AN EMPIRICAL INVESTIGATION OF THE EFFECTS OF EARNINGS PREDICTABILITY AND AUDITOR-CLIENT RELATIONSHIPS ON THE BOND CREDIT MARKET

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(ABSTRACT)

This dissertation explores three current issues relevant to the accounting and business communities by empirically examining the effect these issues have on the bond credit market. The first study examines the effect earnings predictability has on both the initial bond rating and the initial pricing of the issue. Earnings predictability is measured as (1) the annual earnings surprise (actual minus analyst forecast) and (2) the dispersion of initial analyst forecasts. The results indicate a negative association between a lack of earnings predictability and both bond ratings and initial bond price. The results are consistent with creditors interpreting greater earnings variability as a dimension of default risk incremental to the benchmark model. These results add to the existing literature by documenting a favorable benefit in the credit arena for firms that have predictable earnings.

The second study investigates the effect perceived auditor independence has on the rating assigned to newly issued bonds. The magnitude of non-audit service fees is utilized as a proxy for auditor independence. The results of the study document a consistent negative relationship between the level of non-audit fees provided by the external auditor and the bond rating received by the client for new issues. Several non-audit fee measures are used in the study (raw measure, log scaled, asset scaled, unexpected) and each possess a significant negative association with a firm's bond rating. Importantly, no economic effect was discernable in a classification accuracy analysis.

The third study examines what effect, if any, longer auditor tenure has on the client's bond rating. There is some contention that longer auditor tenure can lead to substandard audits either through the auditor's excessive desire to retain the client or through general auditor complacency. However, the issue of auditor tenure is far from one-sided. An alternative view

asserts that longer auditor tenure increases client-specific knowledge and, thus, results in increased audit quality. Results indicate a positive association between auditor tenure and the client's bond rating on new issues suggesting that longer auditor tenure is perceived to be beneficial by bond rating analysts. This is consistent with financial statement users perceiving longer tenured auditors to have more client specific knowledge thus increasing auditor competency and a better audit.

Overall, these results contribute to the existing knowledge-base in accounting by empirically demonstrating how several important issues of interest to the accounting profession are impounded into a firm's bond rating. This research provides a detailed look at how one important group of knowledgeable financial statement users, i.e. bond rating analysts, incorporate several issues that are relevant and important to the professional community.

DEDICATION

This dissertation is dedicated to my family. To my wife Elizabeth, thank you enduring the completion of this process. To my parents, Carol and Gary and my sister, Vanessa thank you for loving and inspiring me through the years. A special dedication is reserved for my grandmother, Mary Ellen. Thanks for all you have done for me.

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1 INTRODUCTION

This dissertation explores three current issues relevant to the accounting and business communities by empirically examining the effects these issues have on the bond credit market. Briefly stated, these issues are (1) the effects of earnings predictability on a firm's bond rating and ultimate cost of debt, (2) the effects of non-audit service fees paid to external auditors on the perception of audit quality, and (3) the effects of auditor tenure on perceived audit quality. Each of these issues is examined with respect to their effects in one of the most important components of our capital market system, the bond credit market.

Firms continually raise more funds each year for new and existing projects through debt issuances than through equity issuances. In 2001 alone, companies raised almost five times ($1,209 billion to $262 billion) as much capital in the bond market versus the equity market (Investment Dealer's Digest 2002). One of the primary drivers of the cost of debt is the rating assigned to each issue (Ziebart and Rieter 1992; Mansi, Maxwell, and Miller 2003). Higher ratings suggest the firm has a lower risk of default and should, *ceteris paribus*, pay a lower effective interest rate on external capital and vice versa. Given the substantial effect bond ratings have on firm capital structure, this provides an excellent setting in which to examine issues relevant to the accounting and business communities. Understanding how a particular issue is treated and addressed in the bond market provides important insight regarding a critical component of our capital market system. This, in turn, affords an opportunity to utilize this

knowledge to advance and improve the accounting profession by modifying laws and regulations regarding the oversight of the profession.

One of the first steps in obtaining a clear understanding of how a particular issue is incorporated into bond ratings is to develop and utilize an appropriate theoretical empirical model of the bond rating process. Models used to explain bond ratings generally incorporate several variables produced by accounting systems and verified by auditors (see Fisher 1959; Kaplan and Urwitz 1979). For example, total assets or sales are used to represent company size; debt to asset ratio is used to represent financial leverage; and income to indicate profitability represent a few of the variables utilized in most accepted bond rating models. With this reliance on accounting information to explain bond ratings, the relationship between the firm and its auditor, as well as the predictability of the information, can potentially have significant effects on the bond rating assigned.

Earnings reported by firms receive substantial attention from investors and researchers and the ability to predict earnings provides important information about the firm (Ball and Brown 1968; Beaver 1968; Collins and Kothari 1989; Hayn 1995). Since earnings represent cash flow (past, future, and present), their predictability can be seen as an extension of the market's ability to assess the probability that a firm will be able to service its debt. A low level of predictability implies an increase in risk which should lead to a lower bond rating. Moreover, meeting or beating earnings forecasts has been a popular subject of academics, managers, and the popular press. Failure to meet forecasts has caused many stocks to tumble and the ability to meet or maintain earnings has been rewarded in the equity market (e.g. Bartov, Givoly, and Hayn 2000). Afleck-Graves, Callahan, and Chipalkatti (2002) find that increased earnings predictability decreases the equity cost of capital for firms with high information asymmetry. Given this research in the equity arena, an important question relates to the effect of earnings predictability on bond ratings. The research presented in Chapter 2 describes these effects.

Chapter 2 contains research that implements a robust and theoretically sound bond rating model to determine if earnings predictability is associated with the initial bond rating issued. The study then examines the extent that earnings predictability is related to the pricing of the issues. Using a sample of new bonds issued from 1990 – 2000, a lack of earnings predictability is found

to be negatively associated with both the initial rating received and the ultimate pricing of the issue. These results document a favorable benefit in the credit market for firms that are able to manage earnings to meet market expectations.

Financial statements, which contain important information used by investors and reasearchers, are produced by accountants and verified by auditors. The auditors provide value to capital markets by providing independent verification of financial statements (Johnstone, Sutton, and Warfield 2001). It is critical to investors, as well as the accounting profession, that auditors maintain their independence and provide objective assessments of client financial statements (Mednick and Previts 1987). Generally accepted auditing standards state that auditors need to be independent in mental attitude for matters relating to the audit.

Importance notwithstanding, no formal theory of auditor independence exists. However, independence is easy to understand in relation to audit quality. DeAngelo (1981) explains audit quality as the joint probability of an auditor discovering an error (competence) and the auditor reporting the error (objectivity). Independence is reflected by objectivity in DeAngelo's definition. Further, independence has two parts that are empirically testable. The first is independence in fact, tested by examining audit failures and discretionary accruals. The second is the perception of auditor independence by financial statement users, which is tested by examining investor reaction to information release.

Recent accounting scandals and perceived audit failures have resulted in criticism of auditors and have led to the questioning of auditor independence and, as a result, audit quality. The Enron bankruptcy in particular has led to changes in regulatory structure (Sarbanes-Oxley) and intense scrutiny of non-audit related fees the auditor collects from clients. Several questions have been raised concerning auditors maintaining independence and, at the same time, collecting large fees from clients for non-audit services (Byran-Low and Opdyke 2002). A tension is created because, while audit firms rely on clients for fees, they also must protect their reputation or suffer consequences (Johnstone, et al. 2001). This issue is addressed in Chapter 3.

Chapter 3 provides results from empirically testing the relationship between perceived auditor independence and firm bond rating. The level of non-audit fees is utilized as a proxy for

auditor independence. While research has shown that the presence of non-audit fees affects investor perception, little has been shown regarding the effects of non-audit fees on decision making. A sample of new bond issues for the period 2001 – 2002 is examined. Using a modified Kaplan and Urwitz (1979) bond rating model, it is shown that the magnitude of non-audit fees are negatively associated with client bond ratings. This is consistent with financial statement users perceiving a lack of independence and/or quality when large amounts of non-audit fees are received by the auditor. While the results are significant, the addition of non-audit fees to the model for classification purposes does not improve accuracy.

Auditor tenure has also received considerable questioning. At the center of the debate is the effect of lengthy auditor-client relationships. Proponents of auditor rotation argue that extended auditor-client relationships can lead to reduced audit quality. Audit quality would suffer if the auditor was under pressure to retain the client or if the auditor becomes complacent, disinterested, or identifies with the client rather than protecting investors. Opponents of mandatory rotation argue that increased auditor-client relationships increase audit quality. They maintain that the longer an auditor audits a client, the more client-specific knowledge the auditor gains and the less reliance is placed on client estimates and representations. Managers generally oppose auditor rotation due to the cost and lost time used to bring auditors up to speed (Dunham 2002). The issue of auditor tenure is addressed in Chapter 4.

The research contained in Chapter 4 examines the effects of auditor tenure on perceived audit quality. This research inspects the auditor-client relationship and documents its effect on the client's bond rating. This research uses a sample of bonds issued from 1990 – 2002 to determine the association between auditor tenure and bond rating. Results show that auditor tenure is positively related to a client's bond rating. This result holds true regardless of the quality of the issue, i.e. investment and non-investment grade. When issues from 2001 – 2002 are examined separately, to determine if there is a change in perception due to Enron and other high profile scandals, auditor tenure continues to be positively related to client bond rating. This is consistent with financial statement users associating longer auditor tenure with increased client-specific knowledge and consequently increased audit quality.

The rest of this dissertation is organized as follows. Chapters 2 through 4 report the findings of each of the three studies. Each chapter includes an introduction, a review of relevant prior literature, a description of research methodology, a summary of results, a discussion of findings, and a reference section. Figures and tables are grouped at the end of each chapter. A conclusion to the dissertation is located in Chapter 5.

1.1 References

Affleck-Graves, J., C. M. Callahan, and N. Chipalkatti. 2002. Earnings predictability, information asymmetry, and market liquidity. *Journal of Accounting Research*. 40 (3): 561-583.

Ball, R., P. Brown. 1968. An empirical evaluation of accounting income numbers. *Journal of Accounting Research.* (Autumn): 159-178.

Bartov, E., D. Givoly, and C. Hayn, 2000, The rewards to meeting or beating earnings expectations. Working Paper, New York University.

Beaver, W. 1968. The information content of annual earnings announcements. *Empirical Research in Accounting: Selected Studies.* Supplement to the *Journal of Accounting Research.* (1968): 67-92.

Bryan-Low, C., and J. D. Opdyke. 2002, How to predict the next fiasco in accounting and bail early, *Wall Street Journal*. (1/24/02). C1.

Collins, D., and S. P. Kothari. 1989. An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. *Journal of Accounting and Economics.* 11(2): 143-182.

DeAngelo, L. E. 1981. Auditor size and audit quality. *Journal of Accounting and Economics.* 3 (3): 183-199.

Dunham, K. J. 2002. Firms that want to switch auditors find it takes time, money and faith. *Wall Street Journal Online* (March15).

Fisher, L. 1959. Determinants of risk premiums on corporate bonds. *Journal of Political Economy.* (June): 217-237.

Hayn, C. 1995. The information content of losses. *Journal of Accounting and Economics.* 20(2): 125-153.

Johnstone, K. M., M. H. Sutton, and T. D. Warfield. 2001. Antecedents and consequences of independence risk: Framework for analysis. *Accounting Horizons*. 15(1): 1-18.

Kaplan, R. S., and G. Urwitz. 1979. Statistical models of bond ratings. *Journal of Business* 52: 231-262.

IDD Inc. 2002. *Investment dealer's digest.* January 7.

Mansi, S.A., W.F. Maxwell, and D.P. Miller. 2003. Does auditor quality and tenure matter to investors? Evidence from the bond market. Working Paper, Virginia Tech.

Mednick, R. and G. J. Previts. 1987. The Scope of CPA Services: A View of the Future from the Perspective of a Century of Progress. *Journal of Accountancy* 163 (5): 220-238.

Ziebart, D. A., and S. A. Reiter. 1992. Bond ratings, bond yields, and financial information. *Contemporary Accounting Research.* 9 (252-282).

2 THE IMPACT OF EARNINGS PREDICTABILITY ON BOND RATINGS AND BOND YIELDS

2.1 Introduction

Substantial attention has been directed towards analyst forecasts and earnings surprises in the accounting literature during the past decade.[1] The ability to meet consensus analysts' forecasts and achieve predictable earnings is often considered a particularly desirable firm attribute.[2] Existing empirical evidence indicates managers behave in a manner consistent with endeavoring to achieve analysts' earnings forecasts, which implies aiming for predictable earnings patterns.[3] An important question relates to the existence of verifiable firm benefits associated with predictable earnings. We investigate this issue by examining the relationship that exists between predictable earnings and bond ratings and bond yields. We provide empirical evidence that firms whose earnings are more predictable have lower costs of debt capital.

The present research examines the influence predictable earnings have on the default risk of the firm as represented by its bond rating. We further investigate the effects of earnings predictability directly on establishing the pricing of the firm's debt. We measure earnings predictability two ways: first, as the difference between the firm's actual earnings and consensus analysts' forecasts, and second, as the dispersion of the individual analysts' forecasts. These measures differ from traditional earnings volatility measures previously utilized in bond rating

[1] See Brown (1997), Healy and Wahlen (1999), Kothari (2001), and Beaver (2002) for reviews.
[2] For example see Bartov, Givoly, and Hayn (2000), Kasnik and McNichols (2002).
[3] Brown (2001).

models in the following important ways. First, our measures do not focus on the past earnings stream itself, but on the ability of that stream to predict future earnings. This distinction is important because a firm might have a fast growing earnings series which has high historical volatility, but also high predictability. Second, our predictability measures are based on analysts' forecasts, as opposed to forecasts derived from a purely mechanical model of earnings, e.g. time series model of earnings. Equity analysts have consistently outperformed models of earnings forecasts that are based solely upon information obtained from past earnings streams (Kothari, 2001). The information set incorporated into analysts forecasts is far richer in its content in that it contains forward looking information that is expected to affect the firm's earnings stream, e.g. corporate restructurings, labor negotiations, R&D expenditures, technology innovations, etc. Comparisons of actual to predicted earnings, with the expectation based on analysts forecasts, provides a more powerful and suitable framework for evaluating earnings predictability than the use of more restricted models that utilize only past earnings levels and deviations from average.

Our results indicate that both the magnitude of a firm's earnings surprise and the individual analyst forecast dispersion are significantly associated with the firm's bond rating. Moreover, we find that specific earnings prediction measures increase bond rating classification accuracy above that of a robust benchmark model. A firm's bond rating is documented to be a critical factor in establishing the interest costs associated with a firm's debt offering.[4] Evidence indicating a positive association between earnings predictability and bond ratings is important because it establishes and identifies the role that earnings predictability plays in establishing the perceived default risk of the firm. In addition to the direct bond rating effect, we provide additional evidence indicating that predictability of a firm's earnings is significantly associated with the offering yield of the firm's debt issues. Our research adds to the existing literature by empirically demonstrating that positive and direct debt market benefits accrue to firms that possess predictable earnings. These direct benefits manifest themselves in the form of higher bond ratings and reduced borrowing costs. This helps to clarify the role of earnings predictability regarding the cost of debt capital. This extends recent research by Affleck-Graves et al. (2002) that examines the effect of earnings predictability on the cost of equity capital, and also research by Sengupta (1998) that examines the role of analyst disclosure scores on the cost of debt capital.

[4] Livingston, Pratt and Mann (1995), Ziebart and Reiter (1992), Allen, Lamy and Thompson (1990).

Bond ratings provide a useful and interesting capital market setting in which to examine the effects of earnings predictability. Earnings information is critical to the fundamental analysis that bond raters undertake when assigning a specific rating to the firm's bonds. Indeed, bond raters utilize various ratio guidelines including some based on profitability that are desirable for a firm to achieve in order to attain a particular bond rating (Standard & Poor's 2002). Thus, given the fundamental importance of predicting future firm earnings on the default risk of a firm's bonds, we hypothesize that expectations regarding a firm's earnings predictability are impounded into the bond rating assigned to the firm.

While the combination of equity and debt markets represent the foundation for raising external capital for business entities in our capital market system, investigating earnings predictability effects' concerning the cost of debt capital differs from the cost of equity capital in several significant aspects. Bondholders are primarily concerned with the default risk of the firm, and correspondingly, the firm's ability to make scheduled interest and principle payments over the life of the bond. Better earnings predictability might signal a higher probability of payment, and hence, lower risk. On the other hand, equity participants are interested in more than a firm's ability to meet minimum traditional payments, i.e. equity cash dividends. Equity holders are typically more interested in the firm's ability to generate positive excess earnings, which translate into higher gains for the shareholder through price appreciation. While both bond holders and equity holders have somewhat similar downside risk, i.e. both could lose their entire investment, they differ dramatically in their upside risk potential. While straight debt holders can hope to, at most, receive interest and principle payments on schedule, equity holders have a virtually unlimited upside potential. This difference in the potential returns distribution metric underlies fundamental differences between debt and equity stakeholders and provides for an important alternative setting in which to examine the effects of earnings predictability. Notwithstanding these fundamental differences in stakeholders, we expect to find the predictability of a firm's earnings to be positively associated with a firm's bond rating and negatively associated with a firm's offering yield.

The remainder of this paper is structured in the following manner. The next section provides a review of the relevant literature and its relation to the topic of interest. Section 3

describes the hypotheses and model development. Section 4 gives details concerning the sample development. Section 5 provides the results and Section 6 ends the paper with a summary.

2.2 Motivation and Literature Review

2.2.1 Analysts Forecasts, Earnings Surprise, and Predictable Earnings

Early empirical accounting research, as well as recent verification, has documented that stock prices move with earnings announcements, possessing both lead and lag effects (Ball and Brown, 1968; Beaver, 1968; Landsman and Maydew, 2002). Research in the past decade has focused more on the degree and effect that earnings surprises have on equity prices. Kinney, Burgstahler and Martin (2000) show that stock prices increase when reported earnings exceed analyst expectations, i.e. a positive surprise, and decrease when a negative surprise occurs. This provides managers incentives to meet or beat earnings expectations. This phenomenon has become so widely embraced by the market that it appears to motivate managers' behavior. Indeed, using IBES earnings estimates, Brown (2001) provides evidence of a trend over the period 1984 to 1999 in which companies have collectively evolved from missing earnings expectations by a small amount to matching expectations, and finally to beating expectations by a small amount. Brown suggests this trend could be attributed to several possible competing interpretations: first, analysts may have become better at predicting earnings over time; second, analyst optimism may be decreasing over time; and third, companies could be getting better at managing their earnings. Brown also reports that the number of analysts following different stocks has increased significantly over this time period which should result in more accurate collective forecasts for individual companies.

Research indicates positive equity market effects for companies that successfully achieve their earnings target, and negative effects for those that fail to achieve the target. Kasznik and McNichols (2002) demonstrate that firms that regularly meet earnings expectations enjoy a significant equity market premium relative to firms that do not meet expectations. This equity premium persists and grows larger over time if firms consistently meet earnings expectations. Similarly, Bartov et al. (2000) find that equity investors reward firms with earnings that meet or beat analysts' estimates by providing a higher return than their peers that fail to do so. Furthermore, the premium associated with meeting or beating earnings expectations appears to

be increasing over time. In a similar spirit, Barth, Elliott and Finn (1999) show that the equity of firms reporting continuous growth in annual earnings is priced at a premium relative to other firms. On the downside, Skinner and Sloan (2002) document that negative effects can also occur for failing to meet analyst earnings predictions. They document the existence of a large negative stock price response for growth stocks that report a negative earnings surprise.

