The Composition and Priority of Corporate Debt: Evidence from Fallen Angels*

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Abstract

We examine the composition and priority structure of corporate debt for firms downgraded from investment grade to speculative grade. Our findings demonstrate the importance of recognizing debt heterogeneity in capital structure studies, and they support theoretical models in which debt structure is set to encourage bank monitoring. Firms experience dramatic changes in debt structure after a downgrade, despite maintaining similar leverage ratios. Post-downgrade, there is a sharp reduction in both bank and non-bank discretionary sources of debt finance, such as revolving credit facilities, commercial paper, and medium-term notes. Firms "spread" the priority structure after credit quality deterioration: While most debt is at the senior unsecured priority level before the downgrade, firms sharply increase their use of both secured bank debt and subordinated private placements and convertibles after the downgrade. Post-downgrade, the relative monitoring intensity of bank versus non-bank debt sharply increases.

Corporate debt is characterized by heterogeneity. Indeed, most corporations obtain debt from both bank and non-bank sources, and structure their debt claims into priority classes with a variety of conditions and restrictions. While a large body of theoretical research explores the optimal composition and priority of corporate debt for different types of firms, the grand majority of empirical capital structure research continues to treat corporate debt as uniform. As a result, there are few empirical studies that examine why firms simultaneously use different types, sources, and priorities of corporate debt.

This study attempts to answer two questions regarding debt structure: First, how do firms structure their debt? Second, what existing theory best explains why firms simultaneously use different types, sources, and priorities of debt? To answer these questions, we examine the debt composition and priority of "fallen angels," which we define as firms that have their debt downgraded from investment grade to speculative grade by Moody's Investors Services. Our focus on variation in credit quality follows directly from extant theoretical research in which credit quality is the primary source of variation driving a firm's optimal debt structure (e.g., Diamond (1991) and Bolton and Freixas (2000)). By investigating fallen angels, we are able to isolate specific variation in credit quality that is explained in detail in the credit rating agencies' reports. This information allows us to assess the precise relation between credit quality and debt structure.

Our analysis employs a novel data set that records the source, type, and priority of every balance-sheet debt instrument for fallen angels from two years before to two years after the downgrade. These data are collected directly from financial footnotes in firms' annual 10-K SEC filings and supplemented with information on pricing and covenants from three origination-based datasets: Reuters LPC's *Dealscan*, Mergent's *Fixed Income Securities Database*, and Thomson's *SDC Platinum*. To our knowledge, this data set is one of the most comprehensive sources of information on the debt structure of a sample of public firms: It contains the detailed composition of the stock of corporate debt on the balance sheet, which goes far beyond what is available from origination-based datasets alone.

We begin our analysis by showing the importance of recognizing debt heterogeneity in capital structure studies. We show that 95% of firms in our sample simultaneously use bank and non-bank debt,

and bank debt accounts for a substantial fraction of firm capital structure. In addition, we show that a unique focus on leverage ratios misses important variation in capital structure decisions. For example, more than half of the firm-year observations in our sample maintain a relatively constant debt level with respect to the previous year. However, among these firm-year observations with constant debt levels, more than 30% experience major adjustments in the composition of their debt. This variation in debt structure would be missed in studies that focus solely on leverage ratios.

We then empirically assess the relationship between credit quality and debt structure. We find that downgraded firms experience a sharp reduction in the availability of "discretionary" debt financing, such as commercial paper, medium-term notes, and bank revolving credit facilities.[1] For example, using firm-fixed effects regressions, we show that bank revolvers as a fraction of total assets drop by 0.045, which is more than a 30% effect evaluated at the mean. The reduction in discretionary public debt (commercial paper and medium-term notes) is even more dramatic: post-downgrade, firms reduce discretionary public debt by almost 70% when evaluated at the mean. These findings suggest that firms face reduced availability of *both* bank and non-bank discretionary sources of debt financing.

Our evidence on the use of bank versus non-bank debt after the downgrade is mixed. Total bank debt capacity—the sum of term bank debt and the used and unused portion of revolvers—declines after the downgrade. However, the decline in total bank debt capacity is driven by the large decrease in unused revolvers. In contrast, bank term debt and the used revolvers slightly increase, especially in the year of the downgrade. In terms of non-bank debt, we find strong evidence that firms begin issuing more Rule 144A private placements and convertible debt. For example, as a fraction of assets, private placements and convertibles increase by almost 0.04 after the downgrade, which represents almost 50% at the mean. Our results suggest that the most important change in debt composition is not a shift from non-bank to bank debt, but a shift away from more discretionary sources of debt financing.

[1] These types of debt are "discretionary" in the sense that the borrower has a relatively large degree of discretion or latitude in quickly accessing additional debt financing.

