Corporate Financial Policies in Overvalued Credit Markets

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We investigate the repercussions of credit market mistakes for a firm's borrowing and investment decisions. When credit ratings are relatively optimistic, we find evidence that firms take advantage of inaccuracies by issuing more debt, increasing leverage, rolling over more debt and lengthening maturities. The result goes beyond a wealth transfer and has real investment implications: approximately 75% of the funds raised from debt issuance related to credit rating mistakes was used for capital expenditures and cash acquisitions. In the cross section, credit rating mistakes affect financially constrained firms the most, suggesting that debt overvaluation loosens financial constraints.

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The irrepressible idea that markets may overvalue assets can be found in much writing on economics from foundational works such as Smith (1776) and Keynes (1936) to modern day texts such as Shleifer (2000) or Barberis and Thaler (2003). Many authors have looked for the effects of overpriced stock on firm behavior. Starting with Morck, Shleifer, and Vishny (1990), several papers have explored managerial investment decisions in the presence of irrational stock prices.[1] The literature on mergers and acquisitions has also considered the effect of overvalued stock on merger activity.[2] While Baker and Wurgler (2002), Welch (2004), Dong, Hirshleifer, and Teoh (2012) and Khan, Kogan, and Serafeim (2012), among others, examine the effect of stock valuation on capital structure. However, the impact of bond market overvaluation on firm policies has received little attention.

The limited focus on potential debt market overvaluation is surprising given its size and importance to the economy– the U.S. corporate bond market comprised $9.6 trillion in assets in 2013.[3] Possibly more attention has focused on equities than debt because bonds are considered easier to correctly price and thus less likely to become overvalued. Recent work by Greenwood and Hanson (2013), however, investigates the forces driving the credit market to overheat, and shows that when aggregate credit increases, the average quality of issuers deteriorates, and that following periods when issuer quality is poor, corporate bonds significantly underperform Treasury bonds. Furthermore, Baker, Greenwood, and Wurgler (2003a) find that when firms issue more long-term debt, future excess bond returns are low. Most likely, the limited attention that the investigation of debt overvaluation has received is due to the lack of an empirical measure of bond market overvaluation.

In this paper we use an assessment of the quality of bond market ratings and examine how it relates to bond prices as well as firm capital structure, investment and M&A decisions. Thus, we

[1] See also Stein (1996), Baker, Stein, and Wurgler (2003b), Gilchrist, Himmelberg, and Huberman (2005), Panageas (2005), Polk and Sapienza (2009), and Bakke and Whited (2010).

[2] For instance, in Shleifer and Vishny (2003), Rhodes-Kropf and Viswanathan (2004), Rhodes-Kropf, Robinson, and Viswanathan (2005) and Dong, Hirshleifer, Richardson, and Teoh (2006).

[3] According to the Securities Industry and Financial Markets Association (SIFMA).

provide some of the first evidence linking bond market mistakes to corporate decision making.

The determinants of a firm's capital structure choice is one of the most fundamental, and still not fully answered, questions in financial economics. The seminal capital structure work, such as Myers (1977), Myers and Majluf (1984) and Fischer, Heinkel, and Zechner (1989), laid out the central issues many decades ago. And although much work since has made progress on capital structure choice, Welch (2004) notes that "corporate issuing motives remain largely a mystery."[4] In particular, Korajczyk and Levy (2003), Faulkender and Petersen (2006) and Erel, Julio, Kim, and Weisbach (2012) argue and find evidence that it is not just firm characteristics but also supply-side factors that impact a company's capital structure. We build on this work by introducing the presence of overvaluation in debt markets and explore its consequences for corporate financial policy. We find that debt issuances and leverage, as well as rollover decisions and maturity lengthening, are strongly correlated with ratings mistakes while controlling for all of the standard firm and market characteristics. This evidence is consistent with the idea that managers are aware of the mistakes in real time and actively exploit them.

We then take this analysis one step further and examine the use of funds: if firm's debt issuance is affected by debt market mistakes, what do they do with the new capital? From a financial economist's point of view, firms' investment decisions are as, if not more, important than their capital structure choices. The investment literature has long hypothesized and examined the determinants of corporate investment and the effect of credit frictions on corporate spending (for example, Fazzari, Hubbard, and Petersen., 1988; Whited, 1992; Kashyap, Lamont, and Stein, 1994; Kaplan and Zingales, 1997; Kiyotaki and Moore, 1997; Hubbard, 1998; Gomes, 2001), and much work mentioned above has considered the effects of overvalued equity on investment. We extend this work by examining how overvalued debt contributes to investment, acquisitions and cash holding decisions.

[4] An incomplete list includes Titman and Wessels (1988), Baker and Wurgler (2002), Fama and French (2002), Korajczyk and Levy (2003), Faulkender and Petersen (2006) and Leary and Roberts (2010).

In order to examine questions on debt issuance and the use of proceeds in the data, we need a measure of credit market mistakes. Moody's analysis of its ratings results in the so called accuracy profile or average default position (henceforth AP), a measure of the rating's accuracy. AP varies from zero to one where a higher AP reflects more accurate ratings. Essentially, if more defaulters are given higher ratings, then AP will fall. A measure of rating accuracy necessarily uses the entire cross-section of debt issuances in any given year and/or industry. Thus, inaccuracies occur in waves that should have implications for how firms behave across time and should differentially affect different types of firms at a point in time. We also use bond market prices to predict Moody's mistakes and find the same results with predicted mistakes. This provides support for the link between Moody's mistakes and overvaluation.

We examine the correlation of Moody's AP with firm policies. That is, we look at firm actions in the year that Moody's issued ratings that ultimately turned out to be too high. We find that in a year in which Moody's gave more optimistic ratings, firms issued more debt. Furthermore, this increase in debt issuance is not offset by equity issuance and thus the capital structure shifts. This finding continues to hold even when we control for a host of firm, industry and macroeconomic variables used in the capital structure literature (see, for instance, Leary and Roberts, 2010; Korajczyk and Levy, 2003). Furthermore, the effect is larger for firms that are more financially constrained – these constrained firms should be more impacted by overvaluation. Moreover, equity issuance is negatively correlated with optimistic debt ratings once we control for equity valuation levels. This suggests our results relate to that portion of overvaluation specific to debt markets.

Two more cross-sectional tests reinforce our interpretation of this evidence. First, during times with optimistic ratings, firms rollover more of their debt. They also tend to issue longer maturity debt. These results are not easy to reconcile with alternative explanations, for instance, that overvalued times coincide with years with more aggregate investment opportunities via growth options. Rollovers cannot increase investment and Myers (1977) argues that firms with growth

options should instead issue short-term debt because growth options worsen the debt overhang problem. Finally, we find evidence that the effect of AP is larger for rated firms and non-investment grade firms, which would be expected to react more to Moody's mistakes.

Potentially, mistakes by Moody's may be perfectly understood and accurately priced by bond market participants. Thus, we cannot be certain that AP captures any bond market overvaluation. However, Campbell and Taksler (2003) has documented that ratings do affect bond prices and moreover, we show that AP is related to corporate bond credit spread deviations from compensation for expected default risk, as modeled by Gilchrist and Zakrajek (2012). When such deviations are negative, AP tends to be low. We also use this excess bond premium to contemporaneously predict AP and show that the predicted part of AP also explains our results. Furthermore, it is worth noting that if the accuracy score were low or high due to unexpected future events, then decisions made at the time the ratings were given should be uncorrelated with the ultimate accuracy score. In summary, we show that AP is strongly correlated with firm behavior in a way not captured by any other variable proposed in the literature, and in a way that is consistent with logical corporate financial decisions in the presence of overvaluation.

If firms are taking advantage of an overvalued debt market by issuing more debt, what do they do with the money? It is possible that even if overvaluation affects the capital structure of the firm it does not alter any real investment decisions and firms just hold the cash on the balance sheet or repurchase equity. We find that Moody's AP is significantly negatively correlated with firm cash balances. That is, in times when Moody's gives more optimistic ratings, firm's build up their cash balances.

If this accumulation of cash was the only effect then overvaluation would only have limited impact, as overvaluation would just result in a transfer, at least initially. However, we find a significantly negative correlation between Moody's AP and firm investment. Thus, while our findings are consistent with the idea that firms take advantage of overvalued debt markets to increase their internal slack, they also increase investment through capital expenditures. An

alternative form of investment is to acquire another firm. When we replace investment with cash acquisitions we find a similarly strong correlation between Moody's AP and cash acquisition activity. This is particularly interesting in light of all the work that has shown the connection between equity overvaluation and stock acquisitions. This finding is the first evidence that debt overvaluation contributes to increased M&A.

One may be concerned that AP is a proxy for the state of the economy. We show, however, that the effects we find operate through the channel we propose, i.e. through the firms' debt issuances. If we include both Moody's AP and the firm's change in debt in our investment specification, then Moody's AP is no longer significantly correlated with investment and acquisitions. If AP were picking up some uncontrolled for macro phenomenon then AP should correlate with investment even in firms that did not issue debt. Whereas a pure debt market mistake should only affect a firm via debt issuance. Even though Moody's AP remains significant with all other firm-level and macroeconomic control variables, when we include the firm's change in debt, Moody's AP is no longer significant. This provides supportive evidence that Moody's AP is related to the bond market and only affects firms through the issuance channel.

Some may also wonder if firms might issue too much debt, overinvest, and cause poor ratings. This suggests that firm actions cause ratings mistakes rather than vice versa. We run alternative specifications that include Moody's AP lagged and leading values and find no evidence of reverse causality. Thus, either overvaluation is operating as we suggest or, alternatively, something else is driving both bond rating mistakes and affecting only those firms that issue debt. Moody's mistakes do seem to occur during boom times. However, in all regressions we control for many macro variables including the market-to-book ratio. Furthermore, the simultaneous cash build up by firms together with the rollover and maturity evidence, suggests limited current growth opportunities and instead that when some issuances are mispriced firms are able to take advantage of the overheated debt market. Overall, it is not easy to articulate another theory that would be related to Moody's mistakes and affect the firm's choices on debt, cash balances,

and investment in the patterns we uncover. Thus, we see this paper as providing some of the first evidence on how bond market mistakes effect corporate decision making. That said, where overvaluation is concerned it is difficult to reach strong conclusions and we see this work as only a first step down this path.

The remainder of the paper is organized as follows. Our data is explained in Section I. Section II presents the evidence on the issuance decision, cash holdings, investmentand acquisitions. Section III addresses potential econometric concerns and the robustness of our results. Finally, Section IV concludes.

I. Data

A. Measuring Overvaluation in Credit Markets

When corporations issue debt, credit rating agencies assign a rating that grades the debtor's ability to make timely payments, the likelihood of default and the loss given default. The majority of debt ratings are done by the "big three" rating agencies (Moody's, S&P, and Fitch) who together account for 95% of the market. The price of a bond or its credit spread over an equivalent maturity government bond reflects in part the return required for the added risk of default. Thus, an accurate assessment of the risk of default is important to accurately price a bond. Campbell and Taksler (2003) has shown that ratings help determine bond prices. However, in the aftermath of the financial crisis the popular press as well as academic work has called into question the accuracy of these ratings (Becker and Milbourn, 2011; He, Qian, and Strahan, 2012; Chen, Lookman, Schrhoff, and Seppi, 2012; Jiang, Stanford, and Xie, 2012; Bolton, Freixas, and Shapiro, 2012; Bar-Isaac and Shapiro, 2013). Thus, inaccurate credit rating should lead to mispriced bond issuances (we show supportive evidence below).

Moody's tracks the ex-post accuracy of its rating measures by examining the initial rating of firms that default in the subsequent 5 years. According to Moody's, the position of any debt

issuance (also called a credit) is defined as the share of credits in a cohort rated better than it in the year the debt was issued. It assumes each debt issuance occupies the midpoint of its rating category. For example, the position of every Aa2 credit is the share of the cohort rated Aaa or Aa1 plus half the share rated Aa2. The 5-year Average Position (henceforth, AP) is calculated as simply the average of the positions of the debt issuances that defaulted within 5 years. Intuitively, a more powerful rating system should have low rated defaults and high rated non-defaulters, meaning the AP should be high.

