DO CREDIT RATINGS REALLY AFFECT CAPITAL STRUCTURE?

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CHAPTER I

INTRODUCTION

The issue of capital structure has been studied extensively over the past few decades. Up until recently, the effect of credit ratings on capital structure had not been considered. While a recent idea, there is still much work to be done in this area. The motivation for further exploring this topic is rooted in Graham and Harvey's (2001) survey paper that listed maintaining a credit rating as the second most important objective in a firm's credit policy. Prior research by Kisgen (2006) finds evidence to support a link between credit ratings and capital structure. I attempt to add to the literature by relating the behaviors of nonrated firms to the behavior of rated firms to further understand if firms are motivated by their credit ratings. The value this addition provides is in determining if the behaviors of an uninterested firm (nonrated) are similar to that of an interested firm (rated). Previous research has failed to introduce nonrated firms as a control in their studies. To be certain that rated firms are balancing their capital structure with credit ratings in mind, it would be advisable to examine the behavior of a firm uninterested in maintaining a credit rating, namely an unrated firm.

In addition, I explore the capital structure reactions of firms that have been added to Standard and Poor's CreditWatch list rather than the response to the actual change in rating. Insight can be gained as to the actual importance of maintaining a credit rating by observing a firm's reaction when it receives a warning about the stability of its rating. More specifically, a firm that is

placed on the CreditWatch list with a negative warning would be expected to reduce its debt ratios in order to appear more financially stable and less distressed. A firm might raise new funds through the use of equity, if said firm is able to be nimble in the markets. On the other end of the spectrum, I wouldn't expect a firm with a positive CreditWatch designation to act in either direction. A firm that has seen its credit rating increase will be able to borrow at a lower cost.[1] However, that cost will not be reduced until the actual change in rating is official.

Finally, I examine if the credit rating hypothesis is sensitive to various subsamples classified by attributes deemed to capture the affinity to credit rating motivated capital structure decisions. To do so, I perform sensitivity analysis to both the sample of firms that appear on the CreditWatch list and also to all rated firms. Previous research has failed to examine sensitivity measures. Instead, previous works have approached the research question under the assumption that all firms would be equally interested or uninterested in making capital structure decisions with credit ratings in mind. The basis of my argument is that the theory is more applicable to a subset of firms, rather than all firms. In particular, I separate firms based on (1) their current credit ratings and examine the behaviors of these firms when faced with a negative signal to establish if the current rating plays a role in the magnitude in which a firm would follow a credit rating motivated capital structure policy. In other words, is an AAA firm more motivated to keep its rating than an A firm? Also, is a firm that is on the verge of losing its investment grade status more motivated than an AA firm? For various reasons we will explore, it follows that some categories of firms are more interested in maintaining or achieving a certain rating. Along these lines, I examine (2) whether firms that are active in the commercial paper market are more sensitive than firms that are not active in the commercial paper markets. I also examine the

[1] Tang (2009) shows that upgraded firms tend to issue more debt and rely more on debt financing. In addition, these firms have more capital investments, less cash accumulation and faster asset growth than downgraded firms. On the other hand, a firm with a ratings increase would also be receiving a signal that the firm is operating well in terms of credit management. With that in mind, we would expect a firm that experiences an upgrade to maintain the debt ratio, or slightly increase it.

sensitivity to this theory for (3) firms that are active capital market participants vs. firms that are less active in capital markets. By showing that certain firms (i.e. firms that are visiting the capital markets to raise new funds often) are more sensitive to this theory, we can strengthen (or possibly refute) previous findings. Lastly, I examine the capital structure behavior of firms as it relates to the investment opportunities available to these firms. I argue that firms with more growth opportunities would be more likely to be concerned with maintaining or achieving a long-term rating. The foundation for this argument is that these firms are likely to be raising capital in the near future and would be interested in raising needed capital at the lowest possible cost.

CHAPTER II

REVIEW OF LITERATURE

The capital structure literature is vast, supported by differing theories and numerous empirical studies. Harris and Raviv (1991) present a survey paper summarizing the state of capital structure literature at its time of publication. The main theories of capital structure discussed were Irrelevance, Agency Theory[2], Asymmetric Information (Signaling), Product/Input Market Interactions, and Corporate Control Considerations. I focus less on the last two theories as recent empirical evidence hasn't provided as much emphasis nor are these two categories considered as part of the fundamental theories in capital structure. I also include Baker and Wurgler's (2002) more recent market timing paper in my fundamental breakdown of the differing theories.

Prior to Harris and Raviv (1991), Myers (1984) categorizes capital structure literature into two main ways of thinking: (1) a static tradeoff framework, which is not specifically included in Harris and Raviv's paper, and (2) pecking order, which is encompassed in Harris and Raviv's asymmetric information category. He purposely excludes agency theory and other "managerial" theories because of the disconnect between managers' acts and stockholder stockholder interests.[3] He concludes that there is a "modified pecking order" in play for firms. Realizing that the theory needs to be further scrutinized, his theory is generally consistent with empirical evidence. The

[2] Leland (1998) develops a quantitative model that integrates Modigliani and Miller's (1958, 1963) irrelevance model with Jensen and Meckling's (1976) agency theory approach.
[3] I make the same exclusions when I remove the last two categories from Harris and Raviv's (1991) paper in my capital structure presentation.

basis of his "modified pecking order" theory is that observed debt ratios will reflect the cumulative requirement for external financing. In other words, a successful firm in a distressed industry will have lower debt ratios than an unsuccessful firm in the same industry during the same time period.

I will focus here on the main theories and present them in the following five categories:

(1) *Irrelevance Theories of Modigliani and Miller (1958, 1963)*

Modigliani and Miller present a theory in which capital structure is irrelevant. Stating the following proposition: "The market value of any firm is independent of its capital structure and is given by capitalizing its expected return at a rate appropriate to its risk class" they illustrate their theory by providing one of the earliest arbitrage pricing arguments. Their model shows that in a comparison of two companies, one levered and one not, if the levered firm has more value the position won't last long due to arbitrage opportunities. An investor can create a homemade leverage position through personal borrowings establishing the same level of risk associated with the levered company.

However, there are many assumptions made in this model. For example, the authors assume that there are no costs to bankruptcy. They also assume that all participants have the same information and that managers always maximize shareholder wealth. Relaxing these assumptions lead to the trade-off theories.

(2) *Optimal Capital Structure/Trade-off*

A generally accepted academic view of capital structure in the 1970s was that an optimal capital structure is one in which tax benefits are balanced against the present value of bankruptcy costs. In Miller's (1977) paper, personal taxes were introduced into the discussion and he shows that

personal tax disadvantages are of concern and also work against the advantage of tax shields at the corporate level.

DeAngelo and Masulis (1980) argue that an optimal capital structure exists in a world with corporate taxes, personal taxes and introduce non-debt tax shields into the conversation. They extend Miller's work by analyzing the effect of tax shields other than interest payments on debt, such as depreciation and investment tax credits. The show a model that predicts that firms will select a level of debt that is negatively related to the level of available non-debt tax shields.

Jensen and Meckling (1977) also recognize that an optimal capital structure exists, but instead argue that the optimal level is one which minimizes agency costs. Agency costs are associated with the problems that arise when managers (agents) do not always act in the best interests of the owners (principals). To help mitigate this agency problem, the firm incurs debt meaning managers are no longer able to freely spend all cash flows, but instead are disciplined with the requirement to meet debt obligations to avoid bankruptcy. The effect of a debt obligation then serves as a tool to monitor agents.

(3) *Signaling*

Ross (1977) and Leland and Pyle (1977) present theories which argue that the issuance of equity is a negative signal and thus a firm's capital structure is simply the result of issuing equity only in extreme circumstances. Consider the following three examples.

First, assume that there is uncertainty in terms of investors being able to identify good firms from bad firms. As a result, all firms are valued the same (pooling equilibrium). In this framework, a good firm will wish to distinguish itself from the bad firms and can do so under the assumption that only good firms can issue debt beyond some threshold. A bad firm cannot follow the same lead and falsely signal because the result will be bankruptcy. Therefore, good firms will issue enough debt to differentiate themselves from the bad firms creating a separating equilibrium.

Secondly, consider a firm with only one owner. The entrepreneur plans to invest in a project by retaining some ownership and borrowing the rest from investors. The entrepreneur alone knows the true value of the project and can signal that value by the amount of ownership she retains. In this context, investors perceive the true value of the firm to be a function of the amount of ownership retained. Similarly, an optimistic owner will only issue debt to avoid diluting her own equity in the company.

Finally, firms send a signal by issuing new shares when they believe they are overpriced. Assuming the insiders alone know the true value of a company, they will issue shares when the market value is greater than the true value of the firm's share. Conversely, redemption of shares signals that a firm (again with inside information) believes its stock is underpriced. Knowing the true value of the firm, the firm can capitalize on market mispricing by repurchasing undervalued shares. Together, these two behaviors signal the true value of a firm to the market.

(4) *Pecking Order Theories*

The pecking order theory is related to the signal theory just mentioned. According to this theory, a firm will use retained earnings to finance any new projects. A firm will only issue debt when retained earnings are insufficient. Equity will only be issued in extreme circumstances, due to the perceived negative signal it would send as outlined in the explanation of the signaling theory.

Myers and Maljuf (1984) argue that there is no optimal capital structure and that a firm's value is greatest when it does not issue equity. Rather, debt ratios are influenced by investment opportunities and funds available for those opportunities. Firms whose investment opportunities cannot be funded with existing retained earnings will turn to debt since issuing equity sends a signal that a firm's stock is overvalued. Equity is thus only used a last resort. Therefore, changes in capital structure are simply the results of a need for external funds as the perception of those inside the company is that retained earnings are a better source of funds than outside financing.

(5) *Market Timing theories*

Market timing theory is based on an inefficient market hypothesis. In other words, there are times when securities are mispriced. Therefore managers will take advantage of this mispricing by issuing equity when it is overvalued and repurchasing shares when they are undervalued. The idea also extends to the debt markets. Funds are then acquired after considering which market presents the more favorable conditions. Under this theory, firms may even visit the markets without any immediate need for funds, but rather for the sole purpose of taking advantage of market inefficiencies.

Baker and Wurgler (2002) postulate that the relationship between firm value and debt structure is relatively weak and therefore view capital structure as the end result of managers attempting to time the market. In other words, a firm will issue equity when it is overpriced and repurchase when equity is undervalued meaning that the resulting capital structure is the passive accumulation of these past market timing attempts.

Recent Empirical Evidence

In this section, I will discuss further contributions to the capital structure literature as the contributions are numerous and also add to the brief list given previously. There are many divergent theories that start with capital structure at the root. For example, there is a line of literature dealing with the effect managerial entrenchment has on capital structure. As one would assume, entrenched managers carry less debt to minimize the risk of their firms (Berger, Ofek, Yermack, 1997). Harris and Raviv (1990) also explore the relationship between debt and management control. Believing that managers do not always act in the best interests of their investors, there is a need for discipline through the use of debt. The very existence of debt can act as an information generating tool to be used by investors. Information is provided in two forms. If a firm is making payments (not making payments), information is obviously passed.

Secondly, a firm in default must be transparent in its financial situation during discussions of debt renegotiations.

A lot of the attention in capital structure over the last 5 – 10 years deals with market timing[4]. When firms (with insider information) feel their firms are not properly priced, capital structure decisions can be made to take advantage of this temporary mispricing. Baker and Wurgler (2002) were among the first to consider the effects of market timing. Since, several papers have been written further exploring the topic. Flannery and Rangan (2006) group these theories under the heading of "inertia theories." Welch (2004) shows that stock returns are really the only driving force behind debt ratios. Like Baker and Wurgler before him, he discounts the tradeoff and pecking order theories and relates capital structure to stock prices. Welch notes that a profitable firm will experience an increase in its stock price and this increase will obviously affect the market equity value of a firm. He concludes that stock returns are the best tool to use in forecasting capital structure. In other words, a firm's debt ratio is strongly correlated with fluctuations in its own stock price. Leary and Roberts (2005) attempt to partially explain the findings of Baker and Wurgler; and Welch. Both these papers find that firms are not adjusting to a target capital structure. Leary and Roberts surmise that this is due to adjustment costs, rather than an absence of a target debt ratio. Furthermore, they show that attempts to rebalance do not happen instantaneously. Instead, firms will move towards a target ratio at specific points in time, rather than every quarter. As a result, it would appear that firms are slow to adjust, or instead, not adjusting at all. Leary and Roberts attribute the apparent lack of a target debt ratio to a cost associated with adjusting.

In another related study of firm value, Jenter (2005) also shows that managers make capital structure decisions that reflect a perceived mispricing of their own firm. This conclusion is based

[4] Marsh (1982) finds that a company's decision between debt and equity is heavily based on current market conditions and historical stock prices.

on a link shown between managers' private portfolio decisions and changes in capital structures. Private portfolio trades are used as a window into the beliefs of the insiders since the true value of a firm should be transparent when analyzing activities of those with private information.

Kayhan and Titman (2007) agree that stock price histories have a substantial effect on capital structure, but only in the short-term. Over the long-term, however, debt ratios tend to move towards a target ratio that is in line with the tradeoff theories. However, firms do adjust at a slow rate. In addition, Kayhan and Titman investigate the reasons firms move away from a target debt ratio. If a firm moves away from a target debt ratio because of a financial deficit, then that firm will adjust back to its target. However, if a firm moves away from a target debt ratio because of the effects of an increase in stock price, that firm will be less likely to move back towards the original target.

In terms of adjustment, Flannery and Rangan (2006) acknowledge that firms may be adjusting to a target debt ratio, but may not be making a complete adjustment[5]. They argue that a partial adjustment model may be more appropriate and may explain conflicting results seen in previous literature. Recognizing the potential for partial adjustments, they conclude that firms will move towards a target ratio at a rate of about 30% per year. Based on their partial adjustment model, they conclude that more than half of the adjustments in capital structure are made with a target in mind. Market timing and pecking order theories explain less than 10% of the adjustment, contrasting the pecking order theories of Shyam-Sunder and Myers (1999) and inertia theories of Baker and Wurgler (2002) and Welch (2004).

In addition to the partial adjustment models, Lemmon, Roberts and Zender (2008) also question the application of previous models. Specifically, they find that much of the variation in capital structure is time-invariant. Also, they believe that existing empirical specifications do not explain

[5] Fama and French (2002) find that debt ratios tend to move towards their target, but at a relatively slow rate.

much of the variation. Their contribution is to recommend that future studies acknowledge the persistence in capital structure and hence focus on factors that are stable over time while also using dynamic specifications.

Other empirical studies of pecking order theories show interesting results. Based on a sample of large, mature companies, Shyam-Sunder and Myers (1999) conclude that the pecking order theory shows more statistical power than a target adjustment model. The point of this paper was to test target models and pecking order models jointly and then examine how each performed when combined with each other and also independently. They conclude that managers were not very interested in achieving any particular optimal debt ratio. Frank and Goyal (2003) recognize that previous work examining the validity of the pecking order theory wasn't necessarily broadly examined (earlier papers had relatively small samples). In reexamining the issue, they find that external financing is more heavily used than previously believed. In violation of the pecking order theory, they find that equity issues are more closely related to shortfalls in internal financing that debt issues. In other words, it appears that when internal financing is insufficient, firms turn to equity to raise new funds. Debt, on the other hand, is more long-term in nature and doesn't track well when compared with financing needs of a firm.

In terms of tradeoff theories, Hovakimian, Opler and Titman (2001) examine whether firms move towards a target debt ratio when raising new capital or retiring or repurchasing existing capital. In contrast to previous optimal capital structure contributions, the authors recognize that target debt ratios change over time. They conclude that firms do, in fact, move towards targeted debt ratios when issuing or retiring capital. They also verify several other prior findings. Profitable firms are more likely to issue debt and are more likely to repurchase equity rather then retire debt. Also, firms with higher stock prices are more likely to issue equity rather than debt and more likely to retire debt than repurchase equity. These conclusions are interesting in that they not

only lend credence to the tradeoff models, but also help validate agency and information asymmetry models.

While also believing that an optimal capital structure exists, Leland (1994) shows that when risk-free interest rates rise, optimal debt levels also rise. This is due to the fact that higher interest rates generate greater tax benefits. Therefore, despite the higher cost of debt, firms will raise debt ratios to take advantage of greater tax benefits. He also finds that optimal debt for firms facing a bankruptcy scare actually carry a lower interest rate than firms with lower bankruptcy costs. The debt is less risky and therefore contains a lower interest rate becomes these firms will have much lower debt ratios.

When studying capital structure, it would make sense to incorporate macroeconomic conditions into a firm's capital structure. Korajczyk and Levy (2003) do just that. They relate macroeconomic conditions to capital structure, finding a difference in capital structure activities between constrained and unconstrained firms. Specifically, constrained firms deviate less from target ratios while unconstrained firms are more liberal. Furthermore, the choice of financing for constrained firms is related to their deviations from target ratios. In other words, constrained firms "take what they can get" and don't make financing decisions based on macroeconomic conditions. On the other hand, unconstrained firms will attempt to time issues to take advantage of market conditions and market prices.

There is also a line of research stating that firms are underleveraged, starting with Graham (2000) showing that a typical firm could increase value by issuing more debt. In Molina (2005), the issue of underutilizing debt is further explored while also being one of the few papers to study credit ratings and capital structure simultaneously. Specifically, Molina measures the impact of increasing leverage on the probability of default, as measured by credit ratings. He shows that

Graham's estimation of the underuse of debt is justified when we consider the impact increasing leverage will have on the rating of a firm.

Frank and Goyal (2009)

Frank and Goyal (2009) provide one of the most recent studies on capital structure and provide empirical evidence consistent with a trade-off theory of capital structure. Motivated by empirical inconsistencies in the classic papers of Titman and Wessels (1988) and Harris and Raviv (1991), they attempt to resolve the empirical problems and provide an up-to-date overview of the existing literature, highlighting the pertinent theories and discarding the rest. The resulting paper provides a nice overview of the current state of the capital structure environment. The authors begin by disclosing what they have determined to be the "core factors for market leverage." The six core factors are: (1) industry median leverage, (2) tangibility, (3) profits, (4) firm size, (5) market-to-book assets ratio and (6) expected inflation. These six factors account for more than 27% of the variation in leverage, while all others factors combined account for only about 2%.

The authors then notice that the sign on 5 out of the 6 factors (all but the sign on profits) are consistent with the static trade-off theory. The static trade-off theory tells us that firms balance the cost of bankruptcy against the benefit of tax savings associated with debt. In addition, the trade-off theory also considers the role of agency costs. Together, the authors believe that is the predominant capital structure theory in play today. Classifying the differing theories into three groups (trade-off theory, pecking order theory and market timing theory)[6], the authors affirm the trade-off theory as the most empirically consistent.

Noting that the pecking order theory performed well in the 1970s and 1980s, the theory has been performing worse since the 1990s and today can be considered far less important than trade-off theories. Another reason for dismissing the importance of the pecking order theory is due to the

[6] This is similar to the groupings I use, although I also mention the irrelevance theory and the signaling theory.

fact that while it appropriately explains one of the core factors of market leverage, profits, three other factors cannot be explained with this theory. The factors of industry median leverage, tangibility and firm size do not flow from the fundamental logic of the pecking order theory, thus reducing its explanatory power.

Additionally, the market timing theories are also discounted by the authors as being unable to adequately explain regularities in empirical data that is accounted for using trade-off theories. Time varying optimization by managers is at the core of the market timing theory. However, dynamic trade-off theories also subscribe to the thought that managers consider time varying costs and benefits. Furthermore, market timing theories alone do not explain any of the six factors mentioned.

In this study covering American firms from 1950 to 2003, they also find that dividend paying firms typically have lower leverage, although note that further research needs to be done in this area due to the ambiguous predictions of existing theories. The main contribution of this paper was to disclose the most reliable factors in determining a firm's structure. It is interesting to note that Frank and Goyal (2009) doesn't list credit ratings as an explanatory variable for market leverage.

Capital Structure and Credit Ratings

Kisgen (2006, 2009) introduces credit ratings[7] into the argument and attempts to add to the previously mentioned theories when he shows that firms in the middle of a credit rating behave differently from those at the lower and upper ranges. In his 2009 paper, he attempts to further answer the question of why firms do not always follow an optimal capital structure. He finds that firms that have been downgraded issue less debt in the following year. Conversely, there is no effect on firms with ratings upgrades.

[7] Molina (2005) mentions credit ratings when he uses credit ratings as a proxy for default probability.