A related stream of concurrent research examines market expectations of earnings and the subsequent release of actual earnings announcements. This research implies that earnings are managed to meet or exceed publicly issued expectations of analysts or management earnings forecasts. DeFond and Park (1997) find evidence that managers 'borrow' earnings from future periods when current earnings are 'poor' and expected future earnings are 'good'. Correspondingly, when current earnings are 'good' and expected future earnings are 'poor', managers 'save' earnings for later use. This helps managers present an earnings stream that is easier to predict. Burgstahler and Eames (1998) also report that firms increase earnings to ensure they do not fall below analysts expectations. Kasznik (1999) finds similar evidence using unexpected accruals to manage earnings upward toward management forecasts. Overall, evidence suggests that managers act in a manner that is consistent with working to report earnings that are growing and/or are consistently predictable.

Francis et al. (2003) examine the effects of earnings quality on a firm's cost of capital and report that firms with lower quality earnings have higher costs of both debt capital and equity capital. Correspondingly, firms with the best earnings quality enjoy substantial market discounts in their costs of debt and their costs of equity relative to firms with the poorest earnings quality. Sengupta (1998) examines the effects of disclosure quality on the cost of debt capital and reports that firms with high disclosure quality ratings from financial analysts have a lower effective interest cost.

The first study (and only one to our knowledge) that empirically examines the effects of predictable earnings on the actual cost of capital is reported by Affleck-Graves, Callahan and Chipalkatti (2002). They provide evidence that the cost of equity capital is greater for NASDAQ stocks with less earnings predictability than for stocks with higher earnings predictability. The authors examine the bid-ask spread for a sample of firms traded on NASDAQ and conclude that

earnings predictability may be a legitimate concern of managers who wish to minimize their cost of equity capital. Our research extends the Affleck-Graves et al. work conducted in the NASDAQ equity market by providing empirical evidence concerning the effects of earnings predictability on the cost of debt capital. We examine this issue here and provide empirical evidence that a firm's earnings predictability is positively associated with its bond rating and negatively associated with its cost of debt capital indicating positive and verifiable firm effects.

2.2.2 Importance of Bond Ratings

Bonds provide an important mechanism by which firms obtain new funds to finance new and continuing activities and projects. The higher the default risk of a particular bond, the higher the interest rate necessary to place the bonds. Firms have typically raised substantially more "new" funds in the bond market each year than in the equity market. For example, in 2001 companies raised $1,209 billion in the bond market compared to $262 billion in the equity market (Investment Dealer's Digest 2002). The assigned rating is very important due to the implications it contains regarding the bond issue. The most immediate implication is the implied effect it has on the subsequent yield. The difference of a single rating category (e.g. Baa vs. Ba) can mean a 130 basis point differential in yield. For a 20 year $400 million bond issue this can result in an additional $60 million in the present value of required interest payments.[5]

In addition to the implications regarding interest yield, there are also many regulatory requirements in the U.S.A. and abroad that are specified in terms of a firm's assigned bond rating. A long list of agencies allow investments to be made only in the top four rating categories (e.g. Aaa, Aa, A, and Baa), typically referred to as "Investment Grade" debt.[6] The fact that regulatory agencies define requirements partially based on independent ratings indicates the importance and degree to which the rating process is ingrained in the market system.

There is also substantial empirical evidence in the finance and accounting literature that establishes the importance and information content of bond ratings and changes in bond ratings.

[5] Discounting yearly interest payments at a six percent rate.
[6] For example, the Federal Reserve Board and the Federal Home Loan Bank System permit their members to invest in corporate debt only with investment grade ratings. The Department of Labor allows pension funds to invest in securities only in top rating categories. In addition, the New York and Philadelphia Stock Exchanges establish margin requirements for mortgage securities depending on their ratings (S&P Corporate Ratings Criteria 2002).

Holthausen and Leftwich (1986), Ederington et al. (1987), and Hand et al. 1993 have all presented convincing evidence over the past two decades that changes in bond ratings have significant effects in both the equity and debt markets. Ziebart and Reiter (1992) empirically demonstrate that bond ratings have a direct affect on bond yields. Goh and Ederington (1993) further examine and analyze stock price reactions to bond rating downgrades. They find that rating downgrades due to an increase in leverage of the firm results in no stock price reaction while downgrades due to deterioration in the firm's prospects results in a negative stock price reaction. Furthermore, analyst's revision of earnings forecasts following ratings downgrades appear to be a reaction to the downgrades themselves (Ederington and Goh 1998). Further research finds that firms receiving rating upgrades outperform firms receiving downgrades by 10 to 14 percent in common stock performance in the year following the bond rating change (Dichev and Piotroski 2001). In addition, they report that current ratings changes predict not only future rating changes, but also changes in the firm's future profitability. These studies show clearly that both the stock and bond markets react in a manner that indicates bond ratings convey important information regarding the value of the firm and its prospects of being able to repay its debt obligations as scheduled.

2.3 Hypotheses and Model Development

2.3.1 Bond Ratings

The modeling of bond ratings and yields has a reasonably long and extensive history. The seminal work in the area was done by Fisher (1959), followed by a series of studies that build on this initial work.[7] Kaplan and Urwitz (KU) (1979) extended this research stream by conducting an extensive examination of alternative bond rating models. One of KU's conclusions was that statistical techniques that exploit the ordinal nature of bond ratings such as probit or logistic regression are theoretically superior and econometrically more sound than methods not designed to handle ordinal dependent variables. A variety of studies have been completed subsequent to KU, but none has proven to be superior[8]. The KU model continues to remain robust in the literature and has been utilized directly or with minor variations in recent

[7] Horrigan (1966), West (1970), and Pinches and Mingo (1973, 1975).
[8] See Ederington (1985), Maher (1987), Reiter and Emery (1991), Maher and Ketz (1993).

research as the primary reference for modeling bond ratings (e.g. Francis et al. 2003, Graham et al. 2001, Sengupta 1998, Shi 2003, Ziebart and Reiter 1992).

We begin with the KU model due to its econometrically sound approach and continued robustness. Our base model requires six independent variables: subordination status of the issue, a measure of firm size, a measure of leverage, a measure of profitability, a measure of income variation, and a measure of firm risk. Based on the work of Maher (1987) and Graham et al. (2001), we enhance the benchmark model to include a net pension variable to incorporate the effects of a firm's defined benefit retirement obligations. Finally, to control for industry effects we include a series of indicator variables representing specific industry groupings.

We address the question of the influence of predictable earnings on the cost of debt by utilizing two measures of earnings predictability based on the work of Imhoff and Lobo (1992), Imhoff (1992), Elliott and Philbrick (1990), and Affleck-Graves et al. (2001). The first measure of predictability utilizes a firm's first consensus annual earnings forecast[9] available from IBES after the prior year's actual earnings have been announced. The standardized absolute forecast error ($SAFE_{i,y}$) is calculated as follows:

$$\text{SAFE}_{i,y} = |(\text{CYF}_{i,y} - \text{AEPS}_{i,y}) / \text{StkPrice}_{i,y}|, \qquad (1)$$

CYF is the consensus analyst yearly earnings forecast, AEPS is the actual earnings per share for the year, and StkPrice is the closing common stock price for firm *i* at the end of fiscal year *y*. The mean absolute forecast error is then calculated as:

[9] Results are reported and tabulated using the mean analysts' consensus earnings forecast. The analysis was also run using the median consensus earnings forecast. The results and primary inferences remain unchanged.

$$EARNSURP_i = (1 / K) \sum_{y=1}^{K} SAFE_{i,y} ,$$

(2)

K equals 3 to 5 years, depending on data availability[10]. EARNSURP provides the relative predictability of each firm's earnings stream.

The second measure represents the amount of dispersion or lack of agreement among analysts when earnings forecasts are made. This measure again utilizes the firm's first consensus annual earnings forecast available from IBES after the prior year's actual earnings have been announced. Following Imhoff (1992) and Imhoff and Lobo (1992), the standard deviation of IBES analysts' forecasts for each firm's earnings is scaled by stock price to measure dispersion:

$$DAF_{i,y} = (\text{Standard Deviation of Analysts Forecast}_{i,y}) / \text{StkPrice}_{i,y}. \quad (3)$$

The mean earnings forecast agreement is calculated in the following way:

$$EARNAGREE_i = 1 / K \sum_{y=1}^{K} DAF_{i,y}, \quad (4)$$

K equals 3 to 5 years of data. This measure represents the relative agreement of individual analysts' forecasts.

These equations provide two measures of earnings predictability, EARNSURP and EARNAGREE, which represent different aspects related to the ease of prediction of a firm's earnings. These measures also differ considerably from the traditional coefficient of variation of net income that we include in the benchmark model. Although the coefficient of variation provides a measure of the volatility of a firm's income over time, it is based solely upon historical earnings. Our two variables provide a measure of the degree of predictability associated with a firm's earnings as compared to analysts' predictions. These analysts'

[10] Over 98% of the sample observations had five full years of data available.

incorporate a great deal of future-looking information into their forecasts, hence our measures differ significantly from the traditional coefficient of variation of net income. The first measure, EARNSURP, is the absolute value of the difference that exists between the firm's actual earnings and mean consensus analysts' forecasts. Stated differently, it is a measure of the degree by which the consensus analyst forecast missed its mark. The larger the error, the more difficult it would appear to be to predict the firm's earnings number. We divide this number by the firm's common stock price at the end of the fiscal year to provide "the unexpected earnings per dollar of common equity".[11] The second measure, EARNAGREE, is developed using the standard deviation of the analysts' earnings forecast. This is a measure of the extent to which analysts can agree on the earnings forecast. A larger dispersion indicates that analysts have widely varying opinions about the firm's earnings, which indicates more difficult earnings to predict. We also standardize this number by the firm's stock price. The surprise is standardized to allow us to examine the relative surprise. We theorize that both the earnings surprise measure and the dispersion of analysts' forecasts measure will be negatively associated with the firm's bond rating.

These two measures of earnings predictability are added one at a time to the benchmark bond rating model to determine the significance of the measures in the bond rating process. The dependant variable (RATING) is the rating assigned to a specific debt issue by Moody's Investment Services. The basic estimation model[12] takes the following form:

$$RATING_j = \beta_0 + \beta_1 SUB_j + \beta_2 TOTASSET_j + \beta_3 LTDEBT_j + \beta_4 BETA_j + \beta_5 NETINC_j + \beta_6 NETPEN_j + \beta_7 CVNI_j + \beta_8 (Earnpred)_j + \beta_9 INDUSTRY_j + \upsilon_j \quad (5)$$

We include the following explanatory variables for our prediction model: the subordination status of the issue (SUB), log total assets (TOTASSET), long term debt/total assets (LTDEBT), the firm's common stock market beta (BETA), and net income from operations/total assets (NETINC). We also include the firm's pension obligation minus the fair market value of pension plan assets to represent the net pension liability (asset) position of the firm (NETPEN)

[11] Imhoff and Lobo (1992)
[12] Interest coverage is not included in either the rating or the yield model. This variable never attained a level of statistical significance and is not included for brevity.

standardized by total assets to adjust for size effects. The last control variable included is the coefficient of variation of a firms' operating income (CVNI). This variable is the standard deviation of operating income from the previous five years divided by the five year average of operating income. The bond ratings are coded so that the highest rated bonds (Aaa) are placed in the highest ordinal category. Thus, our expectation is that the coefficients of TOTASSET and NETINC will be positively associated with RATING, while SUB, LTDEBT, BETA[13], and NETPEN will be negatively associated. The TOTASSET, LTDEBT, NETPEN, NETINC and CVNI variables are all five-year averages. These averages are calculated using the five years of financial data preceding the bond issuance. The Earnpred variable is used to represent each of the two earnings predictability variables, EARNSURP and EARNAGREE, described previously.

In order to control for possible industry effects, Equation (5) includes indicator variables (0,1) for each one-digit SIC code group represented in the sample. This process resulted in seven different SIC groups. An industry dummy (0,1) is added as an independent variable to the benchmark model for six (i.e. n-1) groups.[14] This procedure has been utilized in the accounting and finance literature to control for industry (e.g. see Bradley, Jarrell and Kim 1984; Morck, Shleifer and Vishny, 1988; Graham et al. 2001) and year effects (see Collins and Kothari 1989; Barth, McNichols and Wilson 1997). The earnings predictability measures (EARNSURP and EARNAGREE) are added individually to the benchmark bond rating model to determine if either of them is associated with the rating assigned by the bond rating analysts. Finally, both measures are added to the benchmark model at the same time to determine whether they represent different, but important, aspects of a firm's earnings predictability.

2.3.2 Classification Accuracy

An alternative approach to examining the importance of an independent variable is to measure the improvement in classification accuracy that results when the variable is added to a base model. An increase in classification accuracy due to the addition of an earnings prediction measure provides support for the theory that the level of predictability of a firm's earnings is associated with the bond rating process. A jackknife approach is utilized here, in which one

[13] Beta is obtained directly from the CRSP database. CRSP calculates decile betas using the Scholes and Williams (1977) calculation.

[14] The analyses were also rerun without the industry indicator variables. The results were unchanged with respect to the primary findings and inferences.

observation at a time is withheld from the sample. The logistic model is then estimated and used to classify the holdout observation. The logistic model computes the probabilities that an observation will fall into each of the bond rating categories. The observation is assigned to the bond-rating category with the highest predicted probability. These predictions are compared to the actual bond rating assigned to the issue to calculate classification accuracy for the model.

2.3.3 Bond Yields

While bond ratings are established by a committee process within the respective rating organization (e.g. Moody's, Standard & Poor's or Fitch), the bond yield is ultimately determined by an alternative process in the marketplace. To investigate the direct effect of the earnings predictability measures variables on the actual bond yield, we utilized a model developed based on the work of Ederington et al. (1987), Lamy and Thompson (1988), and Allen et al. [15] (1990), where:

$$YLDPREM_j = \beta_0 + \beta_1 SIZELN_j + \beta_2 CALL_j + \beta_3 IVOL_j + +\beta_4 BOND1_j + ...+ \beta_8 BOND5_j + \beta_9 (Earnpred)_j + \upsilon_j \quad (6)$$

Predicted Sign	Variable
	YLDPREM = the yield premium which is the absolute yield premium or the yield to maturity of an issue minus the yield on a U.S. Treasury issue with a comparable maturity at the time of issue.
+	SIZELN = natural log of the issue size;
+	CALL = ratio of years to call divided by years to maturity;
+	IVOL = volatility of the prior ten days of the U.S. Treasury constant maturity index;
-	Bond default risk variables ($Bond_1$ to $Bond_4$) are indicator variables to represent each of the five (i.e. n-1) major bond rating categories (i.e. Aaa, Aa, A, Baa, or Ba);

[15] A sinking fund variable representing the effects of any required schedule payments into a designated payment fund has been utilized in some prior literature, e.g. Lamy and Thompson (1988) and Allen et al. (1990), but this feature was phased out by corporations in the late 1980's. Thus, it is not necessary (or possible, due to the disappearance of the feature) to incorporate a sinking fund variable in the yield model.

+ Earnpred = earnings prediction variables (i.e. EARNSURP and EARNAGREE as defined previously).

Similar to the work of Ederington et al. (1987), Lamy and Thompson (1988), and Allen et al. (1990) we represent the bond ratings as a series of binary indicator variables. This method of incorporating bond ratings into the bond yield model allows for unequal risk premiums across rating classes, i.e. the risk premium difference between Aaa and Aa rated bonds may be different than that between Baa and Ba. Prior research (e.g. Ederington et al.,1987; and Ziebart and Reiter, 1992) documents the existence of unequal risk premiums across different rating classes. This holds true for the current sample as well. Our expectation is that each of the earnings predictability measures will be positively associated with the bond yield. The larger the earnings surprise (or dispersion of analysts forecasts), the riskier the bond is considered, and thus, the higher the yield will need to be to compensate.

2.4 Sample and Descriptive Statistics

Our dataset was developed by first obtaining all new bond issues rated by Moody's during the period January 1, 1990 through December 31, 2000 and matching these with data from publicly available databases to obtain all the variables necessary to estimate the model equations. The bond-issue related information (i.e. bond yield, bond rating, subordination status, call protection, size of issue) were obtained from the Thompson Financial database. The majority of the control variables for the bond rating model were obtained from the Compustat database through the Wharton WRDS system (i.e. total assets, operating income, longterm debt, net pension variable), except for Beta which was obtained from the CRSP database. The interest volatility data were obtained from the Federal Reserve web site (www.federalreserve.gov). Finally, the data to construct the earnings surprise and predictability measures were obtained from the IBES database. The final sample numbered 1,768 observations with complete data.

Descriptive statistics regarding the sample are provided in Panel A of Table 1 and variable definitions are shown in Panel B of Table 1. The descriptive statistics show that the minimum earnings surprise measure is close to zero (.00009), and the maximum earnings

surprise measure is .84 when scaled by stock price. Similarly, the scaled earnings forecast dispersion measure has a minimum of zero and a maximum of .12. These measures indicate that long term earnings streams are not entirely predictable. Table 2 provides the bivariate correlations that exist between the data items. The pairwise correlations between the variables in the benchmark model are relatively low (0.00 to 0.28), indicating they represent distinct measures of default risk. NETINC is relatively highly correlated with both earnings predictability variables, which is not unexpected because the predictability variables are ultimately related to net income. CVNI is also moderately correlated with the earnings surprise measures, but the correlations are low enough (.37 and .34) to indicate that our earnings surprise measures are not subsumed by CVNI and represent different measures of predictability. No other variable is closely correlated with the earnings predictability variables (.00 to .11). The two earnings predictability measures utilized are relatively closely related which is to be anticipated because they represent proxies for two aspects that, although different are nonetheless associated with the predictability of a firm's earnings stream.

2.5 Results and Discussion

2.5.1 Bond Ratings

The results of the logistic regression analyses for the bond rating model (Equation 5) are shown in Table 3. The first column (Model 1) displays the benchmark model, while the other columns include the earnings predictability measures. The models are all significant at the .0001 level with Likelihood Ratios in excess of 1600 and model c of at least .78 indicating a robust job of modeling the bond rating process. The primary control variables (TOTASSET, SUB, LTDEBT, OPINC, and NETPEN) are significant at the .0001 level with proper signs in all models. BETA which is significant at a reduced level, but with an improper sign and CVNI is marginally significant in three of the four models.

The most essential elements of the table for our research relate to the earnings predictability measures incorporated into Models 2, 3 and 4. Importantly, both the mean earnings surprise measure (EARNSURP, Chi-Square= 107.01) and the deviation of analysts forecasts measure (EARNAGREE, Chi-Square= 112.02) are each found to be significant at the .0001 level when added individually to the base model. Furthermore, each of the two earnings predictability

measures is also found to be significant when they are added to the base model together (EARNSURP, Chi-Square= 23.54; EARNAGREE, Chi-Square= 43.51), indicating they each appear to represent a separate dimension of earnings predictability that is relevant to the bond rating process.

The results shown in Table 3 are consistent with expectations developed based on prior research, except BETA possesses an improper sign[16]. The use of the firm's common stock market Beta to model bond ratings has resulted in inconsistent findings in prior literature. While Kaplan and Urwitz (1979) found it to be a significant variable for their sample, Graham et al. (2001) and Maher (1996) did not find it to be consistently associated with bond ratings with the proper sign in their more recent samples. All of the other individual firm-related independent variables are found to possess the correct sign and be highly associated with the firm's bond rating.

These results are consistent with the interpretation that the degree of a firm's earnings predictability is an important factor in determining a firm's bond rating. That is, the more predictable a firm's earnings, the higher (better) the firm's bond rating. These results hold true for both the absolute mean analysts' earnings surprise and the standard deviation of analysts' forecasts. The fact that each measure remains significant when both are included in the same model at the same time provides some evidence that each of these two variables represent different aspects of earnings predictability, and each represent different dimensions of default risk that are incorporated into a firm's bond rating. To investigate the effects of these earnings predictability measures on bond ratings further, we examine the incremental effect each variable has on bond rating prediction accuracy.