We then examine how the priority of debt changes following a downgrade. We document a "spreading" of the priority structure: while most debt is at the senior unsecured priority before the downgrade, both secured and subordinated debt increase sharply after an angel falls. In other words, a substantial fraction of firms that experience a downgrade subsequently issue debt that is senior and debt that is junior to their existing debt. The fraction of total debt that is secured and the fraction that is subordinated rise by 0.15 and 0.07, respectively, while the number of firms that simultaneously use subordinated and secured debt quadruples. The increase in secured debt is driven primarily by an increase in secured bank debt, whereas the increase in subordinated debt is driven primarily by an increase in subordinated private placements and convertibles. Our findings demonstrate that many firms move to an equilibrium after the downgrade which consists of *simultaneously* using *both* senior secured bank debt and junior subordinated non-bank debt.

Finally, we examine the change in relative monitoring intensities of various creditors after the downgrade. To assess monitoring intensity, we rely on the large theoretical and empirical literature showing that covenants are a primary measure through which creditors monitor borrower activity (e.g., Diamond (1991), Rajan and Winton (1995), and Nini, Smith, and Sufi (2007)). We find a sharp increase in bank monitoring intensity relative to non-bank debt monitoring intensity. For example, bank debt after the downgrade is more likely to contain restrictive covenants, such as dividend and capital expenditure restrictions. Relative to two years before the downgrade, a firm's likelihood of violating a bank financial covenant increases by 15 percentage points after the downgrade. The frequency of bond covenants also increases, but the increase is isolated to restrictions on equity transactions and asset sales. In fact, the incidence of bond covenants restricting secured debt issuance and sale-leaseback transactions decreases following the downgrade.

The richness of our results allows us to assess existing theories explaining *why* firms structure their debt into multiple priority classes from different sources. Any such theory must be consistent with our core finding: after a downgrade, firms simultaneously increase their use of secured bank debt with tight covenants and increase their use of subordinated private placements and convertibles with weaker

covenants. Of the existing models, the findings appear most consistent with the predictions of Park (2000). His model shows that when the threat of asset substitution is severe, banks' monitoring incentives are maximized when there are multiple priorities of debt with bank debt having the first claim. Our results on the spreading of the priority structure and the tightening of bank covenants suggest that one of the primary purposes for issuing multiple debt claims with different priorities is to increase banks' incentives to monitor.

Our findings may at first appear to contradict models in which firms move from non-bank to bank debt after credit quality deterioration (Diamond (1991), Chemmanur and Fulghieri (1994), Bolton and Freixas (2000)). However, the models are not about bank debt *per se*, but about debt with a monitoring function. While we find that total bank debt capacity declines after the downgrade, the fraction of borrowers that use monitored bank debt with tight covenants increases. Our findings are therefore consistent with the hypothesis that firms switch from *unmonitored* to *monitored* bank debt after credit quality deterioration.

While there are existing empirical studies on debt composition (Barclay and Smith (1995), Houston and James (1996, 2001), Johnson (1997), Cantillo and Wright (2000), Hadlock and James (2002), Denis and Mihov (2003), and Gomes and Phillips (2005)), we believe that our core findings are novel in this literature. To our knowledge, we are the first to document that after deterioration in credit quality, firms decrease both bank and non-bank discretionary debt financing and "spread" the priority of their debt structure. We are also the first to examine how monitoring and covenants are related to debt priority. We document for the first time the simultaneous increase in secured bank debt with tight covenants and subordinated non-bank debt with weak covenants after credit quality deterioration, and we analyze these findings in the context of models that relate debt structure to bank monitoring incentives.

In addition, our findings represent an important contribution to the broader corporate finance literature on two dimensions. First, as mentioned above, our findings suggest that the uniform treatment of debt in capital structure studies misses important variation in security issuance decisions. Second, our findings help explain the difference between bank and non-bank debt recovery rates in bankruptcy

(Hamilton and Carty (1999), Carey and Gordy (2007)). According to Standard & Poor's, bank debt recovery rates are 75% whereas senior unsecured bonds recover only 37%. Our findings suggest that one can trace the bank debt recovery premium to the moment when firms move from investment grade to speculative grade debt ratings. It is at this point that banks become secured and increase the use of control-oriented covenants, both of which are likely to increase recovery rates in the event of bankruptcy.

The rest of the paper proceeds as follows. The next section presents the data and summary statistics. Section II provides the theoretical motivation for our study. Section III presents the results, and Section IV concludes.