Debt issuances in each rating category have an expected probability of default. This leads to an expected or average AP. However, if, in a particular cohort, some credits were given too high ratings, then a higher percentage of credits than expected would default in the higher rating categories. In which case the AP would fall. An alternative intuition comes from noting that if all defaulters were initially given the lowest rating, then the AP would approach one. While if all defaulters were initially given a random rating then the AP would be about 1/2. And if all defaulters were initially given the best rating then the AP would approach zero. Importantly, if the world turns out to be worse or better than expected then the AP would have the *same* expected value because each rating category would have the same expected percentage of defaults. Only when more defaulters are given higher ratings is the *AP* expected to fall, i.e. a larger proportion of higher rated companies default. Table A in the appendix provides numerical examples that demonstrate how AP changes with different ratings changes.

In theory a rating mistake could occur because a non-defaulting firm was giving too low a rating or because a defaulting firm was given to high a rating. However, in practice the rating bias tends to be high. Moody's ratings are paid for by the firms issuing the credits. Much work has suggested that this conflict leads to over optimistic ratings. He et al. (2012), for example, shows that important issuers get better ratings, while Jiang et al. (2012) shows that the rating agency S&P assigned higher ratings after it switched from investor-pay to issuer-pay in 1974. Issuers also engage in ratings "shopping" (see Becker and Milbourn, 2011; Bolton et al., 2012;

Chen et al., 2012) in which they pay to be rated by the rating agency that will give them the highest rating. Rating agency's may trade-off reputation for short-run profits. The president and chief operating officer of Moody's Investor's Service acknowledged that, "There is a lot of rating shopping that goes on...What the market doesn't know is who's seen certain transactions but wasn't hired to rate those deals."[5] Furthermore, a firm whose issuance is given what they perceive as too low a rating spends effort to convince rating agencies that they are more sound, while firms stay quiet if given too high a rating. Theoretically, recent work by Bar-Isaac and Shapiro (2013) and Bolton et al. (2012) provides models that demonstrate why ratings agencies should be more prone to inflate ratings in booms.[6]

As an alternative measure to capture the notion of overvaluation still based on credit ratings, we construct the 5-year ratio of downgrades over upgrades. More precisely, for each cohort of credits, we compute the number of downgrades and upgrades during the five years after the cohort year. We compute this measure both at an aggregate level and at the Fama-French twelve-industry level as well. We use this alternative measure to yield support on the interpretation of AP as a measure of overvaluation but also to exploit cross-sectional variation at the industry level. The argument is as follows. Moody's AP uses actual defaults in order to identify the accuracy of ratings. While we believe this is precisely the way of showing why some ratings were too optimistic, it asks a lot from the data when one tries to create an equivalent measure at the industry level. Defaults are relatively rare events. Instead, downgrades-to-upgrades ratios do not rely on actual defaults and yet still capture a similar notion. A measure of this ratio at the industry level is therefore likely to be less noisy than an industry AP.

Figure 1 provides further evidence on AP and overvaluation. It plots the Moody's ratio of downgrades-to-upgrades, that we have discussed in the previous paragraph. We want to highlight

[5] "Bond-Rating Shifts Loom in Settlement; N.Y..s Cuomo Plans Overhaul of How Firms Get Paid", Aaron Lucchetti, Wall Street Journal, June 4, 2008, as noted in Bolton et al. (2012).

[6] Evidence from Ashcraft, Goldsmith-Pinkham, and Vickery (2010) and Griffin and Tang (2012) provide support for this idea.

two patterns. First, that most of the corrections made by Moody's are downwards rather than upwards, the ratio of downgrades to upgrades is almost always above 1. And second, that the spikes coming from downgrade corrections are not found in upgrade corrections. AP has a negative correlation with that cohort's ratio of ratings downgrades to upgrades, i.e., when the accuracy of the ratings was low there were more downgrades relative to upgrades five years later. Furthermore, we can replace AP with the downgrade-to-upgrade ratio in all specification and find similar results- although the inclusion of AP drives out the significance of downgrades-to-upgrades.

[Figure 1 here]

Moody's has provided us with the 5-year AP of annual issuing cohorts from 1983 to 2005 (we stop in 2005 because we need 5 years of data to construct AP and Moody's shared with us data through 2010). Applying the restriction that our observations have the necessary data in Compustat and CRSP for our regressions yields a total of 67,700 firm-years during our sample period.

B. Firm-level and Market-level Data

Our initial dataset is based on the analysis in Leary and Roberts (2010) that incorporates most variables used to date to explain capital structure decisions. Our goal is to test whether managers issue debt to take advantage of debt market overvaluation. We attempt to control for other factors that influence the security issuance choice. We discuss their specification in detail in the next section, but it requires standard data from the Compustat and CRSP databases. Appendix B contains the exact definition for all the firm-level variables used.

We supplement firm-level data with other measures of bond market and macroeconomic activity and conditions, in order to capture both business and credit cycles. Credit market controls include the 5-year Treasury rate (the yield to maturity for 5-year Treasuries), the term spread,

the high-yield credit spread (the difference between the Bank of America Merrill Lynch High-yield 100 index yield and the 5-year Treasury Yield) and the average spread over the Federal Funds rate for commercial and industrial loans (the spread between the average rate on commercial and industrial loans and the Federal Funds rate (Series E.2 from the Federal Reserve)). These variables have been used in previous studies. In order to control for the business cycle and any other non-financial macroeconomic activity we use the average Market-to-Book ratio (the median of the market-to-book ratio for Compustat firms, winsorized at the 1st and 99th percentile); the Hodrick-Prescott filtered log real GDP and the real industrial production growth from the Federal Reserve, the real consumption growth from the Bureau of Economic Activity, a recession indicator (based on the NBER definition) and, as in Greenwood and Hanson (2013), the consumption wealth ratio (*cay*) from Lettau and Ludvigson (2001). Figure 2 plots the time series of AP alongside some other credit market variables.

[Figure 2 here]

A quick glance at Figure 2 suggests that our measure of overvaluation is related to the credit cycle. In particular, the years with the lowest AP score (most inaccurate ratings or highest overvaluation) are 1985-87 and 2004-05 (recall that our sample ends in 2005), followed closely by 1988 and 1997-98. These are all periods that have been previously documented as credit booms. Holmstrom and Kaplan (2001) relate the mid-to-late 80s boom with a leverage buyout wave and the junk-bond market boom. And recent papers characterize the credit boom that started in 2004 as driven by residential mortgages and structured products (see Demyank and Hemert, 2011), and private equity (see Martos-Vila, Rhodes-Kropf, and Harford, 2013).

Finally, Table I presents summary statistics for the variables used in our analysis and a correlation matrix for AP and all the macroeconomic controls.

[Table I here]

II. Evidence

A. Issuance Decision

We start by testing the basic prediction that overvaluation should cause firms to issue more debt. We estimate panel regressions with firm fixed-effects and robust standard errors where the dependent variable is the firm's change in debt in year t. The change in debt is calculated as book debt in year t less book debt in year $t-1$, all scaled by book assets in year $t-1$. The full set of explanatory variables includes AP and other macroeconomic-level credit market and business cycle variables in year t, denoted by M_t, as well as firm-specific characteristics at the end of year $t-1$, denoted by X_{it-1}. Specifically the econometric model is

$$(Debt_{it} - Debt_{it-1})/Assets_{it-1} = \beta_1 AP_t + \beta_2 M_t + \beta_3 X_{it-1} + \gamma_i + \mu_{it} \quad (1)$$

Table II presents the results of estimating (1). In the first column, we show that AP and firm debt issuance are negatively correlated; when AP is low, meaning ratings are high, firms issue more debt. Next, we add other contemporaneous credit market controls as well as the average market-to-book in the Compustat population and a battery of business cycle controls. Higher equity values, as captured by higher average market-to-book, reduces firm's debt issuance, as do higher term spreads. On the other hand, the consumption-wealth ratio and consumption growth affect positively the decision to issue debt. The coefficient on C&I spread is also positive, suggesting a flight-to-quality dominating effect, as suggested in Erel et al. (2012). AP is still negative and significant at the 1% level.

In column (3), we add firm-specific controls. The coefficient on AP actually increases in magnitude once we control for time-varying firm characteristics (even columns (1) and (2) included firm fixed-effects to control for time-invariant firm characteristics). Most of the control variables have the expected sign, such as the positive effect on debt issuance for dividend payers, firms

further from distress (Z-score), and those with more tangible assets. Some are not as expected, such as the negative sign on profitability. All these effects have been previously reported in the literature. While theoretically, profitability should lead to more leverage, empirically, the negative relationship has been found in many regressions (see, for example, Kayhan and Titman, 2007), and explained by models such as Strebulaev (2007).

The coefficient on AP is statistically strongly significant and also economically significant. The coefficient reported in column 3 reveals that a one standard deviation decrease in AP would increase debt (relative to assets) issuance for a given company by 1.9% (this is relative to a mean of 3% and median of 0%).

[Table II here]

We construct an alternative measure of firms' preference for debt issuance as follows. First, we calculate the change in debt as above. We next identify equity issuances using the statement of cash flows sale of common and preferred stock, net of repurchases, again scaled by book assets at the end of year $t-1$. We then take the difference of these two variables–change in debt net of change in equity–as a continuous measure of the firm's preference for issuing debt vs. equity in year t.

The results of our specifications designed to explain the preference for issuing debt over equity are also presented in table II, columns 5 through 6. Again, all specifications include firm fixed effects. In column 5, we show that the relation between AP and net debt issuance is negative, meaning that optimistic ratings (overvalued debt) are associated with firms issuing more debt relative to equity. This finding is incremental to the explanatory power of other standard debt market variables. In column 6, we introduce the variables from the Leary and Roberts (2010) specification. While the magnitude of the overvaluation coefficient drops, its explanatory power survives the addition of all of these firm-specific variables that have been shown to help explain the issuance decision. Some of the control variables, such as market-to-book, have the expected

sign now that we have taken equity issuance into account. The high-yield spread now has the expected negative sign as well. It is also interesting to note that the negative coefficient sign attached to GDP (and to industrial production growth) points at the counter-cyclicality of debt issuance and preference for debt. Erel et al. (2012) find that non-investment public bond issuances are pro-cyclical whereas investment-grade debt is counter-cyclical. Our results would suggest that, overall, the effect coming from investment-grade borrowers dominates.

Again, the economic significance is large. A one standard-deviation decrease in AP would increase the debt to equity (relative to assets) issuance for a given company by 1.7% (this is relative to a mean of 0.4% and median of -.1%). If we compute the mean of the absolute value of the debt issuance minus the equity issuance scaled by assets, we obtain 11.9% (median is 5.3%).

In column 4, the dependent variable is equity issuance. When we put only equity issuance on the left hand side AP is significantly *positively* related to equity issuance as long as we control for M/B. This suggests that as long we control for equity market valuation levels then equity issuance goes down when debt market ratings are too high. This suggests that we are not picking up some general level of market optimism but rather a phenomena related specifically to the bond market. Said differently, both the bond and stock market may tend to be overvalued at the same time, but controlling for equity valuation levels bond market overvaluation should cause issuance to shift away from equity and toward debt - which is what we find.

B. Cross-sectional Variation in Issuance Decision

In table III, we test the prediction that the effect of debt overvaluation will be more pronounced for more financially constrained firms. Specifically, we include an indicator variable, *lowcash*, which is set to one when a firm's cash-to-assets ratio is below its industry's 25th percentile ratio. We interact *lowcash* with AP to identify the incremental effect of debt overvaluation on constrained firms. As predicted, the effect of overvaluation on constrained firms is about 25% greater than that for unconstrained firms, if we look at debt issuance, and slightly smaller if

we instead look at net debt issuance. To make sure this result is robust, we use other proxies for financially constrained firms, following the work of Hadlock and Pierce (2010). Using their approach, we calculate the Size-Age index (henceforth, SA) of financial constraints. We then create a dummy to indicate belonging to the bottom quartile of the index (which are the most financially unconstrained companies) and interact it with Moody's AP. We find that the interaction term is positive and significant, which is a sign that the effect is stronger for more rather than less constrained firms, in line with the results from using our previous proxy, *lowcash*, and of about the same order of magnitude.

[Table III here]

Overall, the results in tables II and III suggest that debt overvaluation, as captured by AP (or alternatively downgrade-to-upgrade ratio), influences financing decisions by firms. Controlling for overall credit conditions, unobservable time-invariant firm characteristics, and a host of firm-specific characteristics that predict issuance decisions, firms are incrementally more likely to issue debt when our measure says it is overvalued.