Following the evidence presented by Graham and Harvey (2001), in which CFOs disclose that a good credit rating is the second most important factor affecting debt policy (second only to "financial flexibility"), Kisgen (2006) was motivated to examine empirically the influence of credit rating on capital structure decisions. He finds that "firms near a credit rating upgrade or downgrade issue less debt relative to equity than firms not near a change in rating." The argument is made based on the following information: A firm with a "plus" or "minus" rating will be reluctant to issue debt. A firm with a "plus" rating doesn't want to sacrifice an opportunity to move into a higher credit rating by issuing debt. At the other end of the spectrum, a firm with a "minus" rating will also be hesitant to issue debt as not wanting to move to an overall lower credit rating.

One of the contributions of this work is to further test Kisgen's (2006) findings. One criticism of Kisgen's findings is the lack of a control group. Without a proper control group, we cannot be certain that the findings were not the result of some omitted variable. Is there some variable associated with a plus or minus rating that is driving the results? To be certain, this paper introduces a control group. The control group used is a set of nonrated firms. If credit ratings are as important as hypothesized, then a firm that is unrated, and thus not concerned with sacrificing a rating, will not act similarly to a rated firm. For example, Kisgen has shown that a firm with a B+ rating would be reluctant to issue debt so as to not compromise an opportunity to move into a BB rating. If an otherwise similar unrated firm issues debt, this would give more credence to Kisgen's findings and also to Graham and Harvey's (2001) findings. Furthermore, while it has been shown in Kisgen (2009) that a rated firm that has been downgraded will issue less debt in the following year, an unrated firm should not behave in the same manner.

Although capital structure has been examined for quite some time, the omission of credit ratings to the equation seems curious.

Credit Ratings

It is important to review the credit rating literature before examining the contributions of this research. Since credit ratings are a large focus of this paper, an understanding of ratings is essential. Additionally, the framework for the first hypothesis of this work lies in separating rated firms from non-rated firms, thus a better understanding of the credit rating literature is paramount. It is first important to note the rating process. A rating is first assigned to a public debt at the time of issue by an independent rating agency (Moody's, S&P).[8] Subsequently, a rating agency can change that initial assignment if there is a change in the credit quality of the issuing firm as made evident during a review. Credit ratings are of interest to creditors, managers and investors alike as they provide an indication of relative credit risk. To better understand the value of the ratings agencies and the service they provide, Table 1 gives an indication of how well the ratings agencies predict distress. The table provides default rates for corporate bonds and shows the percentage of firms that are unable to make their payments as separated by each rating.

It should be noted that the rating systems are both qualitative and quantitative. Common quantitative variables used by ratings agencies, and also for modeling credit ratings, include debt levels, earnings levels, interest expenses, total assets and firm size. They are not solely based on mathematical modeling, but also on a human element that might involve other considerations such as experience of the rater and history of the rated firm. Managerial considerations might also be included in the analysis while also considering the industry of the issuer in order to compare with competitors, industry norms and the current environment. For example, homebuilders in today's market would find it difficult to achieve a AA rating. Furthermore, the

[8] See Appendix A for a more thorough explanation of the rating process.

macroeconomic environment also plays a role in the rating process as there is a limit to how far above a sovereign rating a corporation's rating could go.[9]

Part of the qualitative process for assigning ratings is that they are long-term in nature. The standard policy of rating agencies is to not adjust ratings during different business cycles. In other words, the ideal is to rate "through the cycle." This makes sense as investors are not concerned with short-term fluctuations that may be temporary in nature, both during temporary booms or temporary busts. Amato and Furfine (2004) attempt to interpret the meaning of "through the cycle." They hypothesize that business cycle variables should not affect the rating of a firm. In order to test their hypothesis, they use a probit model that predicts ratings based financial, business and macroeconomic characteristics. Based on their findings, they conclude that credit ratings are indeed unaffected by changes in the business cycle.[10]

Moody's and Standard and Poor's are the main rating agencies. However, there are others. It has been shown that Moody's and Standard and Poor's assign lower ratings on bonds issues than the other rating agencies. For example, Cantor and Packer (1997) show that Duff & Phelps Credit Rating Agency (DCR) and Fitch Investor Services give systematically higher ratings on jointly rated issues than Moody's and S&P. Specifically, DCR rates higher than Moody's 49.7% of the time while rating below Moody's just 10.7% of the time. Is this a result of Moody's and S&P's rating every bond issued in US public markets?[11] Competitors of these two leading agencies will only assign a rating when it is solicited by the issuing firm. Hence, it might be hypothesized that the higher average rating of the other agencies is the result of a selection bias. It would make

[9] These are widely known and accepted facts about credit rating agencies. See Crouhy, Galai and Mark's (2001) paper that details the rating system. See also Ederinton and Yawitz (1987).
[10] Loffler's (2004) findings also verify that ratings agencies assign ratings using a "through the cycle" approach. While stability of ratings is then high, the ability to predict default is thus lessened.
[11] Since all public debt issues greater than $100 million are rated at time of issue, our nonrated sample may contain a sample bias. The nonrated sample will only include issues of less than $100 million. In addition, issues that are less than $100 million but expected to be of high quality will solicit a rating, further biasing our sample. As a result, the nonrated sample will contain smaller issues (smaller firms) and may be skewed towards less financially stable companies.

sense that only quality firms who are unhappy with their S&P or Moody's rating would seek out another rating. The authors discount the selection bias hypothesis when they show that selection bias does not account for the difference in ratings. Instead they find that frequent and large debt issuers are the most likely to seek an additional rating, but not in an attempt to clear regulatory hurdles (such as those necessary to be a suitable investment portfolio holding) as might be expected.

Credit ratings exist to decrease the amount of information asymmetry related to a debt issue. Investors are not able to correctly score each issue. That is why we rely on Moody's, Standard and Poor's and other rating agencies to provide this service. Is this information gap reduced as a result of the work of rating agencies? Regulation Fair Disclosure (Reg FD) was implemented in October, 2000. The goal was to eliminate select entities from receiving information that was not available to the public. For example, before Reg FD equity analysts might receive private information from a firm that was not available to the public. Reg FD eliminated this selective dissemination of information. However, credit rating agencies are exempt from this regulation. The argument was that rating agencies provide a service to the public and the quality of that information could not be compromised. As such, ratings agencies would continue to have access to this private information and could potentially increase the value of these ratings. Jorion, Liu and Shi (2005) examine whether Reg FD affected information content of credit ratings. If ratings agencies have greater information, we should see a pronounced stock price reaction to ratings upgrades and downgrades.[12] As would be expected, the ratings agencies did gain an advantage by having privileged information. The results confirm that the stock price reactions to ratings changes are more pronounced after Reg FD than before, concluding that rating agencies provide information.

[12] Previous literature, Holthausen and Leftwich (1986) and Dichev and Piotroski (2001), shows that stocks react to downgrades, but not to upgrades

Tang (2009) also studies information symmetry as it relates to credit ratings. In 1982, Moody's adjusted their ratings table. More specifically, ratings became more specific and streamlined when modifiers were introduced. For example, prior to 1982, firms were Aaa, Aa and A. After 1982, Aa firms were further separated into subratings of highest, average and worst credit quality for Aa firms using numerical designators, thus producing the ratings of Aa1, Aa2 and Aa3. The same subcategories were introduced for A firms and so forth. Tang studies this change to better understand the effects of asymmetric information on the borrowing habits of firms. His findings support the transparent nature of credit ratings. After the refinement, firms who were better off enjoyed lower costs of borrowing and subsequently increased borrowing levels. Credit ratings provide information that is used by investors and firms alike to reduce information asymmetry.

If credit ratings play a role in reducing information asymmetry, a likely question to ask is how well do rating agencies do their job? In other words, do they protect investors by correctly predicting default? Altman and Rijken (2004) provide an insightful overview of the state of the rating agencies. They cite a survey conducted by the Association for Financial Professionals (2002) that reports that the respondents believe that the rating agencies are slow to react to changes in credit quality. The main issue with the respondents is not in terms of the accuracy of the ratings, but instead the timeliness of the adjustments to new information. Altman and Rijken also reveal that this is the belief of many practitioners as evidenced from their personal conversations with those in the field. In addition, 70% of investors desire a ratings system that reflects short-term changes in credit quality (Ellis, 1998). However, investors also desire ratings stability as to minimize the frequency of portfolio adjustments. As a result, the balance is a delicate one and the ratings agencies tend to error on the side of stability. In a later study, Altman and Rijken (2006) quantify the effects of trying to balance ratings stability, timeliness and the ability to predict default. These three issues encompass the three main issues of credit ratings.

In another study by Altman (1998), the migration (drift) behaviors of bonds is explored. His goal is to show the difference in drift rates for the two main rating agencies. In other words, is the likelihood that a Baa/BBB rated bond will drift to another rating higher for one of the rating agencies? One notable result seen in his findings as it applies to this paper is the drift probabilities in the short-term.[13] For example, over 90% of firms will maintain a credit rating over a one year horizon.

Do credit ratings do a better job than other methods? Bongini, Laeven and Majnoni (2002) attempt to determine the best source of information in regards to predicting bank fragility. The data sample used is gathered in an attempt to better understand bank failures during Asian crisis in the late 1990s. Competing approaches used in their analysis are ones based on balance sheet information, stock price information and credit ratings. They conclude that credit ratings are the least powerful predictors of bank distress, among the three approaches. Another interesting result from this paper is that being rated does not have disciplining effects on a firm. The authors do make certain to note that that their results are specific to Asian banks and specific to this particular crisis and may not be robust to other industries and to other time periods.

We have also seen recent activity in financial markets across the globe that has shown that the science of assigning a credit rating is less than exact.

AIG's credit rating remained critical to its survival over the summer. Even as earnings declined, the company's ratings remained strong. For all its problems, few doubted AIG's ability to repay its obligations. It was still one of the world's most recognized corporate brands, with operations in 130 countries. Its enviable credit rating allowed subsidiaries such as International Lease Finance Corp., its aircraft leasing arm, to borrow on preferable terms. Without that advantage, the logic of

[13] See Altmann (1998) for the rating transition matrix.

staying within AIG would diminish. When AIG reported a $5.36 billion loss in August, talk of a spinoff grew louder.

Business Week, September 29, 2008, News: Wall Street in Crisis; Pg. 40, 1232 words, By Nanette Byrnes

American International Group Inc., the world's largest insurer, fell to the lowest level since 1997 in New York trading after Citigroup Inc. analyst Joshua Shanker said it may yet need more capital than the $20.3-billion (U.S.) raised. AIG may seek $5-billion to $10-billion rather than let its credit ratings be cut again and risk higher borrowing costs and lower sales, Mr. Shanker said late Tuesday in a research note. Standard & Poor's, Fitch Ratings and Moody's Investors Service downgraded AIG this month after the company posted a $7.81-billion first-quarter loss. Spokesman Chris Winans said that AIG didn't anticipate needing to raise more cash and declined to comment specifically on Mr. Shanker's report. AIG (NYSE) fell $1.71 to $34.91, its lowest since November, 1997.

The Globe and Mail (Canada), May 29, 2008 Thursday, REPORT ON BUSINESS: INTERNATIONAL; BUSINESS TICKER: NORTH AMERICA: FINANCIAL SERVICES: INSURANCE; Pg. B9, 130 words, Bloomberg

It's facing losses of tens of billions of dollars on complicated derivatives that it created during the market boom after having its debt ratings downgraded on Monday night by the three main credit ratings agencies, and its boasts the debt crisis trifecta: awesome size, with assets of more than $US1 trillion ($1.3 billion) that have not been marked to market value (US insurance groups aren't required to, unlike the US banks); awesome complexity (it began diversifying away from

vanilla life and general insurance in the mid-'60s and now has major exposure to two of the markets at the heart of this crisis, credit default swaps and mortgages); and a mainline connection into the arteries of the US economy.

Sydney Morning Herald (Australia), September 17, 2008 Wednesday, BUSINESS; Pg. 26, 919 words, Malcolm Maiden maiden@theage.com.au

It is clear that the ratings assigned are not always accurate and not always the best predictor of financial stability[14].

Credit ratings also play a role in determining the source of funding for a new debt issue. In a study of new debt issues, Denis and Mihov (2003) find that the primary determinant of the type of debt a firm will issue is the credit quality of the firm. As would be expected, the highest quality firms tend to borrow from public sources. Firms of average quality borrow from banks while the lowest credit quality firms borrow privately from non-bank lenders.

Billett, Flannery and Garfinkel (1995) also study differences between public and private security issues. Based on previous literature, they note that private and public securities are not perfect substitutes, since markets react differently to the issue of these securities. Specifically, loan announcement are generally met favorably, while public security issuances are met with negative returns. With this information, the authors try to measure the homogeneity of private lenders. In other words, are the private lenders perfect substitutes? They not only classify lenders by their bank or nonbank status, but also by their credit rating. By making this distinction, they find that abnormal returns are a function of the credit quality of a lender. Specifically, higher quality lenders produce higher abnormal returns for the borrower.

[14] Ederington and Yawitz (1987) show that ratings categories used by agencies are not entirely quantitative and not explicitly linked to probabilities of default.

Ratings Changes

A credit rating is not permanent. As a result, surveillance mechanisms are in place to protect the interests of the public. Surveillance on public issues occurs at one year. After this time, firms must pay for ratings surveillance. If a rating has been assigned due to a request from a firm (i.e. not a public issue over $100 million), then the company can elect to pay for monitoring[15] or instead only be rated on a "point-in-time" basis. The surveillance is performed by basically the same team and same lead analyst that assigned the original rating, as outlined in Appendix A.[16]

If a rating change is possible due to information gathered during surveillance, then a closer review takes place. If warranted, a CreditWatch listing will follow. Once a firm is listed on CreditWatch, a more thorough investigation is then launched to determine if a rating change is appropriate. The process of evaluating a firm on CreditWatch is the same as the process used to rate a new issue. Therefore, in the context of this paper, a firm can make adjustments to its debt structure to try to influence the analysts who are considering a change in rating.

Firms are added to Standard and Poor's Credit Watch List when they believe the potential for a change in rating within the next 90 days is substantial (roughly 50% or more). There are three sets of circumstances that would precede this action: (1) when an unexpected event or deviation from an expected trend occurs, (2) when there has been a change in the performance of an issuer, but the magnitude of that change is still undetermined or (3) a change occurs that necessitates the review of all companies in a particular sector or industry. Furthermore, firms are labeled in a manner to suggest that a likely upgrade or downgrade is forthcoming. A firm can also receive a Watch List designation of "developing" if the direction of change is not yet apparent. The use of the CreditWatch list has been increasing over the years. Hamilton and Cantor (2004) report that

[15] Standard and Poor's receives no payment for disseminating a rating, except for subscriptions to its publications. Standard and Poor's Rating Services is paid by the issuer of the securities or by third parties participating in marketing the securities.

[16] As would be expected, some rotation of members occurs to provide fresh perspective. Also, the lead analyst must rotate after five years.

prior to 1998, about 10% of bond issues were placed on a watch list. After 2000, about 40% of bonds were under review at Moody's.

Hand, Holthausen and Leftwich (1992) examine the effects of being added to Standard and Poor's CreditWatch List and also the effects of an actual change in rating by Moody's and Standard and Poor's. Previous work has had mixed results in regards to pricing reactions to both of these sources of information. The authors thus revisit the issue using daily data. Also, they disentangle rating changes as whether or not they had previously been listed on the watch list. They find that both stock and bond prices are affected by the addition of a firm to the CreditWatch list. They also find that the price reactions are more pronounced for downgrades than they are for upgrades. Furthermore, the reaction is even stronger when dealing with bonds below investment grade ratings. More recent papers show that firms' equity reacts negatively to downgrades, but positive rating changes do not produce significant results (Behr and Gnttler, 2008; Cantor, 2004).[17] Hill and Faff (2007) find that the market does not react differently in regards to whether a credit rating change was preceded by a CreditWatch list addition.

In the context of this research, the above findings imply that there are consequences to being added to a CreditWatch list, providing further support for examining the capital structure reaction of firms to being placed on the CreditWatch list. Although there have been some mixed results, knowing that a firm will likely have a negative stock price reaction to being placed on this list, and a subsequent reduction in stockholder wealth, one would expect firms to react to this news to avoid a potential rating reduction becoming reality. Thus, we would expect a firm to take action at the threat of a ratings reduction by adjusting its capital structure in such a way to alleviate the concerns of the ratings team.

Credit Rating Models

[17] Wansley and Clauretie (1985) also show similar results for bond price reactions.

There are numerous models used throughout financial literature attempting to predict credit ratings. The credit rating models are reviewed here as they provide the foundation for the first hypothesis, which involves assigning hypothetical ratings to a non-rated sample.

In addition to the previously mentioned literature studying ratings stability vs ratings timeliness, Fons (2002) points out that markets prefer stability in ratings due to a desire for "ratings to be a view of an issuer's relative fundamental credit risk, which they perceive to be a stable measure of intrinsic financial strength." Moody's also states that ratings are meant to be representative of long-term horizon and thus only adjust ratings when they are confident a company's risk profile is permanently adjusted. So using an estimated rating will likely result in more frequent changes in a firm's credit rating, as the stability that investors and markets desire will not be a factor.

Therefore, although the attempts in this paper might not yield credit ratings for non-rated firms that are precise, they are estimates that do provide a basis to add to the existing literature. However, I recognize that using a purely quantitative model to predict a rating has its limitations, due to the reasons mentioned here and specifically the findings in Ederington and Yawitz (1987) that state that the ratings categories are not purely quantitative.

Most of the models used to predict ratings will focus on inputs used by Standard and Poor in rating assignments.[18] The primary factor in these ratings is the likelihood of default.[19] Those financial variables used to determine likelihood of default involve measures of size, profitability, debt ratios, coverage ratios, etc. Probit models are often used with these measures as the independent variables predicting probability of default. Hwang, Chung, and Chu (2010) recently modified the probit approach by using an ordered semiparametric probit model, thus replacing the linear regression function we usually see in an ordered probit model.

[18] See Table 3 for a list of recent credit ratings modeling papers.
[19] Available at http://www.standardandpoors.com/prot/ratings/articles/en/us/?assetID=1245199822137

When dealing with a polychotomous dependent variable, like a credit rating, a natural order is present. These categories are continuous, unobservable measures which are linear functions of the explanatory variables plus an error term. An ordered logit or ordered probit model is appropriate for these types of dependent variables, where the ordered probit is used when the error term is normal. When the error term is logistic, we use the ordered logit (Kennedy, 2008). One of the two models used to predict credit ratings (shown in the methodology section) is an ordered logit model since recent textbooks suggest the ordered logit model as most appropriate for credit rating models.

Kennedy (2008) further explains the ordered logit model as follows:

is an unobservable index of "creditworthiness."

Then, for example:

$$= \text{A if} \quad \leq$$

$$= \text{AA if} \quad \leq \quad \leq$$

$$= \text{AAA if} \quad \leq$$

We must estimate the s, which are the "threshold" parameters, and also the and . If the equation for includes an intercept, then we can normalize by setting equal to zero. The usual normalization, though, is to omit the intercept to facilitate interpretation.

In order to estimate the aforementioned variables, maximum likelihood is used.

For example:

prob(≤ ≤)

= prob(- - ≤ ≤ - -)

Once a density for is known, a likelihood function can be formed. If is distributed normally, then we use an ordered probit. If the cumulative density of is logistic, then the ordered logit model is used, as stated earlier.

It should be noted that credit ratings seem to be experiencing an evolution. With this in mind, the models used in this paper to predict ratings will be updated frequently to compensate for the rating revolution. Over time, the credit ratings downgrades have outnumbered upgrades. For example, since 1970 the number of issues receiving downgrades has increasingly outpaced the number of issues receiving upgrades. In 1990, Moody's downgraded 301 issues and upgraded only 61. This trend is common to both investment grade bonds and also to noninvestment grade bonds. To what can we attribute this phenomenon? Is the credit quality of US firms declining? Blume, Lim and Mackinlay (1998) find that rating agencies are becoming more stringent. They base their conclusion on a study of accounting variables reportedly used by Standard and Poor's. Specifically, an otherwise similar firm's issue would have a lower rating in 1995 than it would have in 1980.

Non-rated bonds

This paper assigns hypothetical ratings to nonrated firms as part of the first hypothesis. The studies on nonrated bonds reveal that non-rated municipal bonds pay a higher interest rate than investment grade bonds (Reeve and Herring 1986; Ziebell and Rivers 1992). Although this paper doesn't focus on municipal bonds, this finding is interesting in that the assumption for a nonrated

bond is that it carries a higher risk of default. However, based on these studies, we can only draw this conclusion for municipal bonds. In terms of corporate ratings, the results may not be similar. One reason would be that corporate bonds of a certain size will be rated. Consequently, one difference between rated and nonrated bonds is size. Titman and Wessels (1988) show that smaller firms tend to use less debt than larger firms.[20]

In a comparison of rated and nonrated bonds, Faulkender and Petersen (2006) show that firms with access to public bond markets have significantly more debt. In fact, their paper shows that rated firms have 35% more debt. This result is confirmed even when controlling for differences in firm characteristics of rated and non-rated firms.