I. Data, Summary Statistics, and the Importance of Debt Heterogeneity

A. Data

We begin with a sample of all non-financial U.S. public firms that are downgraded from investment grade (Baa3 or better) to speculative grade (Ba1 or worse) by Moody's Investors Services at some point from 1996 through 2005.[2] We restrict our sample to downgrades after 1996 given that the SEC mandated electronic submission of SEC filings in this year, and the availability of electronic filings significantly reduces the cost of our data collection process described below. We require that sample firms have the following *Compustat* data available in the year before and after the downgrade: the market-to-book-ratio, total sales, EBITDA, tangible assets, cash balances, and long- and short-term debt. Our initial sample consists of 149 firms that meet these criteria.

While the number of fallen angels may appear small, our sample size is consistent with the observation that few firms have credit ratings (Faulkender and Petersen (2005)). On average, there are approximately 1,000 non-financial firms per year in the *Compustat* universe that have an S&P issuer credit rating. We find 152 firms that are downgraded from investment grade to speculative grade using

[2] The specific rating on which we focus is the "estimated senior rating," which is a firm-level credit rating for a hypothetical senior unsecured debt obligation of the firm. If the firm has an outstanding rated senior unsecured issue, then the rating on the issue is the most important input into Moody's senior rating. This rating is Moody's measure of fundamental credit risk, and is the most commonly referred to credit rating in Moody's press releases.

the S&P issuer credit rating available in *Compustat*, which suggests that our sample captures most firms downgraded from investment grade to speculative grade.

We make the following three additional restrictions to our sample of fallen angels. First, we exclude firms that file for Chapter 11 bankruptcy in the year of the downgrade (6 firms), given that the pre-petition debt is not included in *Compustat* debt figures after the firm enters bankruptcy proceedings. Second, we exclude firms for which the debt financial footnotes do not provide sufficient detail on debt issues (5 firms). Third, we exclude firms that have over 50% of their debt issued by financial subsidiaries two years before the downgrade (5 firms). This latter restriction is made given that our focus is on debt of non-financial firms, and the behavior of firms with large financial subsidiaries may be significantly different following the downgrade. Our final sample includes 133 fallen angels.

For these 133 firms, we construct two data sets. The first data set is a *balance sheet issue level* data set, which is constructed by examining the debt financial footnotes contained in the annual report of the firms' 10-K SEC filings for two fiscal years before through two fiscal years after the downgrade. The data on each individual outstanding debt issue are available given two SEC regulations. Regulation S-X requires firms to detail their long-term debt instruments. Regulation S-K requires firms to discuss their liquidity, capital resources, and results of operation.[3] As a result of these regulations, firms detail their long-term debt issues and bank revolving credit facilities. Firms often also provide information on notes payable within a year.

While the debt financial footnotes typically list each individual debt issue, there is often insufficient information to categorize the issue. For example, an issue labeled "9.5% notes due 2004" could be medium-term notes, public debt, term bank debt, or a private placement. To aid in the categorization of balance sheet debt issues, we construct a second data set, which is an *origination issue level* data set for these 133 firms using *Dealscan* for syndicated and sole-lender bank loans and *SDC Platinum* for private placements and public debt issues. This origination issue level data set consists of 669 new bank loans and 496 non-bank debt issues for a total of 1,165 issues for 130 of our 133

[3] See Johnson (1997), Kaplan and Zingales (1997), and Sufi (2007b) for more discussion on these regulations.

borrowers. We cross-check the balance sheet issue level data with the origination issue level data when there is any doubt on the type of a particular debt instrument in the financial footnotes.

Using the descriptions in the 10-K financial footnotes and the originations in *SDC Platinum* and *Dealscan*, we classify each debt issue discussed in the debt financial footnotes into one of 8 broad categories:

(1) *Arm's length program debt*: Consists of commercial paper and medium term notes (MTNs).[4] These programs are often exempt from SEC registration requirements, and thus constitute "program" debt.

(2) *Arm's length non-program debt:* Consists of public debt issues, industrial revenue bonds, and debt due to previously acquired companies.

(3) *Private placements:* Consists of both Rule 144A and non-Rule 144A privately placed debt issues[5], and ambiguous notes or debentures which we cannot match to *SDC Platinum*. We label the latter group "likely" private placements. While Rule 144A private placements are typically exempt from SEC registration requirements, they are often registered shortly after issuance. As a result, they tend to be similar to public bonds (Fenn (2000), Gomes and Phillips (2005)).

(4) *Bank debt:* Consists of two main categories. (i) Revolving bank debt, which includes committed revolving credit facilities or lines of credit. The total unused capacity of revolving credit facilities is reduced by outstanding borrowings, commercial paper, and letters of credit;[6] and (ii) Term bank debt, which includes term loans, bank overdrafts, and borrowings on uncommitted lines of credit.

(5) *Mortgage or equipment debt*: Consists of mortgage bonds, mortgage loans, equipment trust certificates, and other equipment based debt.