2.5.2 Bond Rating Classification Accuracy

The results of classification accuracy, shown in Table 4, provide an alternative way of viewing the association of various earnings predictability measures with the bond rating process. This approach to examining the incremental importance of additional variables investigates the

[16] To investigate this finding further, an alternative method was utilized to estimate Beta. It entailed using the Scholes-Williams formula and substituting monthly returns (to control for nonsynchronous trading) for daily returns and estimating Beta over a 60 month period. This estimation of Beta is not significant in the logistic estimation and does not alter the primary results of the paper.

degree to which an added variable increases the classification percentage. The benchmark model, which includes the industry-control variables, performs well when compared to models from the bond rating literature. These models correctly predict between 60 and 66% of their samples. Our benchmark model, utilizing a jackknife logistic regression procedure, successfully classifies 68.03% of the sample, indicating a robust model.

The addition of the earnings predictability measures does increase the predictive accuracy of the model. The highest classification accuracy results are obtained from individually adding EARNSURP and provide an overall classification rate of 70.06%. The individual addition of EARNAGREE to the benchmark model performs somewhat similarly, but not quite as well, with slightly lower classification accuracy (69.67%). When both earnings prediction measures are added to the benchmark model at the same time, the classification results (70.01%) do not exceed those obtained when EARNSURP was added individually to the benchmark model. Overall, these classification results further corroborate the primary analyses and support the theory that earnings predictability measures appear to be a significant factor in the bond rating decision process.

2.5.3 Bond Yields

While the rating of a new bond issue is the result of a detailed analysis performed by a rating agency, the actual bond yield is determined by bond market participants. Although research has documented that bond ratings influence bond yields, the actual pricing of the firm's bond is determined by a variety of factors determined collectively by the bond market. Specific insights into this dynamic pricing process can be obtained by examining the pricing results of the issuance itself. The regression results of estimating Equation 6 are provided in Table 5. Model 1 shows the results of the benchmark bond yield model, while Models 2 through 4 illustrate the effects of adding the earnings prediction measures.

All but one of the control variables are significant at the .0001 level with the correct signs in all models; the interest volatility measure (INTVOL), on the other hand, is only marginally significant in several models. The bond rating indicator variables (Aaa, Aa, A, Baa, and Ba) all prove to be highly significant and, consistent with extant literature, substantiate that the firm's bond rating remains an important factor in determining the ultimate pricing of the bond.

The most relevant aspects of Table 5 for our study relate to the earnings prediction variables added to the models[17]. Each of the individual measures (EARNSURP and EARNAGREE) demonstrates its importance in the bond yield process at the .0001 level when added individually to the benchmark yield model. Furthermore, each of the measures retains its high significance level when they are put into the model together, although the EARNAGREE variable appears to be somewhat more significant in explaining the pricing process (EARNSURP t= 3.45; EARNAGREE t=6.09). These results are consistent with the belief that the magnitude of the earnings surprise, and the standard deviation of the analysts' earnings forecast, are significant factors in establishing the ultimate pricing of a firm's bond issue.

An important aspect of this analysis is that each measure of earnings prediction appears to represent a different dimension of riskiness impounded in the bond yield. The absolute mean earnings surprise represents the degree to which analysts missed the actual earnings announcement representing analysts' ability to precisely estimate the firm's yearly earnings. Our results indicate that this degree of uncertainty regarding actual earnings is captured in the pricing of the firm's bond. The second earnings prediction measure represents the degree to which analysts agree among themselves about the earnings estimate. The larger the dispersion among the analysts as to the firm's earnings estimate, the more difficult it would appear to be to predict the firm's earnings. In combination, the significance of these alternative measures provides strong evidence that earnings predictability plays a significant role in establishing a bond's yield.

2.5.4 Robustness Checks

We conducted several additional robustness checks to ensure the results were not unduly affected by some subset of the sample. First, we limited the sample to those observations for which there were a minimum of five analysts providing earnings forecasts for the firm, and the analyses were rerun. We also restricted the sample to those observations that included a full five years for the earnings predictability measures. In addition, the bond yield analysis was conducted using the relative yield premium as the dependant variable instead of the absolute yield premium. Finally, the sample was broken into subgroups of years (i.e. 1990-1993; 1994-1997; 1998-2000)

[17] The variance inflation factors for the variables of interest are less than 2. Convention suggests that VIFs in excess of 10 require considering multicollinearity when interpreting relations. The condition indices (none above 15) are well below theoretical thresholds of 30 (Hair, Anderson, Tatham, and Black 1998).

and the analyses run separately for each group. Our main results and primary inferences remained unchanged throughout all the additional analyses. Both earnings prediction variables are found to be significant in the bond rating model as well as in the bond yield model indicating that the degree of predictability of a firm's earnings represents an important factor in both the establishment of the firm's bond rating and the determination of the ultimate price the market will pay for the firm's bonds.

2.6 Summary and Conclusion

This study examines the extent to which earnings predictability plays a role in establishing a firm's cost of debt capital as measured by its influence on both the bond rating process and the actual pricing of the firm's debt. We find that each of two separate measures of earnings predictability are significantly associated with a firm's cost of borrowing. The measures we utilize represent the average earnings surprise that exists with respect to the consensus analysts' forecasts and the dispersion of the analysts' forecasts. We examine the influence each of these predictability measures have on establishing a firm's bond rating and find a significant negative association for each predictability variable. In addition, we find that the addition of the earnings predictability measures increases the classification accuracy of a robust bond rating prediction model.

We also examine the effects these two predictability measures have on the actual pricing of the firm's bonds. The empirical analyses indicate that each of the two measures is positively associated with bond yield. Our results are consistent with the hypotheses that the predictability of a firm's earnings plays a significant role and has a direct impact on both the establishment of the bond rating by the independent rating agency, as well as in determining the yield for the firm's bonds in the marketplace. Taken together, these results provide compelling evidence that the degree of predictability of a firm's earnings is an important factor in determining a firm's cost of debt capital. We conclude this from the effect a firm's earnings predictability has on establishing the rating of a firm's bonds, as well as its direct effect in determining the bond yield.

These findings extend the findings of Affleck-Graves et al. (2002), who empirically demonstrate that predictable earnings is a desirable firm attribute that results in positive equity

cost of capital effects for firms listed on the NASDAQ. These results also extend the work of Sengupta (1998), who describes the effects of analysts' disclosure scores on the cost of debt capital. Our results indicate that predictable earnings have positive and direct debt market benefits that manifest themselves in the form of higher bond ratings and a lower cost of debt capital. The implications of these findings are important for researchers and practitioners interested in the effects of earnings predictability on the cost of capital. These results should also be of importance to those interested in the earnings predictability phenomenon and its potential effects on the value of the firm.

2.7 REFERENCES

Affleck-Graves, J., C. M. Callahan, and N. Chipalkatti, 2002, Earnings predictability, information asymmetry, and market liquidity. *Journal of Accounting Research* Vol. 40 (3): 561-583.

Allen, D., R. Lamy, and G. R. Thompson, 1990, The self registration of debt and self selection bias. *Journal of Finance* 45 (1): 275-287.

Ball, R., and P. Brown, 1968, An empirical evaluation of accounting income numbers. *Journal of Accounting Research* 6: 159-178.

Baran, A., J. Lakonishok, and A. R. Ofer, 1980, The value of general price level adjusted data to bond ratings. *Journal of Business Finance and Accounting* 7: 135-149.

Barth, M. E., J. Elliott, and M. Finn, 1999, Market rewards for increasing earnings patterns. *Journal of Accounting Research* 37 (2): 387-413.

Barth, M. E., M. F. McNichols, and P. Wilson, 1997, Factors influencing firm's disclosures and evironmental liabilities. *Review of Accounting Studies* 2: 35-64.

Bartov, E., D. Givoly, and C. Hayn, 2000, The rewards to meeting or beating earnings expectations. *Working Paper*.

Beaver, W. H., 1968, The information content of annual earnings announcements. *Journal of Accounting Research* 6: 67-92.

---, 2002, Perspectives on recent capital market research. *The Accounting Review* 77 (2): 453-474.

Bradley, M., G. A. Jarrell, and E. H. Kim, 1984, On the existence of an optimal capital structure: Theory and evidence. *Journal of Finance* 39 (3): 857-878.

Brown, L. D., 1997, Earnings surprise research: Synthesis and perspectives. *Financial Analysts Journal* (March/April): 13-19.

---, 2001, A temporal analysis of earnings surprises: Profits vs losses. *Journal of Accounting Research* 39 (2): 221-241.

Burgstahler, D., and I. Dichev, 1997, Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24 (1): 99-126.

Burgstahler, D., and M. Eames, 1998, Management of earnings and analyst forecasts. *Working Paper*.

Collins, D. W., and S. P. Kothari, 1989, An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. *Journal of Accounting and Economics* 11 (2-3): 143-181.

Dechow, P., and D. Skinner, 2000, Earnings management: Reconciliing the views of accounting academics, practitioners, and regulators. *Accounting Horizons* 14 (2): 235-250.

DeFond, M. L., and C. W. Park, 1997, Smoothing income in anticipation of future earnings. *Journal of Accounting and Economics* 23 (2): 115-139.

Ederington, L. H., 1985, Classification models and bond ratings. *Financial Review* 20: 237-262.

Ederington, L. H., J. B. Yawitz, and B. E. Roberts, 1987, The informational content of bond ratings. *Journal of Financial Research* 10: 211-226.

Ederington, L. H., and J. C. Goh. 1998. Bond rating agencies and stock analysts: Who knows what when? *Journal of Financial and Quantitative Analysis* 33 (4): 569-585.

Elliott, J., and D. Philbrick, 1990, Accounting changes and earnings predictability. *The Accounting Review* 65 (1): 157-174.

Fisher, L., 1959, Determinants of risk premiums on corporate bonds. *Journal of Political Economy* (June): 217-237.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2003, The market pricing of earnings quality. *Working Paper* Duke University.

Glascock, J. L., W. N. Davidson III, and G. V. Henderson, 1987, Announcement effects on moody's bond rating changes on equity returns. *Quarterly Journal of Business and Economics* 26: 67-78.

Goh, J. C., and L. H. Ederington, 1993, Is a bond rating downgrading bad news, good news, or no news for stockholders? *Journal of Finance* 48: 2001-2008.

Graham, A., J. J. Maher, and W. D. Northcut, 2001, Environmental liability information and bond ratings. *Journal of Accounting, Auditing and Finance* 16: 93-116.

Hair, J., R. Anderson, R. Tatham, and W.Black, 1998, Multivariate Data Analysis. 5th edition. Upper Saddle River, New Jersey, Prentice Hall.

Hand, J. R., R. W. Holthausen, and R. W. Leftwich, 1993, The effect of bond rating agency announcements on bond and stock prices. *Journal of Finance* 47: 733-752.

Healy, P. M., and J. M. Wahlen, 1999, A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13 (4): 365-383.

Holthausen, R. W., and R. W. Leftwich, 1986, The effect of bond rating changes on common stock prices. *Journal of Financial Economics* 17: 57-90.

Horrigan, J. O., 1966, The determination of long term credit standing with financial ratios. *Journal of Accounting Research* (supplement): 44-62.

IDD, 2002 Investment dealers digest. January 8, 2002: 43-49.

Imhoff, E., 1992, The relation between perceived accounting quality and economic characteristics of the firm. *Journal of Accounting and Public Policy* 11 (2): 97-118.

Imhoff, E., and G. Lobo, 1992, The effect of *ex ante* earnings uncertainty on earnings response coefficients. *The Accounting Review* 67 (2): 427-439.

Iskander, M. E., and D. R. Emery, 1994, An empirical investigation of the role of indenture provisions in determining bond ratings. *Journal of Banking and Finance* 18: 93-111.

Kaplan, R. S., and G. Urwitz, 1979, Statistical models of bond ratings. *Journal of Business* 52: 231-262.

Kasznik, R., 1999, On the association between voluntary disclosure and earnings management. *Journal of Accounting Research* 37 (1): 57-81.

Kasznik, R., and M. McNichols, 2002, Does meeting earnings expectations matter? Evidence from analyst forecast revisions and share prices. *Journal of Accounting Research* 40 (3): 13-19.

Kinney, W., D. Burgstahler, and R. Martin, 2000, The materiality of earnings surprise. *Working Paper*.

Kothari, S. P., 2001, Capital markets research in accounting. *Journal of Accounting and Economics* 31 (1-3): 105-231.

Lambert, R. A., 2001, Contracting theory and accounting. *Journal of Accounting and Economics* 32 (1-3): 3-87.

Lamy, R., and G. R. Thompson, 1988, Risk premia and the pricing of primary issue bonds. *Journal of Banking and Finance* 39: 857-878.

Landsman, W. R., and E. Maydew, 2002, Has the information content of quarterly earnings announcement declined in the past three decades? *Journal of Accounting Research* 40 (3): 797-808.

Livingston, M., H. Pratt, and C. Mann, 1995, Drexel, Burnham, Lambert's debt issues. *Journal of Fixed Income* 4: 58-75.

Maher, J. J., 1987, Pension obligations and the bond credit market: An empirical analysis of accounting numbers. *The Accounting Review* 62: 785-798.

---, 1996, Perceptions of postretirement benefit obligations by bond rating analysts. *Review of Quantitative Finance and Accounting* 6 (1): 79-94.

Maher, J. J., and J. E. Ketz, 1993, An empirical investigation of the measurement of pension obligations by bond rating analysts. *Advances in Accounting* 11: 83-103.

Morck, R., A. Shleifer, and R. W. Vishny, 1988, Managment ownership and market valuation: An empirical analysis. *Journal of Financial Economics* 20 (1): 293-315.

Perry, S., and T. Williams, 1994, Earnings management preceding management buyout offers. *Journal of Accounting and Economics* 18: 157-179.

Pinches, G. E., and K. A. Mingo, 1973, A multivariate analysis of industrial bond ratings. *Journal of Finance* 28: 1-18.

Pogue, T. F., and R. M. Soldofsky, 1969, What's in a bond rating? *Journal of Finance and Quantitative Analysis* 4: 201-228.

Pulliam, S., and R. Buckman, 2002, Microsoft, sec discuss settling allegations firm massaged results, The Wall Street Journal (New York).

Reiter, S. A., and D. R. Emery, 1991, Estimation issues in bond-rating models. *Advances in Quantitative Analysis of Finance and Accounting* 1: 147-163.

Sengupta, P. 1998, Corporate disclosure quality and the cost of debt. *The Accounting Review* Vol. 73 (4): 459-474.

Shi, C. 2003, On the trade-off between the future benefits and riskiness of R&D: a bondholders' perspective. *Journal of Accounting & Economics* 35: 227-254.

Skinner, D. J., and R. G. Sloan, 2002, Earnings surprises, growth expectations, and stock returns: Don't let an earnings torpedo sink your portfolio. R*eview of Accounting Studies* 7 (2-3): 289-312.

Standard & Poor's, 2002, Corporate Rating Criteria

Teoh, S. H., I. Welch, and T. J. Wong, 1998, Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics* 50 (1): 63-99.

Teoh, S. H., T. J. Wong, and G. R. Rao, 1998, Are accruals during initial public offerings opportunistic. *Review of Accounting Studies* 3: 175-208.

West, R. R., 1970, An alternative approach to predicting corporate bond ratings. *Journal of Accounting Research* 8: 118-125.

Ziebart, D. A., and S. A. Reiter, 1992, Bond ratings, bond yields, and financial information. *Contemporary Accounting Research* 9 (252-282).

2.8 TABLES

Table 2-1 Descriptive Statistics and Variable Definitions

Panel A: Descriptive Statistics (n=1,768)

Variable		Mean	Std Dev.	Median	Minimum	Maximum
TOTASSET	~	8.73	1.26	8.66	3.96	12.39
SUB		.02	.14	0	0	1.00
LTDEBT	*	.24	.12	.23	.004	1.56
NETINC	*	.05	.034	.05	-.15	.21
BETA		1.04	.39	1.02	-.62	2.93
SNETPEN5	*	-.03	.05	-.016	-.50	.21
CVNI		.69	4.74	.39	-47.32	81.15
INVOL		.06	.03	.05	.01	.18
LOGISSUE		4.67	1.27	5.01	0	7.13
CALLPRO		.78	.46	1.00	0	7.49
EARNSURP		.01	.03	.004	.00009	.84
EARNAGREE		.004	.01	.002	0	.12

~ In millions

* Scaled (divided) by Total Assets

Panel B: Variable Definitions

RATING	Moody's bond rating with highest (best) rating assigned highest number.
YLDPREM	Difference between the yield to maturity and the treasury yield divided by 100.
SIC10S-80S	Series of indicator variables to represent 1-digit SIC classification of the issuer.
TOTASSET	Natural log of 5-year average of total assets.
SUB	Indicator variable set equal to 1 if the bond is subordinated, 0 otherwise.
LTDEBT	5-year average of long-term debt scaled by 5-year average of total assets.
NETINC	5-year average of Operating Income scaled by 5-year average of total assets.
BETA	Firm's common stock beta from CRSP database.
NETPEN	5-year average of net pension liability (asset) of a company calculated by subtracting the pension assets of the firm from the pension obligations and then scaling by the 5-year average of total assets.
INTVOL	Yield volatility of 10-year treasury note for ten days preceding the issuance.
LOGISSUE	Natural log of the bond issue monetary amount.
CVNI	The 5-year standard deviation of a firm's operating income divided by the 5-year average of operating income.
CALLPRO	Number of years bond issue is protected from a firm call, divided by number of years to maturity.
EARNSURP	5-year average earnings surprise calculated as absolute value of difference between actual annual earnings and first mean annual forecast available after prior year's earnings are reported; scaled by stock price.
EARNAGREE	5-year average dispersion of analysts forecasts calculated as the standard deviation of analysts forecast; scaled by stock price.

Table 2-2 Spearman and Pearson Correlation Coefficients

	TOTASSET	SUB	LTDEBT	NETINC	BETA	NETPEN	CVNI	INTVOL	LOGISSUE	CALLPRO	EARNSURP	EARNAGREE
TOTASSET		-.15***	-.03	-.10***	.11***	-.14***	.03	-.02	.36***	.03	-.10***	-.10***
SUB	-.16***		.16***	-.13***	.07***	.05**	.03	.01	.00	-.12***	.11***	.08***
LTDEBT	-.10***	.32***		-.26***	.04*	.22***	.09***	.02	.02	-.04	.06***	.01
NETINC	-.09***	-.17***	-.30***		-.10***	-.16***	-.48***	.02	.03	.05**	-.55***	-.53***
BETA	.06***	.10***	.07***	-.09***		.09***	.10***	.00	-.06***	.06***	-.06***	-.05**
NETPEN	-.06***	.04	.14***	-.07***	.15***		.08***	.00	-.07***	-.05**	-.01	-.03
CVNI	-.04*	.07***	.00	-.06**	.01	.02		.04*	-.08***	-.06**	.37***	.34***
INTVOL	.01	.01	.00	.04	.01	.02	.00		-.01	.00	01	.01
LOGISSUE	.27***	.04	.01	.04	-.03	.01	.00	-.04*		-.20***	.01	.00
CALLPRO	.04*	-.08***	-.05**	.02	.12***	-.04	.00	.01	-.28***		-.06**	-.05**
EARNSURP	-.03	.10***	.06***	-.33***	.04*	.06**	-.02	-.02	.03	-.02		.91***
EARNAGREE	-.02	.10***	.07***	-.38***	.07***	.06**	-.02	-.01	.02	-.01	.65***	

(Spearman correlations on top diagonal, with Pearson correlations on lower diagonal.)

* indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

Table 2-3 Bond Rating Model Logistic Regression Results

Results of logistic regressions based on bond-rating prediction model including industry indicators (coefficients not shown). (n=1,768)

Variable (expected sign)	Model 1	Model 2	Model 3	Model 4
SUB (-)	-3.72 (72.06) [<.0001]	-4.71 (98.95) [<.0001]	-4.53 (99.05) [<.0001]	-4.88 (107.23) [<.0001]
TOTASSET (+)	.97 (563.64) [<.0001]	1.00 (589.35) [<.0001]	1.00 (586.45) [<.0001]	1.00 (587.21) [<.0001]
LTDEBT (-)	-6.35 (215.08) [<.0001]	-7.05 (249.67) [<.0001]	-6.84 (240.12) [<.0001]	-7.01 (248.73) [<.0001]
NETINC (+)	40.52 (568.07) [<.0001]	32.55 (326.76) [<.0001]	33.85 (368.00) [<.0001]	32.54 (334.25) [<.0001]
BETA (-)	.32 (7.93) [.0049]	.33 (8.24) [.0041]	.35 (9.46) [.0021]	.35 (9.43) [.0021]
NETPEN (-)	-4.47 (25.72) [<.0001]	-4.11 (21.66) [<.0001]	-4.19 (22.55) [<.0001]	-4.14 (22.03) [<.0001]
CVNI (-)	-.01 (1.17) [.2786]	-.02 (3.62) [.0569]	-.02 (3.03) [.0819]	-.02 (3.79) [.0516]
EARNSURP (-)		-31.41 (107.01) [<.0001]		-11.78 (23.54) [<.0001]
EARNAGREE (-)			-84.14 (112.02) [<.0001]	-61.383 (43.51) [<.0001]
Model Likelihood Ratio	1643.60	1760.41	1754.48	1776.22
Model P-value	<.0001	<.0001	<.0001	<.0001
Pseudo R^2	.6053	.6305	.6293	.6338
Model c	.78	.787	.783	.788

*Variable Definitions provided in Panel B of Table 1. Regression coefficients provided with Wald's Chi-Square (in parentheses) and p-values [in brackets].

Table 2-4 Bond Rating Classification Results

Benchmark model, controlling for industry effects with and without earnings predictability estimates added individually.	
	n = 1,768
Earnings Predictability Measure	**Classification Accuracy**
Benchmark model	68.03%
+ EARNSURP	70.06%
+ EARNAGREE	69.67%
+ EARNSURP + EARNAGREE	70.01%

(Variable Definitions provided in Table 1)

Table 2-5 Bond Yield Model Regression Results

Results of OLS regressions with indicator variables to denote bond rating. (n=1,768)

Variables (Expected Sign)	Model 1	Model 2	Model 3	Model 4
Aaa (-)	-3.01 (-20.69) [<.0001]	-2.68 (-18.18) [<.0001]	-2.69 (-18.54) [<.0001]	-2.61 (-17.81) [<.0001]
Aa (-)	-2.78 (-26.21) [<.0001]	-2.46 (-22.37) [<.0001]	-2.48 (-23.08) [<.0001]	-2.40 (-21.92) [<.0001]
A (-)	-2.57 (-26.08) [<.0001]	-2.27 (-22.26) [<.0001]	-2.31 (-23.29) [<.0001]	-2.23 (-22.01) [<.0001]
Baa (-)	-2.17 (-21.86) [<.0001]	-1.91 (-18.73) [<.0001]	-1.96 (-19.78) [<.0001]	-1.88 (-18.65) [<.0001]
Ba (-)	-0.80 (-6.44) [<.0001]	-0.63 (-5.15) [<.0001]	-0.71 (-5.88) [<.0001]	-0.65 (-5.36) [<.0001]
SIZELN (+)	0.06 (4.70) [<.0001]	0.05 (4.61) [<.0001]	0.05 (4.57) [<.0001]	.05 (4.56) [<.0001]
CALL (-)	-0.21 (-6.50) [<.0001]	-0.22 (-6.96) [<.0001]	-0.23 (-7.21) [<.0001]	-0.23 (-7.26) [<.0001]
IVOL (+)	0.67 (1.39) [.1637]	0.80 (1.70) [.0893]	0.73 (1.56) [.1193]	0.78 (1.67) [.0955]
EARNSURP (+)		4.55 (8.71) [<.0001]		2.22 (3.45) [.0006]
EARNAGREE (+)			21.06 (10.09) [<.0001]	15.75 (6.09) [<.0001]
Adj R-square	.4435	.4652	.4723	.4755

*Variable Definitions provided in Panel B of Table 1. Regression coefficients provided with t-statistic (in parentheses) and P-values [in brackets].

3 NON-AUDIT FEES, AUDITOR INDEPENDENCE, AND BOND RATINGS

3.1 INTRODUCTION

Recent accounting scandals and perceived audit failures have resulted in criticism of the accounting and auditing professions in the financial press for their alleged role in allowing these situations to evolve. Part of this denunciation has been leveled at firms' external auditors and expresses disdain at the presumably substandard work that was completed for their audit clients ostensibly at the expense of the public good. This has spawned an exceptional amount of interest in the accounting and auditing profession with substantial scrutiny being directed upon auditor independence issues. The Securities and Exchange Commission issued Final Rule S7-13-00, *Revision of the Commission's Auditor Independence Requirements* (hereafter Rule S7) which requires disclosure of audit and non-audit fees on all proxy statements issued after February 5, 2001. The SEC argues that such disclosures help "shed light on the independence of public companies' auditors" (SEC 2000).

As a result of these disclosures, concerns have been articulated in the financial press about the magnitude of non-audit fees being paid annually to a firm's external auditors. Non-audit fees encompass all fees not directly charged to the audit, including systems implementation, systems modification, tax preparation, consultation, and internal audit. Prior to the newly mandated disclosures of actual non-audit fee data, the SEC estimated that 25% of

public companies purchased non-audit services from incumbent auditors (Abbott et al. 2004). The new SEC-required disclosures revealed, however, that in the year 2000, virtually all public companies (96%) purchased non-audit services from their auditors. Furthermore, these non-audit services typically represented material amounts with 51% of companies paying more for non-audit services than audit services (Abbott et al. 2004). The pervasiveness and extent of these material economic alignments between a firm and its external auditor has led many financial statement users (and regulators) to be concerned about the level of audit quality that actually exists, and correspondingly, to become apprehensive about the auditor's veritable independence. Such concerns prompted recent legislation designed to, among other things, prohibit certain non-audit services to audit clients. The Sarbanes-Oxley Act of 2002 identifies and prohibits nine specific non-audit services believed to be incompatible with audit services. The Act also established the Public Company Accounting Oversight Board, which has the authority to prohibit other non-audit services deemed inappropriate.

Despite recent legislation, it is not clear that non-audit services negatively affect auditor independence in *fact* (Ashbaugh et al. 2003, Chung and Kallapur 2003, DeFond et al. 2002, Francis and Ke 2002, Frankel et al. 2002, Geiger and Rama 2003, Reynolds et al. 2004). A related, and equally important, issue that remains unresolved involves the effects that non-audit services have on the *appearance* of independence. Early research investigating the effects of non-audit services on the appearance of independence yielded mixed results; however, some recent findings suggest that non-audit services may impair user perceptions of independence (e.g. Glezen and Millar 1985, Lowe and Pany 1995, 1996, Jenkins and Krawczyk 2002, Frankel et al. 2002, Hackenbrack and Elms 2002, Raghunandan 2003, Francis and Ke 2003). We are not unequivocally predicting that a significant association exists between bond ratings and non-audit service fees, but rather examining both sides of this issue and offering additional empirical insight.

Our research empirically explores the effects of non-audit services performed by a firm's external auditors on perceived auditor independence in the bond market. While bond market research often complements and reinforces research performed in the equity markets, the results can differ due to the underlying diversity in the nature of the stakeholders and their contingent

claims on the firm. Equity stakeholders are primarily interested in the unspecified return they will earn from dividends and price appreciation of shares. They are the recipients of the residual earnings after all other claims are paid by the firm. This unlimited upside potential can result in a willingness to engage in high risk projects. Bondholders, in contrast, because their maximum return has been established and defined by the terms of the debt agreement, are primarily interested in protecting the firm's ability to make scheduled interest and principle payments. While management serves the interests of shareholders, the interests of debt-holders are not management's prime consideration. This is referred to by Penman (2004) as the "moral hazard" of debt that can result in decisions having differential effects on each constituency. This makes the bond market potentially different from the equity market and, therefore, an interesting and important environment in which to examine issues that are significant to the accounting and auditing professions.

Bond ratings provide a particularly useful capital market setting in which to examine the effects of non-audit fees paid to external auditors. Information contained in firm financial statements is critical to the fundamental analysis that bond raters undertake when assigning a specific rating to a firm's bond issue. As part of its process to assign the rating, Standard & Poor's (S&P) requires five years of audited financial statements. Moreover, S&P's Corporate Ratings Criteria (2003) states that "ratings require audited data, and the rating does not entail auditing a company's financial records"(p.22) which clearly indicates the reliance of bond rating analysts on audited financial statements. These financial statements are frequently utilized to develop various ratio guidelines based on profitability and leverage measures that are generally necessary for a firm to attain a particular bond rating. The bond rating is critically important to the firm, in part, because the difference of a single rating category (e.g. Baa vs. Ba) can often mean a 100 basis point differential in yield. For a 20 year $400 million bond issue this translates into an $80 million difference in interest payments. Direct or indirect information concerning the underlying credibility of the firm's audited financial statements is of utmost importance to these bond rating agencies, because their very existence depends upon their ability to provide unbiased evaluations of firm default risk.

Our research examines the potential effects of non-audit service fees on bond ratings but does not investigate the eventual results on yields. We are primarily interested in examining the effects that non-audit service fees have on the *perceptions* of auditor independence as proxied by one clearly identifiable class of sophisticated end-users, bond rating analysts. These analysts make a definitive and observable decision, the bond rating, which has a significant economic impact on the firm. This context provides a valuable and direct setting in which to examine the effects of non-audit service fees on end-user perceptions of auditor independence. Clearly delineating the direct and indirect effects of perceptions becomes considerably more problematic in a bond yield setting (see Ziebart and Rieter 1992), due to the complex and interconnected relationship that exists between bond yields and bond ratings. Examining end user perceptions of auditor independence in the discrete bond rating decision provides a much cleaner and more direct test.

We utilize several proxies for auditor independence that have been established in the literature (see DeFond et al. 2002, Francis and Ke 2002, Frankel et al. 2002, Ashbaugh et al. 2003, Geiger and Rama 2003) to investigate what effects, if any, the magnitude and relative degree of non-audit services have on the bond rating process. Our principal regression results indicate that the level of non-audit services provided by a firm's external auditors is negatively associated with that client's bond rating. These results are robust to several additional sensitivity analyses. First, we investigate the possibility of correlated omitted variables by controlling for twelve additional independent variables that have been established in the audit literature as being related to total auditor fees.[18] Next, we scale the audit and non-audit fee measures by total assets of the company to provide a standardized cross-sectional measure of the size of the fees in relation to the bond issuing company, and add these measures to the rating model. Finally, we estimate the unexpected portion of the non-audit fee measures for the 2001 disclosures and incorporate this "surprise" measure into the bond rating model. The results remain consistent across all sensitivity checks i.e., the non-audit fee measures remain significant in the bond rating estimation equation. These findings are consistent with non-audit service fees affecting bond rater's perception of auditor independence.

[18] See DeFond et al. 2002 for a detailed description of these variables.

Although we find a significant and consistent statistical effect with all of our regression analyses, we are unable to demonstrate any improvement in bond rating classification accuracy when non-audit service fees are added to a benchmark prediction model. It is important to recognize that we are unable to document a significant economic effect on the ultimate bond rating assigned to a firm indicating no practical effect. This result is informative with respect to the question of whether non-audit service fees impair auditor independence. This result is not completely surprising in light of recent studies that also find a lack of association between non-audit service fees and a variety of variables surrogating for auditor independence (e.g. DeFond et al. 2002, Ashbaugh et al. 2003, Geiger and Rama 2003). We must also acknowledge that a failure to find a significant economic effect could potentially be due to the power of our test. Requiring one added variable (e.g. non-audit fees) to move a predicted bond rating from one discrete category to another is a demanding test. Thus, we cannot rule out that our inability to observe a significant economic effect in the classification accuracy results may be due to a low power test. Overall, these results contribute to the existing literature by affording empirical insights into bond rating analysts' perceptions of auditor independence and provide evidence that audit and non-audit service fees play a role in establishing a firm's bond rating.

The remainder of the paper is organized as follows. Section two establishes the necessary background, contains a review of relevant audit-related prior literature, and provides a literature review and brief background with reference to the bond rating area. Section three describes the hypotheses development. Section four describes the research design and sample selection process. Section five provides the results along with discussion. The final section summarizes and concludes the paper.

3.2 BACKGROUND

3.2.1 Non-Audit Service Fees and Auditor Independence

Rule S7 defines independence as "a mental state of objectivity and lack of bias" (SEC 2000, Section I). Due to the fact that mental states are, by definition, unobservable, Rule S7 also stresses the importance of independence in *appearance.* Rule S7 states, "Public faith in the reliability of a corporation's financial statements depends upon the public perception of the outside auditor as an independent professional. If investors were to view the auditor as an

advocate for the corporate client, the value of the audit function itself might well be lost" (SEC 2000, Section III.A).

Auditor independence, both in fact and appearance, has long been recognized as an important aspect of audit quality (DeAngelo 1981a).[19] Previous literature generally supports the contention that equity market participant's value audit quality (Franz et al. 1998, Moreland 1995, Teoh and Wong 1993). Until recently however, there has been relatively little empirical research that has examined the implications of auditors providing non-audit services to audit clients. The research that has been completed primarily relies upon auditor fee disclosures from the late 1970's that was required by Accounting Series Release No. 250 (ASR 250): *Disclosure of Relationships with Independent Public Accountants* (SEC 1978). ASR 250 was effective for a limited period from September 30, 1978, until rescinded in 1982. In general, early research conducted based on ASR 250 data does not find that the provision of non-audit services impairs perceptions of auditor independence (e.g. see Scheiner, 1984; Glezen and Millar, 1985; Antle et al. 1997).

A related and more recent stream of research investigates whether non-audit fees impair independence in *fact* (DeFond et al. 2002, Francis and Ke 2002, Frankel et al. 2002, Ashbaugh et al 2003, Chung and Kallapur 2003, Geiger and Rama 2003, Reynolds et al. 2004). Frankel et al. (2002) find that non-audit fees are positively related to companies beating analysts' forecasts as well as the magnitude of discretionary accruals. However, subsequent research suggests that the results of Frankel et al. (2002) are sensitive to choices in research design and fail to replicate their results (Francis and Ke 2002, Ashbaugh et al. 2003, Chung and Kallapur 2003, Reynolds et al. 2004). Moreover, further research has failed to find evidence that non-audit fees impair auditor independence where independence is proxied for by the propensity to issue modified audit opinions (DeFond et al. 2002, Geiger and Rama 2003). In general, this research provides little evidence to suggest that auditors providing non-audit services to audit clients impairs auditor independence in fact.

[19] A discussion regarding the audit quality implications of audit firms providing non-audit services to audit clients can be found in Defond et al. (2002), and also in Frankel et al. (2002).

An alternative stream of research suggests that non-audit fees can impair the *perception* of audit independence. Several experimental studies utilizing professional decision makers show that the perception of auditor independence is negatively affected by material business relationships with client companies (e.g. Lowe and Pany 1995, 1996, Swanger and Chewning 2001). In addition, several empirical studies examine the reaction of equity market participants to the disclosure of auditor fees. Frankel et al. (2002) use an event study methodology and find evidence of a negative stock price reaction to the unexpected portion of non-audit fees, but not the level of these fees. The authors are careful to point out that the effect is small in economic terms. Ashbaugh et al. (2003) perform similar analyses, but extend the research design to control for other information disclosed in proxy statements. They find no evidence that the market reacts to the information contained in the ratio of non-audit fees to total fees collected by the firm's auditor.

Raghunandan (2003) investigates stockholder voting to approve incumbent auditors. His results indicate that voting to ratify the auditor is negatively associated with the level of non-audit services provided, but similar to Frankel et al (2002), the effect is very small in practical terms. Raghunandan concludes that the majority of shareholders do not perceive non-audit services to impair independence. Francis and Ke (2003) report that the market valuation of earnings surprises is significantly lower for firms that exceed $500,000 in non-audit fees and also pay more for non-audit services than the audit. Contrary to many recent studies, they find the economic impact to be substantial with a 77 percent reduction in the market valuation of earnings surprises. Finally, Hackenbrack and Elms (2002) revisit the ASR 250 fee disclosures and find a negative association between stock returns and non-audit fees for sample companies with the highest ratio of non-audit fees. In summary, while these findings suggest the existence of a negative association between the relative amount of non-audit fees and perceived audit quality, most studies find the effect appears to be small in economic terms.

While several studies investigate the effects of non-audit fees on equity prices, no direct evidence has been provided concerning potential debt market effects. Bondholders are primarily interested in the level of default risk faced by the firm. Because bondholders have different contingent claims on the firm than equity shareholders, evidence regarding debt market effects is

important to obtaining a comprehensive view of the capital markets. Our study contributes to the extant literature by providing empirical evidence that audit and non-audit service fees affect bond rating analysts' perceptions of auditor's independence. Debt markets, specifically bond ratings, are particularly well suited for examining auditor independence issues related to financial statement information. Bond rating analysts directly depend upon the audited financial data to conduct their fundamental firm analysis to assist them in predicting the probability of a particular firm making required payments on time. Our research provides an examination of the impact of audit and non-audit fees on the determination of a firm's debt rating.

3.2.2 Importance of Bond Ratings

Bonds provide a critical mechanism for companies to raise funds to finance new and continuing activities and projects. Corporations raise substantially more capital in the bond market each year than they do in the equity market. For example, in 2001 companies raised $1,209 billion in the bond market compared to $262 billion in the equity market (Investment Dealer's Digest 2002). The assigned rating is very important due to the implications it contains regarding the bond issue and the implied effect it has on the subsequent yield. The yield spread between major categories can be substantial, easily resulting in a difference of tens of millions of dollars in interest payments over the life of an issue.

In addition to the implications regarding interest yield, there are also many regulatory requirements in the U.S.A. and abroad that are specified in terms of a firm's assigned bond rating. A long list of agencies allow investments to be made only in the top four rating categories (e.g. Aaa, Aa, A, and Baa), typically referred to as "Investment Grade" debt.[20] The fact that regulatory agencies define requirements partially based on independent ratings indicates the importance and degree to which the rating process is ingrained in the market system.

There is also substantial empirical evidence in the finance and accounting literature that unequivocally establishes the importance and information content of bond ratings and changes in bond ratings. The most obvious, and arguably most notable, is the documented effect bond

[20] For example, the Federal Reserve Board and the Federal Home Loan Bank System permit their members to invest in corporate debt only with investment grade ratings. The Department of Labor allows pension funds to invest in securities only in top rating categories. In addition, the New York and Philadelphia Stock Exchanges establish margin requirements for mortgage securities depending on their ratings (S&P Corporate Ratings Criteria 2003).

ratings have on bond yields and consequently the firm's cost of debt capital (see Ziebart and Reiter 1992). A substantial body of research also clearly demonstrates the significant and material effect bond ratings and bond rating changes have on firm equity prices.[21] The results of these studies show clearly that both the stock and bond markets react in a manner that indicates bond ratings convey important information regarding the value of the firm and its prospects of being able to repay its debt obligations as scheduled.

3.3 HYPOTHESIS DEVELOPMENT

Although substantial research has been completed in the bond rating area, no previously published research has examined the effects of audit quality on industrial bonds. There is one study that suggests audit quality is associated with municipal bond ratings. Allen (1994) uses auditor size (Big 8 vs. Non-Big 8) as a proxy for audit quality and finds accounting information associated with Big 8 audits is able to predict municipal bond ratings accurately. Conversely, accounting information associated with non-Big 8 audits is unable to achieve prediction results better than those expected by random chance. Our objective in this current study is to expand the understanding of perceived audit quality with respect to the bond market by examining the effects that the relative degree and magnitude of non-audit fees have on the actual bond rating assigned by bond rating analysts. The consequences of negative or questionable perceived audit quality on financial statement users have been well documented in previous literature (e.g.Teoh and Wong 1993, Allen 1994, Franz et al. 1998). One aspect of perceived audit quality is perceived auditor independence. If financial statement users perceive the provision of non-audit services to impair auditor independence, then they are likely to impose a cost-of-capital premium for information risk associated with their inability to rely on the audit (Firth 1997; Johnstone et al. 2001). A cost-of-capital premium suggests a negative association between the provision of non-audit services and bond ratings, given the inverse relationship established between bond ratings and bond yields.