[20] Also, using a LISREL model rather than the standard regression model, they show that debt levels are negatively related to "uniqueness" of the firm's line of business. In other words, niche firms will maintain lower debt ratios.

CHAPTER III

HYPOTHESES DEVELOPMENT

The goal of this paper is to further contribute to the brief existing literature on capital structure as it relates to credit ratings. To do so, I attempt to make contributions in three different ways.

Part I

The first step will be to revisit Kisgen's (2006) findings by introducing a new control group that has not yet been considered. While Kisgen's paper was quite thorough, it would make sense to test these findings against a group of nonrated firms. This will add robustness to the already existing literature. Without this added test to Kisgen's findings, one might possibly conclude that these findings were simply proxying for some omitted variable. By introducing a nonrated sample, we can dismiss any contention that there was another factor in play. Instead, we can be more certain of the findings in Kisgen's paper that credit ratings were the driving force. If the results here instead show that nonrated firms react similarly to rated firms in terms of maintaining or achieving a credit rating, then this would cause a reader to pause and surmise that another factor is affecting the results.

Part II

Kisgen (2009) tests the reaction of firms to a rating change. In Kisgen's paper, we see that a firm

that experiences a ratings change will react in the year following the change. However, it can be argued that a reaction in the year following the change is a reaction that is too late. As we have seen in Hand, Holthausen and Leftwich's (1992) paper, the stock reaction is immediate. Therefore, it would make sense to evaluate a firm's reaction at the time the firm first becomes aware of a potential ratings action. Along those lines, while it is interesting to examine how firms react to a credit rating change, it might be more revealing to see how firms react to the *threat* of a ratings change. If we conclude that a reaction to a ratings change is a reaction that comes too late, firms would instead be wise to know the threats and react appropriately to the threat of a pending change rather than wait for the actual change to occur. In this paper, it is assumed that firms are more likely to react to the threat than the event, if able. As such, The CreditWatch list provides a tool for revealing those firms that have a high potential for a ratings change.

Part III

Finally, it would also be prudent to introduce some sensitivity measures to determine which firms are most likely to consider credit ratings in their capital structure decisions and then explore if these firms do, in fact, behave in a manner that suggests credit ratings are important in these decisions. While this credit rating theory may not pertain to all firms, certainly there are categories of firms for which this theory, if true, would make the most sense. If this subset of firms follows this theory more aggressively, that would further support previous findings suggesting credit ratings play a role in capital structure.

In addition to the three major contributions, a macroeconomic control variable will be added to previous models. When considering capital structure behavior, prevailing interest rates may play a role in a firm's decision to issue equity or debt when making capital structure decisions with credit ratings in mind. In recognition of this likelihood, a short-term interest rate measure (3 month U.S. Treasury security) and long-term interest rate measure (10 year U.S Treasury

security) have been added as controls.

Hypothesis One:

H_0: An unrated firm that is near a hypothetical rating change will make capital structure decisions similar to that of a rated firm.

H_1: An unrated firm that doesn't have an interest in maintaining a credit rating will not make the same capital structure decisions as an otherwise similar rated firm.

Kisgen (2006) finds that firms near a credit rating upgrade or downgrade issue less debt relative to equity than firms that are not near a credit rating change. The argument is made that a firm that is close to a rating upgrade (represented by a firm with a plus rating, i.e. A+, BBB+, etc.) will not risk sacrificing that opportunity by issuing new debt. An increase in a firm's debt ratio might give pause to a credit rating agency that was considering an upgrade in rating.

On the other side of the spectrum, a firm that is close to a rating downgrade (represented by a firm with a negative rating, i.e. A-, BBB-, etc.) will wish to maintain that rating and issuing new debt might give a credit rating agency a reason to reduce that firm's rating to a lower level. Consequently, the expectation is that these firms also will issue less debt relative to equity. Kisgen (2006) verifies these expectations.

To further examine this issue, a new control sample is introduced. If credit ratings matter, then an unrated firm will not behave similarly to rated firms. To examine this issue, nonrated firms are assigned a hypothetical rating using two separate models. The behavior of the nonrated firms is then examined to see if a firm that is near a hypothetical rating upgrade is less reluctant to issue debt. Similarly, is a firm that is near a hypothetical downgrade also less likely to issue debt? If these nonrated firms behave similarly to their rated counterparts, we can then question previous findings that show that rated firms are making capital structure decisions with a goal of

maintaining or achieving a certain credit rating. Conversely, failure to show that a nonrated firm displays similar behaviors would alleviate concerns of an omitted variable.

Hypothesis Two:

H_0: A rated firm that is placed on the CreditWatch list with a negative designation will not adjust its capital structure.

H_1: A rated firm that is placed on the CreditWatch list with a negative designation will lower its debt ratios or take steps to lower its debt ratios.

If we believe that credit ratings are important and firms make capital structure decisions with ratings in mind, it would make sense that the catalyst for a firm to act would be the threat of a ratings change rather than the actual change. Kisgen (2006) uses this line of thinking when he assumes that a firm with a plus or minus rating is on the verge of a ratings change. This paper introduces the CreditWatch list as the tool to communicate a signal, or threat.

While Kisgen (2009) uses the actual ratings change as the event of interest, it can be argued that examining a firm's reaction to a ratings change in the year following the change is too late. Instead, it might be more appropriate to examine a firm's behavior in the quarter it receives a warning about its credit quality, or is placed on the CreditWatch list, rather than after the actual change is made. If firms are nimble in the markets and can issue debt or equity relatively quickly, then we should expect to see reactions in the quarter in which the event occurs or the quarter following. To examine the issue, the net amount of debt issued in the quarter following an addition to the CreditWatch list is examined for firms that receive a negative and positive rating. In addition, I will also examine the actions of firms that have not been placed on a CreditWatch list. After controlling for variables that account for differences in leverage, profitability and size, I compare the responses of firms that receive warnings about their current rating (both positive and negative) with firms that do not receive any indication of a change in credit rating.

In regards to a firm that is assigned a "negative" designation, one might expect this firm to reduce its debt ratio, if able. This would be expected since this firm would like to act before the actual change is made. While firms that are nimble in the markets, and therefore able, will likely take action by issuing equity or paying off debt, this paper would not be complete if it didn't recognize that some firms will not be able to make adjustments to its capital structure in a time span of just 90 days. For this reason, we should also recognize efforts firms are taking to reduce debt ratios. For example, a firm that is threatened with a ratings decrease might hire an investment banker. This would send a signal to the ratings agency that the firm is taking action to reduce debt levels, as the hiring of an investment banker is a likely precursor to the issuance of equity. Alternatively, a firm might attempt to sell assets in order to acquire cash that can be used to retire debt. For these reasons, the actual change in debt ratios will not be the only event considered.

The last designation a firm might have in terms of the CreditWatch list is "developing." An example of a "developing" firm might be a firm that is in the middle of a merger. Since a "developing" firm's credit rating future is unknown, these firms will be removed from the analysis in this paper.

In addition to examining the finance side of a firm's reaction to the threat of a ratings action, I also want to study the implications of the actions. In other words, we don't fully answer the question of whether actions made in response to credit rating threats are sensible unless we determine if the actions thwart the threat. To follow through with this hypothesis, I separate firms into different categories based on whether or not they responded to the threat. Were firms that responded to the threat by adjusting their capital structure rewarded by the ratings agencies? Were firms that were placed on the CreditWatch list with a negative designation able to avoid a rating decrease by adjusting their capital structure? To assess, I note whether the rating was affirmed or not.

Sensitivity Tests: Hypotheses Three – Seven

The remaining hypotheses all test the sensitivity of this theory to different subsets of firms. While all firms might have some desire to maintain or achieve a certain credit rating, that desire is most likely more pronounced for certain types of firms. Frequent market participants are more likely to be concerned with their credit rating than firms that rarely visit the capital markets. Also, firms that currently have an investment grade rating might be more interested in activities that would prevent it from becoming a "fallen angel" than firms that have already lost that status. Firms that issue commercial paper might be more interested in maintaining a credit rating in order to allow it to continue to finance parts of its operations with this type of security. Alternatively, firms that do not rely on commercial paper as a financing tool might be less likely to follow this theory. Finally, firms with investment opportunities might be more interested in its credit rating than a firm with less investment opportunities for the simple reason that an unfavorable credit rating might inhibit its ability to fund these investments.

If we can empirically show that these subsets of firms do take measures to maintain credit ratings when compared with their counterparts, then we can further accept the financial theory that says credit ratings play a primary role in capital structure decisions.

Hypothesis Three:

H_0: Firms that are not frequent market participants will consider credit ratings in their decision making in a manner similar to firms that are frequent market participants.

H_1: Firms that are more frequent market participants will be more likely to consider credit rating in their decisions making than firms that are not frequently raising or retiring capital.

The degree to which a firm enters the markets for the purpose of raising capital is considered. It would make sense that the frequent participants are more concerned with their credit rating

because the cost of capital is at the forefront of their capital raising activities. A firm that rarely visits the market is less concerned with its credit rating because it is not likely to incur the higher costs associated with a lower credit rating when issuing. After quantifying the participation level of a firm, the degree of participation is assessed. If credit ratings play a role in capital structure decisions, we would expect this phenomenon to be more pronounced for the frequent participants.

Hypothesis Four:

H_0: All firms respond to a potential credit rating change in a uniform manner, regardless of the current rating.

H_1: The response to a potential credit rating change is a function of the firm's current rating.

Is moving from a credit rating of AA- to A+ worse than moving from a credit rating of A- to BBB+? The previous assumption in Kisgen (2006) has been that a change in the major rating category is the motivating factor for a firm, regardless of the current rating. However, is this the case? To examine, firms are separated into categories based on their current rating to determine if firms are more sensitive to changes from any specific broad rating to another. Do some ratings drive firms to react more aggressively? The expectation is that a firm that is threatened with the loss of its investment grade designation will be more likely to attempt to preserve its status. As mentioned in Cantor and Packer (1997), regulators will use credit ratings as thresholds to determine whether an institutional investor may hold the debt of a certain company. Therefore, a firm that loses investment grade status will no longer attract institutional investors, as this is a critical regulatory hurdle.

Hypothesis Five:

H_0: The reaction to a potential change in credit rating is similar between firms that issue commercial paper and firms that do not issue commercial paper.

H_1: The reaction to a potential change in credit rating is a function of whether or not a firm issues commercial paper.

Commercial paper[21] is an unsecured note issued by corporations for short-term funding. The maturity for this type of security is less than 270 days and the resulting funds have a variety of uses, such as payroll and financing inventory. These issues are not typically backed by any specific collateral and therefore lenders rely on the financial strength and financial quality of the firm to signal an ability to repay this obligation. Firms are interested in this type of financing because it typically costs the firm less than a bank loan. Consumers are interested in commercial paper because the return is slightly higher than the return that would be earned on a U.S. Treasury bill. Financing through commercial paper has become so popular that it today exceeds Treasury bills in terms of issuance. As of 2007, there was more than $1.97 trillion outstanding and more than 92 percent of all commercial paper outstanding was issued by the financial sector (Kacperczyk and Schnabl, 2010). Kacperczyk and Schnabl also highlight the importance and prevalence of commercial paper as a short-term debt instrument. Using information provided by the Securities Industry and Financial Markets Association, they note that short-term debt financing in the U.S. was approximately $5 trillion, in 2007. As previously mentioned, $1.97 trillion was commercial paper while $940 billion was U.S. Treasury bills, making T-bills the second largest short-term debt instrument. Other short-term instruments mentioned by the Securities Industry and Financial Markets Association were time deposits, repurchase agreements, short-term notes and bankers' acceptances.

A firm that is financially distressed would be unable to attract investors and in turn, unable to borrow short-term using this low-cost type of security. In addition, the rating of a firm's commercial paper has an effect on the type of investors who will supply funds. For example, a financial intermediary such as a mutual fund will be handcuffed by regulations detailing the

[21] See Anderson and Gascon (2009) for more information about commercial paper.

quality of commercial paper that is suitable for investment.

Therefore, firms that borrow short-term through the use of commercial paper should be very interested in maintaining a certain credit rating.[22] If the long-term rating is compromised, a firm will either lose its ability to borrow using commercial paper, may suffer liquidity issues or may have to pay higher rates in the commercial paper market. As a result, it is expected that firms that issue commercial paper will be more likely than an otherwise equivalent firm to make capital structure decisions with credit ratings in mind.

Hypothesis Six:

H_0: The amount of investment opportunities available to a firm will not affect its reaction to a potential ratings change.

H_1: The reaction to a change in credit rating is a function of whether or not the firm has investment opportunities.

A firm with investment opportunities may be more interested in maintaining a credit rating than a firm that does not have the same opportunities.[23] Growth firms are more likely to have positive net present value (NPV) projects available while positive growth opportunities are more limited for mature firms.[24] Therefore, funding becomes a core concern for a growth company making this subset of firms a more likely visitor to the capital markets. As a result, the cost of new funds

[22] Standard and Poor's notes that the long-term rating is usually comparable to the commercial paper rating. See http://www2.standardandpoors.com/spf/pdf/media/Commercial_Paper_I_Banks.pdf
[23] Tobin's q is used as a proxy for investment opportunities, as was used in Lang, Ofek and Stulz (1996).
[24] It is a widely accepted fact in finance literature that mature firms have limited growth opportunities, while rapidly growing firms have numerous growth opportunities. There is a line of literature that relates stock price reactions to new financing. The assumption for these papers is that growth firms have positive NPV projects available, while mature firms are less likely to have profitable opportunities from which to choose. For more information on stock price response to new financing, see Pilotte (92).

will be a function of the firms' current rating and will affect the ability to grow.[25]

Hypotheses 3 - 6 can be applied to the CreditWatch list data and also the sample of all rated firms.

[25] Although there is conflicting literature on the preferred source of new financing (equity or debt) for a growth firm, we will assume that growth firms are using some debt to finance investment opportunities and therefore would be more concerned about their credit rating than a mature firm.

CHAPTER IV

SAMPLE

For hypothesis one, the sample contains all firms listed in Compustat from 1986 until 2009. A subset of this group (1986 – 2001) will also be used to replicate Kisgen's (2006) findings for rated firms in order to confirm his results. In addition, all nonrated firms in Compustat for the years 1986 through 2009 will also be examined. Financial variables of interest needed for the hypothetical rating assignment will also be gathered using Compustat. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating which is the same credit rating used in Kisgen (2006).

For hypothesis two, Standard and Poor's CreditWatch list is available directly from Standard & Poor's and will contain the dates 1990 through 2009. This data includes the CreditWatch designation as defined in the hypothesis development section specific to hypothesis two, CreditWatch date (date the designation was assigned) and the rating of the firm at the time of the CreditWatch designation. Financial variables of interest are again obtained from Compustat.

For hypothesis three, data must be obtained to indicate whether a firm is a frequent market participant. This data is obtained using historical information from Compustat. No other new data is required for hypothesis three. This is simply a reorganization of data already obtained.

The remaining hypotheses involve testing data gathered for the first two hypotheses. Tobin's Q scores and the amount of commercial paper issued by a firm can be obtained from Compustat, along with Standard & Poor's Short-Term Domestic Issuer Credit Rating.

For all data provided by Compustat, I also remove any observations that do not have a CUSIP or have a computed debt ratio that is not between 0 and 1.

CHAPTER V

METHODOLOGY

Hypothesis One:

For the purpose of the first hypothesis, nonrated firms must be examined. In order to examine the nonrated firms, a credit rating must first be assigned. To do this, two different models are used.

Models for Assigning Hypothetical Credit Ratings

Model 1: Altman and Rijken (2004) present an ordered logit model in which they attempt to predict an agency rating. This model is developed with an awareness that rating assignments made by credit agencies are long-term in nature. The model assigns numerical numbers to each of the rating categories. However, AAA and AA+ are combined into one category to ensure a reasonable number of observations in each category. In addition, C, CC, CCC-, CCC and CCC+ are also combined for the same reason. The result is sixteen rating categories with a corresponding numerical rating: CCC/CC/C =1, B- = 2, B = 3, B+ = 4…, AA- = 14, AA = 15 and AA+/AAA = 16. The model used in this paper does not combine AAA and AA+. Also, instead of combining C/CC/CCC, I separate CCC into subcategories and remove firms with a rating below CCC-. The agency-rating prediction model (AR model) is an ordered logit regression model and is as follows:

is the set of model variables for firm .

More specifically,

WK	Net working Capital
RE	Retained Earnings
TA	Total Assets
EBIT	Earnings Before Interest and Taxes
ME	Market Value of Equity
BL	Book Value of Total Liabilities
Size	ln(BL/Mkt) where Mkt is the total value of the US equity market
Age	number of years since firm was first rated by agency (winsorized at 10 years)

This choice of variables made by the authors was inspired by the Z-Score model of Altman. The variables provide a liquidity measure (WK/TA) and also profitability measures (RE/TA, EBIT/TA and ME/BL)[26]. In addition, ME/BL is also used as a measure of leverage.

All income statement variables refer to the four fiscal quarters in the previous calendar year while all balance sheet items are for the latest fiscal quarter in the previous calendar year. In addition, market equity values are based on the stock price and shares outstanding at the end of June. In

[26] To increase the effectiveness of the RE/TA, EBIT/TA and ME/BL variables in the logit model estimate, the variables are log-transformed as follows: RE/TA → - ln(1-RE/TA), EBIT/TA → - ln(1-EBIT/TA) and ME/BL → 1 + ln(ME/BL)

this paper, the age variable will not be used. Since this model is being used to establish a hypothetical rating for an unrated firm, the use of the age variable is inappropriate. An unrated firm would simply have an age value of zero.

The score relates to the agency rating as follows:

if

where is one of the agency rating categories, is the actual agency rating, is the upper boundary for the AR- score rating class

The probability that equals is:

F is the cumulative logistic function.

and are estimated with a maximum likelihood procedure. The coefficients and boundaries are calculated for each 5-year period in the sample.

Model 2: The second model used to assign ratings is based on the regression used in Kisgen (2006) to assign micro ratings.

Kisgen (2006) starts out by considering many explanatory variables, motivated by previous literature.[27] After removing terms due to redundancy and counterintuitive coefficient signs, he is left with a model with an adjusted R^2 of 0.631 for a regression that includes only log of Total Assets, EBITDA/Total Assets and Debt/Capitalization at the end of a particular year:[28]

[27] See Table 2
[28] Debt/Capitalization ratios greater than 1 and less than 0 are removed.

After regressing credit ratings (dependent variable is equal to 1 for CCC-, 2 for CCC,… 19 for AAA and is the credit rating at the end of a particular year) on to these variables, the coefficients from this regression are then used to assign a credit rating.

I will use this same regression to obtain coefficients on the rated sample. I then use those coefficients on the nonrated sample to assign a credit score. Using the entire sample, 27,357 firm-year observations produce an adjusted R^2 of 0.9313 and the following coefficients:

The coefficients are updated annually and applied to the nonrated firms in the nonrated sample. The frequent updates to the coefficients alleviates any concerns in regards to different credit ratings policies at different points in time (Blume, Lim and Mackinlay, 1998).

Again following Kisgen (2006), once the nonrated firms have been assigned a hypothetical rating, three regressions will be used to test this hypothesis:

D_{it}	book long-term debt plus book short-term debt for firm at time (Compustat data item 9 plus data item 34).
D_{it}	long-term debt issuance minus long-term debt reduction plus changes in current debt for firm from time to (Compustat data item 111 minus data item 114 plus data item 301).
LTD_{it}	long-term debt issuance minus long-term debt reduction for firm from time to (Compustat data item 111 minus

	data item 114).
E_{it}	book value of shareholders' equity for firm at time (Compustat data item 216).
E_{it}	sale of common and preferred stock minus purchases of common and preferred stock for firm from time to (Compustat data item 108 minus data item 115).
A_{it}	beginning-of-year total assets for firm at time (Compustat data item 6).
CR_{Plus}	dummy variable (equal to 1) for firms that have a plus credit rating at the beginning of the period.
CR_{Minus}	dummy variable for firms that have a minus credit rating at the beginning of the period.
CR_{POM}	$CR_{Plus} + CR_{Minus}$ = dummy variable for firms that have a minus or plus credit rating at the beginning of the period.
K_{it}	set of control variables, including leverage: $D_{i,t-1}/(D_{i,t-1} + E_{i,t-1})$, profitability: $EBITDA_{i,t-1}/A_{i,t-1}$ (EBITDA is Compustat data item 13), size: $\ln(Sales_{i,t-1})$ (Sales is Compustat data item 12), short-term interest rate (3 month US treasury security) and long-term interest rate (10 year US treasury security).
$NetDIss_{it}$	$(D_{i,t} - E_{i,t})/A_{i,t}$.