We now further examine the effect of potential overvaluation in the cross section of firms. Similar to testing and confirming the increased effect of overvaluation for financially constrained firms, we look for firms that should ex-ante be expected to react more to credit market mistakes. We hypothesize that the effect of overvaluation should be larger for firms that are rated, and hence have the potential to take more advantage of ratings mistakes. We find some support for this idea in a regression that includes an interaction between AP and an indicator for whether the firm is rated by a credit rating agency. The interaction term is insignificant when the dependent variable is the change in debt but becomes significant and negative when we explain net debt issuances. Additionally, one would also expect those firms with lower ratings to react more to overvaluation, hence the effect should be lower for investment grade companies. We estimate our baseline regressions with an interaction of AP with a dummy variable indicating

an investment-grade firm. We find that in both specifications the interaction term is positive and significant, as predicted. We present these results in table IV.

[Table IV here]

We now test two final debt issuance predictions to support a channel that operates through debt overvaluation. First, if managers are responding to overvaluation in credit markets, one would expect that they would prefer to take advantage of it by using relatively longer maturity debt, in order to maximize the transfer from investors. We take this idea to the data and redefine our dependent variables, separating longer and shorter maturity issuances. That is, we split issuances by those with less than 5 years maturity and those with 5 or more years maturity. The way we construct these new dependent variables is as follows. For each year we know the amount of debt maturing in 1, 2, 3, 4 and 5 years. Assuming that debt maturing in $x+1$ years at $t-1$ becomes debt with maturity of x years at t, we can identify the net issuance with maturity x from $t-1$ to t as the difference between the total amount of debt with maturity x at t minus debt with maturity $x+1$ at $t-1$. The results of this specification are in table V.

[Table V here]

The effect of AP is clearly stronger for longer maturity issuances. The coefficient on Moody's AP is of larger magnitude in the regression where the dependent variable is long-maturity debt issuance (-.31 vs. -.07). It is suggestive of longer-term effects in their capital structures coming from debt issuance in times when debt markets are overvalued: this is consistent with firms responding to overvaluation in a way to be expected. Furthermore, it is difficult to reconcile this finding with the alternative explanation that overvalued times might coincide with an omitted macroeconomic variable such as growth options that increase the investment opportunity set (recall as well that we are also controlling for the aggregate market-to-book ratio). Myers (1977) argues that with more growth options firms should issue shorter term debt because the debt overhang problem becomes more important (Barclay and Smith (1995) find evidence consistent

with this idea). So if what AP is picking up is times with more growth options expanding the aggregate investment opportunity set of firms, we should see firms issuing shorter term debt. Instead we see that most of the effect is through the issuance of long maturity claims.

During times of credit market mistakes we should also observe higher refinancing and rollover activity and firms should refinance into longer maturity debt as this this allows them to take the most advantage of overvaluation. Recall that our baseline econometric model looked at debt issuance as the change in debt from one year to the next. While this captures changes in capital structure it does not capture refinancing activity or debt being rolled over. In order to test this idea we construct a simple measure of rollover activity as $Debt\ Issuance_t - \max(Net\ Debt\ Issuance_t, 0)$, where net debt issuance is defined as in our issuance specification, $Debt_{it} - Debt_{it-1}$.

[Table VI here]

The estimates in table VI show evidence that not only do firms increase the amount of debt net of equity when Moody's is more inaccurate but also rollover more of their existing debt. In conjunction with the maturity evidence presented in table V, it appears that during overvalued years firms tend to rollover more debt and into longer maturities. This is consistent with managers reacting to the existence of overvalued credit markets.

C. A Cross-sectional Measure of Overvaluation: Industry Downgrades-to-Upgrades

Our idea of credit market overvaluation being measured with credit ratings requires the use of the entire cross-section of credits at any given time. Naturally, if we identify overvaluation relying on time variation in AP one is concerned that AP is correlated with an unobserved aggregate factor driving a firm's debt issuance. In this section, we test our idea using cross-sectional variation alone. In order to do so we construct the five-year ratio of downgrades to upgrades for each cohort. For example, for the 2005 cohort of rated credits, we record all the

downgrades and upgrades that the credits suffer during the following five years and calculate the ratio of total downgrades to upgrades. We do this for each of the Fama-French industries (using the twelve industries classification). By including year fixed effects in the same debt issuance models that we have already estimated, the identification is purely cross-sectional. The idea is that firms in industries that are relatively more overvalued should issue relatively more debt, other things being equal. Importantly, this should in turn alleviate any concerns that our AP measure might be correlated with some macroeconomic unobserved factor driving debt issuances as well.

The results are in table VII. Recall that the expected sign is now positive because our idea of overvaluation would be consistent with relatively more downgrade corrections compared to upgrade corrections. Indeed the coefficient is positive and statistically significant when firm and year fixed effects and firm-level controls are included.

[Table VII]

D. Bond prices and AP

A potential econometric concern of our overvaluation measure is that because it is constructed ex-post, if a shock to the error term today affects AP, the usual orthogonality condition is violated. In order to address this issue, we first project AP onto a measure of contemporaneous excess bond premia and then estimate our main econometric specification using such projection. Gilchrist and Zakrajek (2012) measure excess bond premia (*ebp* henceforth) as an aggregate of the difference between actual corporate credit spreads and those implied by a very general model of default risk. Since this variable is constructed with information available at time t it does not suffer from the potential problem mentioned above. Moreover we expect excess bond premia to be highly related to AP. In order to capture the idea of overvaluation, we construct the variable *negative ebp* as the value of *ebp* when *ebp* is negative and zero otherwise. We do this because *ebp* could potentially capture any deviation from fundamental values but we are

interested in the effect of overvaluation (i.e., when actual spreads are below those predicted by fundamentals).[7]

This exercise not only counters the above mentioned econometric worry, it also provides evidence that is directly related to high prices rather than to credit market mistakes as a proxy for high prices. It is reassuring that AP and negative *ebp* are highly correlated (the coefficient of correlation is 0.46). This suggests that AP, even though not directly constructed with price information, is related to a non-fundamental component of corporate debt prices and that any inaccuracy in ratings will likely have pricing effects. Furthermore, using AP predicted from prices produces the same pattern of results discussed above.

In table VIII we use negative *ebp* to predict AP and confirm that our main result continues to hold (column 1). The coefficient on the predicted AP is significantly negative. As pointed out by Gilchrist and Zakrajek (2012), *ebp* could partially be driven by other supply-side factors. Two suggested factors are aggregate market liquidity and risk attitude changes of financial intermediaries induced by balance sheet shocks. We use Money Market Mutual Fund Flows as a proxy for the first, following Longstaff, Mithal, and Neis (2005); and the US financial sector return on assets (ROA) to control for the second, as in Gilchrist and Zakrajek (2012). Our main result continues to go through even when we strip negative *ebp* of the effects of liquidity and risk attitude changes of financial intermediaries (see column 2).

[Table VIII here]

In conclusion, we have shown that AP is related to a measure of excess bond premia and that when using this as an "instrument" for AP, our main result holds, indicating that the measure of ratings' accuracy does translate into prices and that its variation is unlikely to be driven by information not available at time *t*. We address other econometric issues, such as reverse causality, in section III. In the following subsections, we investigate the use of the increased

[7]However the qualitative results we present next do not depend on whether we use negative *ebp* or "raw" *ebp*.

debt issuance during periods when credit ratings are more inaccurate.

E. Use of Proceeds

Cash Holdings

It is possible that firms could simply take advantage of temporary overvaluation to issue overvalued debt and hold the proceeds as cash. In this case, debt market overvaluation would have no real effects, instead representing a transfer from the debt buyers to the debt issuers. To examine this we estimate standard specifications used to explain cash holdings, and add the debt rating optimism measure to them. Our base cash specification draws on the corporate cash holdings literature (see, for example, Harford, 1999; Opler, Pinkowitz, Stulz, and Williamson, 1999; Bates, Kahle, and Stulz, 2009). The results are presented in table IX.

[Table IX here]

We build the specifications out as in our issuance regressions. In the first column, we simply show that credit market optimism is correlated with cash holdings. Specifically, lower AP, meaning more optimistic ratings, is associated with higher cash holdings. In the second column, we add the other credit market variables: AP continues to incrementally explain cash holdings. Credit spreads and the treasury yield have the expected sign and are consistent with the results in Bates et al. (2009). Cay, industrial production growth, consumption growth, the recession dummy and GDP all affect cash holdings negatively. Finally, in column (3), we include firm-level variables that have been shown to explain cash holdings. We find, consistent with prior studies, that cash-flow volatility, the cash flow-to-assets ratio, the firm's market-to-book and research and development expenses have positive and significant coefficients, whereas firm size, debt and capital expenditures have negative and significant coefficients and thus correlate with lower cash holdings. Again, even in the presence of these firm-specific characteristics, our results suggest that debt overvaluation continues to incrementally explain firm's cash holdings.

In sum, the results in table IX suggests that firms hold more cash when debt overvaluation allows them to issue debt. Thus, some of the effect seems to be a transfer, at least in the short-run. In terms of economic magnitude, a one standard deviation decrease in AP leads to an increase in cash of 0.45% of assets. Given that a one standard deviation decrease in AP led to a 1.87% increase in debt issuance relative to assets this suggests that approximately 24.23% of the issuance is saved in cash. However, because firms can both add to cash and increase investment, or some firms can add to cash while others increase investment, in the next section we examine the impact of debt overvaluation on subsequent investment, in order to understand the unexplained component (76%) of debt issuance.

Investment

If firms are constrained then credit market mistakes should increase investment. We now estimate regressions to examine capital expenditures. The results are in table X. We follow the specifications used in Faulkender and Petersen (2011) to explain investment decisions which, like most other studies of investment, control for Tobin's q and a measure of cash flows scaled by capital or assets. Their specification calls for year indicators, but since our AP measure is an annual variable, we replace their year indicators with all our macroeconomic controls, including the same credit market variables as in previous tables. The first column shows that investment is inversely correlated with credit rating mistakes. This is consistent with the idea that when firms are able to issue overvalued debt, capex is higher. Next, we add the other credit market and business cycle characteristics and show that AP is still incrementally significant in explaining investment. In column (3), we introduce the remaining variables from Faulkender and Petersen (2011), which while significant in explaining a firm's capex, only minimally impact the coefficient on AP. As expected, both market-to-book and profitability have positive and significant coefficients. In terms of economic significance, the capex effect is of the same order of magnitude as the cash balance effect. A one standard deviation in AP leads to additional

investment of 0.52% of assets, so 27.76% of the effect of AP on issuance is invested in capex.

[Table X here]

If debt market overvaluation is leading firms to issue overvalued debt and then use the proceeds to increase investment, then debt overvaluation acts through the firm's debt issuance. If we control for this channel, then the indirect effect of AP on investment should no longer be significant. So, we re-estimate the full specification from column (3), but including the firm's change in debt as an independent variable (not tabulated). The firm's change in debt positively explains investment and simultaneously eliminates the explanatory power of AP. This is an important test both because it is evidence of our proposed channel - that AP acts through debt issuance, and because it reinforces our conclusion that AP is indeed capturing debt mispricing rather than proxying for some other omitted macroeconomic variable that is correlated with investment.

Acquisitions

In our final test, we examine cash acquisitions (taken from the statement of cash flows), testing whether debt market overvaluation affects only internal, so-called greenfield investment (capex), or whether it also impacts external investment through acquisitions. Table XI mirrors table X, starting by showing that AP is negatively correlated with cash acquisitions. We then add the other market variables. Finally, column (3) includes the market-to-book ratio and profitability. In all cases AP explains cash acquisition spending. In terms of economic significance, a one standard deviation decrease in AP leads to additional cash acquisitions of 0.87% of assets, representing that about 46.54% of the debt issuance goes to acquisitions. This result adds to the M&A literature by showing that the overvaluation theories of M&A are not exclusive of stock acquisitions but can also be linked to cash acquisitions (see Shleifer and Vishny (2003), Rhodes-Kropf and Viswanathan (2004), Rhodes-Kropf et al. (2005) and Dong et al. (2006)).

All together, the proceeds from the additional debt allowed by overvaluation are allocated, on average, as follows: 24.2% to cash, another 27.8% to capex and 46.5% to cash acquisitions. Thus we are examining the three main uses for the additional amount of debt raised in times of credit market mistakes.