To investigate the effects of perceived auditor independence on bond ratings we construct several proxies established in the literature (e.g. DeFond et al. 2002, Francis and Ke 2002,

[21] e.g. Ederington et al. (1987), Holthhausen and Leftwich (1986), Hand et al. (1993), Goh and Ederington (1993), Ederington and Goh (1998), and Dichev and Piotroski (2001).

Frankel et al. 2002) using Rule S7 disclosures. Specifically, three alternative fee measure representations are added in various combinations to a benchmark model of bond ratings: (1) the ratio of non-audit fees paid to the incumbent auditor to total fees paid to the auditor (FeeRatio), (2) the log of total service fees paid by the client to the external auditor (TotFee), and (3) a decomposition of total fees broken into the log of non-audit service fees (NonAud) and the log of audit fees (AudFee). These fee variables represent observable proxies for auditor independence.

Utilizing these measures we investigate the general assertion that larger amounts of non-audit services lead to lower bond ratings. The basic hypothesis (in alternative form) can be represented as follows:

H_a: The amount of non-audit service fees paid to the firm's external auditor is negatively associated with a firm's bond rating.

We investigate this hypothesis by employing the above three non-audit fee measures. The first measure (FeeRatio) offers empirical evidence related to the SEC's goal of providing investors information that will allow them to determine "whether the proportion of fees for audit and non-audit services causes them to question the auditor's independence" (SEC 2000, Section III.c.5). The second measure (TotFee) provides insight concerning the magnitude of the economic bond that exists between the firm and its auditor, and its influence on the determination of the firm's bond rating. While non-audit fees are the focus of our study, DeAngelo (1981b) argues that nonzero auditor switching costs will result in auditors receiving economic rents for audit services. Following this argument, it is reasonable that high total fees could lead to a decline in perceived auditor independence. Finally, the third set of measures (NonAud and AudFee) directly examines the effects that each of the components of total fees has on the firm's bond rating.

3.4 RESEARCH METHOD

3.4.1 Model Specification

Modeling of bond ratings has a long history beginning with the seminal work done in the area by Fisher (1959) and extended by various studies[22]. Kaplan and Urwitz (1979), hereafter KU, continued this stream of research by comprehensively examining alternative prediction models and techniques. They conclude that statistical techniques that exploit the ordinal nature of bond ratings such as probit or logistic regression are theoretically superior and econometrically more sound than methods that are not designed to accommodate ordinal dependant variables. Subsequent studies have attempted to outperform KU, but none have proven to be clearly superior with most correctly predicting 60 to 65% of the ratings (e.g. Belkaoui 1980, Ederington 1985, Iskander and Emery 1994). The KU model continues to remain robust in the literature and has been utilized directly or with minor variations in recent research as the primary reference for modeling bond ratings (e.g. Francis et al. 2003, Graham et al. 2001, Ziebart and Reiter 1992, Shi 2003).

Consequently, the KU model is chosen as the foundation model for our investigation in light of its robust results and econometrically sound approach. The basic model includes seven independent variables including: 1) subordination status (Sub) to indicate if a bond issue is subordinated to other debt. A subordinated bond typically receives a lower rating than a non-subordinated bond. 2) Firm size (TotAsset) is an important determinant of financial strength with larger total assets being consistent with higher bond ratings. 3) The degree of leverage (LtDebt) represents an important risk factor for bond holders with higher long term debt being consistent with lower bond ratings. 4) The profitability of a firm (Income) is important, as higher income indicates a greater probability of repayment. 5) The company's equity beta (Beta) provides a measure of overall price movement of the firm's common stock with respect to the rest of the market and provides a measure of the riskiness of the firm. A higher beta is consistent with higher risk, and hence a lower bond rating. 6) The degree of variability of the firm's income stream (CVNI) provides a measure of income stability with greater variability likely to result in a lower bond rating. 7) Finally, a measure of cash flow (CashFlow) is beneficial to gauge the cash

[22] e.g. Horrigan (1966), Pogue and Soldofsky (1969), West (1970), Pinches and Mingo (1973, 1975).

flow production capability of the firm. Larger positive cash flow is consistent with higher bond ratings.

This base model is augmented with several additional control variables to help ensure a rigorous test of the added non-audit fee measures. Based on evidence provided in Maher (1987) and Graham et al. (2001), we add a net pension (NetPen) variable to control for effects of a firm's defined benefit retirement obligations. Greater net pension liabilities are consistent with lower bond ratings. We also add industry indicator variables to control for any systematic industry rating differences. Finally, the audit and non-audit fee measures described previously (i.e., FeeRatio, TotFee, and AudFee-NonAud) are added to the benchmark model in various combinations to determine their importance in the bond rating process. The primary analysis involves an examination of the significance of the coefficient of the added variable. Finding a significant coefficient is consistent with the theory indicating that variable is an important factor in the bond rating decision process.

The dependent variable (Rating) is the rating assigned to a firm's debt issue by Moody's Investment Services and is coded such that the highest rated bonds (Aaa) are placed in the highest ordinal category. The basic estimation model used for the ordered logistic regression is represented as follows:

$$Rating_j = \beta_0 + \beta_1 Sub_j + \beta_2 TotAsset_j + \beta_3 LtDebt_j + \beta_4 Income_j + \beta_5 NetPen_j + \beta_6 Beta_j + \beta_7 CVNI_j + \beta_8 CashFlow_j + \beta_9 Industry_j + \beta_{10} FeeMeasure_j + \upsilon_j \quad (1)$$

β_1 through β_9 represent the bond rating control variables. These variables are defined more fully in Table 1, Panel C. β_{10} is a generalized representation of the fee measures which are our proxies for auditor independence. Congruent with previous bond rating research, the variables TotAsset, LtDebt, Income, NetPen, and CashFlow are all five year averages. This prevents one-year fluctuations from inaccurately portraying the long-term economics of the firm that are important to bond holders.

3.4.2 Sample Development

The dataset development began with all new unsecured corporate bonds issued from February 2001 through December 2002 that were rated by Moody's. Details were collected from Mergent's (formerly Moody's) Bond Record (2002) for all companies listed on the Compustat Industrial Annual database that issued debt over the period (977 new debt issues). Each bond was issued after the proxy filing date to ensure the audit fee information was available at the time of the bond rating process. These debt issues were matched with the audit services fee data collected individually from proxy statements filed by companies with the SEC and made available on EDGAR. This resulted in 497 bond issues for Compustat-listed companies that had matching fee data. These bonds were merged with required control data for bond ratings from Compustat and CRSP through the Wharton WRDS system. The final dataset included 333 bond issues with all variables needed for the study.

In Table 1, sample descriptive statistics are provided in Panel A, the sample development is outlined in Panel B, and variables are defined in Panel C. The descriptive statistics show that certain characteristics of our sample are somewhat different from those of Frankel et al. (2002), who used all available proxy statements, and those of DeFond et al. (2002), who examined distressed firms. Our sample tends to have higher levels of FeeRatios and higher levels of audit and non-audit fees. This is likely due in part to the fact that our sample contains a greater percentage of larger firms than other recent samples. Table 1 reveals that the minimum FeeRatio observation is relatively small (6 % of total fees) while the maximum is 95%. Most of the firms in our sample purchase substantial non-audit services from their auditor, with a mean (median) FeeRatio of 62% (64%). Consistent with previous research, most sample firms pay more for non-audit services than for the financial statement audits. In fact, over 70 percent of our sample paid more for non-audit services than for audit services. The actual total fees range from $200,000 to $96 million, with a mean (median) of just under $10 ($4) million. Audit fees range from a low of $90,000 to a high of $48 million, with a mean (median) of $2.44 ($1.23) million. Non-audit fees range from $50,000 to $80 million and have a mean (median) of $7.43 ($2.62) million.

3.5 EMPIRICAL RESULTS

3.5.1 Regression Results

The results of the ordered logistic regression analyses for the overall sample are shown in Table 2. The first results column displays the benchmark model, while the remaining four columns present models that include the audit and non-audit fee measures that proxy for auditor independence. All the models in Table 2 have a Pseudo-R^2 greater than 73% with p-values less than .0001 indicating a robust job of representing the bond rating process.

The most notable elements relate to the test variables representing the non-audit fees paid to the firm's external auditors. Model 2 of Table 2 includes the FeeRatio, which is statistically significant ($p = .0233$)[23] and negatively associated with a firm's bond rating. This allows rejection of the null and is consistent with the interpretation that bond rating analysts acknowledge the relative proportion of non-audit fees to total fees that a firm purchases from its external auditors and incorporate this information into the bond rating process as a significant concern. Stated differently, firms that purchase relatively higher levels of non-audit services than audit services from their external auditors, ceteris paribus, appear to receive lower bond ratings than firms that purchase relatively few non-audit services.

To provide further analyses, we add total fees to the benchmark model, resulting in Model 3 and find the TotFee measure to be negative and highly significant ($p < .0001$). This is consistent with bond rating analysts incorporating the total amount of all fees paid to the external auditor as a negative factor when assigning a firm's bond rating. The fourth model incorporates both the FeeRatio and TotFee measures into the same regression. The rationale for doing this is to examine whether each measure represents different dimensions of the economic bond that exists between the auditor and client. The results, shown in Model 4, indicate that FeeRatio is not significant ($p = .9494$) in the presence of TotFee ($p = .0003$), thereby demonstrating that its importance to the bond rating process is subsumed by the total fees paid to the auditor.

Finally, we decompose total fees paid into NonAud and AudFee to simultaneously test the importance of both non-audit and audit fees in the bond rating process. These results, shown

[23] All reported p-values are two-tailed.

in Model 5, indicate that NonAud is significant and negative (p = .0027), but AudFee is not significant (p = .3914). These results suggest that, of total fees paid to external auditors, non-audit service fees alone appears to be the primary driver behind the significance of the TotFee variable. Overall, the results displayed in Table 2 are consistent with the explanation that the amount of fees paid to the external auditor is an important consideration in the bond rating decision process. Moreover, the non-audit fees paid to the auditor appear to be the driving component of the fee measure.

3.5.2 Additional Analyses

To further examine the robustness of our findings we perform several additional sensitivity tests. First, we augment Equation 1 by including twelve additional variables established in the literature as being related to total audit fees to help ensure that our results are not caused by correlated omitted variables.[24] The primary results (non-tabulated) and inferences related to the non-audit fees remain unchanged. Second, we re-estimate the models displayed in Table 2 using an alternative representation of the non-audit fee measures. We scale the audit and non-audit fee measures by total assets of the company to provide a standardized cross-sectional measure of the size of the fees in relation to the audited company. Consistent with previous results, this scaling of fees results in the same fundamental relationships as those described in Table 2 i.e., the non-audit fee measures remain significant in the bond rating estimation equation.

Finally, following DeFond et al. (2002), we estimate the unexpected portion of the non-audit fee measures for the 2001 disclosures. We model the non-audit fees in a first stage regression and obtain the residual value representing the unexpected portion of the non-audit fees. We then utilize this unexpected (surprise) portion of the non-audit fees in a second stage bond rating estimation model. The results remain consistent with those displayed in Table 2 that unexpected total fees are significant in the bond rating process and subsume the fee ratio measure (not tabulated). The surprise portion of the non-audit fees also remains the significant component of the total fees paid to the external auditor. As a whole, these additional analyses reinforce the primary findings of Table 2 and remain consistent with the theory that the level of

[24] These audit fee variables are described in detail in DeFond et al. 2002, as noted previously.

non-audit fees paid to the financial statement auditor appears to be a significantly affect the assignment of a firm's debt rating by bond analysts.

3.5.3 Median Sample Split

There is some research that suggests it is possible that the primary results could be driven by the sub-segment of our sample with the largest percentage of non-audit services. Hackenbrack and Elms (2002) find abnormal returns only for the firms receiving the highest level of non-audit services, while Lowe and Pany (1995, 1996) find the perception of auditor independence to be affected in loan decisions only for material relationships. To examine this possibility, we split the sample based on the median non-audit fees (NonAud) paid to the external auditor by the audit client and re-perform the analyses. The results, shown in Table 3, indicate that the p-value of the NonAud variable for the above-median subsample of firms is considerably smaller (p = .0081) than for the below-median subsample (p = .0995). The fee measure variable remains significant at traditional levels for both samples, however.[25]

These results, while not as conclusive as the experimental evidence established by Lowe and Pany (1995, 1996) and those described by Hackenbrack and Elms (2002) vis-a-vis the equity market, still indicate that relatively large fees paid to the external auditor can have negative effects on the bond rating decision process. Overall, the results shown in Tables 2 and 3 remain consistent with the theory that the total fees paid to the external auditor are a significant factor in the bond rating decision process.

3.5.4 Classification Accuracy Results

To investigate the economic implications of the effects that non-audit fees have on bond ratings, we examine the change that occurs in classification prediction accuracy when the constructed measures of audit and non-audit fees are added to the benchmark bond rating prediction model. We again utilize Equation (1) and execute a jack-knife logistic regression analysis to determine classification accuracy. Our benchmark model results in over 61% of our sample being correctly predicted, indicating a robust model and comparing favorably with prior bond rating research results. Importantly, the addition of the constructed audit and non-audit fee

[25] The same basic findings hold true when the TotFee variable is used in the analyses and the sample is split based on the median TotFee value.

measures does not increase the resulting classification accuracy. While it should be noted that it can be difficult for incremental variables to significantly improve the classification accuracy of a robust prediction model, these results fail to indicate any clear economic importance of the audit fee variables in the ultimate determination of a firm's debt rating. Similarly, when the unexpected (surprise) portion of the non-audit fee measures from the 2001 disclosures are incrementally added to the benchmark model, the results remain the same i.e., a failure to clearly ascribe a material economic effect to the non-audit fee measures in the determination of a firm's debt rating.

To further explore the possibility of a material economic effect of non-audit service fees on bond ratings, we conduct a threshold test that investigates bond movement from one predicted rating category to another due to the inclusion of the non-audit service fee measures. We estimate Equation (1) and predict the classification category for each bond using the benchmark model. We repeat this process using the benchmark model enhanced with the non-audit service fee variable. We then perform a bond by bond comparison to search for changes in predicted classification category. The results indicate there is no systematic downward movement in rating class for those bonds on the threshold once the non-audit fee variable is added. In fact, for the few bonds that actually shift rating classes, it is just as likely that they shift upward as downward. Furthermore, the shifted bonds are just as likely to shift to an incorrect bond rating category as they are to a correct category. Consequently, consistent with the overall classification accuracy analyses, we can find no definitive evidence supporting a material economic impact of non-audit service fees on the bond rating decision process.

3.6 SUMMARY AND CONCLUSIONS

Our study adds to the extant literature by providing evidence regarding the effects of providing non-audit services to audit clients on a firm's bond rating. We provide empirical support regarding the systematic incorporation of auditor fee information into the bond rating process. A decomposition of total fees paid to the auditor reveals that non-audit service fees appear to be the most important component. Results indicate that the magnitude of non-audit fees paid to the external auditors is negatively associated with a firm's bond rating. Employing these measures as established proxies for auditor independence, our results provide empirical

evidence regarding bond rating analysts' perceptions of audit independence. However, while this evidence indicates non-audit service fees are negatively associated with a firm's bond rating, we can not validate a substantive economic effect by demonstrating systematic changes in the actual rating assigned to a debt issue by bond rating analysts indicating no practical effect. These findings should be of interest to those parties concerned with the perceived independence of the audit process, as well as those interested in the affects of perceived audit quality on the bond rating process.

Recent legislation (i.e. the Sarbanes-Oxley Act of 2002) has been enacted that relates to external auditors providing additional services to their clients. The act specifically identifies nine non-audit services that may not be performed by incumbent auditors.[26] In response to such requirements, many firms have divested themselves from their information technology consulting units (Fisher 2002). However, while the act limits the type of services that may be provided, there are no limits on the amount of fees that may be generated from services that do not meet the specific requirements of the act. Given the evolving legislation and recent changes initiated by the firms, it is likely that the fee structures of the audit firms will change. It will be useful to monitor and examine the effects these changes have on the perception of auditor independence and audit quality. Our results from the bond market, in addition to research conducted in the equity markets, should help provide a point of reference to which future research findings can be compared as the Sarbanes-Oxley Act matures and evolves in practice.

[26] These include: bookkeeping, financial information systems design and implementation (only if it is reasonable to conclude that the results will be subject to audit), appraisal or valuation services, actuarial services, internal audit, management functions or human resources, investment services, legal services, and expert services unrelated to the audit (i.e. advocacy services)

3.7 REFERENCES

Abbott, L., S. Parker, G. Peters, and D. V. Rama. 2004. Audit, non-audit and information technology fees: Some empirical evidence. *Forthcoming, Accounting and the Public Interest*.

Allen, A. C. 1994. The effect of large-firm audits on municipal bond rating decisions. *Auditing: A Journal of Practice & Theory* 13 (1): 115-125.

Antle, R., P. A. Griffen, D. J. Teece, and O. E. Williamson. 1997. An economic analysis of auditor independence for a multi-client, multi-service public accounting firm. *Report prepared for the AICPA by The Law & Economics Consulting Group, Inc.*

Ashbaugh H., R. LaFond, and B.W. Meyhew. 2003. Do nonaudit services compromise auditor independence? Further Evidence. *The Accounting Review* 78 (3): 611-639.

Barth, M. E., M. F. McNichols, and P. Wilson. 1997. Factors influencing firm's disclosures and environmental liabilities. *Review of Accounting Studies* 2: 35-64.

Belkaoui, A. 1980. Industrial bond ratings: A new look. *Financial Management* 9: 44-51.

Bradley, M., G. A. Jarrell, and E. H. Kim. 1984. On the existence of an optimal capital structure: Theory and evidence. *Journal of Finance* 39 (3): 857-878.

Chung, H., and S. Kallapur. 2003. Client importance, non-audit services, and abnormal accruals. *The Accounting Review* 78 (4): 931-955.

Collins, D. W., and S. P. Kothari. 1989. An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. *Journal of Accounting and Economics* 11 (2-3): 143-181.

Davis, L. R., D. N. Ricchiute, and G. Trompeter. 1993. Audit effort, audit fees, and the provision of nonaudit services to audit clients. *The Accounting Review* 68 (1): 135-150.

DeAngelo, L. E. 1981a. Auditor independence, 'low balling', and disclosure regulation. *Journal of Accounting and Economics* 3 (2): 113-127.

DeAngelo, L. E. 1981b. Auditor size and audit quality. *Journal of Accounting and Economics* 3 (3): 183-199.

Defond, M. L., K. Raghunandan, and K. R. Subramanyam. 2002. Do non-audit service fees impair auditor independence? Evidence from going concern audit opinions. *Journal of Accounting Research* 40 (4): 1247-1274.

Dichev, I. D., and J. D. Piotroski. 2001. The long run stock returns following bond ratings changes. *Journal of Finance* 56 (1): 173-203.

Dopuch, N., R. R. King, and R. Schwartz. 2003. Independence in appearance and in fact: An experimental investigation. *Contemporary Accounting Research* 20 (1): 79-114.

Ederington, L. H. 1985. Classification models and bond ratings. *Financial Review* 20: 237-262.

Ederington, L. H., and J. C. Goh. 1998. Bond rating agencies and stock analysts: Who knows what when? *Journal of Financial and Quantitative Analysis* 33 (4): 569-585.