These regressions will be run twice each, once for each hypothetical rating model.

Hypothesis Two:

To answer this question, I use a data set of all rated firms. I assign dummy variables to firms that

have been placed on the CreditWatch list. One dummy variable is assigned for firms that received a "negative" warning and one for firms that received a "positive" warning. There are also firms included in the sample that do not receive any type of credit rating warning. I then examine (1) the net debt issued for "negative" firms, as in Kisgen (2009) and (2) compare these firms to the "positive" firms.

To study net debt issued, I follow Kisgen (2009), which examines reactions to ratings change in the year following the change. To answer the question, I use the following adjusted regression:

$$NetDIssi,t = \quad + \Phi 1 Negativei,t\text{-}1 + \Phi 2 Positivei,t\text{-}1 + \beta Ki,t\text{-}1 + \varepsilon i,t$$

NetDIss and *K* are as defined before. The expectation is that the coefficient $\Phi 1$ is less than zero while $\Phi 2$ is not different from zero. t denotes the calendar quarter following the day the firm was added to the CreditWatch list. For example, if a firm was added to the list on January 15, 2001, then the quarter of interest would be the 2nd quarter of 2001.

I include the second term on the right hand side of the regression to compare the behaviors of the "positive" firms with the "negative" firms. As stated in the previous paragraph, the expectation is that firms placed on the "negative" list will issue less debt, hence the negative relationship. Since we don't expect a firm with a "positive" designation to act in either direction, the coefficient should not be different from zero.

I also examine the net debt issued in the quarters around the CreditWatch action. Specifically, I examine net debt issues 2 quarters before the action, one quarter before the action, the quarter of the action and 2 quarters after the action. This is in addition to the quarter following the CreditWatch action where the main changes in net debt issued are expected to be found. The purpose of this analysis is to get a better understanding of when a firm might react to a CreditWatch action. Do firms adjust two quarters following the action or do they adjust immediately? Do firms adjust at all? One purpose for examining the capital structure activities

prior to the CreditWatch action is to consider if previous capital structure adjustments are being rewarded (penalized) with positive (negative) CreditWatch designations. We also want to examine if firms are taking action in anticipation of a CreditWatch listing in the hopes of avoiding a potentially punitive designation. If credit ratings are important in capital structure decisions, firms should be making capital structure adjustments when the stability of their ratings is threatened. Examining the time periods around the action gives an indication of when, if ever, firms are acknowledging the threat.

To examine the actions a firm might take to initiate the process of reducing debt, I examine corporate announcements made in both the quarter in which a firm was placed on the Credit Watch list and the quarter following, for the firms in question. This is used as an alternative to the *NetDIss* variable to study firms that might not be able to move quickly enough to make capital structure announcements during the CreditWatch period. To quantify this observation, I use an action dummy that takes the value of 1 if a firm has taken some action towards raising equity or cash. Two examples are the hiring of an investment banker or an announced sale of assets.

$$Actioni,t = \quad + \Phi 1 Negativei,t\text{-}1 + \Phi 2 Positivei,t\text{-}1 + \beta Ki,t\text{-}1 + \varepsilon i,t$$

Finally, I separate firms into two categories: (1) firms that had a ratings change after a CreditWatch negative addition and (2) firms whose ratings did not change after the CreditWatch negative addition. After separating, I examine the average amount of debt issued for each of these categories. The expectation is that there will be a difference between the two sets of firms in terms of the amount of new debt issued. For firms that were able to avoid a rating downgrade following a negative signal, I expect that these firms reduced their debt levels. For firms with a rating downgrade following a negative signal, the expectation is that these firms were unable to adjust their capital structure, or adjusted their capital structure by issuing new debt.

Hypothesis Three:

Using the average amount of debt and equity raised in the previous five years, scaled by assets, I interact this figure with the aforementioned dummy variables (POM, Plus and Minus) to create new independent variables. I then apply the same methodologies used in the first two hypotheses, but with the interacted terms included. These tests are performed three times.

The first set of tests is performed using a variable, that captures both the average amount of equity and the average amount of debt issued in the five years preceding the year of interest. I add the two variables together, averaged over the previous five years, and then scale this figure by total assets. I then interact this term with the regressions used in the previous two hypotheses.

$$NetDIssi,t = + \Phi 1 Negativei,t\text{-}1 + \Phi 2 Positivei,t\text{-}1 + + Ki,t\text{-}1 + \varepsilon i,t$$

$$NetDIssi,t = + \Phi 3 Negativei,t\text{-}1 + \Phi 4 *Negativei,t\text{-}1 + \Phi 5 Positivei,t\text{-}1 +$$

$$\Phi 6 \quad *Positivei,t\text{-}1 + \quad + \quad Ki,t\text{-}1 + \varepsilon i,t$$

$$NetDIssi,t = \quad + \Phi 7Negativei,t\text{-}1 + \Phi 8Positivei,t\text{-}1 + \quad + \varepsilon i,t$$

$$NetDIssi,t = \quad + \Phi 9Negativei,t\text{-}1 + \Phi 10 \quad *Negativei,t\text{-}1 + \Phi 11Positivei,t\text{-}1 + \Phi 12 \quad *Positivei,t\text{-}1 + \quad + \varepsilon i,t$$

I apply a second set of regressions to determine if the results are being driven by either the debt or equity side. Taken together, there might be some concern that a firm is more concerned with maintaining a rating if there is frequent activity in the debt market while activity in the equity market is less of a concern. To address this concern, the second set of regressions includes a variable, representing the average of amount of debt issued in the previous five years,[29] and once again this figure is scaled by total assets.

[29] This is the long-term debt issued variable used in the calculation of NetDIss (Compustat Item 111).

The same approach is used to assess the role equity issues play in this hypothesis. To analyze, the same regressions are used, but the variable is replaced with

This variable is calculated in the same manner, but instead using the equity issued variable in the calculation of *NetDIss*[30]. Once again, the goal of this set of tests is to determine if one form of capital acquisition (equity) is more important than the other (debt) in terms of maintaining a credit rating in capital structure decisions.

Hypothesis Four:

I examine the magnitude to which firms follow a capital structure policy that considers credit rating based on their current rating. To examine, I separate firms into categories based on their current rating (AA-, BBB+, CCC…). Using the CreditWatch data, I examine the reactions of firms to the threat of a ratings change using the same regression as in Hypothesis Two:

[30] This is the sale of common and preferred stock variable (Compustat Item 108).

$$NetDIssi,t = \quad + \Phi 1 Negativei,t\text{-}1 + \Phi 2 Positivei,t\text{-}1 + \beta Ki,t\text{-}1 + \varepsilon i,t$$

The expectation is that for certain ratings categories, firms are more likely to follow the CR-CS hypothesis. As a result, the *Negative* and *Positive* dummy variables may only be significant for certain ratings categories. For example, firms on the edge of being downgraded to non-investment grade are expected to have a coefficient $\Phi 1$ that is significant and less than zero, as these firms would be expected to react to the threat of losing institutional investors.

I also apply the same regressions from Kisgen (2006) to see if the results are more pronounced for certain broad rating categories. I regress *NetDIss* onto the *Plus* and *Minus* dummy variables and also the control variables, after separating firms into each broad rating category.

Hypothesis Five:

Whether or not a firm participates in the commercial paper market is proxied using Standard & Poor's Short-Term Domestic Issuer Credit Rating. This Compustat variable represents "the obligor's capacity and willingness to meet its short-term financial commitments (those with maturities of one year or less)." As previously stated, commercial paper constitutes the majority of short-term financing.

Most commercial paper is rated by either Standard & Poor's or Moody's. The rating process is initiated by a firm with a commercial paper program to lend credibility and increase marketability of their paper. The commercial paper rating assigned by ratings agencies is applicable to the commercial paper program of these companies, rather than individual issues. Also, the long-term rating of the firm begins to establish the short-term rating as the long-term prospects of a firm will certainly influence the credit quality of a firm's short-term obligations. Failure to acquire a rating for a commercial paper program would remove institutional investors from the pool of

available lenders. As a result, most commercial paper is rated. Combined with the previous fact that the majority of short-term debt obligations are in the form of commercial paper, it is the author's belief that the Short-Term Domestic Issuer Credit Rating serves as an appropriate proxy for determining whether a firm employs a commercial paper program.

To test the commercial paper hypothesis, the now familiar regressions are run on a sample of firms that have a Short-Term Domestic Issuer Credit Rating. All firm-year observations that have unrated short-term debt are removed under the assumption that these firms do not issue commercial paper. Less than 10% of all firm-year observations in Compustat have this rating again reinforcing the belief that this variable is an appropriate proxy for commercial paper issuers.

The commercial paper issuing firms are also tested using the CreditWatch data.

$$NetDIssi,t = \quad + \Phi 1Negativei,t\text{-}1 + \Phi 2Positivei,t\text{-}1 + \beta Ki,t\text{-}1 + \varepsilon i,t$$

Next, a subset of firms that have a long-term rating, but that do not have a short-term credit rating is examined. The same regressions are applied to this subset of firms to determine the different behaviors associated with being a firm that issues commercial paper as compared with one that does not.

To further test this hypothesis, the amount of commercial paper issued by financial institutions and utilities is examined. To do so, I interact the amount of outstanding commercial paper (scaled by assets) at the end of a particular year with each of the dummy variables. I measure the outstanding commercial paper at the end of the particular year because the interest is in determining the relationship between debt/equity issues and outstanding commercial paper. Previous control variables that have been used were values obtained at the beginning of a particular year. In comparison, this is a variable that is best measured concurrently with debt/equity issues. To better understand how a firm's commercial paper program affects its propensity to follow a capital structure policy that considers credit ratings, these variables should be evaluated contemporaneously. In other words, the volume of the previous year's commercial paper program is less revealing than the volume of the commercial paper program in the year of interest.

While we can only draw conclusions for utilities and financial firms using this approach, we should recall that more than 92 percent of all commercial paper is issued by the financial sector. As a result, this variable is an appropriate measure. The following regressions include the interacted independent variables and will be applied to all financial/utility firms that have outstanding commercial paper.[31]

[31] I also attempt to interact the commercial paper variable with the CreditWatch list sample. However, due to a low number of observations, the results are not full rank.

Hypothesis Six:

To assess the role growth opportunities play in this theory, Tobin's Q is used. Tobin's Q can be calculated using the simple approximation methods of Chung and Pruitt (1994). More specifically:

Where = product of a firm's share price at the beginning of a particular year and number of shares outstanding, = the liquidating value of the firm's outstanding preferred stock, = value of the firm's short-term liabilities net of its short-term assets, plus the book value of the firm's long-term debt and = book value of the total assets of the firm.

I then include the estimation of q in the Kisgen (2006) regressions by interacting this variable with each of the dummy variables and explore the role q plays in firms' net debt issuance.

$$NetDIssi,t = \quad + \Phi 1Negativei,t\text{-}1 + \Phi 2Positivei,t\text{-}1 + \quad + \quad Ki,t\text{-}1 + \varepsilon i,t$$

$$NetDIssi,t = \quad + \Phi 3Negativei,t\text{-}1 + \Phi 4Q^{*}Negativei,t\text{-}1 + \Phi 5Positivei,t\text{-}1 + \Phi 6Q^{*}Positivei,t\text{-}1 + \quad + \quad Ki,t\text{-}1 + \varepsilon i,t$$

$$NetDIssi,t = \quad + \Phi 7Negativei,t\text{-}1 + \Phi 8Positivei,t\text{-}1 + \quad + \varepsilon i,t$$

$$NetDIssi,t = \quad + \Phi 9Negativei,t\text{-}1 + \Phi 10Q^{*}Negativei,t\text{-}1 + \Phi 11Positivei,t\text{-}1 + \Phi 12Q^{*}Positivei,t\text{-}1 + \quad + \varepsilon i,t$$

Firms are also separated into quartiles based on the approximation of Tobin's Q and then the same regressions from Kisgen (2006) are applied.

CHAPTER VI

FINDINGS

The first goal in a study of this type is to replicate previous findings in this area. Specifically, it is important to replicate Kisgen (2006). Unfortunately, I am unable to replicate previous findings. Following Kisgen's design, I examine all firms with a credit rating at the beginning of a particular year. My sample covers the period from 1986 until 2001 and excludes all firm years that have missing data for any variables required in the regressions or calculations of other variables. The results can be seen in Table 4 and show that the introduction of control variables makes the POM variable insignificant. In other words, once we control for leverage and profitability, we can not empirically show that a firm is making capital structure decisions with credit ratings in mind. In addition, Table 4 also shows the result of many other fact finding regressions, along with the results from Kisgen's paper.

Figure 1 represents these results separated by credit rating. We can visually see that the only phenomenon we're witnessing is that investment grade firms (with the exception of firms near a change in investment grade status: BBB and BBB-) tend to issue more debt relative to equity when raising funds, while firms below investment grade rating are likely to issue more equity relative to debt when raising new capital.

In a further attempt to replicate the findings, I remove the financials and utilities from the sample.

Those results can be seen in Table 5 and Figure 2.

In other attempts to replicate the findings (results not shown), I winsorize the debt ratio variable by setting all debt ratios greater than 1 to 1; and all debt ratio less than 0 to 0. Furthermore, instead of dropping all variables with missing data, I instead set them equal to 0. I also perform the regression analysis after removing all sales data that has a negative entry. None of these adjustments to the sample qualitatively affect my results.

The results change slightly when examining a longer time span. Specifically, I perform the same regressions for years 1986 – 2009. The results can be seen in Table 6 and show that we have significant results for the POM variable even in the presence of control variables. Further examination shows the results are perhaps being driven by the minus variable. The second regression in Table 6 shows that firms near a rating decrease issue 0.3% less debt relative than equity. However, we can draw no conclusions from firms near a rating upgrade.[32]

Part I

H1 Results:

The goal of the first hypothesis is to begin to alleviate concerns that the results of Kisgen's (2006) Credit Rating – Capital Structure Hypothesis (CR-CS) are driven by some omitted variable. Following the previously stated methodology, hypothetical ratings are assigned to the non-rated sample. Using the coefficients obtained from the aggregate rated sample (Tables 8 & 9), it can be seen that the non-rated firms are behaving similarly to the rated firms. Non-rated firms at the edge of a credit rating issue 0.46% less debt relative to equity. More specifically, firms that are faced with a hypothetical decrease in rating will issue 1.15% less debt relative to equity.

The expectation for the nonrated sample was behavior inconsistent with the CR-CS hypothesis, as

[32] Table 7 shows the results for the extended time period with financials and utilities removed.

non-rated firms will not be constrained in their capital structure decisions with regard to credit rating. It is striking to note that the coefficients are actually larger for the non-rated sample than in the replication shown in Table 6, suggesting that maintaining a hypothetical credit rating is more important to firms without a credit rating than to rated firms when making capital structure decisions. Of course, this result is illogical.

Closer examination reveals that the distribution of the hypothetical ratings was skewed toward the lower rated firms. In fact, firms with a CCC- hypothetical rating dominated the population. With this in mind, perhaps the effect we are seeing is driven by the behavior of these firms. To be certain, the tests are run once again after removing all firms with a rating of CCC+, CCC and CCC-. Removal of these observations produces the expected behavior, which is the absence of any significant independent dummy variables (due to the lack of any significant variables, results are not shown). Therefore, we can start to remove any suspicion that the results of Kisgen (2006) were driven by some omitted variable. Applying the ordered logit model (coefficients shown in Table 10) also produces the same expected results: Firms with a hypothetical rating do not follow the CR-CS hypothesis.

Part II

H2 Results:

The second hypothesis considers the capital structure reactions of firms that receive a threat about the status of their current rating. As stated previously, it is expected that firms will make decisions when the threat is first known, if able, rather than react to the actual event at a point one year in the future. Thus, the importance of the CR-CS hypothesis can further be examined with a data set that contains a group of firms that have been placed on S&P's CreditWatch list. Table 11 shows these results.

When pooling all results for the entire time period, a curious result is observed. Firms that are

placed on the CreditWatch list with a negative implication actually issue *more* debt relative to equity in the quarter following the action. It is expected that firms that receive this threat will make capital structure decisions to alleviate the threat. A capital structure decision that might send a positive signal to the rating agency would be to decrease debt levels. However, it is shown that the opposite is happening. Controlling for leverage, profitability and size, firms that are threatened with a rating decrease issue 1.04% more debt relative to equity.

Another interesting finding is that firms that are informed of a likely increase in their credit rating are the firms that issue less debt relative to equity. The expectation was that these firms would take no action. However, a firm that has been informed about a potential increase in a credit rating would likely issue equity if it was going to raise new capital. The firm's capital structure decisions have been rewarded and it is likely these firms would not want to jeopardize the impending increase in rating. Thus, if the firm was in need of immediate new funding, equity would be the rational decision. Removal of the controls and different alterations of the regressions have little qualitative effect on the results.

For robustness, the actions of firms taken two quarters after the ratings threat is revealed are examined. By definition, a CreditWatch action informs the particular firm that a rating change is more likely than not coming within the next 90 days. However, since it can be argued that all firms are not able to be nimble enough to react appropriately, the period two quarters after the action is examined. While this reaction might be too late to satisfy the immediate threat, firms that are concerned with reclaiming a past rating (if the action was negative) would adjust their capital structure when able. This assumption can be made if one believes that firms make capital structure decisions with ratings in mind. When evaluating the capital structure actions of firms two quarters following the threat, no significant capital structure activities are observed as revealed by the insignificant coefficients for the variables of interest. These results can be seen in

Table 12.[33] Firms that receive a threat about the stability of their rating either take action in the quarter following the threat or take no action. This makes sense if we consider that the threat represents a timeline of 90 days, or one quarter. Capital structure actions of firms 3, 4 or more quarters after the threat can also be considered, but any findings found that far into the future would be exposed to too many other factors, leaving researchers without a definitive conclusion.

The question then can be asked for the negatively warned firms. Why? Why do firms increase leverage in the quarter following a warning of a potential downgrade? Two explanations that might explain this phenomenon need to be explored further. One might surmise that the role of the credit rating agency is driving these results. As stated in the appendix, firms are in constant contact with ratings agencies. Therefore, while the ratings action might be news to the public, perhaps it is not news to the firm. When faced with the imminent prospects of a ratings decrease, a firm will take actions to increase the wealth of the firm by taking on new projects and investing in new assets. At this point, the acquisition of funds is important and the means of obtaining these funds becomes secondary. A second explanation, related to the first, might be that the incremental cost of equity is greater than the incremental cost of debt at this point. Further studies should explore the changes in the cost of these two components of capital. It should be noted that these explanations imply that the preservation of a rating is not a first order concern for companies. This implication is further supported in forthcoming results of this paper shown for other hypotheses.

To further explore when the firms are reacting to the publicly announced CreditWatch action, the same regressions are applied to the data at different quarters around the CreditWatch announcement. These results can be seen in Table 13 and show firms with a positive

[33] When evaluating capital structure decisions two quarters after the rating action, the activity considered is between the second quarter after the rating and the quarter after the rating. For example, if the CreditWatch action occurs in quarter 1, I examine the net debt issued in quarter 3, using second quarter data as controls and the starting point for current capital structure decisions. If the difference between quarter 3 and quarter 1 was measured (in this scenario), it wouldn't be obvious in which quarter the action was taking place.

CreditWatch designation are reacting two quarters before the announcement. We might argue that these firms, through their ongoing relations with the ratings agencies, are aware of the potential for an upgrade. As a result, they are reinforcing the idea that their firm should have its rating increased. If we believe that the CreditWatch list is a tool to communicate information to the public that is already known to the firm, this finding would support that argument. These firms are taking steps to reduce debt in the quarters leading up to the affirmation. We see that the firms with a positive listing continue to issue less debt, perhaps to support and reinforce the expected upgrade. Firms that are faced with a likely downgrade start issuing more debt once the threat is made public and continue to do so the following quarter. In the quarters preceding the negative CreditWatch placement, firms do not adjust their capital structure, as evidenced by the insignificant coefficients in these quarters. This result is not too surprising. Firms that are placed on the CreditWatch list with a negative designation are firms that are experiencing some financial distress. One would expect such firm to be experiencing a decrease in its stock price, reducing the likeliness such a firm would want to issue new equity. Also, issuing new debt would likely solidify a possible CreditWatch addition. Consequently, these firms may just be hoping to avoid the negative designation by not incurring any new debt. Once the CreditWatch addition becomes reality though, the firm then has little to lose and will start issuing new debt, perhaps engaging in more risky behavior, with the view that changes need to be made to adjust the future outlook for the firm. Perhaps this behavior is an example of adverse selection in action.