(6) *Convertible debt*

(7) *Collateralized leases*

(8) *Unclassified debt*

In the data appendix, we provide two examples of the data collection process and how we place debt issues into one of the above categories.

[4] Although shelf debt is also program debt, it is often not distinguished from non-shelf debt in debt financial footnotes. As a result, we cannot distinguish shelf versus non-shelf public debt.
[5] Rule 144A is an SEC rule that entered into effect in 1990 and allowed qualified institutional buyers to trade amongst themselves in unregistered securities which they initially acquired in a private placement.
[6] Commercial paper is subtracted from unused capacity because they are backed up by revolvers. For more information on how bank revolving credit facility data are collected, see Sufi (2007b).

We also classify the priority of each issue into one of three categories: secured, senior unsecured, and subordinated. An issue is considered secured if the firm states that the issue is collateralized by any of the firm's assets, or if the issue is a mortgage bond or equipment loan. An issue is considered subordinated if the issue description includes the word "subordinated". Any issue labeled senior subordinated, subordinated, and junior subordinated are included in the subordinated category. If the issue description either states the issue is senior unsecured or if the issue does not fall into the secured or subordinated categories discussed above, we classify the issue as senior unsecured. While the classification of priority based on these three categories is coarse, both academic and practitioner evidence suggest this classification is accurate.[7] For example, the Chapter 11 bankruptcy process gives significant additional cash flow and control rights to secured creditors relative to unsecured creditors.

While the majority of our analysis focuses on the balance sheet debt-instrument level data, we also use the issuance level data from *SDC Platinum* and *Dealscan* for information on covenants and interest spreads. We utilize this issuance level data set to examine how covenants and interest spreads change following the downgrade, given that covenants and interest spreads are often not detailed for the financial issues in the debt footnotes of the 10-K filings.

B. Summary Statistics

Table I presents summary statistics. The first column presents the fraction of firm-year observations for which the type of debt is used. Almost 98% of firm-year observations in our sample have either a bank revolving credit facility or a bank term loan, which strongly disputes the notion that firms with access to public debt markets do not use bank debt. Over 80% of firm-year observations have arm's length non-program debt, and almost 60% have private placements. Our dataset also allows us to show the fraction of firm-year observations that use commercial paper (17%), medium-term notes (20%), and revenue bonds (24%).

The second and fourth columns of Table I document the amount of each debt type scaled by total assets and total debt capacity, respectively. Total debt capacity is defined as total debt outstanding plus

[7] See Table I in Barclay and Smith (1995) and Baird and Rasmussen (2006) for support of this classification.

unused bank revolving credit capacity. The unused bank revolving credit capacity represents funds committed by banks, but not drawn by the firm.[8] Unused bank revolvers are the largest fraction of both assets and total debt capacity: they represent more than 10% of assets and 25% of debt capacity on average. Public debt represents the second largest debt type as a fraction of assets (12%), followed by private placements (6%) and draw-downs on bank revolvers (5%). Draw-downs on bank revolvers and bank term loans represent more than 7% of total assets, which suggests that firms continue to employ bank debt even when they have credit ratings.

Column 1 also documents that almost 50% of firm-year observations have secured debt capacity in their capital structure, but less than 25% have subordinated debt. Secured bank debt comprises almost 15% of total debt capacity, whereas subordinated debt comprises 5% of total debt capacity. The residual category is senior unsecured debt, which represents about 80% of total debt capacity.

C. The Importance of Debt Heterogeneity

Table II presents evidence that recognition of debt heterogeneity is critical to capital structure research. Panel A documents that the grand majority of firms simultaneously utilize bank and non-bank debt in their capital structure. Only 2% of firm-year observations in our sample utilize no bank debt, and only 2% utilize only bank debt. The grand majority of firms utilize a mix of bank debt, arm's length debt, and private placements. Conditional on using both bank and non-bank debt, bank debt accounts for a substantial fraction of debt capacity. For example, among firms that utilize bank debt, arm's length debt, and private placements, used revolvers and bank term loans account for over 15% of debt capacity. With the inclusion of unused revolvers, bank debt capacity accounts for almost 40% of total debt capacity within this category. Overall, Panel A demonstrates that bank and non-bank debt represents a significant portion of capital structure from almost all rated firms.