Ederington, L. H., J. B. Yawitz, and B. E. Roberts. 1987. The informational content of bond ratings. *Journal of Financial Research* 10: 211-226.

Firth, M. 1997. The provision of nonaudit services by accounting firms to their audit clients. *Contemporary Accounting Research* 14 (2): 1-21.

Fisher, L. 1959. Determinants of risk premiums on corporate bonds. *Journal of Political Economy* (June): 217-237.

Fisher, L. 2002. Business: FTSE 100 audit survey - Consultancy booms, but tough times ahead ahead. *Accountancy* September: 13-16.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2003. The market pricing of earnings quality. Working Paper, Duke University.

Francis, J. R., and B. Ke. 2002. Further evidence on non-audit services and auditor independence. Working Paper, Pennsylvania State University.

Francis, J. R., and B. Ke. 2003. Disclosure of Fees Paid to Auditors and the Market Valuation of Earnings Surprises. Working Paper, Pennsylvania State University.

Frankel, R. M., M. F. Johnson, and K. K. Nelson. 2002. The relation between auditors' fees for non-audit services and earnings quality. *Accounting Review* 77 (Supplement): 71-114.

Franz, D. R., D. Crawford, and E. N. Johnson. 1998. The impact of litigation against an audit firm on the market value of nonlitigating clients. *Journal of Accounting, Auditing & Finance* 13 (2): 117-134.

Geiger, M., and D. V. Rama. 2003. Audit fees, non-audit fees, and auditor reporting on stressed companies. *Auditing: A Journal of Practice and Theory* 22 (2):53-69.

Glezen, G. W., and J. A. Millar. 1985. An empirical investigation of stockholder reaction to disclosures required by ASR No. 250. *Journal of Accounting Research* 23 (2): 859-870.

Goh, J. C., and L. H. Ederington. 1993. Is a bond rating downgrading bad news, good news, or no news for stockholders? *Journal of Finance* 48: 2001-2008.

Graham, A., J. J. Maher, and W. D. Northcut. 2001. Environmental liability information and bond ratings. *Journal of Accounting, Auditing and Finance* 16: 93-116.

Hackenbrack, K., and H. Elms. 2002. Mandatory disclosure and the joint sourcing of audit and non-audit services. Working Paper, University of Florida.

Hand, J. R., R. W. Holthausen, and R. W. Leftwich. 1993. The effect of bond rating agency announcements on bond and stock prices. *Journal of Finance* 47: 733-752.

Holthausen, R. W., and R. W. Leftwich. 1986. The effect of bond rating changes on common stock prices. *Journal of Financial Economics* 17: 57-90.

Horrigan, J. O. 1966. The determination of long term credit standing with financial ratios. *Journal of Accounting Research* (supplement): 44-62.

IDD Inc. 2002. *Investment Dealer's Digest.* January 7. IDD, I.

Iskander, M. E., and D. R. Emery. 1994. An empirical investigation of the role of indenture provisions in determining bond ratings. *Journal of Banking and Finance* 18: 93-111.

Jenkins, J. G., and K. Krawczyk. 2002. The relationship between nonaudit services and perceived auditor independence. *Journal of Business and Economic Perspectives* Fall/Winter: 25-36.

Johnstone, K. M., M. H. Sutton, and T. D. Warfield. 2001. Antecedents and consequences of independence risk: Framework for analysis. *Accounting Horizons* 15 (1): 1-18.

Kaplan, R. S., and G. Urwitz. 1979. Statistical models of bond ratings. *Journal of Business* 52: 231-262.

Lowe, D. J., M. Geiger, and K. Pany. 1999. The effects of internal audit outsourcing on perceived external auditor independence. *Auditing: A Journal of Practice & Theory* 18 (Supplement): 7-26.

Lowe, D. J., and K. Pany. 1995. CPA performance of consulting engagements with audit clients: Effects on financial statement users' perceptions and decisions. *Auditing: A Journal of Practice & Theory* 14 (2): 35-53.

Lowe, D. J., and K. Pany. 1996. An examination of the effects of type of engagement, materiality and structure on CPA consulting engagements with audit clients. *Accounting Horizons* 10 (4): 32-51.

Maher, J. J. 1987. Pension obligations and the bond credit market: An empirical analysis of accounting numbers. *The Accounting Review* 62: 785-798.

Maher, J. J. 1996. Perceptions of postretirement benefit obligations by bond rating analysts. *Review of Quantitative Finance and Accounting* 6 (1): 79-94.

Mergent, Inc. 2002. *Mergent Annual Bond Record.* Special Edition. New York: Mergent.

Mergent, Inc. 2002. *Mergent Bond Record.* Feb-May. New York: Mergent.

Moreland, K. A. 1995. Criticisms of auditors and the association between earnings and returns of client firms. *Auditing: A Journal of Practice & Theory* 14 (1): 94-104.

Penman, S. 2004. *Financial Statement Analysis and Security Valuation*, Second Edition. New York: McGraw-Hill.

Pinches, G. E., and K. A. Mingo. 1973. A multivariate analysis of industrial bond ratings. *Journal of Finance* 28: 1-18.

Pinches, G. E., and K. A. Mingo. 1975. The role of subordination and industrial bond ratings. *Journal of Finance* 30: 201-206.

Pogue, T. F., and R. M. Soldofsky. 1969. What's in a bond rating? *Journal of Finance and Quantitative Analysis* 4: 201-228.

Raghunandan, K. 2003. Nonaudit services and shareholder ratification of auditors. *Auditing: A Journal of Practice & Theory* 22 (1): 155-163.

Reynolds, K., D. Deis, and J. Francis. 2004. Professional service fees and auditor objectivity. *Forthcoming, Auditing: A Journal of Practice & Theory* 23 (1).

S & P Rating Group. 2003. *S & P Corporate Ratings Criteria.* New York: S&P, R. G.

Scheiner, J. H. 1984. An empirical assessment of the impact of SEC nonaudit service disclosure requirements on independent auditors and their clients. *Journal of Accounting Research* 22 (2): 789-797.

Shi, C. 2003. On the trade-off between the future benefits and riskiness of R&D: a bondholders' perspective. *Journal of Accounting & Economics 35* (2): 227-254.

SEC. 1978. Disclosure of Relationships with Independent Public Accountants. June 29, 1978. Washington D.C.: SEC.

SEC. 2000. Final rule: Revision of the Commission's Auditor Independence Requirements. New York: SEC.

Simunic, D. A. 1984. Auditing, consulting, and auditor independence. *Journal of Accounting Research.* 22 (2): 679-702.

Swanger, S. L., and E. G. J. Chewning. 2001. The effect of internal audit outsourcing on financial analysts' perceptions of external auditor independence. *Auditing: A Journal of Practice & Theory.* 20 (2): 115-129.

Teoh, S. H., and T. J. Wong. 1993. Perceived auditor quality and the earnings response coefficient. *The Accounting Review.* 68 (2): 346-366.

Watts, R. L., and J. L. Zimmerman. 1986. *Positive Accounting Theory.* (Prentice-Hall, INC, New Jersey).

West, R. R. 1970. An alternative approach to predicting corporate bond ratings. *Journal of Accounting Research.* 8: 118-125.

Ziebart, D. A., and S. A. Reiter. 1992. Bond ratings, bond yields, and financial information. *Contemporary Accounting Research.* 9 (252-282).

3.8 Tables

Table 3-1 Descriptive Statistics, Sample Development, and Variable Definitions

Panel A: Descriptive Statistics (n=333)

Variable		Mean	Std Dev	First Quartile	Median	Third Quartile	Minimum	Maximum
Sub		.11	.32	0	0	0	0	1
Total Assets	^	18,440	36,037	2,208	7,079	18,129	122	277,615
TotAsset	**	8.78	1.48	7.70	8.86	9.81	4.81	12.53
Long Term Debt	^	4,077	6,369	642	1,771	5,038	26	65,805
LtDebt	*	.31	.15	.20	.29	.40	.01	1.12
Income From Ops	^	557	1,177	51	187	536	-824	7,190
Income	*	.04	.05	.02	.03	.06	-.13	.37
Pension Liability	^	396	1,582	-1.06	.47	161	-4,045	11,534
NetPen	*	.01	.04	0.00	0.00	.02	-.07	.27
Beta		.89	.57	.42	.82	1.33	-.35	2.67
Cvni		1.76	28.32	.18	.41	.79	-33.81	506.27
CashFlow		.09	.06	.06	.09	.12	-.07	.42
FeeRatio		.62	.19	.47	.64	.75	.06	.95
Total Fees	^	9.87	15.61	1.53	4.00	9.14	0.20	96.00
TotFee	**	15.23	1.35	14.24	15.20	16.03	12.21	18.38
Non-audit Fees	^	7.43	13.31	.80	2.62	6.70	.05	80.00
NonAud	**	14.68	1.61	13.60	14.78	15.72	10.85	18.20
Audit Fees	^	2.44	3.57	.63	1.23	2.96	.09	48.00
AudFee	**	14.13	1.09	13.36	14.02	14.90	11.35	17.69

* Scaled (divided) by Total Assets ** Log scaled ^ In millions

Panel B: Sample Development

Active Non-financial Companies listed in the Compustat Database	10,202
Unsecured bond issues for non-financial Compustat companies during the period Feb. 2001- Dec. 2002 listed by Mergent's Bond Record	977
Bond issues that did not have corresponding audit fee information or did not issue proxy statements	(480)
Bond issues that did not have 5-year average Compustat data or Beta information on CRSP	(164)
Final Sample	333

Panel C: Variable Definitions

Rating	Polychotomous representation of Moody's Bond Rating, Aaa=8, Aa=7, A=6…, Ca=1.
SIC10S-80S	Series of indicator variables to represent 1-digit SIC classification of the issuer.
Sub	Indicator variable set equal to 1 if the bond is subordinated, 0 otherwise.
Total Assets	The 5-year average of a firm's total assets.
TotAsset	Natural log of 5-year average of total assets.
Long Term Debt	The 5-year average of a firm's long term debt.
LtDebt	5-year average of long-term debt scaled by 5-year average of total assets.
Income From Ops	The 5-year average of a firm's income before discontinued items.
Income	5-year average of Operating Income scaled by 5-year average of total assets.
Pension Liability	The 5-year average of a firm's net pension liability. This is calculated by subtracting net pension assets from the pension obligations.
NetPen	5-year average of net pension liability (asset) of a company scaled by the 5-year average of total assets.
Beta	Firm's common stock beta from CRSP database.
CVNI	The coefficient of variation of operating income for the past five years
CashFlow	The 5-year average of cash flows from operations scaled by the 5-year average of total assets
Total Fees	Total fees paid by a firm to it's auditor.
TotFee	Log of Total fees
FeeRatio	The non-audit fees paid by a firm to its auditor scaled by total fees paid to the auditor.
Non-audit Fees	All fees paid to a firm's auditor for services outside the audit.
NonAud	Log of Other fees
Audit Fees	Fees paid to a firm's auditor for the audit of financial statements.
AudFee	Log of Audit fees

Table 3-2 ***Logistic Regression Bond Rating Results***

Models for 333 bond issues during the period February 2001 until December 2002.

		Model 1	Model 2	Model 3	Model 4	Model 5
	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
Sub	-	-2.011 (.00)	-2.087 (.00)	-2.353 (.00)	-2.354 (.00)	-2.319 (.00)
Totasset	+	1.135 (.00)	1.209 (.00)	1.684 (.00)	1.687 (.00)	1.596 (.00)
LtDebt	-	-4.807 (.00)	-4.814 (.00)	-5.184 (.00)	-5.187 (.00)	-5.094 (.00)
Income	+	30.302 (.00)	30.088 (.00)	29.671 (.00)	29.670 (.00)	29.756 (.00)
NetPen	-	0.455 (.87)	0.353 (.90)	0.203 (.94)	0.203 (.94)	0.192 (.95)
Beta	-	0.080 (.69)	0.032 (.87)	-0.025 (.90)	-0.024 (.91)	-0.007 (.98)
CVNI	-	-0.001 (.78)	-0.000 (.91)	-0.000 (.86)	-0.000 (.86)	-0.000 (.90)
CashFlow	+	4.589 (.07)	5.314 (.04)	5.576 (.03)	5.560 (.03)	5.538 (.03)
FeeRatio	-		-1.344 (.0233)		0.046 (.9494)	
TotFee	-			-0.652 (<.0001)	-0.659 (.0003)	
AudFee						-0.173 (.3914)
NonAud	-					-0.369 (.0027)
Likelihood Ratio		431.46	436.63	449.99	449.99	445.93
Pseudo R^2		73.06%	73.49%	74.55%	74.55%	74.23%

*All p-values are two-tailed. Industry indicator variable statistics not reported.
Variable definitions provided in Table 1, Panel C.

Table 3-3 Logistic Regression Bond Rating Models

Sample is split based on the median Non-Audit fees paid to auditor, n=167 lower sample and n=166 for the upper sample.

		Lower Sample	Upper Sample
	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)
Sub	-	-2.762 (.00)	-0.166 (.84)
Totasset	+	1.569 (.00)	2.007 (.00)
LtDebt	-	-5.193 (.00)	-7.097 (.00)
Income	+	22.906 (.00)	36.775 (.00)
NetPen	-	6.032 (.18)	-5.843 (.13)
Beta	-	0.270 (.37)	-0.121 (.70)
CVNI	-	0.000 (.83)	0.109 (.03)
CashFlow	+	5.891 (.07)	12.930 (.01)
NonAud	-	-0.317 (.0995)	-0.684 (.0081)
Likelihood Ratio		238.34	205.18
Pseudo R^2		76.51%	71.58%

*All p-values are two-tailed. Industry indicator variable statistics not reported.
Variable definitions provided in Table 1, Panel C.

4 THE IMPACT OF AUDITOR TENURE ON NEW BOND RATINGS

4.1 Introduction

Recent corporate problems with financial reporting have spawned intense scrutiny of the auditor-client relationship. Among the most widely debated issues raised is the possible effects of lengthy auditor-client relationships. A major concern is that extended auditor tenure could lead to reduced auditor independence and has led to calls for mandatory audit firm rotation. Several constituencies have responded by pointing out that mandatory audit firm rotation could conceivably have a negative impact on overall audit quality. Further, opponents of mandatory rotation argue that the costs associated with rotating auditors outweigh the benefits given other recent legislation enacted to strengthen auditor independence.

A substantial portion of the Sarbanes-Oxley Act of 2002 (S-O) is intended to preserve auditor independence. In addition to various regulations and prohibitions S-O places on external auditors of public companies and their clients, Section 207 of S-O required the General Accounting Office (GAO) to conduct a study of the effects of mandatory audit firm rotation to determine its efficacy. The GAO made no specific recommendations after completing the study. Instead the GAO suggested that regulatory agencies should monitor the situation to determine if mandatory rotation is needed in addition to auditor independence safeguards currently in place (GAO 2003). Further, the GAO suggests that audit committees consider voluntary auditor

rotation. Given these suggestions and the possibility of future regulation, it is critical to understand both the actual and perceived audit quality implications of auditor tenure.

Proponents of auditor rotation primarily argue that rotation can remedy the potential reduction in auditor independence and related declines in the quality of financial reporting resulting from lengthy client relationships. In addition to pressures to retain the client, an extended relationship may cause the auditor to become complacent. This could lead to substandard audits or even acquiescence to client preferences. Proponents say rotation would bring a "fresh look" at firm financial statements which might increase the likelihood that the auditor will uncover misstatements and/or challenge questionable accounting practices. Lastly, rotation could lead to audit innovations that allow auditors to audit new clients more efficiently.

Opponents of auditor rotation, generally led by the accounting profession (Melancon 2002; Copeland 2002; PricewaterhouseCoopers 2002), argue that extended auditor-client relationships actually increase audit quality. They point out that new auditors must rely more heavily on client estimates and representation in the initial years of an audit engagement. As auditor tenure increases, the auditor learns more about the client and its business processes, allowing the auditor to reduce reliance on management estimation and representation resulting in a more effective audit. Managers tend to be opposed to mandatory auditor rotation because of the costs and time commitment associated with bringing new auditors up to speed. Another concern is that new auditors may not have the industry expertise or may not possess the same level of firm specific knowledge required to audit a new client effectively (Dunham 2002).

Prior research has established auditor independence, both in fact and appearance, to be an important aspect of audit quality (DeAngelo 1981). If auditors appear to lack independence, this increases the perception that they are less objective and therefore less likely to report a discovered misstatement (Lowe and Pany 1995). Prior research also supports the supposition that investors and managers react to, and price accordingly, audits that have higher perceived quality. For example, both Titman and Trueman (1986) and Datar, Feltham, and Hughes (1991) provide models in which the initial value of an IPO is demonstrated to be an increasing function of audit quality. Further, extant research provides support that there are capital market consequences when the perception of audit quality is compromised by a possible reduction in independence

(Brandon, Crabtree, and Maher 2004, Raghunandan 2003, Francis and Ke 2004, Frankel, Johnson, and Nelson 2002).

Existing empirical research on the effects of auditor tenure on audit quality and independence (both in fact and appearance) provides mixed results (e.g. Davis, Soo, and Trompeter 2003; Dies and Giroux 1992; Ghosh and Moon 2003; Mansi, Maxwell, and Miller 2003; Myers, Myers, and Omer 2003; Carcello and Nagy 2004). The present research provides useful information relevant to the debate and adds to the literature by empirically documenting the effect auditor tenure has on new bond ratings.

Debt ratings provide an appropriate context to examine questions related to auditor independence because bond rating analysts rely extensively upon audited financial information to conduct their fundamental analysis of the company. Thus, any information that pertains to the quality and/or independence of the auditor is particularly germane. Ratings assigned to debt are a significant determinant of the ultimate yield the firm has to pay (Ziebart and Reiter 1992). Higher ratings represent smaller default risk and are consistent with a reduced effective interest rate incurred by the firm. The spread between rating classes typically represents substantial interest differences. Given the reliance on financial statements, information that pertains to the credibility of the firm's audited financial statements is of utmost importance to these bond rating agencies whose existence depends on their ability to provide unbiased evaluations of firm default risk.

The primary focus of this study is to examine the effects of audit firm tenure on the *perceptions* of auditor independence by one clearly identifiable class of sophisticated end-users, bond rating analysts. These analysts make a definitive and observable decision, the bond rating, which has a significant economic impact on the firm. This context provides a valuable and direct setting in which to examine the effects of auditor tenure on end-user perceptions of auditor independence.

We examine newly issued bonds from the period 1990-2002 and find auditor tenure to be positively related to ratings received. This finding is consistent for all issues, regardless of investment grade, firm performance, or time period. Our findings contrast with those reported

by Mansi et al. (2003), who find a negative relationship between required rate of return for credit investors and auditor tenure for investment grade firms, but a positive relationship for non-investment grade firms.

The remainder of this paper is organized as follows. Section 2 discusses relevant prior literature and is followed by the development of our hypothesis. Section 3 describes our research method. Finally, we conclude with a summary.

4.2 Literature Review

4.2.1 Auditor Tenure

Studies investigating the effects of auditor tenure on actual audit quality examine a variety of dependent variables and report inconsistent results. For example, Geiger and Raghunandan (2002) investigate audit reporting failures and find no evidence of impaired audit quality when auditor tenure is longer. Their results indicate that audit failures are more likely to occur in the beginning of the auditor-client relationship. Carcello and Nagy (2004) investigate the relationship between tenure and fraudulent financial reporting and find, consistent with Geiger and Raghunandan (2002), that fraudulent reporting is more likely in the early years of the relationship. Furthermore they report no evidence of a relationship between fraud and longer tenure. Several recent studies investigate the relation between accounting accruals and auditor tenure. Discretionary accruals are frequently used as an indicator of earnings management and also audit quality. Myers, et al. (2003) find an inverse relationship between the level of discretionary accruals and auditor tenure as well as an inverse relationship between auditor tenure and the dispersion of accruals. These results imply that auditors with longer tenure actually restrict management discretion in the reporting of earnings. Similar results are reported by Ghosh and Moon (2003) and Johnson, Khurana, and Reynolds (2002).