In an attempt to add more clarity to the results, corporate announcements are examined around the CreditWatch action. In the methodology section, a regression which would include dummy variables for firm activities such as hiring an investment banker or selling assets was presented. However, these types of activities were not seen for the sample of firms examined. Instead, the corporate announcements helped further explain the reasons for the CreditWatch action, and often times the listing was not relevant to the firm's capital structure. For example, when Kroger Co.

received a negative CreditWatch listing in March, 2005, it was due mainly to a lawsuit filed against them. The same reason is given when Kraft Foods received the same designation in March, 2003. Poor earnings reports also were a heavily cited reason for a CreditWatch negative designation (Cornell Companies in March, 2005; Energen Corp. in October, 2008; Ford Motor Co. in October, 2002). Other popular justifications for CreditWatch action were "poor industry outlook" (Nordstrom in February, 2009) or action for firms in the middle of an acquisition (Lear Corp. in March, 1999) or spin-off (EOG Resources in July, 1999). When the designation was due to a change in capital structure, it was due to an already announced, but not yet realized, debt issue (Arris Group, Inc. in June, 2003; Arrow Electronics in March, 1998). This supports claims in the previous paragraph in regards to firms being in contact with the credit rating agencies and thus aware of the potential for the CreditWatch designation. Knowing the financial stability of the firm is tenuous already, the firm seeks to improve firm performance through restructuring its business interests. The few examples given here lend some more insight into why a firm is not responding to a CreditWatch action by reducing debt. These corporate announcements continue to conspire against beliefs that credit ratings are a first order concern for firms. When a firm is interested in acquiring another firm, the acquisition seems more important than the downgrade in debt rating (if the downgrade isn't already expected). Furthermore, the recent examples show that the capital structure policy of a firm was often not a consideration in the CreditWatch listing, rather it was due to poor company performance or a poor industry outlook. Neither of these positions is a direct result of a firm's debt ratio, but rather its expected inability to increase shareholder wealth.

It should also be noted that in examination of the firms that were able to maintain a credit rating following a negative CreditWatch designation as compared with those that weren't, the firms that maintained their rating actually issued less debt than firms that had a rating decrease. As has been mentioned, firms react to a CreditWatch designation by issuing more debt. Perhaps the

capital structure adjustment is fruitless at this point or has already been contracted. However, for the 835 firms in this sample that were able to maintain their rating after a negative CreditWatch action, 0.63% more debt was raised relative to equity. For the 239 firms that saw their rating decrease after the negative CreditWatch action, these firms issued 2.12% more debt relative to equity. So although we can conclude that firms, on average, raise more debt when faced with a likely decrease in rating, the amount of debt issued was less for those that were able to maintain their rating. In the context of the CreditWatch list announcements, perhaps the firms that had already planned a debt increase of a lesser degree were less likely to see a follow through in the form of a ratings decrease.

Part III

H3 Results:

First, we examine the findings that result from considering the total capital market activity. Our expectation is that firms that are most involved in capital markets are most likely to concern themselves with their credit rating when making capital structure decisions. The results can be seen in Table 14 and show that when we interact the average amount of equity and debt issued in the previous five years with the independent dummy variables, significant results are not observed. When we control for total market activity, along with the other standard controls used in previous regressions (as seen in Table 6), the *POM* variable is not significant. As a result, we cannot say that firms that are more active in the capital markets are more likely to follow the CR-CS hypothesis.

Next, the firms are analyzed while only considering the average amount of debt issued over the previous five years. The results can be seen in Table 15. Note that this subset of firms isn't necessarily visiting only the debt markets. In other words, raising capital via debt doesn't preclude a firm from issuing equity over the same time period. This set of firms is simply those

reporting recent capital market activity.[34] However, the focus of this set of results is on the amount of debt raised in the recent past. It can be seen that the results focusing on debt issues are qualitatively similar to the results focusing on total capital market activity, in that the *POM* variable is the only significant variable and only significant when only controlling for recent activity and not the other controls. Once again, firms that are frequent visitors to the capital markets for the purpose of raising debt are not following the CR-CS hypothesis.

Finally, the firms are analyzed while only considering the average amount of equity issued over the previous five years. Similar to the findings for the debt issues, this subset of firms may or may not have been raising capital in the debt markets. Firms that were also raising capital in the debt markets are not excluded from this sample. The findings are shown in Table 16 and reveal results divergent from those seen in the previous two tables. The second equation shows a negative, albeit insignificant, coefficient for the *POM* variable. However, when interacted with the *AverageEquity* variable, the net effect becomes positive. When *POM* is one (a firm is on the edge of a broad rating category), firms that have been recently active in raising new equity will issue more debt. For all of the equations in Table 16, there is a negative relationship for the amount of equity raised recently and the amount of debt raised in the year of interest. In other words, the more active a firm was recently in raising new equity, the less likely that firm is to raise new debt in the current year. This is in line with the CR-CS hypothesis. However, once we consider the average amount of equity recently raised for firms on the verge of a rating change, the opposite occurs. These firms are the ones more likely to issue more debt. Equation four shows that this result is consistent for firms with a Plus rating and also for firms with a Minus rating, meaning that there isn't a subset of the *POM* group driving the results.

In the hypothesis development section, it was expected that these types of firms would be more

[34] This explains why the number of observations is the same for firms in Tables 15 and 16, as the reported amount can be zero or any number greater than zero.

likely to follow the CR-CS hypothesis. That assumption has shown to be a naive one. A valid explanation, one that will be more fully validated in subsequent findings, is that these firms are active in the markets and are less concerned with their credit rating as a result. Firms that are able to readily raise funds for corporate expansion needn't be as concerned with their rating as firms that are less frequent market participants. A primary goal of a credit rating agency is to reduce asymmetric information. Firms that are frequent market participants are quite transparent and information asymmetry becomes less of a concern for investors. As such, it shouldn't be surprising that these firms are the least concerned with their credit rating. These firms have established reputations that allow them to raise capital when needed and an incremental change in a credit rating will not alter that ability.

This subset of firms is finally evaluated to determine their capital structure response to the threat of a ratings change, in the form of an addition to the CreditWatch list. The results can be seen in Table 17 and show similar patterns to what was seen in the second hypothesis. Recall that when pooling all firms together, firms actually issued more debt relative to equity when faced with a likely decrease in their credit rating (Table 11). The same result is seen here. Even when controlling for previous market activity, firms that receive a negative threat about the stability of their rating continue to issue more debt. However, when we interact the total activity variable with the dummy variables, the net effect becomes negative, suggesting that these firms actually issue less debt. This is in conflict with the previous paragraph, but can be explained in the findings related to the CreditWatch list. Recall that oftentimes a CreditWatch addition has little to do with a change in capital structure policy and is more times than not a product of a poor outlook for either the firm or the industry. Therefore, these firms are being told that all of their recent activity in the capital markets has resulted in poor business prospects. As a result, the firms may be scaling back any further borrowing and reevaluating its goals. In this context, the results are sensible.

H4 Results:

Hypothesis four attempts to lend credence to previous research findings by examining the behaviors of firms after they have been partitioned by ratings. Certain ratings categories should be more interested in maintaining a rating while others should be more concerned with achieving a certain rating. The results once again are confounding[35] (see Table 18). Many different laws and regulations dictate the value of an investment grade status. For example, institutional investors may be prohibited from holding non-investment grade debt. Lacking this status, trading of a firm's debt might be compromised, increasing the liquidity premium and perhaps having an adverse effect on the overall risk premium (which is a function of liquidity premium) of a firm. Consequently, the cost of debt increases with the lowered status. As a result, the expectation is that the results around the investment grade rating (BBB) would be pronounced. However, this result is not seen. In fact, the behaviors of a firm on the verge of becoming a "fallen angel" are not significantly different from zero, meaning that firms with a rating of BBB- do not make capital structure decisions with credit ratings in mind.

On the other side of the investment grade argument, firms with a rating of BB+ should also be motivated to increase their standing. However, we can make no such claim based on the findings. The expectation is that these firms would issue less debt relative to equity in order to minimize concerns rating agencies might have when evaluating the potential for an increase. Instead these firms are shown to issue more debt. Pooling all firms together does not reveal the intended results. Perhaps there are other factors in play.

It is also important to highlight the fact that once the sample is broken down into different ratings categories, the minus dummy variable is only significant for the firms with a B rating.[36] The

[35] The introduction of macroeconomic variables (3-month treasury rate and 10-year treasury rate) do not qualitatively affect the results. See Table 19.

[36] Kisgen's dissertation shows similar results. In a sample of firms covering the years 1986 – 2001 (and excluding financials and utilities), the Plus and Minus dummy variables are only significant and of the

results show that a firm with a rating of B- will issue 2.72% less debt relative to equity in an attempt to maintain its rating. However, the same cannot be said for any other rating category. When pooled together, the minus variable is of the correct sign and significant, but once the results are examined by ratings categories, only one major rating category is significant. When separated, we cannot say that firms in any other rating category follow a capital structure policy that considers credit ratings. According to Standard & Poor's[37], the difference between a rating of B and CCC is the ability of the issuer to make payments on its debt in different conditions. A firm with a rating of B can meet the expectation of payments under current business, financial and economic conditions. However, a CCC-rated firm is dependent upon favorable conditions to meet its debt obligations. For this reason, perhaps a firm with a rating of B is reluctant to issue any more debt relative to equity knowing that it will struggle with its ability to repay such financing unless conditions turn favorably.

Another interesting observation to note is that the investment grade firms all have significant findings for the plus variable, along with the firms that have a BB rating. However, in three out of four cases, the coefficient is the wrong sign. In other words, firms that are on the edge of achieving a new rating actually will issue more debt relative to equity. This is obviously counter-intuitive and allows us to further questions previous findings. In fact, we would expect the firms with a rating of BB+ to be very interested in achieving a new rating and earning the investment grade designation. Findings that suggest these firms actually issue more debt are alarming. The only exception to the positive coefficient is for the AA-rated firms, which issue 0.59% less debt relative to equity when presented the opportunity to perhaps earn a AAA rating.

Turning to the ratings when separated under the broad categories of investment grade and non-investment grade, curious results are also seen. Neither the plus nor minus dummy variable is

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correct sign for firms with a rating of B and AA. However, only the Minus firms are significant for the AA firms. Therefore, the results here are quite consistent with his dissertation findings.

[37] http://www.standardandpoors.com/prot/ratings/articles/en/us/?assetID=1245199822137

significant for the investment grade firms. As such, no conclusions can be drawn for the majority of firms (12,157 investment grade firms and 4,905 non-investment grade firms) as far as their implementation of a capital structure policy that considers credit ratings.

In terms of the non-investment grade firms, the minus variable is significant while the same cannot be said for the plus variable. The only statement that can therefore be made is that non-investment grade firms are concerned with losing their current rating and will issue 0.83% less debt relative to equity in an effort to preserve its current rating.

Overall, the results when the firms are separated by rating are discouraging if one wants to believe in the CR-CS hypothesis. However, the findings here are congruent to the findings in the previous hypothesis that suggest credit ratings play a role in alleviating adverse selection issues for less visible (non-investment grade) firms.

When the CreditWatch sample is separated into credit ratings, the results aren't any more promising (see Table 20). Net debt issued is examined in the quarter following a CreditWatch action. The quarter following this action is examined due to the definition provided by Standard and Poor's, which says that a firm will be placed on this list if it is more likely than not that the firm will have a ratings change within the next 90 days. "More likely than not" is defined as better than 50% chance. For this reason, we are interested in any capital structure actions firms will take within 90 days, or in the quarter following the action.

The first observation to note is that the firms with a rating of AA that receive a positive signal are the only firms with an expected negative and significant coefficient. Firms with a rating of CCC also seem to follow the CR-CS hypothesis when they react to a positive CreditWatch designation by issuing 6.0% less debt relative to equity perhaps in an effort to affirm the rating upgrade. The only other significant variables show that firms on the verge of achieving a AA+ rating actually issue 5.36% *more* debt relative to equity and firms that are expecting to decrease from BBB+ to

BBB issue 1.55% *more* debt relative to equity. Of course, this is the opposite of what the CR-CS hypothesis suggests.

Other ratings of interest are those firms that are near a change in investment grade status. No definitive results are seen, suggesting that firms that receive a signal either threatening their investment grade status or a signal that a firm will move from a non-investment grade designation to investment grade make any adjustments to their capital structure. This is in line with the findings presented when analyzing the CR-CS hypothesis with the previous sample set. Based on two different tests, with two different samples, an observer cannot conclude that firms are adjusting their capital structure to preserve an investment grade status.

Considering firms when pooled together based on their broad ratings category, firms with a broad rating of A and BBB that receive a positive CreditWatch designation follow the CR-CS hypothesis. The same cannot be said for firms within these two ratings categories that receive a negative warning. In fact, consistent with previous findings in this paper, these firms actually issue more debt relative to equity.

H5 Results:

The goal of this hypothesis is to examine the magnitude to which commercial paper issuing firms follow a capital structure policy which considers credit ratings. The expectation is that these firms are more concerned with maintaining/achieving a credit rating than otherwise similar firms. The foundation for this hypothesis is that a firm might sacrifice its ability to issue short-term debt if its long-term debt rating was compromised. Unfortunately, Table 21 shows that commercial paper issuing firms do not follow the CR-CS hypothesis. When a sample of commercial paper issuing firms is introduced, and all other firms removed, it can be seen that this subset of firms is not interested in maintaining a certain long-term credit rating (minus dummy variable is not different from zero) nor are these firms interested in achieving a new rating (plus dummy variable

is not different from zero). As a result, we cannot reject the null hypothesis and must conclude that commercial paper issuing firms are not making capital structure decisions with long-term credit ratings in mind.

On the other side of this argument, all commercial paper issuing firms are removed and the same methodologies are applied to this subsample of firms. The findings can be seen in Table 22 and show that firms that do not issue commercial paper are following the CR-CS hypothesis. The only exception is the Minus variable in the 2nd regression. However, once the controls are removed (not shown), the Minus variable is negative and significant. This is the opposite of what was suspected in the hypothesis development.

In order to further test this hypothesis, the amount of commercial paper issued in a particular year is interacted with each of the dummy variables. The results can be seen in Table 23 and show results consistent with those previously seen when only evaluating commercial paper issuing firms. Controlling for the amount of commercial paper issued, we see that commercial paper issuing firms are still not following the CR-CS hypothesis, as none of the interacted variables are significant.

An examination of commercial paper issuing firms is also applied to the CreditWatch list sample. With an expectation that commercial paper issuing firms would be more likely to follow the CR-CS hypothesis, the results contradict expectations. Table 24 shows that commercial paper issuing firms that receive a threat about the stability of their rating actually issue more debt. Commercial paper issuing firms that receive a notification that their rating is likely to increase make no changes to their capital structure.

Taken together, these approaches for testing the CR-CS hypothesis on commercial paper issuers return the same result. That result is that commercial paper issuers do not make capital structure decisions with long-term credit ratings in mind. In fact, those firms that do not issue commercial

paper are the firms that do follow this theory.

One plausible explanation for these findings might lie in the accepted definition of a commercial paper issuing firm. Because commercial paper is typically unsecured, it will only be issued by firms that are financially stable. The financial strength of the firm is the collateral. As a result, firms that issue commercial paper are not concerned with fluctuations in their long-term rating. The very definition of a commercial paper issuing firm is one of financial strength. Thus, the market has already determined that these firms are stable and their debt is likely to be repaid. Therefore, these firms are confident in their ratings stability and will thus issue commercial paper to receive the benefits of this low cost form of short-term funding without concern for the potential cost (ratings change). This finding is uniform with previous findings in this paper relative to behaviors of investment grade vs non-investment grade firms. Since commercial paper issuing firms are typically investment grade, the findings here are consistent.

This argument can also be applied to the firms that do not issue commercial paper. These firms do not have the same financial strength of the commercial paper issuing firms. Consequently, the market isn't investing in unsecured debt from these firms due to the transparent instability. In this scenario, commercial paper serves as a proxy for financially stable firms. The less stable firms will thus be more reluctant to issue debt when they are on the verge of a ratings change as the market has already determined their rating to be potentially varying. This rationale is once again homogenous with previous non-investment grade findings.

Another possible explanation for these findings is the broad ratings categories for commercial paper. Crabbe and Post (1994) show that firms will issue less commercial paper after a commercial paper ratings downgrade. However, they show similar results found here when looking at the amount of commercial paper issued after a bond rating downgrade. When examining firms that had their bond rating lowered but did not have any change to the

commercial paper rating, it was concluded that the bond rating change conveyed little to commercial paper investors, as there was no change in the amount of commercial paper issued. This finding makes sense for both this paper and Crabbe and Post's paper as several bond ratings are found in a single commercial paper rating. For example, Standard and Poor's highest commercial paper rating, A-1+, correlates with as many as five bond rating categories (AAA, AA+, AA, AA-, A+). This explanation combined with the financial stability argument previously mentioned suggests that these findings might not be so unexpected after all.

H6 Results:

To assess the investment opportunities available to firms, an approximation of Tobin's q is used. Tobin's q provides a ratio of future expected cash flows to book value of the firm's assets. As such, a firm with more investment opportunities will see the market increase its stock price when compared with the book value of its assets. Calculations in this paper show a median q equal to 0.71 with a high value of 17.[38]

The findings in Table 25 show the effect q has when interacted with the independent variables. The interaction term is only significant when evaluated with the plus dummy variable. However, the sign is once again the opposite of what was hypothesized suggesting that firms with more growth opportunities and on the verge of a credit rating increase will issue *more* debt relative to equity. No conclusions can be drawn for firms that are on the verge of a rating decrease in terms of the role Tobin's q plays in the decision process. In other words, investment opportunities do not influence a firm's decision to follow a capital structure policy with credit ratings in mind. A possible explanation for this result is that firms that can generate q, or firms with investment opportunities, are not concerned with their rating. Investment opportunities trump credit ratings when pursuing the goal of maximizing shareholder wealth. A firm with positive NPV projects

[38] This is in line with previous findings. See Lang and Stulz (1994) findings which show a median q of 0.77 with a high value of 17.

will pursue funding of those projects and the manner in which they are funded is not important.

To further explore the role investment opportunities play in the CR-CS hypothesis, if any, firms are separated into quartiles based on Tobin's q. The results can be seen in Table 26. When separating firms into different quartiles, no further conclusions can be easily drawn. Results show that firms in the 2nd quartile and faced with a potential ratings upgrade will issue 0.78% less debt relative to equity. However, significance is not found on any other independent variables. When segmenting firms into two halves, the results are once again less than promising.

The expectation was that firms with more growth opportunities would be most concerned about maintaining or achieving a certain credit rating. Hence, these firms would be even more cautious than otherwise similar firms without the same opportunities when making a capital structure decision. The results do not support this hypothesis further calling into question the role of credit ratings in capital structure decisions. However, consistent with the other results in this paper, we can surmise that less visible and less known firms are again the firms most likely to follow the CR-CS hypothesis. A firm with a higher q value is a firm that the market accepts as being vibrant and growing. Therefore, these firms are widely known and credit ratings are not a concern as these firms have already demonstrated strength.

The role growth opportunities play in the CR-CS hypothesis is also evaluated using the CreditWatch sample. The results can be seen in Table 27 and once again are behaving in an unanticipated manner. Although no conclusions can be drawn about firms that receive a positive CreditWatch notification, we still find that firms issue more debt relative to equity when warned of a ratings downgrade when Tobin's q is added as a control. Furthermore, when we interact Tobin's q with the negative variable, it can be seen that firms with more growth opportunities issue 0.89% more debt relative to equity. The foundation of this hypothesis is rooted in the suspicion that firms with investment opportunities would be more concerned with

maintaining/achieving a credit rating and would thus make capital structure decisions to aid in the firm's credit rating goals. However, consistent with previous findings in this paper, the opposite is once again occurring. Firms with a threat about the stability of their rating and facing a likely downgrade will actually issue more debt. Additionally, firms with more growth opportunities issue even more debt. The CR-CS hypothesis is once again questioned.