Panel B demonstrates that capital structure studies that ignore debt heterogeneity and focus uniquely on leverage ratios miss important variation in security issuance decisions. We place all firm-year

[8] The unused portion of revolving credit facilities is not considered debt on the balance sheet. See Sufi (2007b) for more information on the structure of revolving credit facilities.

observations into categories based on whether they experience an adjustment in their debt issuance by 5% of lagged assets. Of the 378 firm-year observations for which we have current and lagged data, we find that 51.6% experience no major adjustment in their total debt issuance. However, conditional on experiencing no major adjustment in total debt, we find that 32% of "non-adjusters" make major adjustments to their debt structure. For example, 15% of firms that do not experience a major adjustment in total debt issuance experience a major adjustment in their bank debt. These findings demonstrate that firms often adjust the components of their debt in a significant manner even if their amount of total debt outstanding remains relatively constant.

II. Theoretical Motivation

The results in Table II demonstrate that an explicit recognition of debt heterogeneity is necessary to understand security issuance decisions. In this section, we motivate the empirical analysis by examining hypotheses from the theoretical literature on debt composition and priority.

The first group of theories hypothesizes that firms should move from non-bank debt to bank debt as credit quality deteriorates (Diamond (1991), Chemmamur and Fulghieri (1994), Boot and Thakor (1997), and Bolton and Freixas (2000)). The seminal article is Diamond's (1991) model of reputation acquisition. In his model, firms graduate from bank debt to arm's length debt by establishing a reputation for high earnings. More specifically, the main variable that generates cross-section predictions is the ex-ante probability that a firm is a bad type with a bad project; this ex-ante probability is updated over periods based on earnings performance, and is interpreted as a credit rating. Bad firms have a lower history of earnings, and a higher probability of selecting a bad project in the future. High quality firms borrow directly from arm's length lenders and avoid additional costs of bank debt associated with monitoring, medium-quality firms borrow from banks that provide incentives from monitoring, and the lowest quality firms are rationed.[9]

[9] Diamond (1991) interprets his model as describing the trade-off between bank debt and *commercial paper*, not necessarily all types of non-bank debt (see page 715).

The model by Bolton and Freixas (2000) explores the optimal mix of bonds, bank debt, and equity. The key distinction between bonds and bank debt is the monitoring ability of banks. If current returns are low and default is pending, banks can investigate the borrower's future profitability, whereas bond holders always liquidate the borrower. In their model, high quality firms do not value the ability of banks to investigate, and therefore rely primarily on arm's length debt. Lower quality borrowers value the ability to investigate by the bank, and thus rely more heavily on bank financing.[10]

The second group of theories examines why firms structure debt into multiple classes based on priority, maturity, or type (Diamond (1993), Besanko and Kanatas (1993), Park (2000), DeMarzo and Fishman (2007), and DeMarzo and Sannikov (2006)). We focus in particular on Park (2000), who examines the reasons why lenders with monitoring duties may be senior in priority. In Park's (2000) model, borrowers may undertake risky negative NPV projects, and the moral hazard problem is so severe that external financing is possible only if a debt claimant monitors the borrower's activities. There are two main hypotheses. First, the lender with monitoring duties (the bank) should be the most senior in the capital structure. The intuition is as follows: a bank's incentive to monitor is maximized when the bank appropriates the full return from its monitoring effort. In the presence of senior or pari passu non-monitoring lenders, the bank is forced to share the return to monitoring with other creditors, which reduces the bank's incentive to monitor.

Second, the presence of junior non-bank creditors enhances the senior bank's incentive to monitor. This result follows from the somewhat counterintuitive argument that a bank has a stronger incentive to monitor if its claim is *smaller*.[11] Park (2000) describes this intuition as follows:

> … if the project continues, an impaired senior lender will get less than a sole lender simply because his claim is smaller. On the other hand, if the project is liquidated, an impaired senior lender will get the same amount as a sole lender, the liquidation value. Therefore, a small piece of bad information may prompt the senior lender to choose liquidation over continuation whereas it takes far worse information to induce the sole lender to seek liquidation … in other words, the

[10] Bolton and Freixas (2000) also investigate the use of equity, which is used as the primary source of financing by the lowest quality borrowers.

[11] If the bank is to have any incentive to monitor, its claim must be large enough to be impaired by liquidation. This assumption is supported by the fact that observed bank debt recovery rates are 75% according to S&P.

> impaired senior lender is more sensitive to his information and thus has a stronger incentive to monitor (p. 2159).

Given its lower value in the going concern, a bank with a smaller claim actually has a stronger incentive to monitor and liquidate the firm. The presence of junior debt reduces the size of the bank's claim, which increases the amount of socially beneficial monitoring.

The intuition of this latter result is evident if one considers a bank creditor with a claim that represents a very large fraction of the borrower's capital structure. In such a situation, the bank has less of an incentive to liquidate a risky borrower, given that the bank's large claim benefits relatively more from risk-taking than a smaller claim. In other words, a large bank claim is more "equity-like" than a small bank claim given its upside potential. As a result, reducing the size of the senior bank claim by adding junior debt *improves* the banks' incentive to detect risk-shifting.