Two studies provide evidence that audit quality declines as auditor tenure increases. Davis, et al. (2003) examine the relationship between discretionary accruals and auditor tenure and report that discretionary accruals increase with auditor tenure. They also note that analyst earnings forecast errors decrease as auditor tenure increases. These findings are consistent with

the possibility of auditors acquiescing more in later years of the engagement and management using this to meet earnings forecasts. Similarly, Dies and Giroux (1992) find that auditor tenure is positively related to the number of quality control review findings and that audit deficiencies increase with audit tenure for a sample of small independent school systems which is consistent with audit quality decreasing as tenure increases.

A related stream of research investigates whether *perceptions* of audit quality are affected by auditor tenure. Several behavioral studies investigate this and report inconsistent results. Shockley (1981) finds no evidence that auditor tenure affects independence perceptions of Big Eight partners, local and regional CPA firm partners, commercial loan officers, or financial analysts. Knapp (1991), however, finds that audit committee members perceive audit quality as increasing in the early years of the engagement and then decreasing in quality in subsequent years. More recently, Chang and Monroe (2002) sampled *auditors* to examine their perception of various factors that may affect audit quality and find that auditor tenure has a positive effect on auditors' perceptions of audit quality.

Two recent capital market studies investigate the effects of auditor tenure on market participants' perceptions of audit quality. Ghosh and Moon (2002) report that both earnings response coefficients and seasoned bond ratings are positively related to auditor tenure. These findings are consistent with capital market participants perceiving an increase in audit quality as auditor tenure increases. Mansi et al. (2004) note that auditor tenure has a positive effect on bond yields for noninvestment grade debt; however, they document a negative effect for investment grade debt. This suggests that extended auditor relationships may be a benefit in some situations, but not in others.

Overall, the effect of auditor tenure on the perception of auditor independence (and audit quality) is unclear (e.g. Knapp 1991; Chang and Monroe 2002; Ghosh and Moon 2002; Mansi et al. 2004). Our research adds to previous literature by providing empirical evidence related to the effects of auditor tenure on the bond rating process. Our analysis allows inferences to be made concerning a critical group of informed financial statement users - bond rating analysts. By analyzing a large sample of new bond issues we are able to examine ratings that are 'fresh' and reflect a current assessment of the issuing firm's financial health. We use new bond issues

because once a rating for an issue is assigned, changing the rating takes a substantial period of time. The first step involved with a ratings change is being place on a credit "watchlist". The duration of time an issue spends on the watchlist varies substantially. The average time for an issue on the watchlist is over 3 months, with some longer than 8 months (Moody's 1998). Part of the reason for the amount of time an issue spends on the watchlist reflects ratings agencies' reluctance to change ratings until a reversal is unlikely to happen in a relatively short period of time (Cantor 2001). Ratings changes have also been shown to lag changes in a firm's default risk (Loffler 2003). Therefore, we believe new issue ratings represent an accurate assessment of firm financial health.

4.2.2 Bond Ratings

Bonds provide an important mechanism by which firms obtain new funds to finance new and continuing activities and projects. Typically, firms raise substantially more "new" funds in the bond market each year than in the equity market. For example, in 2001 companies raised $1,209 billion in the bond market compared to $262 billion in the equity market (Investment Dealer's Digest 2002). The initial assigned rating is important because of what it implies about the bond issue. An immediate implication is the effect it has on the subsequent yield. Higher bond ratings imply a lower required effective interest rate, resulting in lower interest payments. Yield spread between categories can be substantial, resulting in a difference of millions of dollars in interest over the life of the obligation.

In addition to the implications related to interest yield, there are also many regulatory requirements in the United States and abroad that are specified in terms of a firm's assigned bond rating. Several agencies allow investments to be made only in the top rating categories (e.g. Baa3 and above), typically referred to as "Investment Grade" debt. For example, the Federal Reserve Board and the Federal Home Loan Bank System permit their members to invest in corporate debt only with investment grade ratings. The Department of Labor allows pension funds to invest in securities only in top rating categories. In addition, the New York and Philadelphia Stock Exchanges establish margin requirements for mortgage securities depending on their ratings (S&P Corporate Ratings Criteria 2003). The fact that regulatory agencies define requirements

partially based on independent ratings indicates the importance and degree to which the rating process is ingrained in the market system.

There is substantial empirical evidence in the finance and accounting literature that establishes the importance and information content of bond ratings and changes in bond ratings. Previous studies have demonstrated evidence of stock price movement and abnormal returns after bond rating changes (Holthausen and Leftwich, 1986; Glascock, Davidson, and Henderson, 1987). Hand, Holthausen, and Leftwich (1993) examine the bond and stock price effects that occur when a firm is placed on Standard & Poor's Credit Watch List (often a preliminary step to a rating change), as well as the effects of an actual rating downgrade or upgrade. They conclude that there are both bond and stock price effects associated with all these events. Ziebart and Reiter (1992) provide evidence that bond ratings have a direct impact on bond yields. Dichev and Piotroski (2001) examine the equity market effects of rating changes and show that firms that receive upgrades on their bond ratings outperform firms that receive bond rating downgrades by 10 to 14 percent in common stock performance in the year following the bond rating change. Furthermore, they report that current ratings changes predict not only future rating changes, but also changes in the firm's future profitability. These studies show clearly that both the stock and bond markets react in a manner indicating bond ratings convey important information as to the overall financial health and value of the firm and its future prospects.

4.3 Hypothesis Development

Previous research has demonstrated that perceived audit quality is significantly associated with a firm's bond rating. Allen (1994) uses auditor size (Big 8 vs. Non-Big 8) as a proxy for audit quality and finds accounting information associated with Big 8 auditors is significant in explaining municipal bond ratings while accounting information associated with Non-Big 8 auditors is not significantly associated with municipal bond ratings. Further, classification accuracy for the municipalities that engaged Big-8 auditors was greater than those that did not. More recently, Brandon et al. (2004) examine the relationship between information potentially indicative of audit quality and bond ratings and report an inverse relationship between the amount of non-audit fees provided to the client and bond ratings for new corporate issues.

Several studies have examined the effect of auditor tenure on audit quality, both perceived and in-fact. Contrary to concerns raised in the popular press, several of these studies find a positive relationship between auditor tenure and proxies for audit quality. The results are mixed, however, as other studies provide evidence of a negative relationship. The objective of our research is to provide evidence related to perceived audit quality with respect to new bond issues by investigating the existence of an association between auditor tenure and the actual rating assigned. Consequences of questionable perceived audit quality on financial statement users have been well documented in previous literature (e.g. Teoh and Wong 1993, Allen 1994, Franz et al. 1998). If financial statement users feel that longer auditor tenure compromises auditor quality, contracting for the firm will be more costly and result in a lower bond rating (Johnstone et al. 2001). Conversely, if financial statement users perceive longer auditor tenure provides the auditor with more client expertise (competence), contracting for the firm will be less costly, and should result in a higher bond rating.

This study examines the bond rating arena and what effect, if any, auditor tenure has on the default risk perceptions of a sophisticated set of financial statement users, bond rating analysts. Our measure of auditor tenure is the number of consecutive years an auditor has been the auditor of record for the same client. Based on prior research that provides mixed evidence regarding audit tenure, we investigate the following null hypothesis[27]:

H_0: The number of consecutive years a client has retained an auditor has no effect on the client's bond rating.

4.4 Research Method

4.4.1 Model Development

We utilize the model developed by Kaplan and Urwitz (1979) as the benchmark model due to its econometrically sound approach and robustness. The model contains six basic

[27] The original proposal also included the analysis of bond ratings changes and their correlation with auditor switches. After obtaining the Auditor-Trak database, out of 1,279 bond ratings changes, there were only 38 firms that switched auditors in the 5 years prior to a bond ratings change. Of these 38, only 19 included reasons for the switch and no reliable inferences could be drawn.

independent variables: subordination status of the issue, a measure of firm size, a measure of leverage, a measure of profitability, an indication of the firm's ability to service new debt, and a measure of firm risk. Based on the work of Maher (1987) and Graham, Maher, and Northcut (2001), the benchmark model is enhanced by the inclusion of a net pension variable to incorporate the effects of a firm's defined benefit retirement obligations. To control for industry effects, a series of indicator variables are incorporated based on industry classifications found in Fama and French (1997). We also include issue year indicators to control for the year of issuance.

Our measure of auditor tenure follows the work of Beck, Frecka, and Solomon (1988); Dies and Giroux (1992); Davis et al. (2003); Myers, et al. (2003); and Mansi et al. (2003) and is calculated as the number of consecutive years an auditor has audited the firm's financial statements since 1980[28]. Longer auditor tenure could indicate one of two things as described in previous research, and depending on the perception of the financial statement user: (1) a possible increase in complacency or a decrease in objectivity thus increasing risk or (2) a greater insight into the client's inherent risk and operations increasing expertise, thus decreasing overall risk. An indicator of firm age (AGE), calculated as the number of years the firm has been listed on Compustat since 1980 is also added to the model because Myers, et al. (2003) found firm age to be an important predictor for audit quality. The dependant variable (RATING) is the rating assigned to a specific debt issue by Moody's Investment Services (Aaa, Aaa1, Aaa2, etc.). The basic estimation model takes the following form:

$$RATING_j = \beta_0 + \beta_1 SUB_j + \beta_2 SIZE_j + \beta_3 LEVERAGE_j + \beta_4 PROFIT_j + \beta_5 PENSION_j + \beta_6 TIMES_j + \beta_7 BETA_j + \beta_8 AGE_j + \beta_9 TENURE_j + \beta_{10}(FF1\text{-}43)_j + \beta_{11}(YEAR90\text{-}02)_j + \upsilon_j \quad (1)$$

Where:

SUB	1 for subordinated bonds and 0 otherwise. The subordination status is expected to be associated with a higher risk, therefore exhibiting a negative association with bond rating.
SIZE	Log of total assets. Size proxies for, and has, an inverse relationship with default risk. Size is expected to have a positive association with bond rating.

[28] The log transformation of TENURE (Geiger and Raghunandan 2002) in our analysis and the results are qualitatively similar to those reported in Table 2.

LEVERAGE	Long term debt divided by total assets. Leverage represents the relative amount of debt current incurred by the firm. Leverage is expected to have a negative association with bond rating.
PROFIT	Operating income for the year divided by total assets. Profitability is expected to have a positive association with bond rating.
PENSION	Net pension liability divided by total assets. Pension is a representation of future liabilities. Pension is expected to have a negative association with bond rating.
TIMES	Operating income before interest expense divided by interest expense. Times is expected to have a negative association with bond rating.
BETA	The firms common stock Beta. Firms with a higher beta are considered riskier, hence Beta is expected to have negative association with bond rating.
AGE	The number of years the firm has been listed on Compustat since 1980. Older firms are more stable and Age is expected to have a positive association with bond rating.
FF1-43	Industry indicator variables (0,1) are added as independent variables to the benchmark model to represent the Fama-French industry classifications. This procedure has been utilized in the accounting and finance literature to control for industry
YEAR90-02	Indicator variables (0,1) are included to control for specific year effects

4.4.2 Sample

The sample covers the time period January 1990 to December 2002. We examine new corporate bonds issued and rated by Moodys/Mergent's bond rating agency. The sample consists of bonds backed solely by the issuer's ability to pay. No convertible bonds, mortgage bonds, asset-backed bonds, or deferred interest bonds are included in the sample. This allows us to examine bonds whose ratings are based entirely on the issuing firms default risk and not the risk of another underlying asset or option. New issues are chosen because ratings connected with new issues are current because new analyses on the firms are conducted when a new public issuance is offered.

The initial sample consists of 4,492 new debt issues from firms listed on Compustat. Of those, 247 firms did not have information for beta available on CRSP and an additional 1,207 did not have the other necessary control variables available (e.g. total assets, long term debt) on

Compustat for the year preceding the issue. This results in a sample of 3,038 new issues during the period 1990-2002. Descriptive statistics for the sample are shown in Panel A of Table 1. The sample contains only 21 bonds that were issued by firms that were not audited by Big 4 auditors which is consistent with extant research indicating a decrease of publicly traded firms using non-Big 4 auditors (Shu 2000) [29]. Our sample firms are substantially larger than some previous auditor tenure studies as indicated by firm total assets (Geiger and Raghunandan 2002; Myers et al. 2003). Our sample firms, on average, also have longer auditor tenure and are older than firms studied in previous studies with over 75% of the sample using the same audit firm for 10 years or longer (Geiger and Raghunandan 2002; Myers et al. 2003). Panel B of Table 1 shows the distribution of the ratings in the sample. The sample consists of 18 different ratings from Aaa to Ca representing a wide range of bond ratings. Of the issues 2,505 are investment grade (Baa3 or higher) and 533 are non-investment grade.

4.5 Empirical Results

4.5.1 Regression Results

Results from the ordered logistic regression for the overall sample are shown in Table 2. Model 1 represents the results of the benchmark model. The summary statistics of the benchmark model (Psuedo R^2 =69.57%; Model c = .780) indicate the model explains a significant amount of the variation involved in the bond rating decision process. All control variables except times interest earned are significant and have the expected signs (p-values reported are all two tailed).

Model 2 displays the results with firm age and auditor tenure included. The primary variable of interest is auditor tenure (TENURE). Model 2 illustrates that auditor tenure is significant and positively related to a firm's bond rating, indicating that longer auditor tenure has a significant positive impact. This is consistent with the proposition that bond rating analysts perceive greater company expertise for those auditors with longer tenure and is not consistent with the lack of objectivity and loss of independence argument. Alternatively stated, the continued presence of the same auditor is associated with lower firm default risk.

[29] Results remain the same when these bonds are removed from the data set.

To further analyze these results, we segment the sample by investment grade. The segmented sample consists of 533 non-investment grade issues (below Baa3) and 2,505 investment grade issues (Baa3 and above). Results of the regression for each are presented in Table 3. Both samples indicate that tenure has a significant positive association with bond ratings, contrary to the findings of Mansi et al. (2003). Mansi et al. (2003) report that investors require a lower rate of return as tenure increases for firms that are not investment grade. On the other hand, Mansi et al. (2003) report the opposite for investment grade firms. They find that investors require a higher rate of return for investment grade firms that have longer auditor tenure. Our results show that auditor tenure is significant and positive for investment grade firms ($p = .0170$) as well as for non-investment grade firms ($p = .0077$). These results indicate that the relationship between auditor tenure and bond ratings remains consistent across firms regardless of the investment grade status of the issue. The difference in results may be due to the difference in financial statement users. The yield of the bond is set individual investors whose perception of auditor independence differs from bond rating analysts.

4.5.2 Additional Analysis

Next the sample is segmented based on return on assets to determine if financial performance might be driving the primary results. Given results found by Mansi et al. (2003), perceived audit quality may be less critical for higher performing firms. The sample is partitioned based on the median ROA observation and regressions rerun for each half. Results are reported in Table 4 and indicate auditor tenure is positively related to a firm's bond rating for both samples ($p<.0001$).

Finally, we investigate whether recent accounting scandals (e.g. Enron) and the subsequent collapse of Arthur Andersen has any effect on our results by partitioning our sample into pre- and post Enron time periods. The results shown in Table 5 indicate that auditor tenure continues to have a positive association with bond rating for bonds issued from 2001-2002 ($p<.0001$) as well as for those issued prior to 2001, i.e. 1990-2000 ($p<.0001$). This indicates that the impact of auditor tenure on bond ratings did not change even given the excessive scrutiny the auditing profession received during this period. Overall, the results displayed in Tables 2-5

consistently illustrate a positive association between auditor tenure and the actual bond rating assigned to an issue. These results are consistent with the theory that increased auditor tenure is viewed as a positive signal to bond rating analysts regarding the quality of the issue. This is consistent with the increased auditor expertise argument espoused by the auditing profession.

4.6 Summary and Conclusions

This study adds to the literature related to how sophisticated financial statement users perceive the auditor-client relationship. Specifically, we investigate the effect of auditor tenure on new corporate bond ratings. Using a sample of 3,038 new issues from the period 1900-2002, we document a significant positive effect of auditor tenure on new bond ratings. We contribute to the extant literature by providing evidence of the systematic inclusion of the client-auditor relationship in the bond rating process and by documenting the perceptions of an important class of financial statement users regarding this relationship.

It is possible that our findings are the result of self-selection by auditing firms. Given sophisticated risk management practices currently used by auditors, our results are not surprising (e.g. Bell, Bedard, Johnstone, and Smith 2002). If audit firms' risk management processes are effective, we would expect to see longer auditor tenure for companies with lower default risk. This possibility is carefully controlled for, however, by including variables identified in prior literature as being associated with bond ratings. Further, although we cannot definitively state that audit firm rotation would have a negative impact on firm's cost of capital, our research indicates that longer auditor tenure is considered to be more beneficial than shorter auditor tenure.

The present study provides relevant and timely evidence to regulators and members of the accounting profession as mandatory rotation is currently being considered. We find no evidence that financial statement users consider increased auditor tenure to lead to a decrease in auditor objectivity. Our results are consistent with an observation that users perceive an increase in audit quality. Furthermore, these results hold true regardless of the level of default risk, i.e. investment grade or non-investment grade. These results do not agree with Mansi et al. (2003),

who report greater required rate of return for investment grade firms that have longer auditor tenure. We continue to find a consistent positive association between new bond ratings and auditor tenure for all firms regardless of investment grade status. Furthermore, these same results remain consistent regardless of the financial performance of the firm or the time period involved.

4.7 References

Balvers, R. J., B. McDonald, and R. E. Miller. 1988. Underpricing of new issues and the choice of auditor as a signal of investment banker reputation. *Accounting Review* 63 (4): 605-622.

Barth, M. E., J. Elliott, and M. Finn. 1999. Market rewards for increasing earnings patterns. *Journal of Accounting Research* 37 (2): 387-413.

Beatty, R. P. 1989. Auditor reputation and the pricing of initial public offerings. *Accounting Review* 64 (4): 693-709.

Beatty, R. P. 1993. The economic determinants of auditor compensation in the initial public offerings market. *Journal of Accounting Research* 31 (2): 294-302.

Beck, P. J., T. J. Frecka, and I. Solomon. 1988. An empirical analysis of the relationship between mas involvement and auditor tenure: Implications for auditor independence. *Journal of Accounting Literature* 7: 65-84.

Bell, T. B, J. C. Bedard, K. M. Johnstone, and E. F. Smith. KRisk^{SM}: A computerized decision aid for client acceptance and continuance risk assessments. *Auditing: A Journal of Practice & Theory* 21 (2):97-113.

Benson, M. 2002. California pension fund vows to help prevent audit schemes. *Wall Street Journal* (February 21).

Bradley, M., G. A. Jarrell, and E. H. Kim. 1984. On the existence of an optimal capital structure: Theory and evidence. *Journal of Finance* 39 (3): 857-878.

Brandon, D., A. Crabtree, and J. Maher. 2004. Non-Audit Fees, Auditor Independence, and Bond Ratings. Forthcoming *Auditing: A Journal of Practice and Theory.*

Cantor, R., 2001. Moody's investors service response to the consultative paper issued by the Basel Committee on Banking Supervision and its implications for the rating agency industry. *Journal of Banking and Finance* 25 (1) 171-186.

Carcello, J. V., A. L. Nagy. 2004. Audit firm tenure and fraudulent financial reporting. Working Paper, University of Tennessee.

Chaney, P. K., and K. L. Philipich. 2002. Shredded reputation: The cost of audit failure. *Journal of Accounting Research* 40 (4): 1221-1245.

Chang, M., and G. S. Monroe. 2002. The impact of reputation, audit contract type, tenure, audit fees and other services on auditors perceptions of audit quality. Working Paper, University of Western Australia.