CHAPTER VII

CONCLUSION

Recent research has begun to establish a link between credit ratings and capital structure. Although this is a relationship that is intuitively appealing and one that has been suspected by practitioners for years, only recently has the relationship been tested empirically. The goal of this paper was to further examine recent findings in three ways: (1) by introducing a new control group, (2) by introducing a new tool to measure ratings instability and (3) to evaluate previous findings by examining certain subsets of firms that are more or less likely to follow a capital structure policy that considers credit ratings.

The results here are sometimes in stark contrast to previous findings which have suggested that firms do make capital structure decisions with credit ratings in mind. While studying the CR-CS hypothesis on a set of nonrated firms, the findings help alleviate any concerns about an omitted variable by showing that nonrated firms do not make capital structure decisions with their (hypothetical) ratings in mind. However, when introducing a new variable to serve as catalyst for a ratings threat, an addition to the CreditWatch list, the results here are not congruent to a firm making capital structure decisions with credit ratings in mind. Instead, we see that firms that receive a negative threat about the stability of their rating actually issue more debt relative to equity. In the final set of hypotheses, firms are partitioned based on different criteria to examine whether certain subsets of firms follow the CR-CS hypothesis. Firms that are frequent market

participants, firms that have a commercial paper program and firms with investment opportunities all do not make capital structure decisions with credit ratings in mind, contrary to expectations of the CR-CS hypothesis. A likely explanation for these findings might be simply explained by the role of a credit rating agency in reducing asymmetric information. The aforementioned sets of firms are transparent, financially stable firms that are active in the markets and known to investors. As a result, the need for a credit rating to reveal information and alleviate adverse selection problems is reduced. In this situation, the credit rating is not a first order concern for these firms. This belief is further supported in the examination of firms separated by their current broad rating. Taken together, investment grade firms do not follow the CR-CS hypothesis, while noninvestment grade firms as a whole do adhere to such a policy when on the verge of a ratings downgrade. This result also is line with the asymmetric information theory in that noninvestment grade firms are less visible, less traded and less transparent.

In conclusion, when considering the work done here as a whole, the findings support credit ratings as a tool to reduce asymmetric information when other tools are unavailable. In other words, credit ratings are not a first order concern for firms that are well known and active in different financial markets. Firms feel that investors will turn to credit ratings to convey information only when other forms of market activities are unavailable for information producing purposes.

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APPPENDIX

Rating Process[39]

The rating process is typically initiated by the corporation prior to the sale of a new debt issue. The motivation for the corporation is to gain insight on the type of rating to be assigned. In addition, a firm with existing rated debt will better understand the effect the new issue will have on the rating of any existing debt. Although firms typically initiate the rating process, all public corporate debt issues in excess of $100 million will be rated and those ratings will be published. This is done whether the firm requests it or not.

The analysts who assign ratings typically work in one or two concentrated industries. These analysts will cover the entire spectrum of ratings within their specified industry. Specialization for analysts helps improve the rating accuracy by allowing for these individuals to accumulate expertise. Typically, there is a lead analyst assigned to an issuer, but a team of analysts is also assigned to the rating relationship.

At the beginning of the rating process, analysts will meet with a firm's management team to review the factors that will have an effect on the rating. These management meetings will involve discussions of the company's operating and financial plans, as well as other elements that would impact the firm's rating.

[39] Source: S & P's Rating Process

While the rating agency is represented by a team of analysts during its meeting with management, the firm will typically be represented by the chief financial officer. In addition, the chief executive officer will participate if strategic issues are being reviewed and operating executives may participate by presenting relevant information regarding their business segments.

These meetings typically occur at the firm and current and past financial statements are also reviewed. As a result of the enormous amount of information being disclosed, confidentiality might become a concern. The policy of the rating agency is not to disclose any nonpublic information with any third parties, including the rating agency's other units.[40]

As a result of the meetings, the rating team (five to seven voting members) will arrive at a conclusion (the team of analysts responsible for the rating is also confidential). The company is then notified of the rating for the issue and is allowed to respond prior to the rating becoming public. The response might include new or additional data to influence the rating. In addition, the firm may appeal the rating based on new information. This appeal will be resolved within a day or two. Once the rating process has been completed, the information will be disclosed to the public. S & P discloses these ratings to the public via RatingsDirect, S&P.com, and the news media.

Corporate Rating vs Bond Rating[41]

Ratings are assigned at both the firm level and at the issue level. In other words, both the issuer (obligor) and the issue (obligation) have a rating. At the firm level, the rating is an overall opinion on the issuer's ability to pay its debt obligations on time. Its primary objective is to indicate likelihood of default.

The rating of an issue reflects the blend of default risk and the recovery prospects in the event of

[40] Credit rating agencies are exempt from Regulation Fair Disclosure.
[41] Source: S & P's Principles of corporate and government ratings

default. The creditworthiness of the issuer is taken into consideration, along with the currency of the obligation. An issue might be rated differently from its issuer due to subordination and collateral. For example, an issue that is heavily collateralized would have a higher rating than unsecured issue. Also, subordinated issues would likely have lower ratings than a more senior debt issue. This paper focuses on ratings at the firm level.

Ratings evolution over time[42]

The ratings services of Standard & Poor's dates back to 1860. Currently, S & P is the leading rating firm and rate trillions of dollars worth of financial obligations. They began rating insurance companies and financial guarantees in 1971. Shortly after, S & P began rating mortgage-backed bonds in 1975 and mutual funds and assets-backed securities in 1985. Most recently, they began examining the credit quality of secured loan recovery in 2003.

Private vs Public

Credit rating agencies rate both private and public debt. One might ask why a privately issued obligation would require a rating. One reason such a rating would be of interest is because of "ratings triggers." A financial contract that contains a ratings trigger demands certain actions from a borrower when a rating changes. For example, the lender may demand cash collateral at a certain credit rating level. At another level, a lender might demand repayment in full. In other words, "rating triggers are contractual provisions that terminate credit availability or accelerate credit obligations in the event of specified rating actions."[43]

[42] Source: S & P's Ratings – And their role in the financial markets
[43] U.S. Securities and Exchange Commission. 2003. Report on the role and function of credit rating agencies in the operation of the securities market.

TABLES

Table 1
2007 Study by Moody's Investor Services. Period covers 1970 – 2006. Default rates are listed.

Rating Categories	Moody's	S&P
Aaa/AAA	0.52%	0.60%
Aa/AA	0.52%	1.50%
A/A	1.29%	2.91%
Baa/BBB	4.64%	10.29%
Ba/BB	19.12%	29.93%
B/B	43.34%	53.72%
Caa-C/CCC-C	69.18%	69.19%
Investment Grade	2.09%	4.14%
Non-Investment Grade	31.37%	42.35%
All	9.70%	12.98%

Table 2
Previous literature providing the variables used in the regression in the 2nd model for hypothetical ratings, as supplied by Kisgen (2006).

Pogue and Soldofky (1969)	Net Income/Total Assets
Kaplan and Urwitz (1979)	
Kamstra, Kennedy and Suan (2001)	
Pogue and Soldofky (1969)	Debt/Total Capitalization
Ederington (1985)	
Standard and Poor's	
Pogue and Soldofky (1969)	Debt/Total Capitalization Squared
Kaplan and Urwitz (1979)	EBITDA/Interest Expense
Standard and Poor's	
Standard and Poor's	EBIT/Interest Expense
Kamstra, Kennedy and Suan (2001)	(Log of) Total Assets
Standard and Poor's	

Table 3
List of recent credit ratings modeling papers.

Paper	Classification	Accuracy	Variables	Time Period
Kisgen (2006)	Regression	Adj. R^2=0.631	EBITDA, Aseets, Debt, Total Cap	1986-2001
Altman and Rijken (2004)	Ordered logit model	Standard deviation = 25% for 16 ratings classes when compared with actual ratings.	Net working capital, retained earnings, assets, EBIT, market value of equity, book value of total liabilities	1981-2001
Amato and Furfine (2004)	Ordered probit model	Actual goodness of fit accuracy not provided. Instead provide a table comparing actual to predicted rating. Depending on the rating, accurate anywhere from 20% to 71% of the time. Model is less accurate at tails (AAA, AA, CCC, CC)	Size, beta, interest coverage, operating income, sales, long-term debt, total debt, assets	1981-2001
Blume, Lim and Mackinlay (1998)	Ordered probit model	Same as AF (2004). From 26% - 74%. Only use 4 ratings categories: AAA, AA, A, BBB	Same as AF (2004).	1978-1995
Hand, Holthausen, Leftwich (1992)	Price-based expectations model	Not reported. Simply used as a tool to show if a ratings change was expected/unexpected.	Yield to maturity (YTM). Compare YTM of firm in question to YTM of a benchmark (bonds with same rating). If YTM of bond of interest is greater than benchmark, then bond rated too high and vice versa.	1977-1982

Table 4
Credit Rating Impact on Capital Structure Decisions - Plus or Minus Tests (with financials and utilities)

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2001. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are lagged one year. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.0180***	-0.0180***	0.0002	0.0002	0.0433***	0.0630***	-0.0289***	0.0186***
	(-3.28)	(-3.29)	(0.16)	(0.15)	(17.88)	(-10.95)	(-11.35)	(5.14)
POM	0.0003		-0.0061***		-0.0027*	-0.0030*	-0.0036**	-0.0011
	(0.19)		(-3.94)		(-1.82)	(-1.93)	(-2.30)	(-0.73)
Plus		0.0009		-0.0058***				
		(0.51)		(-3.19)				
Minus		-0.0004		-0.0063***				
		(-0.22)		(-3.33)				
Leverage	-0.0821***	-0.0822***			-0.0953***			-0.0875***
	(-15.16)	(-15.16)			(-17.53)			(-15.76)
Profitability	0.1300***	0.1297***					0.2046***	0.1487***
	(9.11)	(9.08)					(13.56)	(10.02)
Size	0.0049***	0.0049***				0.0083***		
	(8.82)	(8.85)				(11.53)		
Adj R2	0.0810	0.0810	0.0013	0.0012	0.0523	0.0256	0.0338	0.0730
N	10,578	10,578	10,962	10,962	10,962	10,612	10,578	10,578

Kisgen (2006) results, with White's consistent standard errors.

	(9)	(10)	(11)	(12)	(13)
Intercept	-0.0718***	-0.0054	-0.0787***	-0.0787**	-0.0006
	(-13.93)	(-0.99)	(0.0082)	(0.0082)	(0.0012)
POM	-0.0016	-0.0005	-0.0058***		-0.0102***
	(-1.02)	(-0.31)	(0.0016)		(0.0017)
Plus				-0.0064***	
				(0.0020)	
Minus				-0.0051***	
				(0.0019)	
Leverage		-0.0933***	-0.0153***	-0.0153**	
		(-17.22)	(0.0066)	(0.0066)	
Profitability	0.1764***		0.1288***	0.1293***	
	(12.29)		(0.0265)	(0.0264)	
Size	0.0062***	0.0063***	0.0090***	0.0090***	
	(10.77)	(9.27)	(0.0008)	(0.0008)	
Adj R2	0.0471	0.0701	0.0541	0.0542	0.0030
N	10,578	10,612	10,842	10,842	10,842

Table 5
Credit Rating Impact on Capital Structure Decisions - Plus or Minus Tests (without financials and utilities)

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2001. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Both control variables are lagged one year. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude SIS codes 4000-4999 and 6000-6999 and all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss			
	(1)	(2)	(3)
Intercept	-0.0123***	0.0123***	-0.0007
	(2.63)	(2.63)	(-0.45)
POM	-0.0019		-0.0094***
	(-0.90)		(-4.17)
Plus		-0.0017	
		(-0.68)	
Minus		-0.0022	
		(-0.82)	
Leverage	-0.0994***	-0.0994***	
	(-15.25)	(-15.23)	
Profitability	0.1983***	0.1983***	
	(9.77)	(9.77)	
Adj R2	0.1096	0.1094	0.0025
N	6,150	6,150	6,187

Table 6
Credit Rating Impact on Capital Structure Decisions - Plus or Minus Tests (with financials and utilities)
Updated Time Period

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are lagged one year. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(2)	(2)	(3)	(4)
Intercept	-0.0215***	-0.0210***	-0.0007	-0.0007
	(-5.04)	(-5.03)	(-0.75)	(-0.75)
POM	-0.0020*		-0.0060***	
	(-1.72)		(-5.15)	
Plus		-0.0011		-0.0052***
		(-0.81)		(-3.81)
Minus		-0.0029**		-0.0068***
		(-2.12)		(-4.82)
Leverage	-0.0790***	-0.0791***		
	(-21.22)	(-21.23)		
Profitability	0.1353***	0.1349***		
	(12.49)	(12.45)		
Size	0.0049***	0.0049***		
	(12.00)	(12.03)		
Adj R2	0.0868	0.0868	0.0014	0.0014
N	17,062	17,062	18,046	18,046
F Value	406.46***	325.49***	25.56***	13.39***

Table 7
Credit Rating Impact on Capital Structure Decisions - Plus or Minus Tests (without financials and utilities)
Updated Time Period

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are lagged one year. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude SIS codes 4000-4999 and 6000-6999 and all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)	(4)
Intercept	-0.0435***	-0.0437***	-0.0013	-0.0013
	(-7.36)	(-7.38)	(-0.98)	(-0.98)
POM	-0.0009		-0.0083***	
	(-0.59)		(-4.82)	
Plus		0.0005		-0.0075***
		(0.25)		(-3.74)
Minus		-0.0025		-0.0092***
		(-1.28)		(-4.33)
Leverage	-0.0891***	-0.0893***		
	(-19.71)	(-19.74)		
Profitability	0.1872***	0.1865***		
	(12.71)	(12.67)		
Size	0.0065***	0.0066***		
	(12.96)	(11.97)		
Adj R2	0.1304	0.1305	0.0021	0.0020
N	10,138	10,138	10,191	10,191
F Value	381.09***	305.33***	22.27***	11.45***

Table 8
Credit Rating Impact on Capital Structure Decisions - Plus or Minus Tests on Hypothetical Ratings

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. Hypothetical ratings were obtained using the coefficients from the following regression on a rated sample:

The time period includes years 1986 - 2009. I examine all firms with a hypothetical credit rating at the beginning of a particular. Plus/Minus is a dummy variable equal to 1 if the hypothetical credit rating has a plus/minus rating and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.
Regressions (1) – (3) reflect the coefficients obtained from the entire sample. Regressions (4) – (6) reflect coefficients obtained from updating the coefficients annually. Coefficient for the credit rating prediction model can be seen in Table 9.

Dependent Variable: Netdiss

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0962***	-0.0955***	-0.0335***	-0.0961***	-0.0957***	-0.0332***
	(-28.34)	(-28.26)	(-23.73)	(-27.69)	(-27.63)	(-21.39)
POM	-0.0028		-0.0102***	-0.0027		-0.0099***
	(-1.60)		(-5.32)	(-1.45)		(-5.01)
Plus		0.0022			-0.0004	
		(1.15)			(-0.18)	
Minus		-0.0073***			-0.0040**	
		(-3.51)			(-1.97)	
Leverage	-0.0801***	-0.0804***		-0.0798***	-0.0797***	
	(-16.13)	(-16.18)		(-16.06)	(-16.04)	
Profitability	0.3330***	0.3307***		0.3334***	0.3331***	
	(18.38)	(18.28)		(18.39)	(18.40)	
Size	0.0110***	0.0109***		0.0109***	0.0109***	
	(15.88)	(15.84)		(15.82)	(15.72)	
Adj R2	0.2177	0.2183	0.0009	0.2177	0.2178	0.0007
N	24,581	24,581	26,100	24,581	24,581	26,100
F Value	1711.29***	1373.95***	23.33***	1711.18***	1369.62***	20.46***

Table 9
Coefficients to Determine Hypothetical Ratings (OLS Model) and Distribution of Resulting Ratings

Year	Assets	Earnings	Debts		Distribution of Hypothetical Ratings	
1986	1.47304	7.92518	-48.50351		Rating	Observations
1987	1.50655	3.99683	-61.56741		AA+	17
1988	1.41997	8.12876	-27.18919		AA	37
1989	1.37034	10.50915	-14.63243		AA-	71
1990	1.29676	13.50470	-16.43641		A+	160
1991	1.26198	14.84053	2.50449		A	319
1992	1.25970	14.31427	3.84972		A-	537
1993	1.25717	13.58075	2.48695		BBB+	849
1994	1.27183	11.20179	-2.03037		BBB	1364
1995	1.26256	10.36564	0.13398		BBB-	2276
1996	1.23818	10.46309	-1.14324		BB+	3982
1997	1.27567	6.33072	-1.46649		BB	5617
1998	1.23221	8.27766	1.63156		BB-	5981
1999	1.19453	8.48067	-3.61817		B+	5123
2000	1.14802	8.87692	-0.17824		B	4043
2001	1.14914	8.15620	-2.02305		B-	3034
2002	1.11891	8.31318	-2.35615		CCC+	1900
2003	1.09385	8.19072	-3.09870		CCC	1216
2004	1.10358	5.66815	-1.94485		CCC-	8715
2005	1.10019	5.74396	-0.74188			
2006	1.08901	4.79172	-2.91637			
2007	1.08668	3.92071	-1.76669			
2008	1.06671	4.63746	-3.40875			
2009	1.03672	4.74279	2.48326			
Overall	1.18784	8.39197	-3.20994			

Table 10
Coefficients to Determine Hypothetical Ratings (Ordered Logit Model)

Parameter estimates for the agency-rating prediction model (ordered logit regression) based on the approach established by Altman and Rijken (2004). WK is Net Working Capital; RE is retained earnings; TA is total assets; EBIT is earnings before interest and taxes; ME is market value of equity; BL is book value of assets; Size is ln(BL/Mkt), where Mkt is the total value of the US Equity Market. To increase the effectiveness of the RE/TA, EBIT/TA and ME/BL variables in the logit model estimate, the variables are log-transformed as follows: RE/TA → - ln(1-RE/TA), EBIT/TA → - ln(1-EBIT/TA) and ME/BL → 1 + ln(ME/BL). All income statement variables refer to the four fiscal quarters in the previous calendar year while all balance sheet items are for the latest fiscal quarter in the previous calendar year. In addition, market equity values are based on the stock price and shares outstanding at the end of June.