[Table XI here]

Once again, we test our hypothesis that AP acts through debt issuance by re-estimating the full specification with the firm's change in debt included as an additional variable. As before we find that the change in debt is strongly significant in explaining acquisition spending, while eliminating the indirect effect of AP in explaining acquisitions. This suggests that the change in debt is the channel through which credit market mistakes affect acquisition spending.

III. Further Robustness and Endogeneity Concerns

Section II.D addressed a potential econometric concern related to AP. In this section we address other potential issues. A concern that could plague our analysis is one of omitted variables. In the cross section, any biases stemming from firm-level unobserved heterogeneity are unlikely to contaminate our results since we use firm fixed effects in all of our regressions, as mentioned in the results' section. Perhaps more importantly, one might be concerned about AP being correlated with a macroeconomic variable that we might have omitted in our specifications. We believe that we have attenuated such concern by including all the usual macroeconomic variables found in the literature to be determinant. The inclusion of the exhaustive number of macroeconomic controls increases the point estimates of Moody's AP in all of our specifications, and especially the debt issuance ones. Therefore we think it is unlikely that an omitted macroeconomic factor is driving the results. Moreover we have demonstrated that in our investment regressions the channel is through debt issuance. Furthermore, we have shown that AP positively correlates with equity (thus it would need to be a macro factor that positively related to

equity while negatively relating to debt).

Another potential concern is reverse causality. First, it is not clear whether reverse causality is actually a concern in this setting. If debt issuance was higher in some periods (for some unexplained reason), firms would then have either too much debt and/or invest poorly. This could cause them to default more than they otherwise would have. But this would not cause the ratings to turn out to have been wrong unless Moodys simultaneously makes mistakes exactly during these periods. Recall that more defaults does not lower AP, rather ratings mistakes lower AP.[8]

A true reverse causality argument requires that all firms coordinate to issue more debt (for some unexplained reason) and that higher debt issuance level causes Moody's to rate the credit of companies less accurately. This could be the case if their analysts became overwhelmed and devoted less time to assess each company. One way to check this concern is to test whether the aggregate (economy-wide) change in debt causes (in the sense of Granger) lower AP. If anything, we find the opposite, that the aggregate change in debt Granger causes (weakly) higher AP. Note that this is not a concern for the causal interpretation of our results (it suggests increases in aggregate debt issuance makes AP *more* accurate, not less). We also run the main specification including lags and leads of AP. We find that the one-year (also two-year) lagged AP is negative and strongly significant confirming the direction of causality, especially since the one-year lead AP loads positively instead of negatively. The results of these regressions are in table XII.

[Table XII here]

Finally, our regressions could be subject to econometric problems typical in models with time-series variation. In particular, one could be concerned about excessively serially correlated errors. We estimate (not tabulated) our main issuance regression with Newey-West standard errors and obtain similar results, the coefficient for AP is significantly negative. Moreover the Durbin-

[8]Moreover, the evidence in section II.B is inconsistent with this direction of causality. Both rollovers and maturity extension should decrease distress probabilities over the next 5 years rather than increase them.

Watson test statistic is not less than one, which alleviates concerns of excessive positive serial correlation. Note that the Newey-West procedure does not allow for fixed effects, so it comes at a cost. Alternatively, we run a fixed-effects panel regression allowing for AR(1) estimation errors-transforming the data to remove the autocorrelation. Untabulated results show that the coefficient on AP is still significantly negative. Finally, our result continues to hold when we cluster standard errors at firm and year level. We show this in table XIII.

[Table XIII here]

IV. Concluding Remarks

The potential for overvaluation to impact firm decision-making is a potent idea with a long history in the economic literature. However, virtually all work on this idea has considered the potential for *equity* overvaluation to have an impact. This has left the potential impacts of bond market overvaluation an understudied phenomenon.

We fill this gap in the literature by introducing rating agency mistakes and their relation to prices. We examine the correlation in bond rating mistakes with the issuance decisions of firms as well as their cash holding, investment and acquisition decisions. We find that mistakes by Moody's correlate with increased issuance of debt, increased cash holding, increased investment and increased acquisition activity.

Thus, we have found a variable that has relevance for two of the most important questions in financial economics – Why do firm's choose to issue debt or equity? What causes firms to invest?

Although our work is only a first step, and much work needs to be done in this area, our findings suggest the potential for researchers to find a very rich set of impacts of overvalued debt.

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Figure 1. Moody's Downgrade-to-Upgrade Ratio

The figure plots Moody's AP (right axis) and the ratio of downgrades to upgrades for the period of (1980-2009), for a given year and three years after any given year (left axis). We present the yearly average of the quarterly ratios provided by Moody's.

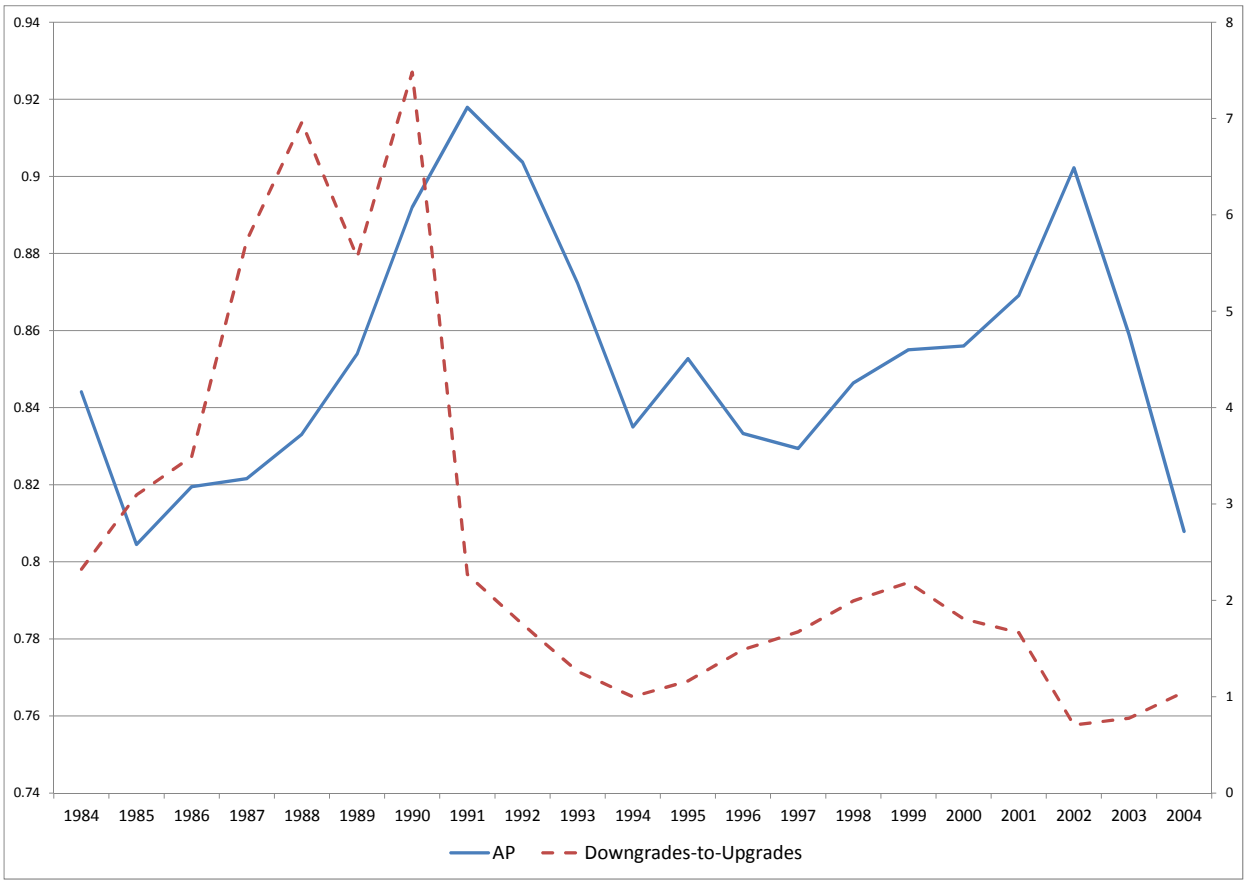

Figure 2. Moody's AP, Financial Markets and the Business Cycle

The figure plots Moody's AP (right axis) and the 5-year Treasury rate (percentage), the Commercial and Industrial (C&I) loan spread (percentage x10), High-yield spread (percentage), the overall Market-to-book ratio (x10) and the H-P filtered log GDP (x100).

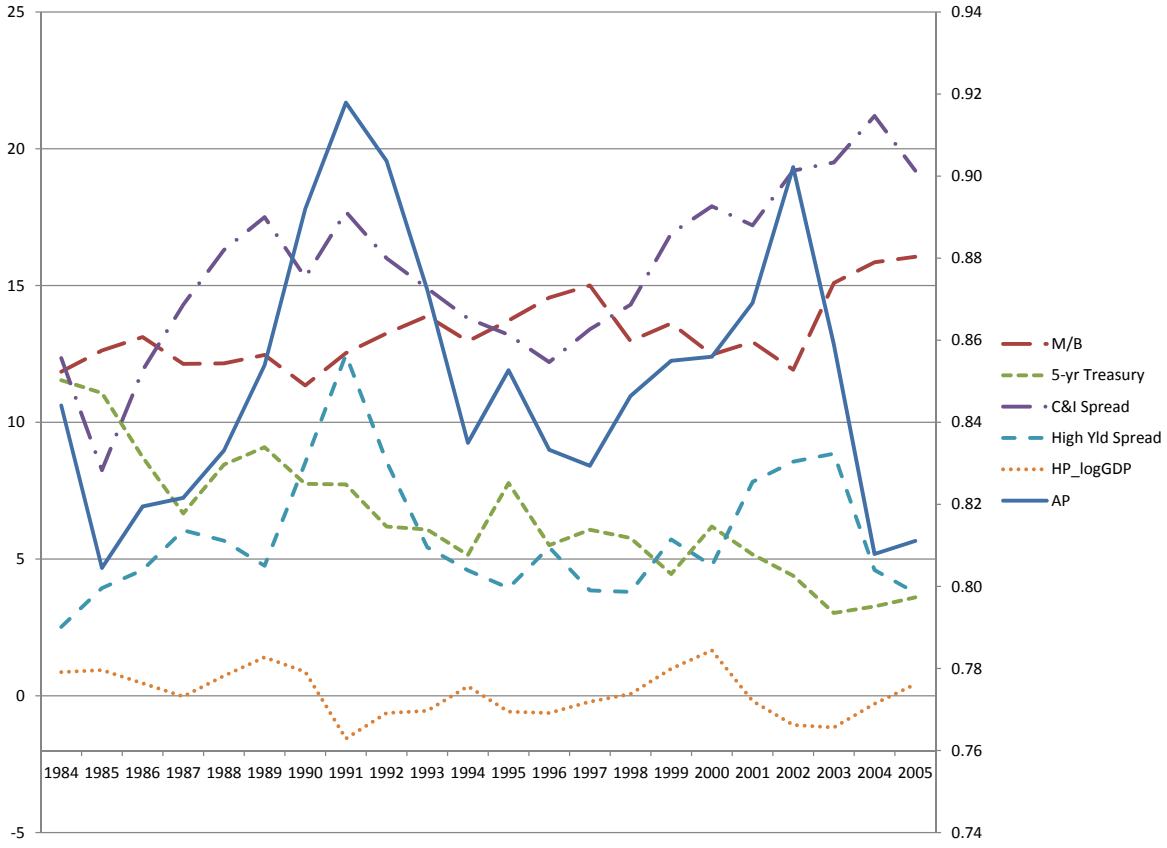

Table I. Summary Statistics

The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level variables are formally defined in appendix B. Macroeconomic variables are defined in section I. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years.