Clarkson, P. M., and D. A. Simunic. 1994. The association between audit quality, retained ownership, and firm-specific risk in U.S. Vs. Canadian IPO markets. *Journal of Accounting and Economics* 17 (1-2): 207-228.

Collins, D. W., and S. P. Kothari. 1989. An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. *Journal of Accounting and Economics* 11 (2-3): 143-181.

Copeland, J. E. 2002. Prepared statement of Mr. James E. Copeland, CPA Chief Executive Officer Deloitte & Touche before the US Senate Committee on Banking, Housing, and Urban Affairs.

Datar, S. M., G. A. Feltham, and J. S. Hughes. 1991. The role of audits and audit quality in valuing new issues. *Journal of Accounting and Economics* 14 (1): 3-49.

Davis, L. R., B. S. Soo, and G. Trompeter. 2003. Auditor tenure, auditor independence and earnings management. Working Paper, Boston College.

DeAngelo, L. E. 1981. Auditor independence, 'low balling', and disclosure regulation. *Journal of Accounting and Economics* 3 (2): 113-127.

Deis, D. R. J., and G. A. Giroux. 1992. Determinants of audit quality in the public sector. *The Accounting Review* 67 (3): 462-479.

Dichev, I. D., and J. D. Piotroski. 2001. The long run stock returns following bond ratings changes. *Journal of Finance* 56 (1): 173-203.

Dunham, K. J. 2002. Firms that want to switch auditors find it takes time, money and faith. *Wall Street Journal Online* (March15).

Ederington, L. H. 1985. Classification models and bond ratings. *Financial Review* 20: 237-262.

Ederington, L. H., and J. C. Goh. 1998. Bond rating agencies and stock analysts: Who knows what when? *Journal of Financial and Quantitative Analysis* 33 (4): 569-585.

Ederington, L. H., J. B. Yawitz, and B. E. Roberts. 1987. The informational content of bond ratings. *Journal of Financial Research* 10: 211-226.

Eichenseher, J. W., M. Hagigi, and D. Shields. 1989. Market reaction to auditor changes by otc companies. *Auditing: A Journal of Practice & Theory* 9 (1): 29-40.

Fama, E.F., and K.R. French. 1997. Industry Costs of Equity. *Journal of Financial Economics.* 43: 153-193.

Feltham, G. A., J. S. Hughes, and D. A. Simunic. 1991. Empirical assessment of the impact of auditor quality on the valuation of new issues. *Journal of Accounting and Economics* 14 (4): 375-399.

Fisher, L. 1959. Determinants of risk premiums on corporate bonds. *Journal of Political Economy* (June): 217-237.

Francis, J. R. 1984. The effect of audit firm size on audit prices : A study of the Australian market. *Journal of Accounting and Economics* 6 (2): 133-151.

Fried, D., and A. Schiff. 1981. CPA switches and associated market reactions. *The Accounting Review* 56 (2): 326-341.

Geiger, M. A., and K. Raghunandan. 2002. Auditor tenure and audit reporting failures. *Auditing* 21 (1): 67-78.

General Accounting Office (GAO). 2003. *Public Accounting Firms Required Study on the Potential Effects of Mandatory Audit Firm Rotation*. Washington, D.C.

Gentry, J. A., D. T. Whitford, and P. Newbold. 1988. Predicting industrial bond ratings with a probit model and funds flow components. *Financial Review* 23: 269-286.

Ghosh, A., and D. Moon. 2003. Does auditor tenure impair audit quality. Working Paper. Office of Economic Analysis.

Glascock, J. L., W. N. Davidson III, and G. V. Henderson. 1987. Announcement effects on moody's bond rating changes on equity returns. *Quarterly Journal of Business and Economics* 26: 67-78.

Graham, A., J. J. Maher, and W. D. Northcut. 2001. Environmental liability information and bond ratings. *Journal of Accounting, Auditing and Finance* 16: 93-116.

Hackenbrack, K. E., and C. E. Hogan. 2002. Market responses to earnings surprises conditional on reasons for an auditor change. *Contemporary Accounting Research* 19 (2): 195-223.

Hand, J. R., R. W. Holthausen, and R. W. Leftwich. 1993. The effect of bond rating agency announcements on bond and stock prices. *Journal of Finance* 47: 733-752.

Holthausen, R. W., and R. W. Leftwich. 1986. The effect of bond rating changes on common stock prices. *Journal of Financial Economics* 17: 57-90.

Horrigan, J. O. 1966. The determination of long term credit standing with financial ratios. *Journal of Accounting Research* (supplement): 44-62.

IDD Inc. 2002. *Investment dealer's digest.* January 7.

Johnson, W. B., and T. Lys. 1990. The market for audit services : Evidence from voluntary auditor changes. *Journal of Accounting and Economics* 12 (1-3): 281-308.

Johnson V. E., I. K. Khurana, and J. K. Reynolds. 2002. Audit-firm tenure and the quality of financial reports. *Contemporary Accounting Research* 19 (4): 637-660.

Johnstone, K. M., M. H. Sutton, and T. D. Warfield. 2001. Antecedents and consequences of independence risk: Framework for analysis. *Accounting Horizons* 15 (1): 1-18.

Kaplan, R. S., and G. Urwitz. 1979. Statistical models of bond ratings. *Journal of Business* 52: 231-262.

Klock, M. 1994. The stock market reaction to a change in certifying accountant. *Journal of Accounting Auditing and Finance* 9 (2): 339-347.

Knapp, M. C. 1991. Factors that audit committee members use as surrogates for audit quality. *Auditing* 10 (1): 35-51.

Loffler, G., 2003. Avoiding the rating bounce: why rating agencies are slow to react to new information. Working Paper, University of Frankfurt.

Lowe, D. J., and K. Pany. 1995. CPA performance of consulting engagements with audit clients: Effects on financial statement users' perceptions and decisions. *Auditing: A Journal of Practice & Theory* 14 (2): 35-53.

Maher, J. J. 1987. Pension obligations and the bond credit market: An empirical analysis of accounting numbers. *The Accounting Review* 62: 785-798.

Mansi, S.A., W.F. Maxwell, and D.P. Miller. 2003. Does auditor quality and tenure matter to investors? Evidence from the bond market. Working Paper, Virginia Tech.

Melancon, B. 2002. Statement of Barry Melancon, President and CEO, American Institute of Certified Public Accountants to the Committee on Financial Services, US House of Representatives. New York: AICPA.

Moody's Investor Service, 1998. An historical analysis of moody's watchlist. *Moody's Global Credit Research*.

Myers, J., L. A. Myers, and T. C. Omer. 2003. Exploring the term of the auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation? Forthcoming: *The Accounting Review*.

Nichols, D. R., and D. B. Smith. 1983. Auditor credibility and auditor changes. *Journal of Accounting Research* 21 (2): 534-544.

Pinches, G. E., and K. A. Mingo. 1973. A multivariate analysis of industrial bond ratings. *Journal of Finance* 28: 1-18.

Pinches, G. E., and K. A. Mingo. 1975. The role of subordination and industrial bond ratings. *Journal of Finance* 30: 201-206.

PriceWaterhouseCoopers. 2002. Mandatory rotation of audit firms: Will it improve audit quality? New York: PriceWaterhouseCoopers (March 8).

Reiter, S. A., and D. R. Emery. 1991. Estimation issues in bond-rating models. *Advances in Quantitative Analysis of Finance and Accounting* 1: 147-163.

S & P Rating Group. 2003. *S &P Corporate Ratings Criteria.* New York.

Securities and Exchange Commission (SEC).1977. *Exhange act release no. 34-13989, auditor changes, proposed rule.* Washington, D.C. (September).

Securities and Exchange Commission (SEC).1978. *Exchange act release no.34-14808, auditor changes, final rule.* Washington, D.C. (May).

Shockley, R. 1981. Perceptions of auditors' independence: An empirical analysis. *The Accounting Review* 56 (4): 785-800.

Shu, S. 2000. Auditor resignations: clientele effects and legal liability. *Journal of Accounting and Economics.* 29(2): 173-205.

Teoh, S. H., and T. J. Wong. 1993. Perceived auditor quality and the earnings response coefficient. *The Accounting Review* 68 (2): 346-366.

Titman, S., and B. Trueman. 1986. Information quality and the valuation of new issues. *Journal of Accounting and Economics* 8 (2): 159-172.

Trumka, R. 2001. Request for rulemaking concerning definition of independent auditor and limiting services accounting firms may provide to audit clients. Letter to the U.S. Securities Exchange Commission.

Watts, R. L., and J. L. Zimmerman. 1986. *Positive accounting theory* (Prentice-Hall, INC, New Jersey).

West, R. R. 1970. An alternative approach to predicting corporate bond ratings. *Journal of Accounting Research* 8: 118-125.

Ziebart, D. A., and S. A. Reiter. 1992. Bond ratings, bond yields, and financial information. *Contemporary Accounting Research* 9 (252-282).

4.8 Tables

Table 4-1 Descriptive Statistics

Panel A: Descriptive Statistics (n=3,038)

Variable		Mean	Std Dev	First Quartile	Median	Third Quartile
Total Assets	^	13,794	26,229	2,082	5,563	14,125
Long-term Debt	^	3,262	5,938	459	1,313	3,743
Operating Income	^	548	1,036	58	230	639
Pension Liab	^	2,776	8,582	37	517	1,585
SUB		.07	.26	0	0	0
SIZE	**	8.57	1.45	7.64	8.62	9,56
LEVERAGE	*	.28	.17	.17	.25	.36
PROFIT	*	.05	.05	.02	.05	.07
PENSION	*	.15	.18	.02	.09	.20
TIMES		6.61	12.62	2.35	4.37	7.27
BETA		.95	.45	.66	.96	1.22
AGE		14.98	4.82	12	16	18
TENURE		13.34	5.71	10	14	18

* Scaled (divided) by Total Assets ** Log scaled ^ In millions

Panel B: Sample Bond Ratings

Rating	Number of Issues	Percentage of Sample
Aaa	56	1.84
Aa1	35	1.15
Aa2	85	2.80
Aa3	136	4.48
A1	313	10.30
A2	486	16.00
A3	408	13.43
Baa1	283	9.32
Baa2	523	17.22
Baa3	180	5.92
Ba1	97	3.19
Ba2	70	2.30
Ba3	93	3.06
B1	97	3.19
B2	104	3.42
B3	65	2.14
Caa1	6	0.20
Ca1	1	0.03

Table 4-2 Logistic Regression Results

Bond Rating Models for 3,038 new bond issues from Jan 1990 – Dec 2002.

$$RATING_j = \beta_0 + \beta_1 SUB_j + \beta_2 SIZE_j + \beta_3 LEVERAGE_j + \beta_4 PROFIT_j + \beta_5 PENSION_j + \beta_6 TIMES_j + \beta_7 BETA_j + \beta_8 AGE_j + \beta_9 TENURE_j + \beta_{10}(FF1\text{-}43)_j + \beta_{11}(YEAR90\text{-}02)_j$$

		Model 1	Model 2
	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)
SUB	-	-2.72 (<.0001)	-2.69 (<.0001)
SIZE	+	1.08 (<.0001)	1.04 (<.0001)
LEVERAGE	-	-4.88 (<.0001)	-4.85 (<.0001)
PROFIT	+	18.84 (<.0001)	18.86 (<.0001)
PENSION	-	-0.44 (.0543)	-0.68 (.0037)
TIMES	-	-0.004 (.2156)	-0.003 (.2917)
BETA	-	-0.42 (<.0001)	-0.43 (<.0001)
AGE	+		0.02 (.0805)
TENURE	+		0.04 (<.0001)
Likelihood Ratio		3,566.22	3,625.82
Model c		.780	.783
Pseudo R^2		69.57%	70.18%

*All p-values are two-tailed. Industry and year indicator variables statistics suppressed.

Table 4-3 Logistic Regression Results

Bond Rating Models for Non-Investment Grade issues (n=533) and Investment Grade issues (n=2,505).

$$RATING_j = \beta_0 + \beta_1 SUB_j + \beta_2 SIZE_j + \beta_3 LEVERAGE_j + \beta_4 PROFIT_j + \beta_5 PENSION_j + \beta_6 TIMES_j + \beta_7 BETA_j + \beta_8 AGE_j + \beta_9 TENURE_j + \beta_{10}(FF1\text{-}43)_j + \beta_{11}(YEAR90\text{-}02)_j$$

		Non-Investment Grade	Investment Grade
	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)
SUB	-	-1.72 (<.0001)	0.47 (.3617)
SIZE	+	1.01 (<.0001)	0.88 (<.0001)
LEVERAGE	-	-0.98 (.0247)	-6.56 (<.0001)
PROFIT	+	13.51 (<.0001)	18.02 (<.0001)
PENSION	-	1.06 (.1706)	-0.74 (.0043)
TIMES	-	-0.005 (.4784)	-0.004 (.1986)
BETA	-	-0.07 (.6830)	-0.63 (<.0001)
AGE	+	-0.04 (.0837)	0.02 (.2527)
TENURE	+	.06 (.0077)	0.03 (.0170)
Likelihood Ratio		436.98	1,896.00
Model c		.830	.792
Pseudo R^2		57.43%	53.98%

*All p-values are two-tailed. Industry and year indicator variables statistics suppressed.

Table 4-4 Logistic Regression Results

Bond Rating Models—Sample is split based on median ROA observation, each group classification has n=1519.

$$RATING_j = \beta_0 + \beta_1 SUB_j + \beta_2 SIZE_j + \beta_3 LEVERAGE_j + \beta_4 PROFIT_j + \beta_5 PENSION_j + \beta_6 TIMES_j + \beta_7 BETA_j + \beta_8 AGE_j + \beta_9 TENURE_j + \beta_{10}(FF1\text{-}43)_j + \beta_{11}(YEAR90\text{-}02)_j$$

		Above Median	Below Median
	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)
SUB	-	-3.11 (<.0001)	-2.56 (<.0001)
SIZE	+	1.15 (<.0001)	1.13 (<.0001)
LEVERAGE	-	-6.46 (<.0001)	-3.57 (<.0001)
PROFIT	+	10.04 (<.0001)	25.71 (<.0001)
PENSION	-	1.17 (.0001)	-0.20 (.6509)
TIMES	-	-0.003 (.3376)	.15 (<.0001)
BETA	-	-0.41 (.0025)	-0.66 (<.0001)
AGE	+	0.06 (.0009)	-0.01 (.4339)
TENURE	+	.07 (<.0001)	0.05 (<.0001)
Likelihood Ratio		1710.72	1,999.20
Model c		.811	.686
Pseudo R^2		68.18%	73.74%

*All p-values are two-tailed. Industry and year indicator variables statistics suppressed.

Table 4-5 Logistic Regression Results

Bond Rating Models—Sample is split based pre- and post-Enron samples. The 1990-2000 group has n=2405 and the 2001-2002 group has n=633.

$$RATING_j = \beta_0 + \beta_1 SUB_j + \beta_2 SIZE_j + \beta_3 LEVERAGE_j + \beta_4 PROFIT_j + \beta_5 PENSION_j + \beta_6 TIMES_j + \beta_7 BETA_j + \beta_8 AGE_j + \beta_9 TENURE_j + \beta_{10}(FF1\text{-}43)_j + \beta_{11}(YEAR90\text{-}02)_j$$

		1990-2000	2001-2002
	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)
SUB	-	-3.23 (<.0001)	-1.89 (<.0001)
SIZE	+	1.10 (<.0001)	1.09 (<.0001)
LEVERAGE	-	-4.79 (<.0001)	-6.71 (<.0001)
PROFIT	+	21.45 (<.0001)	19.73 (<.0001)
PENSION	-	-0.84 (.0017)	-0.68 (.2390)
TIMES	-	-0.005 (.1032)	.005 (.5101)
BETA	-	-0.28 (.0038)	-1.14 (<.0001)
AGE	+	0.02 (.3236)	0.02 (.3162)
TENURE	+	.05 (<.0001)	0.05 (.0015)
Likelihood Ratio		3059.36	742.26
Model c		.745	.831
Pseudo R^2		72.50%	70.09%

*All p-values are two-tailed. Industry and year indicator variables statistics suppressed.

5 CONCLUSIONS

5.1 Summary and Conclusions

This dissertation investigates three important issues facing the accounting and business profession by examining their effects in the bond credit market. The first study (Chapter 2) examines the effect earnings predictability has on perceptions of firm default risk through the initial bond rating and subsequent issue pricing. The study uses earnings surprise and dispersion of analyst agreement as two proxies for earnings predictability. Results of the study show that earnings predictability affects the bond market in two ways. First, a lack of earnings predictability is negatively associated with the bond rating assigned when added to the control model. This implies bond ratings analysts perceive the lack of earnings predictability as an increase in default risk. Second, the lack of earnings predictability is negatively related to bond yields (ultimate pricing of the bond) when added to a control model that includes the bond rating. This shows that investors recognize that a lack of predictable earnings represents an increase in default risk and also creates a direct and indirect effect on the ultimate yield.

The second study empirically tests the importance of the auditor-client relationship in the bond market. The magnitude of non-audit fees provided to the client is used to proxy for auditor independence. Given the recent criticism of auditors regarding their consulting practices (Bryan-Low and Opdyke 2002), the perceptions of a defined user set (bond rating analysts) can shed more light on the issue. This study examines whether or not the provision of non-audit services

results in a perception of independence impairment. Findings indicate that non-audit services have a negative effect on bond ratings. Further analysis shows that the results are largely due to those firms that purchase relatively large amounts of non-audit services. While this effect is statistically significant, it appears to have limited economic effect on the company (Raghunandan 2003). While analyst perception is not directly observable, the results are consistent with the argument that the provision of substantial non-audit services to a client leads to a perceived reduction in independence.

The third study examines a different aspect of the auditor-client relationship. This study uses auditor tenure to proxy for audit quality. There are two sides to the mandatory auditor rotation issue. One argument contends that extended auditor tenure reduces audit quality because the auditor can become complacent. A competing argument asserts that longer auditor tenure leads to more client specific knowledge and results in a higher quality audit. The study finds a consistently positive relationship between auditor tenure and bond ratings received for new firm issuances. These results are consistent for investment and non-investment grade issues and for bonds issued during a period of intense auditor-client relationship scrutiny (2001 – 2002). This is consistent with the argument that financial statement users perceive longer auditor tenure to add to audit quality by increasing client specific knowledge. These studies highlight the importance of perceived auditor quality and auditor independence to the bond market.

5.2 Suggestions for Future Research

Given the results of the first study, future research should examine the quality of earnings and their relationship to the bond market. Future research can further partition the results described in Chapter 2. It could also be beneficial to use different proxies for earnings predictability to determine if the negative effect associated with a lack of earnings predictability is consistent or if there is more/less extra information contained in different definitions of earnings predictability.

The results of the second and third studies indicate the auditor-client relationship is important to the firm's bond rating and consequently to the firm's cost of capital. Given the interest in the subject of auditor independence and audit quality, it would be interesting to see if

the results are consistent over time. In addition, auditor fee data are only available from 2001 forward, thereby providing a very short time series of data. It would also be interesting to determine if the results from the United States are similar to other countries that have similar reporting requirements – e.g. the United Kingdom and Australia. Auditor tenure studies for other countries would be interesting to contrast different needs for different countries. In India, for example, management and ownership are largely the same group, with limited outside investment (Sivakumar 2002). With different capital structures and different investor needs, it would be interesting to see if audit quality and auditor independence are viewed differently across countries and cultures.

5.3 References

Bryan-Low, C., and J. D. Opdyke. 2002, How to predict the next fiasco in accounting and bail early, *Wall Street Journal*. (1/24/02). C1.

Raghunandan, K. 2003. Nonaudit services and shareholder ratification of auditors. *Auditing: A Journal of Practice & Theory* 22 (1): 155-163.

S. Sivakumar. 2002. The two sides of rotation, *The Hindu Business Line.* (10/3/02).

6 VITA

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