Dependent Variable: Agency Rating Scale

	(1985-90)	(1991-1995)	(1996-2000)	(2001-2005)	(2006-2009)	(1985-2009)
WK/TA	-1.3902	-1.4131	-1.3802	-0.1819	0.8054	-0.7113
	(<.0001)	(<.0001)	(<.0001)	(0.2382)	(<.0001)	(<.0001)
RE/TA	4.3716	3.4605	3.2613	2.7991	2.0693	2.8145
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
EBIT/TA	3.8844	3.9923	4.7209	4.7027	5.7883	4.6060
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
ME/BL	0.6594	0.5288	0.1875	0.1944	0.3332	0.2851
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Size	1.0331	0.9705	1.0470	1.0730	1.0968	0.9668
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Boundaries B_k						
AAA	-0.6668	-0.8465	-1.9145	-1.3595	-0.7701	-1.1031
AA+	-1.2439	-1.4012	-2.3677	-1.7148	-0.9705	-1.5510
AA	-2.5409	-2.5166	-3.4434	-2.7441	-2.1819	-2.6148
AA-	-3.2394	-3.3705	-4.2925	-3.4854	-2.9149	-3.3226
A+	-4.1137	-4.1530	-5.1929	-4.4759	-3.7954	-4.1217
A	-5.0884	-5.2420	-6.3729	-5.6021	-4.8230	-5.1029
A-	-5.7652	-5.8864	-6.9838	-6.3630	-5.5873	-5.7300
BBB+	-6.3100	-6.4695	-7.7192	-7.1064	-6.4268	-6.3742
BBB	-7.0088	-7.1758	-8.4192	-7.9835	-7.2901	-7.1021
BBB-	-7.4924	-7.7557	-9.0579	-8.6320	-7.9583	-7.6834
BB+	-7.9386	-8.1768	-9.4827	-9.0958	-8.3921	-8.0980
BB	-8.4929	-8.9029	-10.1776	-9.8188	-9.1232	-8.7568
BB-	-9.3534	-9.8347	-11.1790	-10.9192	-10.2497	-9.7354
B+	-11.2586	-11.4101	-12.7215	-12.2220	-11.4189	-11.1352
B	-12.2510	-12.6062	-14.1060	-13.4292	-12.7072	-12.3341
B-	-13.1388	-13.8282	-15.4887	-14.8731	-14.4337	-13.6642

CCC+	-13.7956	-15.1361	-16.7881	-15.6986	-15.7842	-14.6393
CCC	-14.8605	-15.5674	-19.2186	-17.8695	-17.9758	-16.1012
CCC-	-∞	-∞	-∞	-∞	-∞	-∞

Table 11
Credit Rating Impact on Capital Structure Decisions – CreditWatch Data
One Quarter Following Credit Action

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular quarter minus net equity raised for the quarter, following the quarter in which a firm was placed on S&P's CreditWatch list. Data is provided directly from Standard and Poor's and includes years 1990 - 2009. I examine all firms that have been placed on S&P's CreditWatch list during this time period. Positive/Negative is a dummy variable equal to 1 if the action has a positive/negative designation and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are quarterly values and are calculated in the quarter in which the credit action takes place. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss in quarter following credit action

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.0086***	0.0015***	0.0085***	0.0087***	0.0015***	0.0017***
	(6.92)	(7.82)	(6.85)	(6.94)	(7.44)	(8.50)
Negative	0.0104***	0.0101***	0.0105***		0.0102***	
	(4.72)	(4.53)	(4.76)		(4.56)	
Positive	-0.0174***	-0.0150***		-0.0176***		-0.0151***
	(-3.16)	(-2.77)		(-3.18)		(-2.80)
Leverage	-0.0241***		-0.0241***	-0.0241***		
	(-19.88)		(-19.86)	(-19.87)		
Profitability	0.0622***		0.0616***	0.0607***		
	(5.50)		(5.45)	(5.37)		
Size	0.0006***		0.0006***	0.0006***		
	(3.54)		(3.55)	(3.69)		
Adj R2	0.0101	0.0006	0.0097	0.0097	0.0004	0.0003
N	86,106	93,832	86,106	86,106	93,832	93,832
F Value	176.83***	30.41***	212.16***	212.37***	34.07***	27.18***

Table 12
Credit Rating Impact on Capital Structure Decisions – CreditWatch Data
Two Quarters Following Credit Action

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular quarter minus net equity raised for the quarter, two quarters following the quarter in which a firm was placed on S&P's CreditWatch list. Data is provided directly from Standard and Poor's and includes years 1990 - 2009. I examine all firms that have been placed on S&P's CreditWatch list during this time period. Positive/Negative is a dummy variable equal to 1 if the action has a positive/negative designation and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are quarterly values and are calculated in the quarter in which the credit action takes place. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss in 2nd quarter following credit action

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.0062***	0.0016***	0.0062***	0.0062***	0.0016***	0.0016***
	(5.22)	(8.44)	(5.21)	(5.22)	(8.46)	(8.51)
Negative	0.0005	0.0005	0.0005		0.0005	
	(0.24)	(0.26)	(0.24)		(0.26)	
Positive	-0.0007	0.0010		-0.0007		0.0010
	(-0.16)	(0.24)		(-0.17)		(0.23)
Leverage	-0.0214***		-0.0214***	-0.0214***		
	(-18.42)		(-18.41)	(-18.42)		
Profitability	0.0666***		0.0665***	0.0664***		
	(5.92)		(5.92)	(5.92)		
Size	0.0007***		0.0007***	0.0007***		
	(4.72)		(4.72)	(4.73)		
Adj R2	0.0088	0.0000	0.0088	0.0088	0.0000	0.0000
N	83,119	90,421	83,119	83,119	90,421	90,421
F Value	148.06***	0.11	185.06***	185.05***	0.10	0.12

Table 13
Credit Rating Impact on Capital Structure Decisions – CreditWatch Data
Quarters Around Credit Action

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular quarter minus net equity raised for the quarter, around the quarter in which a firm was placed on S&P's CreditWatch list. Data is provided directly from Standard and Poor's and includes years 1990 - 2009. I examine all firms that have been placed on S&P's CreditWatch list during this time period. Positive/Negative is a dummy variable equal to 1 if the action has a positive/negative designation and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are quarterly values and are calculated in the quarter in which the credit action takes place. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss in quarters around and including credit action

	(-2)	(-1)	(0)	(1)	(2)
Intercept	0.0060***	0.0083***	0.0084***	0.0086***	0.0062***
	(5.03)	(6.64)	(6.67)	(6.92)	(5.22)
Negative	0.0003	0.0001	0.0040*	0.0104***	0.0005
	(0.21)	(0.04)	(1.85)	(4.72)	(0.24)
Positive	-0.0098***	-0.0028	-0.0177***	-0.0174***	-0.0007
	(-3.64)	(-0.82)	(-4.08)	(-3.16)	(-0.16)
Leverage	-0.0209***	-0.0237***	-0.0237***	-0.0241***	-0.0212***
	(-17.94)	(-19.43)	(-19.45)	(-19.88)	(-18.42)
Profitability	0.0683***	0.0604***	0.0616***	0.0622***	0.0666***
	(5.98)	(5.24)	(5.35)	(5.50)	(5.92)
Size	0.0007***	0.0006***	0.0006***	0.0006***	0.0007***
	(4.60)	(3.70)	(3.65)	(3.54)	(4.72)
Adj R2	0.0087	0.0091	0.0096	0.0101	0.0088
N	81,835	84,981	84,982	86,106	83,119
F Value	144.84***	157.56***	165.57***	176.83***	148.06***

Table 14
Credit Rating Impact on Capital Structure Decisions
Capital Market Activity - Total

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. TotalAct is the average of the total amount of capital market activity over the previous five years divided by total assets. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0134**	-0.0138**	-0.0132**	-0.0138**	0.0067***	0.0062
	(-2.46)	(-2.51)	(-2.42)	(-2.46)	(4.53)	(4.08)
POM	0.0001	0.0008			-0.0031**	-0.0020
	(0.09)	(0.40)			(-2.10)	(-0.81)
TotalAct x POM		-0.0107				-0.0163
		(-0.43)				(-0.46)
Plus			0.0015	0.0020		
			(0.88)	(1.03)		
TotalAct x Plus				-0.0086		
				(-0.43)		
Minus			-0.0013	-0.0006		
			(-0.76)	(-0.21)		
TotalAct x Minus				-0.0116		
				(-0.34)		
TotalAct	-0.0249**	-0.0190	-0.0248**	-0.0190	-0.0480***	-0.0390**
	(-2.02)	(-1.23)	(-2.02)	(-1.24)	(-2.73)	(-1.96)
Leverage	-0.0689***	-0.0688***	-0.0691***	-0.0690***		
	(-14.05)	(-13.87)	(-14.09)	(-14.08)		
Profitability	0.1634***	0.1635***	0.1626***	0.1627***		
	(11.24)	(11.25)	(11.20)	(11.21)		
Size	0.0034***	0.0034***	0.0034***	0.0034***		
	(6.73)	(6.73)	(6.71)	(6.71)		
Adj R2	0.0931	0.0931	0.0932	0.0931	0.0103	0.0105
N	8,500	8,500	8,500	8,500	8,845	8, 845
F Value	175.42***	146.38***	146.60***	110.09***	46.94***	32.14***

Table 15
Credit Rating Impact on Capital Structure Decisions
Capital Market Activity - Debt

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. AverageDebt is the average amount of debt issued by a particular firm over the previous five years divided by total assets. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0138**	-0.0143***	-0.0136**	-0.0140**	0.0064***	0.0058***
	(-2.54)	(-2.60)	(-2.49)	(-2.55)	(4.53)	(4.07)
POM	0.0001	0.0009			-0.0031**	-0.0020
	(0.07)	(0.45)			(-2.13)	(-0.86)
AverageDebt x POM		-0.0135				-0.0200
		(-0.54)				(-0.56)
Plus			0.0015	0.0021		
			(0.87)	(1.08)		
AverageDebt x Plus				-0.0106		
				(-0.54)		
Minus			-0.0013	-0.0005		
			(-0.78)	(-0.20)		
AverageDebt x Minus				-0.0148		
				(-0.43)		
AverageDebt	-0.0238**	-0.0164	-0.0237**	-0.0164	-0.0474***	-0.0363*
	(-1.98)	(-1.11)	(-1.97)	(-1.11)	(-2.72)	(-1.89)
Leverage	-0.0690***	-0.0688***	-0.0691***	-0.0690***		
	(-14.06)	(-13.81)	(-14.10)	(-14.02)		
Profitability	0.1637***	0.1639***	0.1629***	0.1630***		
	(11.27)	(11.28)	(11.24)	(11.24)		
Size	0.0034***	0.0034***	0.0034***	0.0034***		
	(6.76)	(6.76)	(6.74)	(6.74)		
Adj R2	0.0928	0.0928	0.0929	0.0929	0.0097	0.0100
N	8,500	8,500	8,500	8,500	8,845	8,845
F Value	174.80***	145.97***	146.09***	109.79***	44.41***	30.85***

Table 16
Credit Rating Impact on Capital Structure Decisions
Capital Market Activity - Equity

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. AverageEquity is the average amount of equity issued by a particular firm over the previous five years divided by total assets. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0108**	-0.0091	-0.0106*	-0.0088	0.0057***	0.0078***
	(-1.97)	(-1.64)	(-1.93)	(-1.59)	(4.65)	(5.53)
POM	0.0003	-0.0026			-0.0030**	-0.0062***
	(0.23)	(-1.40)			(-2.03)	(-3.50)
AverageEquity x POM		0.4215**				0.4788**
		(2.06)				(2.36)
Plus			0.0017	-0.0013		
			(1.01)	(-0.59)		
AverageEquity x Plus				0.4399*		
				(1.71)		
Minus			-0.0011	-0.0040*		
			(-0.65)	(-1.87)		
AverageEquity x Minus				0.4103*		
				(1.90)		
AverageEquity	-0.2589***	-0.5423***	-0.2579***	-0.5426***	-0.2950***	-0.6164***
	(-2.65)	(-3.18)	(-2.63)	(-3.18)	(-3.05)	(-3.68)
Leverage	-0.0730***	-0.0727***	-0.0732***	-0.0728***		
	(-15.26)	(-15.21)	(-15.29)	(-15.26)		
Profitability	0.1627***	0.1629***	0.1619***	0.1620***		
	(11.00)	(10.94)	(10.97)	(10.97)		
Size	0.0034***	0.0034***	0.0033***	0.0033***		
	(6.65)	(6.63)	(6.64)	(6.60)		
Adj R2	0.0924	0.0935	0.0926	0.0935	0.0030	0.0044
N	8,500	8,500	8,500	8,500	8,845	8,845
F Value	174.09***	147.07***	145.50***	110.63***	14.11***	13.90***

Table 17
Credit Rating Impact on Capital Structure Decisions – CreditWatch Data
Capital Market Activity - Total

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular quarter minus net equity raised for the quarter, following the quarter in which a firm was placed on S&P's CreditWatch list. The credit rating is provided directly from Standard and Poor's and includes years 1990 - 2009. I examine all firms that have been placed on S&P's CreditWatch list during this time period. Positive/Negative is a dummy variable equal to 1 if the action has a positive/negative designation and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are quarterly values and are calculated in the quarter in which the credit action takes place. TotalAct is the average of the total amount of capital market activity over the previous five years divided by total assets. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss in quarter following credit action

	(1)	(2)	(3)	(4)
Intercept	0.0045***	0.0046***	0.0044***	0.0044***
	(2.87)	(2.88)	(3.92)	(3.82)
Negative	0.0139***	0.0204***	0.0136***	0.0206***
	(4.45)	(4.32)	(4.36)	(4.36)
TotalAct x Negative		-0.0709**		-0.0750**
		(-2.02)		(-2.16)
Positive	-0.0024	-0.0012	-0.0003	0.0010
	(-0.33)	(-0.14)	(-0.04)	(0.12)
TotalAct x Positive		-0.0142		-0.0148
		(-0.18)		(-0.19)
TotalAct	-0.0151	-0.0145	-0.0242	-0.0234
	(-0.91)	(-0.86)	(-1.58)	(-1.52)
Leverage	-0.0183***	-0.0182***		
	(-6.10)	(-6.10)		
Profitability	0.0892***	0.0896***		
	(4.31)	(4.33)		
Size	0.0008***	0.0008***		
	(4.43)	(4.29)		
Adj R2	0.0146	0.0149	0.0050	0.0053
N	33,680	33,680	34,069	34,069
F Value	84.40***	64.65***	58.63***	37.61***

Table 18
Credit Rating Impact on Capital Structure Decisions
By Rating

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year and run separate regressions for each broad rating category. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(AA)	(A)	(BBB)	(BB)	(B)	(CCC)	(Inv)	(Non-Inv)
Intercept	-0.0149**	0.0028	0.0188***	-0.0228**	-0.0223	-0.1129*	0.0006	-0.0389***
	(-2.05)	(0.42)	(2.83)	(-2.24)	(-1.57)	(-1.77)	(0.16)	(-4.17)
Plus	-0.0059*	0.0047*	0.0047**	0.0064*	-0.0084	0.0014	0.0023	-0.0021
	(-1.79)	(1.94)	(2.39)	(1.73)	(-1.61)	(0.06)	(1.64)	(-0.66)
Minus	-0.0017	-0.0013	-0.0037	-0.0033	-0.0272**	-0.0106	-0.0012	-0.0083**
	(-0.62)	(-0.60)	(-1.59)	(-0.84)	(-2.86)	(-0.29)	(-0.90)	(-2.24)
Leverage	-0.0251***	-0.0599***	-0.0729***	-0.0677***	-0.0673***	-0.1593***	-0.0609***	-0.0747***
	(-2.70)	(-8.53)	(-11.25)	(-7.78)	(-5.50)	(-3.98)	(-14.87)	(-10.68)
Profitability	0.1073***	0.1090***	0.1125***	0.0670***	0.1063***	0.0736	0.1272***	0.1000***
	(5.99)	(5.19)	(5.89)	(2.94)	(3.04)	(0.71)	(11.51)	(4.76)
Size	0.0032***	0.0024***	-0.0004	0.0035***	0.0033*	0.0220**	0.0019***	0.0058***
	(5.02)	(3.91)	(-0.51)	(2.98)	(1.78)	(2.17)	(4.95)	(5.21)
Adj R2	0.0452	0.0715	0.0543	0.0362	0.0262	0.0744	0.0609	0.0433
N	1760	4879	5079	2679	2055	171	12,157	4,905
F Value	17.66***	54.85***	59.34***	21.13***	12.04***	3.73***	158.66***	45.37***

Table 19
Credit Rating Impact on Capital Structure Decisions – With Macroeconomic Variables
By Rating

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year and run separate regressions for each broad rating category. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. T10y and T3mo are 10 year and 3 month annualized US Treasury rates, respectively. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(AA)	(A)	(BBB)	(BB)	(B)	(CCC)
Intercept	0.0036	0.0262***	0.0564***	-0.0051	-0.0000	-0.1051
	(0.34)	(2.88)	(6.54)	(-0.31)	(-0.00)	(-1.16)
Plus	-0.0065**	0.0049**	0.0046**	0.0058	-0.0078	0.0009
	(-1.99)	(2.04)	(2.39)	(1.57)	(-1.50)	(0.04)
Minus	-0.0023	-0.0017	-0.0035	-0.0039	-0.0269***	-0.0083
	(-0.84)	(-0.75)	(-1.50)	(-0.99)	(-2.82)	(-0.25)
Leverage	-0.0270***	-0.0588***	-0.0667***	-0.0664***	-0.0671***	-0.1568***
	(-2.92)	(-8.44)	(-10.62)	(-7.78)	(-5.51)	(-4.07)
Profitability	0.1009***	0.1026***	0.1056***	0.0602***	0.1036***	0.0721
	(5.69)	(4.90)	(5.63)	(2.65)	(2.99)	(0.69)
Size	0.0029***	0.0021***	-0.0013*	0.0031**	0.0028	0.0224**
	(4.43)	(3.01)	(-1.76)	(2.33)	(1.43)	(2.17)
T10y	-0.0065***	-0.0096***	-0.0132***	-0.0067***	-0.0086***	-0.0051
	(-4.53)	(-8.59)	(-11.92)	(-3.14)	(-2.77)	(-0.35)
T3mo	0.0057***	0.0085***	0.0106***	0.0058***	0.0074***	0.0047
	(5.06)	(10.78)	(13.78)	(4.09)	(3.36)	(0.42)
Adj R2	0.0567	0.0715	0.0880	0.0412	0.0307	0.0643
N	1760	4879	5079	2679	2055	171
F Value	16.12***	54.66***	70.98***	19.45***	10.93***	3.12***

Table 20
Credit Rating Impact on Capital Structure Decisions – CreditWatch Data
By Rating

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular quarter minus net equity raised for the quarter, following the quarter in which a firm was placed on S&P's CreditWatch list. The credit rating is provided directly from Standard and Poor's and includes years 1990 - 2009. I examine all firms that have been placed on S&P's CreditWatch list during this time period. Positive/Negative is a dummy variable equal to 1 if the action has a positive/negative designation and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are quarterly values and are calculated in the quarter in which the credit action takes place. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss in quarter following credit action by rating

	(AA+)	(AA)	(AA-)	(A+)	(A)	(A-)	(BBB+)	(BBB)
Intercept	NFR	-0.0005	-0.0041	0.0010	0.0001	0.0122***	0.0164***	0.0132***
	NFR	(-0.20)	(-1.63)	(0.23)	(0.05)	(3.79)	(4.25)	(4.49)
Negative	NFR	-0.0081**	0.0061	-0.0024	-0.0111	-0.0113	0.0155**	0.0078
	NFR	(-2.15)	(0.85)	(-0.24)	(-1.40)	(-0.76)	(2.41)	(1.27)
Positive	NFR	0.0536*	-0.0064	0.0003	0.0076	-0.0022	-0.0058	0.0015
	NFR	(1.71)	(-1.39)	(0.03)	(0.31)	(-0.13)	(-0.67)	(0.16)
Leverage	NFR	-0.0088***	-0.0007	-0.0043	-0.0090***	-0.0185***	-0.0309***	-0.0287***
	NFR	(-2.77)	(-0.24)	(-1.03)	(-3.39)	(-5.81)	(-8.65)	(-8.34)
Profitability	NFR	0.0839***	0.0684***	0.0746	0.1220***	0.0938***	-0.0522	0.0795**
	NFR	(3.28)	(3.22)	(1.31)	(4.74)	(3.34)	(-1.03)	(2.32)
Size	NFR	0.0008***	0.0009**	0.0006*	0.0009***	-0.0003	0.0004	0.0001
	NFR	(3.11)	(2.32)	(1.68)	(2.90)	(-0.86)	(0.66)	(0.19)
Adj R2	NFR	0.0157	0.0061	0.0033	0.0142	0.0122	0.0137	0.0130
N	NFR	2,265	2,791	5,058	8,402	7,344	8,470	10,368
F Value	NFR	8.21***	4.41***	4.35***	25.22***	19.19***	24.52***	28.37***

	(BBB-)	(BB+)	(BB)	(BB-)	(B+)	(B)	(B-)	(CCC+)
Intercept	0.0193***	0.0198***	0.0144*	0.0239***	0.0269***	0.0151**	-0.0029	-0.0022
	(5.19)	(3.49)	(1.85)	(4.32)	(4.97)	(2.07)	(-0.36)	(-0.19)
Negative	-0.0016	-0.0001	0.0059	0.0044	0.0106	0.0092	0.0089	0.0078
	(-0.36)	(-0.01)	(1.07)	(0.72)	(1.22)	(1.33)	(1.59)	(0.86)
Positive	-0.0010	-0.0010	-0.0071	-0.0009	-0.0300	0.0101	-0.0199	0.0050
	(-0.21)	(-0.21)	(-0.59)	(-0.06)	(-1.55)	(0.89)	(-0.89)	(0.36)
Leverage	-0.0218***	-0.0261***	-0.0320***	-0.0390***	-0.0363***	-0.1954**	-0.0187**	-0.0322*
	(-6.73)	(-4.84)	(-4.94)	(-7.29)	(-6.72)	(-2.12)	(-2.23)	(-1.94)
Profitability	0.1355***	0.0712	0.0685	0.0910**	0.0462	0.0178	-0.0175	0.1595
	(3.91)	(1.44)	(1.52)	(2.43)	(1.06)	(0.41)	(-0.21)	(1.53)
Size	-0.0017***	-0.0011	0.0000	-0.0010	-0.0014*	-0.0017*	0.0020	0.0017
	(-3.55)	(-1.51)	(0.01)	(-1.22)	(-1.72)	(-1.18)	(1.36)	(0.60)
Adj R2	0.0122	0.0067	0.0068	0.0058	0.0093	0.0017	0.0017	0.0101
N	7,603	4,630	5,582	7,247	7,269	3,764	1,902	612
F Value	19.81	7.26***	8.60***	17.23***	14.62***	2.31**	1.64	2.25***