Our empirical analysis is focused on two broad questions raised by the theoretical literature. First, do firms switch from less monitored to more monitored debt as credit quality deteriorates? Second, when the potential cost of asset substitution is large, do firms place bank debt with a monitoring function senior to all other debt in the capital structure? We examine these two questions below.

III. Empirical Strategy and Results

Theoretical research exploring the composition and priority of corporate debt hypothesize that variation in credit quality has important implications for debt structure. In this section, we examine the debt structure of fallen angels to examine these hypotheses.

A. Empirical Strategy

Our main empirical specification is a firm fixed effects regression relating measures of debt to fiscal year indicators around the downgrade. More specifically, we estimate the following equation:

$$\frac{DebtType_{it}}{Assets_{it}, DebtCapacity_{it}} = \alpha_i + \lambda_t + \mathbf{I}_{it}^{t-1}\beta_1 + \mathbf{I}_{it}^{t}\beta_2 + \mathbf{I}_{it}^{t+1}\beta_3 + \varepsilon_{it} \quad (1)$$

where the **I** variables are indicator variables for the fiscal year before, the fiscal year of, and the fiscal year after the downgrade respectively. The dependent variable is either the type or priority of debt scaled by either total assets or total debt capacity, where the latter is defined as total debt plus the unused portion of bank revolvers. The coefficients of interest are β_1, β_2, and β_3, which represent the within-firm change in the dependent variable for a given fiscal year relative to the omitted category, which is two years before the downgrade. For example, if the dependent variable is commercial paper scaled by total assets, the coefficient estimate for β_3 represents the average within-firm change in commercial paper scaled by assets in the fiscal year after the downgrade relative to two fiscal years before the downgrade. The estimation in equation (1) includes firm and year fixed effects, and standard errors are clustered by firm.

The scaling of debt types by debt capacity as opposed to scaling by total debt reflects the importance of unused revolving credit facilities. Unused revolvers are important for two reasons: First, they are a key component of bank exposure. Banks have a very strong incentive to monitor what firms do with an additional dollar of drawn capacity as draw-downs may signal that the firm is in need of liquidity (Mester, Nakamura, and Renault (2005)). Furthermore, the unused portion of revolving credit facilities counts against bank capital in domestic and international capitalization standards. Second, firms likely draw down lines of credit during the reporting period and pay them back at the end of the reporting period as a form of window dressing. Therefore, from the perspective of the firm, it is incorrect to ignore unused revolving credit facilities in calculating implied debt outstanding. Nonetheless, as we show in robustness analysis at the end of the next sub-section, our results are similar if we scale by total debt instead of total debt capacity.

Our specification in (1) is motivated by theoretical literature discussed in Section II which formulates hypotheses on the relation between credit quality and debt structure. However, it is important to emphasize that the theory is about credit quality in general and not specifically about credit ratings. In our analysis, rating downgrades serve as the primary measure of credit quality deterioration, but we are not necessarily interested in the effect of credit ratings *per se*. As a result, we do not include additional

credit quality control variables in our core specification, given that these variables also measure credit quality. In sub-section D below, we include other credit quality controls and show that the effects of the downgrade on debt priority and composition are essentially unchanged.

An alternative concern is that the theoretical models with which we motivate the analysis propose hypotheses concerning long-run equilibrium differences in debt structure for high and low credit quality firms. However, the coefficients in (1) are identified using firms that transition from high to low credit quality. We exploit the variation of firms transitioning from high to low credit quality because such an analysis produces more convincing evidence of the causal effect of credit quality on debt structure given standard econometric concerns of omitted variables and reverse causality. For example, an alternative analysis examining only the cross section would not take into account that low and high credit quality firms may differ on unobservable dimensions other than credit quality. In addition, a cross-sectional analysis would be unable to rule out the hypothesis that firms are downgraded because they change their debt structure (reverse causality). Our reliance on fixed effects estimation and the availability of Moody's credit reports which reveal the reason for the downgrades addresses many of these problems. Furthermore, in the robustness section, we examine a cross-section of debt structure for a sample of firms that have been at the same credit rating for 4 years and find similar results.

B. Results: Composition and Priority of Debt after the Downgrade

1. Unconditional means

Table III presents the unconditional means of the composition and priority of corporate debt for the years around the downgrade. As the fourth row of Table III demonstrates, the mean debt capacity to assets ratio is relatively constant through the downgrade. However, Table III also shows dramatic changes in debt structure through the downgrade. First, there is a sharp drop in both arm's length program debt (commercial paper and MTNs) and unused revolvers. The drop in arm's length program debt is concentrated in the year of the downgrade, whereas the drop in unused revolvers begins in the year before the downgrade. This latter result reflects the fact that almost 30% of the firms are downgraded from A to

Baa in the year before the downgrade to Ba.[12] In contrast to the reduction in arm's length program debt and unused revolvers, firms experience a sharp increase in both private placements and convertibles. The increase in private placements and convertibles is concentrated in the year of the downgrade.