	Mean	Median	S.D.	5th Pctile	95th Pctile	Obs
Chg Debt Net of Chg Equity	0.004	-0.001	0.229	-0.272	0.301	67700
Chg Debt / TA	0.030	0	0.174	-0.153	0.303	67700
Moody's AP	0.852	0.853	0.030	0.808	0.904	67700
Cash/TA	0.130	0.062	0.166	0.002	0.492	67700
Investment/TA	0.104	0.064	0.221	-0.050	0.379	67700
Capex/TA	0.076	0.050	0.090	0.006	0.236	66716
Acq/TA	0.029	0.000	0.096	0.000	0.170	64866
Average M/B	1.335	1.297	0.126	1.185	1.585	67700
5-yr Treasury Yield	6.336	6.070	2.157	3.270	11.070	67700
C&I Rate Spread	1.568	1.600	0.292	1.190	1.950	67700
Cay	0.014	0.014	0.014	-0.016	0.034	67700
Ind. Prod. Growth	0.239	-0.103	1.592	-0.778	5.132	67700
Consumption Growth	3.585	3.500	1.216	2.000	5.500	67700
Recession	0.093	0.000	0.291	0.000	1.000	67700
H-P Filtered Log Real GDP	0.001	-0.000	0.008	-0.012	0.017	67700
Term Spread	1.888	1.700	1.013	0.210	3.150	67700
High-Yield Spread	5.828	5.431	2.265	3.771	8.854	67700
Pecking Order	0.129	0.143	0.407	-0.550	0.757	67700
Size	5.843	5.594	1.870	3.276	9.367	67700
Age	17.195	13.000	12.266	4.000	42.000	67700
Cash-flow Volatility	0.141	0.076	0.295	0.016	0.398	67700
Dividend Payer	0.488	0.000	0.500	0.000	1.000	67700
Z-Score	1.739	1.945	1.873	-1.192	4.110	67700
R&D / Sales	0.077	0.000	0.443	0.000	0.191	67700
No R&D Reported	0.432	0.000	0.495	0.000	1.000	67700
M/B	1.627	1.258	1.171	0.715	3.833	67700
Tangible Assets	0.327	0.274	0.230	0.041	0.792	67700
Prior one-year return	0.153	0.038	0.690	-0.646	1.335	67700
Industry Leverage	0.226	0.230	0.096	0.072	0.389	67700
Profitability	0.073	0.089	0.176	-0.211	0.296	67700
Investment Grade	0.121	0	0.326	0	1	67700
Rated	0.224	0	0.417	0	1	67700
Low Cash	0.510	1	0.500	0	1	67700
Size-Age Index	-3.360	-3.295	0.685	-4.624	-2.315	67700
Size-Age Fin. Constraint	0.500	0	0.500	0	1	67700

Panel B: Correlation Matrix

	AP	Avg M/B	Tr. Yd.	C&I	Cay	In.Prod.	C Gth.	Recess.	GDP	Term	H-Y
AP	1										
Avg M/B	-0.4111	1									
Tr. Yd.	-0.0663	-0.6207	1								
C&I Sp.	0.3212	0.287	-0.6739	1							
Cay	0.5039	-0.3578	0.3265	-0.4074	1						
Ind. Prod.	-0.1796	-0.3374	0.1691	-0.0852	-0.2165	1					
Cons. Gth.	-0.5347	0.0046	0.1669	-0.3852	-0.3518	0.2029	1				
Recess.	0.3011	-0.2864	-0.01	0.0718	0.1319	-0.0205	-0.312	1			
GDP	-0.4098	-0.3167	0.4182	-0.2143	-0.3148	0.4689	0.6084	0.0974	1		
Term Sp.	0.1031	-0.0053	0.0166	-0.0481	-0.0815	-0.1878	-0.1354	-0.1939	-0.4789	1	
H-Y Sp.	0.7832	-0.2196	-0.2331	0.4218	0.2987	-0.19	-0.7404	0.3213	-0.5713	0.2889	1

Table II. Debt Issuance

The table presents panel regressions explaining the one-year change in debt (Models 1-3), change in equity (model 4) and change in debt net of change in equity (Models 5-6). The dependent variables are defined in section II.A and appendix B. The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level and macroeconomic-level variables are also defined in section I and appendix B. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. Robust standard errors are in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	$\Delta Debt$			$\Delta Equity$	$\Delta Debt - \Delta Equity$	
Moody's AP	-0.4259***	-0.5741***	-0.6231***	0.0904**	-0.6517***	-0.5609***
	(0.0210)	(0.0541)	(0.0531)	(0.0424)	(0.0667)	(0.0661)
Average M/B		-0.0757***	-0.0754***	0.0728***	-0.1490***	-0.1413***
		(0.0108)	(0.0104)	(0.0081)	(0.0135)	(0.0135)
5-yr Treasury Yield		0.0017***	-0.0004	0.0036***	-0.0010	-0.0051***
		(0.0007)	(0.0008)	(0.0007)	(0.0008)	(0.0011)
C&I Rate Spread		0.0030	0.0362***	-0.0393***	0.0190**	0.0474***
		(0.0061)	(0.0065)	(0.0049)	(0.0075)	(0.0078)
Cay		0.4820***	0.3506***	-0.5638***	0.1373	0.2901**
		(0.1111)	(0.1098)	(0.1129)	(0.1367)	(0.1356)
Ind. Prod. Growth		-0.0035***	-0.0032***	0.0018***	-0.0082***	-0.0062***
		(0.0006)	(0.0006)	(0.0005)	(0.0008)	(0.0008)
Cons. Growth		0.0068***	0.0116***	-0.0049***	0.0076***	0.0109***
		(0.0014)	(0.0014)	(0.0012)	(0.0017)	(0.0017)
Recession		-0.0136***	-0.0011	-0.0146***	-0.0038	0.0052
		(0.0030)	(0.0030)	(0.0025)	(0.0039)	(0.0040)
H-P Log GDP		-0.1768	-0.9935***	0.5989***	-0.6164**	-1.1210***
		(0.2039)	(0.2226)	(0.1574)	(0.2527)	(0.2715)
Term Spread		-0.0080***	-0.0123***	-0.0022**	-0.0106***	-0.0118***
		(0.0010)	(0.0012)	(0.0009)	(0.0013)	(0.0014)
High-Yield Spread		0.0008	0.0022***	0.0039***	-0.0014	-0.0024***
		(0.0007)	(0.0007)	(0.0006)	(0.0009)	(0.0009)
Pecking Order			-0.0633***	0.0215***		-0.0882***
			(0.0040)	(0.0038)		(0.0055)
Size			-0.0462***	-0.0415***		-0.0068**
			(0.0021)	(0.0022)		(0.0027)
Age			0.0002	0.0018***		-0.0009*
			(0.0004)	(0.0003)		(0.0005)
Cash-flow Volatility			-0.0008	-0.0108		0.0045
			(0.0079)	(0.0099)		(0.0137)
Dividend Payer			0.0262***	-0.0031		0.0300***
			(0.0032)	(0.0024)		(0.0038)
Z-Score			0.0200***	-0.0101***		0.0339***
			(0.0014)	(0.0021)		(0.0025)
R&D/Sales			0.0053	0.0397***		-0.0302***
			(0.0036)	(0.0095)		(0.0091)
No R&D Reported			-0.0074	0.0048		-0.0132**
			(0.0052)	(0.0038)		(0.0060)
M/B			0.0140***	0.0235***		-0.0110***

			(0.0014)	(0.0021)		(0.0024)
Tangible Assets			0.0299**	0.0415***		-0.0150
			(0.0120)	(0.0111)		(0.0154)
Prior one-year return			0.0055***	0.0132***		-0.0043**
			(0.0014)	(0.0015)		(0.0019)
Industry Leverage			-0.0693***	0.0589***		-0.1163***
			(0.0222)	(0.0171)		(0.0262)
Profitability			-0.0305***	-0.0066		-0.0293*
			(0.0097)	(0.0129)		(0.0152)
Constant	0.3930***	0.5862***	0.7873***	0.0572	0.7364***	0.6763***
	(0.0179)	(0.0473)	(0.0481)	(0.0363)	(0.0586)	(0.0596)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	67,700	67,700	67,700	67,700	67,700	67,700
R-squared	0.0058	0.0149	0.0691	0.0036	0.0105	0.0566
Number of gvkey	8,634	8,634	8,634	8,634	8,634	8,634

Table III. Financial Constraints and Debt Issuances

The table presents panel regressions explaining the one-year change in debt (Models 1 and 3) and change in debt net of change in equity (Models 2 and 4). The dependent variables are defined in section II.A and appendix B. The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level and macroeconomic-level variables are also defined in section I and appendix B. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. Robust standard errors are in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)
Variables	$\Delta Debt$	$\Delta Debt - \Delta Equity$	$\Delta Debt$	$\Delta Debt - \Delta Equity$
Moody's AP	-0.5619***	-0.5078***	-0.7296***	-0.7296***
	(0.0573)	(0.0712)	(0.0602)	(0.0602)
Low Cash	0.1008***	0.0658		
	(0.0363)	(0.0469)		
AP x Low Cash	-0.1225***	-0.0991*		
	(0.0422)	(0.0548)		
Size-Age Fin. Const.			-0.1780***	-0.1780***
			(0.0366)	(0.0366)
AP x SA			0.1994***	0.1994***
			(0.0425)	(0.0425)
Average M/B	-0.0758***	-0.1405***	-0.0742***	-0.0742***
	(0.0105)	(0.0135)	(0.0104)	(0.0104)
5-yr Treas. Yield	-0.0004	-0.0052***	-0.0002	-0.0002
	(0.0008)	(0.0011)	(0.0008)	(0.0008)
C&I Rate Spread	0.0362***	0.0479***	0.0361***	0.0470***
	(0.0065)	(0.0078)	(0.0065)	(0.0065)
Cay	0.3532***	0.3110**	0.3089***	0.3089***
	(0.1099)	(0.1355)	(0.1100)	(0.1100)
Ind. Prod. Growth	-0.0032***	-0.0062***	-0.0032***	-0.0032***
	(0.0006)	(0.0008)	(0.0006)	(0.0006)
Cons. Growth	0.0116***	0.0110***	0.0115***	0.0115***
	(0.0014)	(0.0017)	(0.0014)	(0.0014)
Recession	-0.0010	0.0056	-0.0010	-0.0010
	(0.0030)	(0.0040)	(0.0030)	(0.0030)
H-P Log GDP	-0.9980***	-1.1302***	-1.0085***	-1.0085***
	(0.2226)	(0.2712)	(0.2226)	(0.2226)
Term Spread	-0.0122***	-0.0117***	-0.0123***	-0.0123***
	(0.0012)	(0.0014)	(0.0012)	(0.0012)
High-Yield Spread	0.0022***	-0.0026***	0.0022***	0.0022***
	(0.0007)	(0.0009)	(0.0007)	(0.0007)
Pecking Order	-0.0625***	-0.0843***	-0.0634***	-0.0634***
	(0.0040)	(0.0056)	(0.0040)	(0.0040)
Size	-0.0460***	-0.0058**	-0.0450***	-0.0450***
	(0.0021)	(0.0027)	(0.0022)	(0.0022)
Age	0.0002	-0.0008*	0.0004	0.0004
	(0.0004)	(0.0005)	(0.0004)	(0.0004)
Cash-flow Volatility	-0.0011	0.0039	-0.0006	-0.0006
	(0.0080)	(0.0137)	(0.0079)	(0.0079)

Dividend Payer	0.0262***	0.0298***	0.0265***	0.0265***
	(0.0032)	(0.0038)	(0.0032)	(0.0032)
Z-Score	0.0199***	0.0338***	0.0201***	0.0201***
	(0.0014)	(0.0025)	(0.0014)	(0.0014)
R&D / Sales	0.0052	-0.0308***	0.0053	-0.0302***
	(0.0036)	(0.0091)	(0.0036)	(0.0036)
No R&D Reported	-0.0074	-0.0133**	-0.0075	-0.0130**
	(0.0052)	(0.0060)	(0.0052)	(0.0052)
M/B	0.0140***	-0.0114***	0.0138***	0.0138***
	(0.0014)	(0.0024)	(0.0014)	(0.0014)
Tangible Assets	0.0320***	-0.0028	0.0304**	0.0304**
	(0.0122)	(0.0155)	(0.0120)	(0.0120)
Prior One-year Return	0.0055***	-0.0043**	0.0056***	0.0056***
	(0.0014)	(0.0019)	(0.0014)	(0.0014)
Industry Leverage	-0.0718***	-0.1280***	-0.0717***	-0.0717***
	(0.0222)	(0.0263)	(0.0222)	(0.0222)
Profitability	-0.0304***	-0.0295*	-0.0313***	-0.0313***
	(0.0097)	(0.0152)	(0.0097)	(0.0097)
Constant	0.7359***	0.6309***	0.8710***	0.8710***
	(0.0510)	(0.0632)	(0.0542)	(0.0542)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Observations	67,700	67,700	67,700	67,700
R-squared	0.0693	0.0576	0.0695	0.0695
Number of gvkey	8,634	8,634	8,634	8,634