	(CCC)	(CCC-)	(AA)	(A)	(BBB)	(BB)	(B)	(CCC)
Intercept	-0.0239	NFR	-0.0023	0.0034***	0.0158***	0.0195***	0.0171***	-0.0067
	(-1.04)	NFR	(-1.32)	(7.82)	(6.85)	(5.22)	(7.44)	(-0.66)
Negative	-0.0277	NFR	0.0086	0.0003***	0.0099**	0.0017	0.0098**	0.0050
	(-0.80)	NFR	(1.44)	(4.53)	(4.76)	(0.47)	(4.56)	(0.46)
Positive	-0.0600***	NFR	0.0178	-0.0063**	-0.0108***	-0.0073	-0.0222	0.0138
	(-2.67)	NFR	(0.96)	(-2.77)	(-3.11)	(-0.94)	(-1.62)	(1.39)
Leverage	-0.0079	NFR	-0.0048**	-0.0103***	-0.0264***	-0.0336***	-0.0286***	-0.0405***
	(-0.26)	NFR	(-2.37)	(-5.71)	(-19.86)	(-10.15)	(-6.86)	(-3.84)
Profitability	-0.3432**	NFR	0.0693***	0.1009***	0.0546**	0.0774***	0.0418	0.0306
	(-2.31)	NFR	(4.42)	(5.28)	(5.45)	(3.11)	(1.44)	(0.42)
Size	0.0035	NFR	0.0009***	0.0005**	0.0004	-0.0006	-0.0006	0.0035*
	(0.93)	NFR	(4.49)	(2.56)	(3.55)	(-1.21)	(-1.00)	(1.70)
Adj R2	0.0007	NFR	0.0101	0.0096	0.0112	0.0091	0.0057	0.0084
N	284	NFR	5,675	20,806	26,443	17,461	12,937	1,382
F Value	1.04	NFR	13.30***	41.29***	63.64***	33.16***	15.76***	3.34***

Table 21
Credit Rating Impact on Capital Structure Decisions
Commercial Paper Issuers

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a long-term credit rating at the beginning of a particular year that also have a short-term credit rating at the beginning of a particular year. The short-term rating from Compustat is Standard & Poor's Short-Term Domestic Issuer Credit Rating and serves as a proxy for commercial paper issuing firms. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are lagged one year. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)
Intercept	-0.0009	-0.0007	0.0101***
	(-0.13)	(-0.10)	(8.19)
POM	0.0008		-0.0023
	(0.48)		(-1.44)
Plus		0.0028	
		(1.49)	
Minus		-0.0017	
		(-0.86)	
Leverage	-0.0707***	-0.0708***	
	(-11.50)	(-11.52)	
Profitability	0.1625***	0.1615***	
	(9.62)	(9.57)	
Size	0.0021***	0.0021***	
	(3.20)	(3.20)	
Adj R2	0.0790	0.0795	0.0001
N	7,083	7,083	7,545
F Value	152.84***	123.27***	2.13

Table 22
Credit Rating Impact on Capital Structure Decisions
Excluding Commercial Paper Issuers

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a long-term credit rating at the beginning of a particular year that also do not have a short-term credit rating at the beginning of a particular year. The short-term rating from Compustat is Standard & Poor's Short-Term Domestic Issuer Credit Rating and serves as a proxy for commercial paper issuing firms. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are lagged one year. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)
Intercept	-0.0205***	-0.0203***	-0.0100***
	(-3.60)	(-3.58)	(-7.97)
POM	-0.0031*		-0.0056***
	(-1.88)		(-3.37)
Plus		-0.0039**	
		(-1.99)	
Minus		-0.0023	
		(-1.15)	
Leverage	-0.0784***	-0.0783***	
	(-16.48)	(-16.43)	
Profitability	0.1066***	0.1070***	
	(7.63)	(7.64)	
Size	0.0048***	0.0048***	
	(7.69)	(7.62)	
Adj R2	0.0673	0.0673	0.0009
N	9,445	9,445	9,943
F Value	171.35***	137.20***	10.43***

Table 23
Credit Rating Impact on Capital Structure Decisions
Amount of Commercial Paper Issued

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. CMP is the natural log of the amount of outstanding commercial paper at the end of a particular year. I remove all firm-year observations that do not have a commercial paper value greater than zero, that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.0502***	0.0509***	0.0505***	0.0511***	0.0003	0.0012
	(4.21)	(4.23)	(4.24)	(4.25)	(0.21)	(0.76)
POM	-0.0016	-0.0028			-0.0014	-0.0029
	(-0.88)	(-1.33)			(-0.82)	(-1.38)
cmp x POM		0.0807				0.0953
		(0.98)				(1.14)
Plus			-0.0004	-0.0009		
			(-0.17)	(-0.37)		
cmp x Plus				0.0348		
				(0.25)		
Minus			-0.0029	-0.0048**		
			(-1.35)	(-1.96)		
cmp x Minus				0.1175		
				(1.38)		
CommPaper	0.2757***	0.2263***	0.2783***	0.2262***	0.2664***	0.2082***
	(6.02)	(4.61)	(6.04)	(4.61)	(5.92)	(4.03)
Leverage	-0.0830***	-0.0829***	-0.0833***	-0.0836***		
	(-5.59)	(-5.58)	(-5.62)	(-5.66)		
Profitability	-0.0208	-0.0204	-0.0220	-0.0214		
	(-0.53)	(-0.52)	(-0.56)	(-0.55)		
Size	-0.0007	-0.0007	-0.0007	-0.0007		
	(-0.85)	(-0.86)	(-0.87)	(-0.80)		
Adj R2	0.0524	0.0527	0.0526	0.0529	0.0265	0.0270
N	2,478	2,478	2,478	2,478	2,589	2,589
F Value	28.42***	23.95***	23.92***	18.29***	36.25***	24.90***

Table 24
Credit Rating Impact on Capital Structure Decisions – CreditWatch Data
Commercial Paper Issuers

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular quarter minus net equity raised for the quarter, following the quarter in which a firm was placed on S&P's CreditWatch list. S&P data is provided directly from Standard and Poor's and includes years 1990 - 2009. I examine all firms with a short-term credit rating (the short-term rating from Compustat is Standard & Poor's Short-Term Domestic Issuer Credit Rating and serves as a proxy for commercial paper issuing firms) that have been placed on S&P's CreditWatch list during this time period. Positive/Negative is a dummy variable equal to 1 if the action has a positive/negative designation and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are quarterly values and are calculated in the quarter in which the credit action takes place. I remove all firm-year observations that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss in quarter following credit action

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.0061***	0.0037***	0.0061***	0.0062***	0.0037***	0.0039***
	(3.49)	(15.51)	(3.48)	(3.52)	(15.58)	(16.10)
Negative	0.0140***	0.0154***	0.0140***		0.0154***	
	(3.51)	(3.62)	(3.51)		(3.61)	
Positive	0.0084	0.0108		0.0083		0.0106
	(0.94)	(1.18)		(0.91)		(1.16)
Leverage	-0.0147***		-0.0147***	-0.0148***		
	(-9.21)		(-9.21)	(-9.28)		
Profitability	0.1011***		0.1015***	0.0996***		
	(4.55)		(4.56)	(4.49)		
Size	0.0002		0.0002	0.0003		
	(1.17)		(1.19)	(1.33)		
Adj R2	0.0129	0.0017	0.0128	0.0115	0.0016	0.0001
N	29,761	30,239	29,761	29,761	30,239	30,239
F Value	78.64***	27.06***	97.63***	87.69***	49.87***	4.08**

Table 25
Credit Rating Impact on Capital Structure Decisions
Investment Opportunities

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. Tobin's Q is based on the stock price at the beginning of a particular year and is approximated as (MVE + PS + DEBT)/TA. I remove all firm-year observations that have a Tobin's Q value below zero, that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0319***	-0.0309***	-0.0318***	-0.0302***	-0.0144***	-0.0133***
	(-5.68)	(-5.49)	(-5.67)	(-5.36)	(-8.25)	(-6.09)
POM	-0.0023	-0.0046*			-0.0065***	-0.0085***
	(-1.55)	(-1.86)			(-4.16)	(-2.89)
q x POM		0.0026				0.0023
		(1.00)				(0.70)
Plus			-0.0015	-0.0069**		
			(-0.80)	(-2.26)		
q x Plus				0.0064**		
				(1.97)		
Minus			-0.0032*	-0.0030		
			(-1.82)	(-1.03)		
q x Minus				-0.0004		
				(-0.13)		
Tobin's q	0.0092***	0.0079***	0.0092***	0.0080***	0.0189***	0.0178***
	(5.99)	(4.10)	(6.00)	(4.14)	(11.56)	(7.62)
Leverage	-0.0840***	-0.0839***	-0.0841***	-0.0840***		
	(-17.40)	(-17.38)	(-17.41)	(-17.41)		
Profitability	0.1410***	0.1408***	0.1405***	0.1388***		
	(7.63)	(7.62)	(7.61)	(7.57)		
Size	0.0053***	0.0053***	0.0053***	0.0052***		
	(10.11)	(10.14)	(10.12)	(9.99)		
Adj R2	0.1241	0.1242	0.1241	0.1247	0.0384	0.0384
N	9,733	9,733	9,733	9,733	9,807	9,807
F Value	276.79***	231.01***	230.80***	174.27***	196.79***	131.64***

Table 26
Credit Rating Impact on Capital Structure Decisions
Investment Opportunities - Quartiles

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular year minus net equity raised for the year. The credit rating used from Compustat is Standard & Poor's Long-Term Domestic Issuer Credit Rating and includes years 1986 - 2009. I examine all firms with a credit rating at the beginning of a particular year. Plus/Minus is a dummy variable equal to 1 if the credit rating has a plus/minus rating and 0 otherwise. POM is a dummy variable equal to 1 if the credit rating is either a plus or minus and 0 otherwise. Leverage is a lagged control variable defined as Debt/(Debt + Equity). Profitability is a lagged control variable defined as EBITDA/total assets. Sales is a lagged control variable defined as log of sales. Tobin's Q is based on the stock price at the beginning of a particular year and is approximated as (MVE + PS + DEBT)/TA. Break points for the quartiles are 1.04, 0.71, and 0.43. I remove all firm-year observations that have a Tobin's Q value below zero, that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss

	(Quartile 1)	(Quartile 2)	(Quartile 3)	(Quartile 4)	(Above)	(Below)
Intercept	-0.0804***	0.0058	-0.0012	-0.0098	-0.0420***	-0.0059
	(-5.56)	(0.54)	(-0.13)	(-2.24)	(-4.69)	(-0.84)
Plus	0.0030	-0.0078*	0.0030	-0.0040	-0.0029	-0.0009
	(0.70)	(-2.34)	(1.02)	(1.73)	(-1.06)	(-0.38)
Minus	-0.0007	-0.0035	-0.0038	-0.0017	-0.00271	-0.0031
	(-0.15)	(-1.09)	(-1.25)	(-0.84)	(-1.00)	(-1.33)
Leverage	-0.0806***	-0.0897***	-0.0937***	-0.0913***	-0.0815***	-0.0912***
	(-8.77)	(-8.89)	(-10.22)	(-7.78)	(-11.75)	(-13.86)
Profitability	0.2264***	0.0870***	0.0383	0.0870**	0.1933***	0.0701***
	(6.60)	(2.82)	(1.39)	(2.94)	(8.17)	(2.71)
Size	0.0109***	0.0037***	0.0041***	0.0032***	0.0073***	0.0035***
	(8.02)	(4.17)	(4.42)	(2.98)	(9.34)	(4.98)
Adj R2	0.1613	0.0793	0.0835	0.0646	0.1330	0.0714
N	2369	2418	2502	2447	4785	4948
F Value	92.08***	42.62***	46.60***	34.79***	147.80***	77.07***

Table 27
Credit Rating Impact on Capital Structure Decisions – CreditWatch Data
Investment Opportunities

Coefficients and t-statistics for pooled time series regressions of net debt raised for a particular quarter minus net equity raised for the quarter, following the quarter in which a firm was placed on S&P's CreditWatch list. The credit rating is provided directly from Standard and Poor's and includes years 1990 - 2009. I examine all firms that have been placed on S&P's CreditWatch list during this time period. Positive/Negative is a dummy variable equal to 1 if the action has a positive/negative designation and 0 otherwise. Leverage is a control variable defined as Debt/(Debt + Equity). Profitability is a control variable defined as EBITDA/total assets. Sales is a control variable defined as log of sales. All control variables are quarterly values and are calculated in the quarter in which the credit action takes place. Tobin's Q is based on the stock price at the beginning of a particular year and is approximated as (MVE + PS + DEBT)/TA. I remove all firm-year observations that have a Tobin's Q value below zero, that have missing variables and all observations that do not have a debt ratio between 0 and 1. I also exclude all debt issues greater than 10% of assets. Errors are White's consistent standard errors. ***,** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable: Netdiss in quarter following credit action

	(1)	(2)	(3)	(4)
Intercept	0.0111***	0.0113***	-0.0015***	-0.0014**
	(5.93)	(6.03)	(6.85)	(-2.57)
Negative	0.0144***	0.0075*	0.0136***	0.0051
	(5.23)	(1.71)	(4.76)	(1.10)
q x Negative		0.0089*		0.0109***
		(1.71)		(1.86)
Positive	-0.0111	-0.0174	-0.0106	-0.0142
	(-1.52)	(-1.32)	(-1.52)	(-1.26)
q x Positive		0.0067		0.0037
		(0.60)		(0.43)
Tobin's q	0.0031***	0.0029***	0.0049***	0.0047***
	(5.01)	(4.74)	(8.90)	(8.58)
Leverage	-0.0322***	-0.0323***		
	(-15.80)	(-15.82)		
Profitability	0.0753***	0.0744***		
	(3.72)	(3.68)		
Size	0.0003	0.0003		
	(1.15)	(1.18)		
Adj R2	0.0182	0.0184	0.0057	0.0060
N	38,301	38,301	40,551	40,551
F Value	119.35***	90.73***	79.01***	50.00***

Figure 1:
The percentage of net debt issued scaled by assets and separated by credit rating. The credit rating is the rating at the beginning of a particular year (sample includes years 1986 – 2001). I also remove all debt issues greater than 10% of assets.

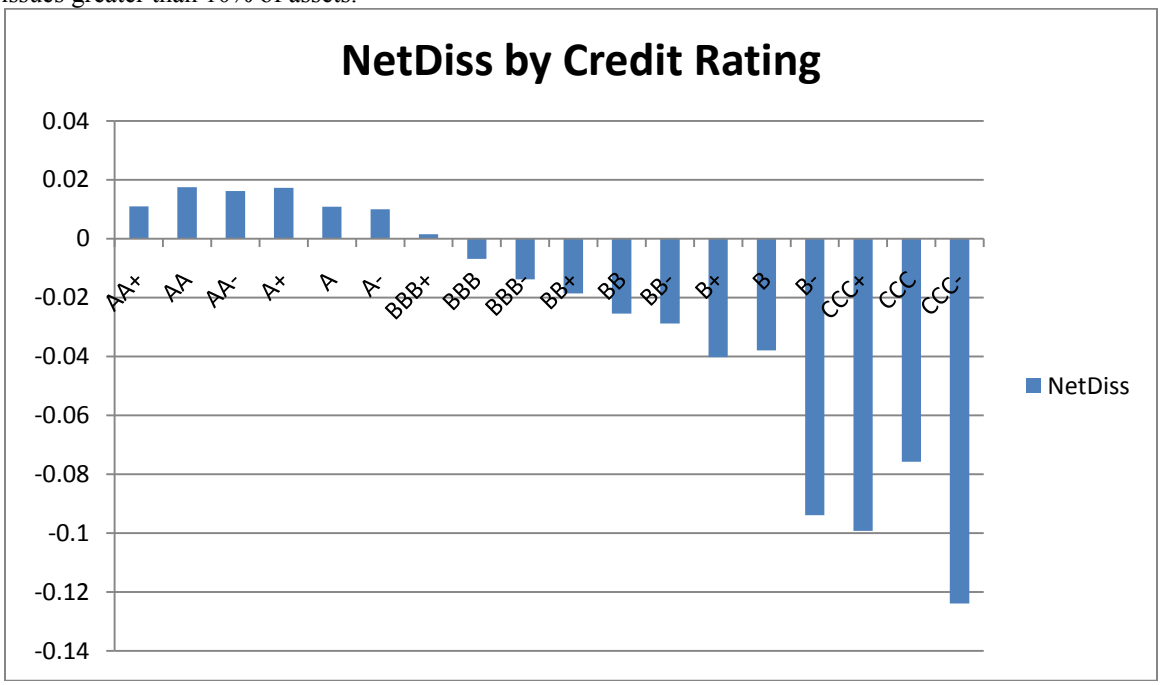
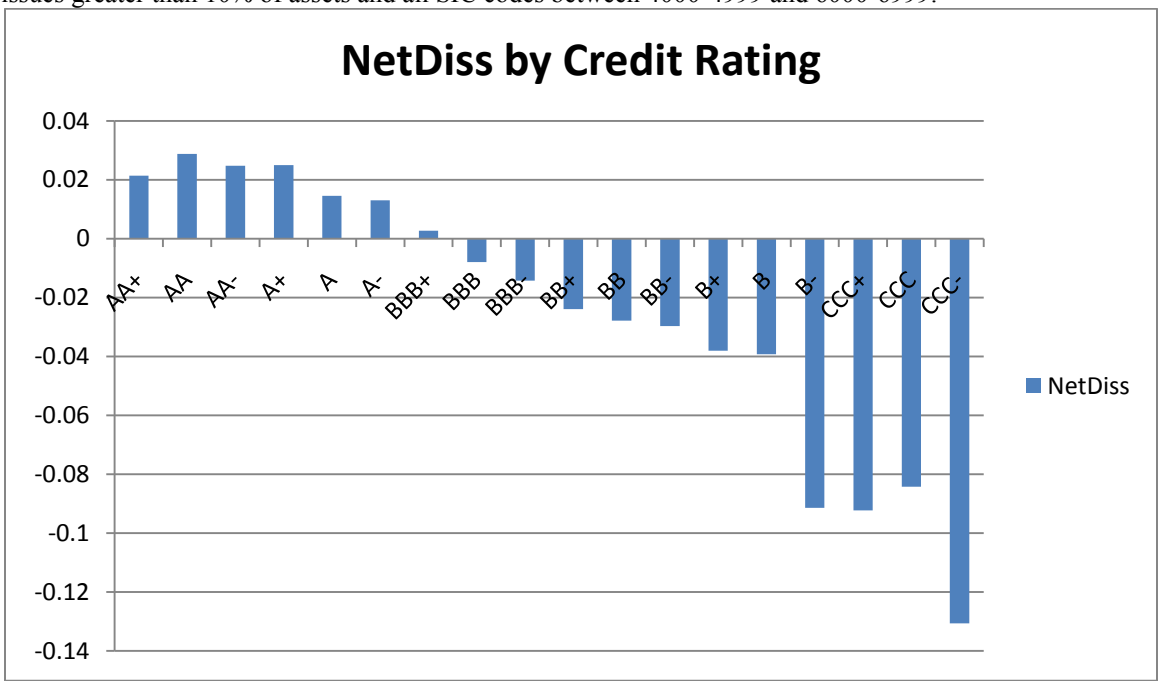


Figure 2:
The percentage of net debt issued scaled by assets and separated by credit rating. The credit rating is the rating at the beginning of a particular year (sample includes years 1986 – 2001). I also remove all debt issues greater than 10% of assets and all SIC codes between 4000-4999 and 6000-6999.



VITA

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Title of Study: DO CREDIT RATINGS REALLY AFFECT CAPITAL STRUCTURE?

Pages in Study: 115 Candidate for the Degree of Doctor of Philosophy

Major Field: Finance

Scope and Method of Study: This paper revisits the recently tested theory of credit ratings affecting capital structure. While this has been a phenomenon observed by practitioners for year, it only recently has been studied empirically by academics. To add to the brief existing literature, I introduce subsamples of firms with the belief that not all firms are interested in following a capital structure policy that considers credit ratings. Instead, certain firms should be more likely to follow such a road map as particular segments might be more concerned with maintaining a credit rating. In addition, I also introduce a new catalyst to proxy for a threat to a credit rating, namely the CreditWatch list of Standard & Poor's.

Findings and Conclusions: The findings suggest that credit ratings are not a first order concern in capital structure decisions. Rather, firms use credit ratings to reduce asymmetric information when other tools are absent.

ADVISER'S APPROVAL: Ramesh Rao