Table III also demonstrates another core finding of our analysis: the priority structure of corporate debt "spreads" as firms move through the downgrade. Secured debt increases from 5% of debt capacity two years before the downgrade to almost 25% in the year after the downgrade. Subordinated debt capacity increases from 3% to 8% of debt capacity. Taken together, these figures imply that the fraction of senior unsecured debt decreases by more than 30% of debt capacity.

2. Regression results

Tables IV and V present the coefficient estimates relating the type of debt to the indicator variables for fiscal years around the downgrade. These results differ from the unconditional means due to the presence of firm and year fixed effects. As the results in Table IV demonstrate, total bank capacity scaled by total debt capacity falls by 0.06 in the year after the downgrade relative to two years before the downgrade, which represents a 15% decline when evaluated at the mean. The decline in bank capacity is driven by a decline in unused bank revolvers, which decline by more than 0.08, or 30% at the mean. Although unused revolvers begin to decline in the year before the downgrade, the coefficient estimates on the year before the downgrade and the year after the downgrade indicator variables are statistically distinct from one another at the 5 percent level. In other words, there is a statistically significant reduction in the year after the downgrade relative to the year before the downgrade.

Both bank term debt and the used portion of revolving credit facilities increase in the year of the downgrade. However, the decline in the unused portion of revolving credit facilities offsets these increases, leading to a total decline in the availability of bank debt. The results are similar when bank debt is scaled by total assets. In addition to documenting the effect of credit quality deterioration on the use of

[12] This finding is consistent with evidence in Nini, Smith, and Sufi (2007) that shows that many bank loan terms, including the incidence of dividend restrictions and financial covenants, tighten when firms move from A to Baa.

bank debt, these results highlight the importance of separately considering the effect of credit quality on bank term debt versus bank revolvers.

Table V presents the coefficient estimates for non-bank debt. There is a sharp drop in arm's length program debt, which includes commercial paper and MTNs. Given that arm's length program debt represents 6.4% of debt capacity on average, the decline of 4.8% represents 75% at the mean. In contrast, the use of Rule 144A private placements and convertible debt increases following the downgrade. Scaled by debt capacity, the increase of 5.8% in Rule 144A private placements in the year after the downgrade represents an 85% increase at the mean.

The fact that the increase in private placements after the downgrade is driven by Rule 144A private placements is significant given that most Rule 144A private placements are registered shortly after issuance. As Fenn (2000) argues, "Rule 144A has been widely adopted by domestic, below-investment-grade firms as a means of quickly issuing securities that are subsequently registered." The fact that these new private placements are registered shortly after issuance suggests that they more closely resemble arm's length public bonds than relationship bank loans.

The bottom panels of Tables IV and V show the effects on the same debt types scaled by total assets rather than debt capacity. Even under the extreme view that unused revolvers are not debt for the firm or the bank, these results do not support the hypothesis that bank debt increases relative to non-bank debt. In the year after the downgrade, relative to two years before the downgrade, there is an increase in bank term loans of 1.4% of assets, a statistically insignificant increase in used revolvers of 0.4% of assets, a decrease arm's length program debt of 1.8% of assets, an increase in private placements by 2.8% of assets, and an increase in convertibles by 1.5% of assets respectively. Even when unused revolvers are excluded, bank debt and non-bank debt appear to rise by about the same share of assets when firms experience a downgrade.

On average, Tables IV and V demonstrate that firms decrease bank debt capacity and increase convertibles and private placements. Figure 1 examines a slightly different question: what is the fraction of firms that simultaneously decrease bank debt capacity and increase non-bank debt? Figure 1 presents

two-way joint distributions of borrowers that increase or decrease different types of debt from the year before the downgrade through the year after the downgrade. Panel A shows the joint distribution of borrowers that increase or decrease bank debt capacity versus non-bank debt capacity. As Panel A demonstrates, over 30% of firms simultaneously increase non-bank debt capacity and decrease bank debt capacity, whereas only 15% increase bank debt capacity and decrease non-bank capacity. Panel D examines bank debt capacity and private placements, and shows that the most common outcome (30%) is for firms to simultaneously decrease bank debt capacity and increase private placements.