Table IV. Debt Issuance: Further Cross-sectional Tests

The table presents panel regressions explaining the change in debt (Models 1 and 3) and the change in debt net of change in equity (Model 2 and 4); see section II.A and appendix B for the definition of all the variables. The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. Moody's AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. Robust standard errors in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)
Variables	$\Delta Debt$	$\Delta Debt - \Delta Equity$	$\Delta Debt$	$\Delta Debt - \Delta Equity$
Moody's AP	-0.6413***	-0.5562***	-0.6501***	-0.5749***
	(0.0547)	(0.0680)	(0.0543)	(0.0674)
Rated	-0.0520	0.0453		
	(0.0405)	(0.0486)		
AP x Rated	0.0319	-0.0932*		
	(0.0470)	(0.0565)		
Investment Grade			-0.1593***	-0.0789*
			(0.0416)	(0.0476)
AP x Inv. Grade			0.2110***	0.1095**
			(0.0480)	(0.0551)
Average M/B	-0.0776***	-0.1456***	-0.0745***	-0.1407***
	(0.0105)	(0.0135)	(0.0104)	(0.0135)
5-yr Treasury Yield	-0.0014*	-0.0063***	-0.0001	-0.0048***
	(0.0008)	(0.0011)	(0.0008)	(0.0011)
C&I Rate Spread	0.0403***	0.0517***	0.0359***	0.0470***
	(0.0065)	(0.0078)	(0.0065)	(0.0078)
Cay	0.3813***	0.3327**	0.3272***	0.2733**
	(0.1097)	(0.1354)	(0.1098)	(0.1355)
Ind. Production Growth	-0.0031***	-0.0061***	-0.0033***	-0.0063***
	(0.0006)	(0.0008)	(0.0006)	(0.0008)
Consumption Growth	0.0115***	0.0107***	0.0116***	0.0109***
	(0.0014)	(0.0017)	(0.0014)	(0.0017)
Recession	-0.0008	0.0052	-0.0009	0.0053
	(0.0030)	(0.0040)	(0.0030)	(0.0040)
HP Filtered Log GDP	-1.0577***	-1.1779***	-0.9923***	-1.1157***
	(0.2228)	(0.2718)	(0.2231)	(0.2719)
Term Spread	-0.0132***	-0.0128***	-0.0120***	-0.0116***
	(0.0012)	(0.0014)	(0.0012)	(0.0014)
High-Yield Spread	0.0020***	-0.0025***	0.0021***	-0.0025***
	(0.0007)	(0.0009)	(0.0007)	(0.0009)
Pecking Order	-0.0623***	-0.0868***	-0.0630***	-0.0880***
	(0.0040)	(0.0055)	(0.0040)	(0.0055)
Size	-0.0434***	-0.0029	-0.0475***	-0.0077***
	(0.0022)	(0.0028)	(0.0021)	(0.0027)
Age	0.0000	-0.0011**	0.0002	-0.0009*
	(0.0004)	(0.0005)	(0.0004)	(0.0005)
Cash-flow Volatility	-0.0003	0.0051	-0.0007	0.0045
	(0.0079)	(0.0136)	(0.0079)	(0.0137)
Dividend Payer	0.0260***	0.0297***	0.0258***	0.0297***

	(0.0032)	(0.0038)	(0.0032)	(0.0038)
Z-Score	0.0195***	0.0333***	0.0200***	0.0340***
	(0.0014)	(0.0025)	(0.0014)	(0.0025)
R&D/Sales	0.0054	-0.0301***	0.0052	-0.0302***
	(0.0036)	(0.0091)	(0.0036)	(0.0091)
No R&D Reported	-0.0074	-0.0131**	-0.0072	-0.0130**
	(0.0052)	(0.0060)	(0.0052)	(0.0060)
M/B	0.0140***	-0.0110***	0.0138***	-0.0112***
	(0.0014)	(0.0024)	(0.0014)	(0.0024)
Tangible Assets	0.0268**	-0.0192	0.0302**	-0.0147
	(0.0121)	(0.0155)	(0.0120)	(0.0154)
Prior One-year Return	0.0053***	-0.0046**	0.0057***	-0.0042**
	(0.0014)	(0.0019)	(0.0014)	(0.0019)
Industry Leverage	-0.0641***	-0.1097***	-0.0701***	-0.1169***
	(0.0222)	(0.0262)	(0.0221)	(0.0261)
Profitability	-0.0289***	-0.0272*	-0.0306***	-0.0293*
	(0.0097)	(0.0152)	(0.0097)	(0.0152)
Constant	0.8007***	0.6697***	0.8132***	0.6902***
	(0.0491)	(0.0608)	(0.0491)	(0.0607)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Observations	67,700	67,700	67,700	67,700
R-squared	0.0702	0.0579	0.0697	0.0568
Number of gvkey	8,634	8,634	8,634	8,634

Table V. The Maturity of Debt Issuances

The table presents panel regressions explaining debt issuance with less than 4 years maturity (Models 1-3) and debt issuances of 5 years or more maturity (Models 3-6). See section II.A for the construction of the dependent variable. The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2004. All firm-level and macro-economic variables are also defined in section I and appendix B. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. Robust standard errors in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	$\Delta Debt < 4$			$\Delta Debt > 4$		
Moody's AP	0.0108	-0.0388	-0.0686**	-0.2928***	-0.3205***	-0.3058***
	(0.0123)	(0.0301)	(0.0310)	(0.0166)	(0.0405)	(0.0411)
Average M/B		-0.0441***	-0.0462***		0.0080	0.0137*
		(0.0062)	(0.0065)		(0.0082)	(0.0083)
5-yr Treasury Yield		-0.0006	-0.0002		0.0022***	0.0007
		(0.0004)	(0.0005)		(0.0005)	(0.0006)
C&I Rate Spread		0.0015	0.0071*		-0.0034	0.0091*
		(0.0035)	(0.0037)		(0.0046)	(0.0049)
Cay		0.0271	-0.0105		0.1569*	0.1429*
		(0.0605)	(0.0613)		(0.0834)	(0.0846)
Ind. Prod. Growth		-0.0011***	-0.0010***		-0.0007	-0.0006
		(0.0003)	(0.0003)		(0.0004)	(0.0004)
Cons. Growth		0.0003	0.0013		0.0050***	0.0063***
		(0.0008)	(0.0008)		(0.0010)	(0.0011)
Recession		-0.0042**	-0.0014		-0.0015	0.0026
		(0.0019)	(0.0020)		(0.0024)	(0.0025)
H-P Log GDP		0.1713	0.0385		-0.5945***	-0.8527***
		(0.1192)	(0.1305)		(0.1583)	(0.1751)
Term Spread		-0.0010*	-0.0015**		-0.0057***	-0.0073***
		(0.0006)	(0.0007)		(0.0008)	(0.0009)
High-Yield Spread		-0.0003	0.0002		0.0014***	0.0017***
		(0.0004)	(0.0004)		(0.0005)	(0.0005)
Pecking Order			-0.0149***			-0.0249***
			(0.0020)			(0.0030)
Size			-0.0164***			-0.0052***
			(0.0011)			(0.0015)
Age			0.0005**			-0.0006**
			(0.0002)			(0.0003)
Cash-flow Volatility			0.0045			-0.0049
			(0.0062)			(0.0071)
Dividend Payer			0.0078***			0.0110***
			(0.0017)			(0.0024)
Z-Score			-0.0022***			0.0087***
			(0.0007)			(0.0011)
R&D/Sales			-0.0012			0.0028
			(0.0017)			(0.0029)
No R&D Reported			-0.0055*			0.0033
			(0.0029)			(0.0040)

M/B			0.0036***			0.0067***
			(0.0006)			(0.0010)
Tangible Assets			-0.0037			0.0468***
			(0.0065)			(0.0088)
Prior One-year Return			-0.0017**			0.0046***
			(0.0008)			(0.0010)
Industry Leverage			-0.0154			-0.0403**
			(0.0119)			(0.0169)
Profitability			-0.0037			-0.0028
			(0.0051)			(0.0076)
Constant	0.0073	0.1128***	0.2137***	0.2519***	0.2394***	0.2116***
	(0.0105)	(0.0258)	(0.0275)	(0.0141)	(0.0350)	(0.0364)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	67,700	67,700	67,700	67,700	67,700	67,700
R-squared	0.0000	0.0023	0.0135	0.0048	0.0081	0.0227
Number of gvkey	8,634	8,634	8,634	8,634	8,634	8,634

Table VI. Rollover of Debt and Moody's AP

The table presents panel regressions explaining rollover decision by firms. See section II.A for the construction of the dependent variable. The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2004. All firm-level and macro-economic variables are also defined in section I and appendix B. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. Robust standard errors in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Variables	(1)	(2)	(3)
Moody's AP	-0.0656***	-0.0793	-0.1463***
	(0.0218)	(0.0547)	(0.0555)
Average M/B		0.0277***	0.0096
		(0.0086)	(0.0093)
5-yr Treasury Yield		-0.0025***	-0.0007
		(0.0006)	(0.0007)
C&I Rate Spread		0.0278***	0.0164***
		(0.0061)	(0.0062)
Cay		0.5848***	0.4728***
		(0.1373)	(0.1399)
Ind. Prod. Growth		0.0013***	0.0004
		(0.0005)	(0.0005)
Cons. Growth		0.0069***	0.0053***
		(0.0016)	(0.0015)
Recession		0.0114***	0.0065**
		(0.0027)	(0.0026)
H-P Log GDP		-0.6002***	-0.3589**
		(0.1896)	(0.1778)
Term Spread		-0.0049***	-0.0043***
		(0.0010)	(0.0010)
High-Yield Spread		-0.0009	-0.0000
		(0.0006)	(0.0006)
Pecking Order			0.0239***
			(0.0035)
Size			-0.0129***
			(0.0025)
Age			0.0022***
			(0.0004)
Cash-flow Volatility			-0.0051
			(0.0111)
Dividend Payer			-0.0027
			(0.0035)
Z-Score			0.0008
			(0.0013)
R&D/Sales			0.0033***
			(0.0012)
No R&D Reported			-0.0071
			(0.0064)
M/B			-0.0014

			(0.0009)
Tangible Assets			0.0624***
			(0.0127)
Prior One-year Return			0.0045***
			(0.0012)
Industry Leverage			0.0453*
			(0.0266)
Profitability			0.0305***
			(0.0082)
Constant	0.1216***	0.0495	0.1443***
	(0.0186)	(0.0426)	(0.0445)
Firm Fixed Effects	Yes	Yes	Yes
Observations	57,174	57,174	57,174
R-squared	0.0002	0.0076	0.0148
Number of gvkey	7,547	7,547	7,547

Table VII. Downgrades-to-Upgrades and Debt Issuance

The table presents panel regressions explaining the one-year change in debt (Models 1-3) and change in debt net of change in equity (Models 4-6). The dependent variables are defined in section II.A and appendix B. The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level variables are also defined in section I and appendix B. Industry Downgrades/Upgrades is Moody's number of downgrades divided by number of upgrades for any given cohort over the following 5 years, calculated for each industry (Fama-French 12-industry classification). Robust standard errors are in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	$\Delta Debt$			$\Delta Debt - \Delta Equity$		
Industry Downgrades/Upgrades	0.0019***	0.0004	0.0005**	0.0024***	0.0006*	0.0008**
	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Financing Deficit			-0.0636***			-0.0887***
			(0.0040)			(0.0055)
Size			-0.0472***			-0.0078***
			(0.0022)			(0.0027)
Age			0.0010***			0.0008**
			(0.0003)			(0.0003)
Cash-flow Volatility			-0.0006			0.0043
			(0.0080)			(0.0139)
Dividend Payer			0.0264***			0.0302***
			(0.0033)			(0.0038)
Z-Score			0.0199***			0.0336***
			(0.0014)			(0.0025)
R&D / Sales			0.0054			-0.0297***
			(0.0036)			(0.0091)
No R&D Reported			-0.0086			-0.0138**
			(0.0053)			(0.0061)
M/B			0.0138***			-0.0116***
			(0.0014)			(0.0024)
Tangible Assets			0.0292**			-0.0139
			(0.0121)			(0.0154)
Prior One-Year Return			0.0057***			-0.0045**
			(0.0014)			(0.0019)
Industry Leverage			-0.0647***			-0.1166***
			(0.0225)			(0.0265)
Profitability			-0.0304***			-0.0280*
			(0.0097)			(0.0153)
Constant	0.0238***	0.0566***	0.2386***	-0.0042***	0.0250***	0.0408**
	(0.0008)	(0.0039)	(0.0154)	(0.0009)	(0.0045)	(0.0189)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Observations	67,038	67,038	67,038	67,038	67,038	67,038
R-squared	0.0013	0.0163	0.0700	0.0012	0.0127	0.0584
Number of gvkey	8,603	8,603	8,603	8,603	8,603	8,603

Table VIII. AP Timing and Debt Pricing

The table presents panel regressions explaining the one-year change in debt net of change in equity. The dependent variables are defined in section II.A and appendix B. The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level and macroeconomic-level variables are the same as in table II. In panel A, we present the first stage regressions, where we predict Moody's AP using excess bond premia. In model 1, $\widehat{AP}_1$ is the predicted value of Moody's 5-year average position on negative *ebp*, which equals the excess bond premium constructed in Gilchrist and Zakrajek (2012) when the realized spread is below the fundamental spread and zero otherwise. In model 2, $\widehat{AP}_2$ is the predicted value of AP using negative *ebp* orthogonal to MMMF (the Money Market Mutual Funds Flow published by the Federal Reserve Board) and ROA (the financial sector aggregate return on assets). Robust standard errors are in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel A	(1)	(2)
Variables	AP	AP
EBP	0.0719**	
	(0.0316)	
Adjusted EBP		0.0741*
		(0.0392)
Constant	0.863***	0.861***
	(0.0084)	(0.0085)
R-squared	0.214	0.159
Panel B		
Variables	$\Delta Debt - \Delta Equity$	$\Delta Debt - \Delta Equity$
$\widehat{AP}_1$	-1.6954***	
	(0.6377)	
$\widehat{AP}_2$		-1.2990**
		(0.5780)
Average M/B	-0.1889***	-0.1569***
	(0.0549)	(0.0500)
5-yr Treasury Yield	0.0007	-0.0020
	(0.0046)	(0.0043)
C&I Rate Spread	0.0711**	0.0531*
	(0.0318)	(0.0290)
Cay	-0.2205	0.0337
	(0.3979)	(0.4144)
Ind. Prod. Growth	-0.0030	-0.0034
	(0.0030)	(0.0030)
Cons. Growth	0.0201***	0.0159**
	(0.0073)	(0.0066)
Recession	0.0281*	0.0172
	(0.0162)	(0.0145)
H-P Log GDP	-2.4126**	-2.0324*
	(1.1045)	(1.0584)
Term Spread	-0.0119**	-0.0120**
	(0.0049)	(0.0049)
High-Yield Spread	-0.0046	-0.0066**
	(0.0030)	(0.0028)
Firm controls	Yes	Yes
Firm Fixed Effects	Yes	Yes
Observations	65,125	65,125
R-squared	0.0572	0.0569

Number of gvkey	8,405	8,405

Table IX. Cash Holdings

The table presents panel regressions explaining cash holdings (as defined in section II.E and appendix B). The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level and macroeconomic-level variables are defined in section I and appendix B. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. CF/TA, NWC/TA, Debt/TA and INV/TA are winsorized at 1%. Robust standard errors in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)
Variables			
Moody's AP	-0.106***	-0.150***	-0.151***
	(0.0160)	(0.0322)	(0.0324)
Average M/B		-0.0045	-0.0002
		(0.0057)	(0.0058)
5-yr Treasury Yield		0.0023***	0.0012***
		(0.0004)	(0.0004)
C&I Rate Spread		-0.0011	0.0067**
		(0.0032)	(0.0033)
Cay		-0.557***	-0.656***
		(0.0615)	(0.0614)
Ind. Prod. Growth		-0.0018***	-0.0017***
		(0.0003)	(0.0003)
Consumption Growth		-0.0039***	-0.0019**
		(0.0009)	(0.0009)
Recession		-0.0037**	0.0013
		(0.0016)	(0.0017)
HP Filtered Log GDP		-0.272**	-0.659***
		(0.123)	(0.125)
Term Spread		0.0025***	-0.0004
		(0.0006)	(0.0006)
High-Yield Spread		0.0006	0.0010***
		(0.0004)	(0.0004)
Cash-flow Volatility			0.0198***
			(0.0077)
M/B			0.0091***
			(0.0010)
Log Sales			-0.0193***
			(0.0016)
CF/TA			0.0696***
			(0.0085)
NWC(No Cash)/TA			-0.0069
			(0.0051)
Debt/TA			-0.0416***
			(0.0040)
Investment/TA			-0.0475***
			(0.0042)
R&D/Sales			0.0117***
			(0.0041)
Dividend Payer			-0.0030
			(0.0021)
Constant	0.220***	0.266***	0.351***
	(0.0136)	(0.0290)	(0.0298)
Firm Fixed Effects	Yes	Yes	Yes
Observations	67,700	67,700	65,151
R-squared	0.001	0.011	0.058
Number of gvkey	8,634	8,634	8,426

Table X. Investment: Capital Expenditures

The table presents panel regressions explaining capital expenditures (as defined in section II.E and appendix B). The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level and macroeconomic-level variables are defined in section I and appendix B. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. Robust standard errors in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)
Variables			
Moody's AP	-0.170***	-0.178***	-0.173***
	(0.0126)	(0.0315)	(0.0310)
Average M/B		-0.0175***	-0.0164***
		(0.0055)	(0.0054)
5-yr Treasury Yield		0.0021***	0.0020***
		(0.0003)	(0.0003)
C&I Rate Spread		-0.0345***	-0.0296***
		(0.0038)	(0.0038)
Cay		0.193***	0.207***
		(0.0571)	(0.0560)
Ind. Production Growth		0.0010***	0.0002
		(0.0003)	(0.0003)
Consumption Growth		-0.0026***	-0.0028***
		(0.0008)	(0.0007)
Recession		-0.0034***	-0.0052***
		(0.0013)	(0.0013)
H-P Log GDP		0.551***	0.591***
		(0.0984)	(0.0973)
Lag H-P Log GDP		-0.689***	-0.540***
		(0.0936)	(0.0925)
Term Spread		-0.0040***	-0.0024***
		(0.0009)	(0.0009)
High-Yield Spread		0.0017***	0.0018***
		(0.0005)	(0.0005)
M/B			0.0156***
			(0.0009)
Profitability			0.0603***
			(0.0046)
Constant	0.223***	0.297***	0.252***
	(0.0107)	(0.0321)	(0.0314)
Firm Fixed Effects	Yes	Yes	Yes
Observations	66,716	66,716	66,716
R-squared	0.003	0.025	0.058
Number of gvkey	8,588	8,588	8,588

Table XI. Investment: Acquisitions

The table presents panel regressions explaining Cash Acquisition decisions (as defined in section II.E and appendix B). The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level and macroeconomic-level variables are defined in section I and appendix B. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. Robust standard errors in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)
Variables			
Moody's AP	-0.243***	-0.299***	-0.290***
	(0.0176)	(0.0542)	(0.0546)
Average M/B		-0.0476***	-0.0468***
		(0.0103)	(0.0103)
5-yr Treasury Yield		-0.0008	-0.0010*
		(0.0006)	(0.0006)
C&I Rate Spread		-0.0074	-0.0040
		(0.0063)	(0.0064)
Cay		-0.107	-0.0909
		(0.115)	(0.114)
Ind. Prod. Growth		-0.0014**	-0.0018***
		(0.0006)	(0.0006)
Cons. Growth		0.0035***	0.0035***
		(0.0013)	(0.0013)
Recession		-0.0053**	-0.0063**
		(0.0025)	(0.0025)
H-P Log GDP		-0.686***	-0.676***
		(0.174)	(0.174)
Lag H-P Log GDP		-0.154	-0.0561
		(0.132)	(0.132)
Term Spread		-0.0090***	-0.0080***
		(0.0014)	(0.0014)
High-Yield Spread		0.0009	0.0009
		(0.0006)	(0.0007)
M/B			0.0089***
			(0.0017)
Profitability			0.0483***
			(0.0069)
Constant	0.240***	0.370***	0.338***
	(0.0150)	(0.0489)	(0.0480)
Firm Fixed Effects	Yes	Yes	Yes
Observations	64,866	64,866	64,866
R-squared	0.003	0.005	0.010
Number of gvkey	8,585	8,585	8,585

Table XII. Robustness: Net Debt Issuance and AP Dynamics

The table presents panel regressions explaining the change in debt net of change in equity (as defined in section III and appendix B). The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level and macroeconomic-level variables are defined in section I and appendix B. FF12 AP is Moody's 5-year average position calculated at the industry level, according to the Fama-French 12 industries classification. Robust standard errors in parenthesis. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)
Variables			
AP(t+1)		0.3695***	0.2656**
		(0.0925)	(0.1156)
AP	-0.5609***	-0.4864***	-0.3041**
	(0.0661)	(0.1268)	(0.1310)
AP(t-1)		-0.2743***	-0.1275
		(0.1031)	(0.1221)
AP(t-2)			-0.2871***
			(0.0843)
Average M/B	-0.1413***	-0.0892***	-0.0729***
	(0.0135)	(0.0258)	(0.0270)
5-yr Treasury Yield	-0.0051***	-0.0050***	-0.0054***
	(0.0011)	(0.0012)	(0.0015)
C&I Rate Spread	0.0474***	0.0492***	0.0579***
	(0.0078)	(0.0119)	(0.0151)
Cay	0.2901*	0.3941	0.6770*
	(0.1356)	(0.2997)	(0.3691)
Ind. Prod. Growth	-0.0062***	-0.0054***	-0.0043***
	(0.0008)	(0.0010)	(0.0011)
Cons. Growth	0.0109***	0.0141***	0.0138***
	(0.0017)	(0.0028)	(0.0033)
Recession	0.0052	-0.0059	0.0024
	(0.0040)	(0.0056)	(0.0071)
H-P log GDP	-1.1210***	-1.1988***	-1.1472***
	(0.2715)	(0.3973)	(0.4160)
Term Spread	-0.0118***	-0.0031	0.0004
	(0.0014)	(0.0026)	(0.0029)
High-Yield Spread	-0.0024***	-0.0026*	-0.0060***
	(0.0009)	(0.0014)	(0.0018)
Pecking Order	-0.0882***	-0.0858***	-0.0908***
	(0.0055)	(0.0067)	(0.0075)
Size	-0.0068**	-0.0075**	-0.0106***
	(0.0027)	(0.0034)	(0.0036)
Age	-0.0009*	-0.0003	-0.0003
	(0.0005)	(0.0006)	(0.0006)
Cash-flow Volatility	0.0045	0.0060	-0.0039
	(0.0137)	(0.0157)	(0.0170)
Dividend Payer	0.0300***	0.0307***	0.0330***
	(0.0038)	(0.0049)	(0.0053)
Z-Score	0.0339***	0.0458***	0.0480***
	(0.0025)	(0.0036)	(0.0040)
R&D/Sales	-0.0302***	-0.0318**	-0.0275*
	(0.0091)	(0.0135)	(0.0163)
No R&D Reported	-0.0132**	-0.0107	-0.0106
	(0.0060)	(0.0071)	(0.0076)
M/B	-0.0110***	-0.0100***	-0.0063**
	(0.0024)	(0.0028)	(0.0029)
Tangible Assets	-0.0150	-0.0052	0.0195
	(0.0154)	(0.0193)	(0.0214)

Prior one-year return	-0.0043**	-0.0066***	-0.0077***
	(0.0019)	(0.0023)	(0.0025)
Industry Leverage	-0.1163***	-0.1048***	-0.0691**
	(0.0262)	(0.0306)	(0.0319)
Profitability	-0.0293*	-0.0601***	-0.0723***
	(0.0152)	(0.0196)	(0.0226)
Constant	0.6763***	0.3961***	0.4179***
	(0.0596)	(0.0964)	(0.1048)
Observations	67,700	48,478	41,175
R-squared	0.0566	0.0630	0.0661
Number of gvkey	8,634	6,600	5,791

Table XIII. Robustness: Double Clustering

The table presents panel regressions explaining the one-year change in debt (Models 1-3), change in equity (model 4) and change in debt net of change in equity (Models 5-6). The dependent variables are defined in section II.A and appendix B. The sample consists of all non-financial and non-utility firms in the Compustat database from 1983 to 2005. All firm-level and macroeconomic-level variables are also defined in section I and appendix B. AP is Moody's 5-year average position, a measure of the accuracy of a given year's bond ratings over the following 5 years. Robust standard errors are in parenthesis and are clustered at the firm and year level. *** indicates $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)	
Variables	$\Delta Debt$			$\Delta Equity$	$\Delta Debt - \Delta Equity$		
Moody's AP	-0.4300***	-0.5399***	-0.5914***	0.1332	-0.6878***	-0.5957***	
	(0.1041)	(0.1085)	(0.0898)	(0.1176)	(0.2088)	(0.1778)	
Industry d2u							0.0019**
							(0.0008)
Average M/B		-0.0644***	-0.0757***	0.0911***	-0.1518***	-0.1568***	-0.1125***
		(0.0246)	(0.0204)	(0.0218)	(0.0465)	(0.0372)	(0.0334)
5-yr Treasury Yield		-0.0002	-0.0007	0.0026***	0.0000	-0.0044***	-0.0062***
		(0.0010)	(0.0011)	(0.0009)	(0.0019)	(0.0016)	(0.0016)
C&I Rate Spread		0.0065	0.0027	-0.0387***	0.0090	0.0216	-0.0156
		(0.0092)	(0.0084)	(0.0113)	(0.0180)	(0.0148)	(0.0136)
Cay		0.5629***	0.4636***	-0.3743	0.2832	0.3438	-0.2837
		(0.1686)	(0.1663)	(0.2842)	(0.3893)	(0.3662)	(0.3028)
Ind. Prod. Growth		-0.0032**	-0.0044***	0.0023**	-0.0086***	-0.0076***	-0.0076***
		(0.0013)	(0.0013)	(0.0010)	(0.0024)	(0.0019)	(0.0018)
Cons. Growth		0.0075***	0.0075***	-0.0044	0.0039	0.0076**	0.0023
		(0.0021)	(0.0018)	(0.0030)	(0.0043)	(0.0034)	(0.0027)
Recession		-0.0137***	-0.0163***	-0.0144***	-0.0117*	-0.0079	-0.0130***
		(0.0036)	(0.0029)	(0.0054)	(0.0069)	(0.0054)	(0.0050)
H-P Log GDP		-0.2888	-0.3709	0.6308*	-0.0837	-0.6453	-0.2141
		(0.3121)	(0.2660)	(0.3743)	(0.6593)	(0.4811)	(0.4403)
Term Spread		-0.0104***	-0.0122***	-0.0029	-0.0084**	-0.0110***	-0.0096***
		(0.0018)	(0.0014)	(0.0022)	(0.0039)	(0.0030)	(0.0030)
High-Yield Spread		0.0004	0.0019*	0.0044***	-0.0011	-0.0030	-0.0072***
		(0.0011)	(0.0010)	(0.0014)	(0.0021)	(0.0020)	(0.0016)
Pecking Order			-0.0082	0.0104***		-0.0269***	-0.0268***
			(0.0051)	(0.0024)		(0.0063)	(0.0063)
Size			-0.0000	-0.0065***		0.0069***	0.0069***
			(0.0006)	(0.0008)		(0.0007)	(0.0007)
Age			-0.0006***	-0.0003***		-0.0002***	-0.0002**
			(0.0001)	(0.0001)		(0.0001)	(0.0001)
Cash-flow Volatility			0.0103***	0.0106		0.0000	0.0002
			(0.0037)	(0.0067)		(0.0071)	(0.0071)
Dividend Payer			0.0089***	-0.0006		0.0099***	0.0097***
			(0.0019)	(0.0021)		(0.0029)	(0.0029)
Z-Score			0.0009	-0.0106***		0.0143***	0.0143***
			(0.0008)	(0.0009)		(0.0013)	(0.0013)
R&D/Sales			0.0083***	0.0630***		-0.0425***	-0.0422***
			(0.0026)	(0.0090)		(0.0076)	(0.0076)
No R&D Reported			-0.0119***	-0.0050***		-0.0056**	-0.0059**

			(0.0017)	(0.0016)		(0.0025)	(0.0028)
M/B			0.0083***	0.0210***		-0.0142***	-0.0143***
			(0.0010)	(0.0029)		(0.0028)	(0.0028)
Tangible Assets			0.0178**	0.0143***		0.0053	0.0067
			(0.0072)	(0.0044)		(0.0084)	(0.0084)
Prior one-year return			0.0160***	0.0248***		-0.0050*	-0.0056**
			(0.0026)	(0.0029)		(0.0027)	(0.0026)
Industry Leverage			0.0684***	-0.0067		0.0722***	0.0712***
			(0.0146)	(0.0086)		(0.0165)	(0.0162)
Profitability			0.0429***	-0.0952***		0.1258***	0.1271***
			(0.0108)	(0.0217)		(0.0171)	(0.0171)
Constant	0.3965***	0.5519***	0.5843***	-0.1398	0.7854***	0.6637***	0.2099***
	(0.0904)	(0.1159)	(0.0985)	(0.0952)	(0.2125)	(0.1679)	(0.0779)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	67,700	67,700	67,700	57,174	67,700	67,700	67,038
R-squared	0.0056	0.0142	0.0336	0.1915	0.0104	0.0922	0.0920
Number of gvkey	8,634	8,634	8,634	8,634	8,634	8,634	

Appendix A: Variable Definitions

Variables are defined by their Compustat mnemonics, in capital letters.

Variable	Definition
Cash Acquisitions	AQC/AT(t-1)
Cash Holdings	CHE/AT
Cash Flow Volatility	std dev(Profitability) over years $t-1$ up to $t-10$
Capex	CAPX/AT(t-1)
Chg in Debt	$[Debt(t) - Debt(t-1)]/AT(t-1)$
Chg in Equity	$(SSTK - PRSTKC)/AT(t-1)$
Chg in Debt, Net	Chg in Debt − Chg in Equity
Debt	DLTT + DLC
Dividend Payer	$I[DV(t-1) > 0]$
Firm Size	$ln(AT * ConsumerPriceIndex(CPI)deflator)$
Firm Age	number of years since first observation in Compustat
Pecking Order	Investment – Cash + Debt; as in Leary and Roberts (2010)
Industry Leverage	$median(Book\ Leverage(t-1))$, among firms in the same two–digit SIC group
Investment	$= CAPX + IVCH + AQC + FUSEO - SPPE - SIV$ format code 1, 2 and 3 $= IVCH - SIV + CAPX - SPPE + AQC - IVACO$ format code 7
Marginal Tax Rate	Before–financing MTR, kindly provided by John Graham, (http://faculty.fuqua.duke.edu/jgraham/taxform.html)
Market-to-Book	$(AT - BookEquity + (PRCC\_F * CSHO))/AT$
Profitability	$IB + XINT + TXT/AT(t-1)$
RD / Sales	$XRD/SALE$ (set to zero if XRD missing)
RDD	$I[RD/Sales = 0]$
Size-Age Fin. Const.	Dummy to indicate bottom quartile of Hadlock and Pierce (2012) Size-Age index.
Stock Return	$(PRCC\_F/(lag(PRCC\_F) * (AJEX/lag(AJEX)))) - 1$
Tangible Assets	$PPENT/AT$
Total Assets	AT
Z–Score	$[3.3 * (IB + XINT + TXT)$ $+SALE + 1.4 * RE + 1.2 * (ACT - LCT)]/AT$

Appendix B Table: The Effect of Overvaluation on Moody's AP Specifications

In this table we demonstrate numerical examples of the extent to which Moody's AP captures the accuracy of the ratings. Using historical default probabilities for each Moody's rating category at origin (see Altman's website) as our benchmark case, we calibrate the effect of ratings on AP. We compute AP following the method used by Moody's, which is the sum of the number of defaults in each rating category times the position of credits in that category all divided by the total number of defaulting credits, i.e., the average default position (AP). Panel A, examines two types of potential mistakes. The assumed effect of the Moody's mistake is to shift 10% of the issuances in each rating category to the category above or below. Furthermore, this mistake uniformly affects the population of issuances. Panel A shows that either type of mistake lowers the AP . Panel B examines less verses more accurate ratings. In Panel B the mistake moves 10% of the credits that default up a rating category while simultaneously moving the same number of credits that do not default down a rating category (this holds the total number of credits in a rating category constant and is unambiguously a worse set of ratings.) In the more accurate example, 10% of the credits that ultimate default are given a lower rating, while simultaneously moving the same number of credits that do not default up a rating category (this is unambiguously a better set of ratings). One can look at many different examples, but in general any time credits that ultimately default are given higher ratings the AP falls.

Panel A: Assumes 10% of issues in each rating category moves up or down, both are less accurate than baseline.

	Baseline					Less Accurate = Too High Ratings					Less Accurate = Too Low Ratings				
10%	Issuances	Def Prob	Defaults	Position	D x P	Issuances	Def Prob	Defaults	Position	D x P	Issuances	Def Prob	Defaults	Position	D x P
Aaa	1000	0.10%	1.000	7%	0.071	1100	0.11%	1.18	8%	0.093	900	0.10%	0.90	6%	0.058
Aa	1000	0.18%	1.800	21%	0.386	1000	0.21%	2.09	23%	0.478	1000	0.17%	1.72	20%	0.344
A	1000	0.47%	4.700	36%	1.679	1000	0.62%	6.17	37%	2.292	1000	0.44%	4.41	34%	1.512
Baa	1000	1.94%	19.400	50%	9.700	1000	2.77%	27.68	51%	14.235	1000	1.79%	17.93	49%	8.709
Ba	1000	10.22%	102.200	64%	65.700	1000	11.88%	118.77	66%	78.049	1000	9.39%	93.92	63%	59.035
B	1000	26.79%	267.900	79%	210.493	1000	29.37%	293.73	80%	234.984	1000	25.13%	251.33	77%	193.883
C	1000	52.62%	526.200	93%	488.614	900	52.62%	473.58	94%	443.136	1100	50.27%	552.99	92%	509.541
Total or Avg	7000		923.2		AP 0.841	7000		923.2		AP 0.838	7000		923.20		AP 0.837

Panel B: Less Accurate Vs More Accurate - Assumes 10% of defaulters in each rating category moves up (Less Accurate) or down (More Accurate) replaced by nondefaulters

	Baseline					Less Accurate = Defaulters Up - Nondefaulters Down					More Accurate = Defaulters Down - Nondefaulters Up				
10%	Issuances	Def Prob	Defaults	Position	D x P	Issuances	Def Prob	Defaults	Position	D x P	Issuances	Def Prob	Defaults	Position	D x P
Aaa	1000	0.10%	1.00	7%	0.071	1000	0.12%	1.18	7%	0.084	1000	0.09%	0.90	7%	0.064
Aa	1000	0.18%	1.80	21%	0.386	1000	0.21%	2.09	21%	0.448	1000	0.17%	1.72	21%	0.369
A	1000	0.47%	4.70	36%	1.679	1000	0.62%	6.17	36%	2.204	1000	0.44%	4.41	36%	1.575
Baa	1000	1.94%	19.40	50%	9.700	1000	2.77%	27.68	50%	13.840	1000	1.79%	17.93	50%	8.965
Ba	1000	10.22%	102.20	64%	65.700	1000	11.88%	118.77	64%	76.352	1000	9.39%	93.92	64%	60.377
B	1000	26.79%	267.90	79%	210.493	1000	29.37%	293.73	79%	230.788	1000	25.13%	251.33	79%	197.474
C	1000	52.62%	526.20	93%	488.614	1000	47.36%	473.58	93%	439.753	1000	55.30%	552.99	93%	513.491
Total or Avg	7000		923.20		AP 0.841	7000		923.20		AP 0.827	7000		923.20		AP 0.847

Def Prob = Default Probability - is the historical default probability for each rating category from Moody's at origin from Altman's website.