These results suggest that fallen angels do not move from non-bank to bank debt following the downgrade. While bank term debt and used revolvers increase slightly after the downgrade, the reduction in unused revolvers more than offsets the increase, which leads to an overall reduction in bank debt availability. While borrowers experience a sharp reduction in arm's length program debt, they increase the use of Rule 144A private placements and convertible debt. While firms do not appear to shift from non-bank debt to bank debt, there is a dramatic decrease in the use of both non-bank and bank discretionary sources of debt finance. The combined reduction in discretionary debt finance (arm's length non-program and unused bank revolver capacity) is more than 12% of debt capacity.

Table VI examines how secured and subordinated debt increase or decrease after the downgrade.[13] As Panel A demonstrates, there is a sharp and large increase in both the fraction of debt capacity that is secured and the fraction that is subordinated after the downgrade. From two years before the downgrade to the year after, the fraction of debt capacity that is secured increases by 0.15, which represents over 100% of the mean. The fraction of subordinated debt increases by 0.07 of debt capacity. These two estimates imply that the fraction of senior unsecured debt capacity falls by 0.22 from two years before the downgrade to one year after. On average, firms experience a sharp "spreading" of the priority structure of debt, simultaneously increasing both secured and subordinated debt.

[13] The coefficient estimates on senior unsecured debt (unreported) are mechanically equal to: –1*(coefficient on secured + coefficient on subordinated).

Panels B and C show that the increase in secured debt capacity is driven primarily by an increase in secured bank debt, which accounts for 90% (0.137/0.150) of the increase in secured debt capacity. In contrast, Panel D shows that the increase in subordinated debt is driven primarily by subordinated private placements and convertibles, which account for 80% [(0.018+0.038)/0.069] of the increase in subordinated debt.

In Figure 2, we examine the joint distribution of firms that use secured and subordinated debt. Panel A examines the year before the downgrade and Panel B examines the year after the downgrade. Before the downgrade, almost 50% of firms have neither secured nor subordinated debt in their capital structure—all debt for these firms is senior unsecured. Less than 5% of the firms before the downgrade simultaneously have both secured and subordinated debt. Panel B shows a sharp decrease post-downgrade in the fraction of firms that do not have either secured or subordinated debt: the fraction goes from almost 0.50 to less than 0.30. In contrast, post-downgrade, the fraction of firms that have both secured and subordinated debt increases from less than 0.05 to over 0.20. The increase in the fraction of firms that have secured bank debt but no subordinated debt increases by 0.10.

3. Robustness

In this sub-section, we present two sets of robustness tests. In the first set, we present tests that demonstrate that our core results are not driven by omitted variables, specification choice, or reverse causality. In the second set, we examine the cross section of debt structure for an alternative set of firms that are at a long-run equilibrium credit rating. This latter set of robustness tests helps ensure that our results are not unique to firms transitioning from high to low credit quality.

In Table VII, we examine the coefficient estimates in robustness tests for the key 5 dependent variables of our analysis: unused bank revolvers, arm's length program debt, Rule 144A private placements, subordinated debt, and secured debt. In Panel A, we include four control variables which capture variation in other firm characteristics: the market-to-book ratio, the leverage ratio, EBITDA, and size. The inclusion of the control variables does not significantly alter the significance or magnitude of

our point estimates. The estimates suggest that the credit rating measure of credit quality has a robust effect on debt composition and priority, even after controlling for alternative measures of credit quality.

Panels B and C examine the concern that the scaling of debt instruments by current assets or debt capacity may lead to artificial changes in our measures of composition and priority. In Panel B, we report estimates from a specification in which the debt types are scaled by beginning of period assets. This specification isolates variation in the numerator of the dependent variables. We exclude 12 firms for which assets either grow by more than 200% or shrink by more than 50% to eliminate noise caused by large acquisitions and asset sales. In Panel C, we scale by total outstanding debt instead of total debt capacity. In both panels, the coefficient estimates are qualitatively similar to the results in Tables 4 through 6.[14]

In Panels D and E, we examine reverse causality. More specifically, one concern is that firms are downgraded *because* they change the composition and priority structure of their debt, as opposed adjusting their debt composition and priority in response to the downgrade. In Panel D, we exploit the fact that Moody's provides a detailed press release describing the reason for the downgrade. We manually read these reports, and we isolate the sample to firms for which Moody's cites only business reasons for the downgrade. We exclude any firm for which Moody's cites financial weaknesses such as leverage, coverage ratios, lower financial flexibility, or worsened credit metrics. The remaining firms are downgraded for reasons such as market conditions, cash flows, operations, operating performance, competitive environment, weakened demand, terrorism, litigation, and decreased profitability, without mention of financial factors. Even in this sample of only 53 borrowers, the coefficient estimates are almost identical and actually larger for subordinated debt.

In Panel E, we isolate the sample to 34 borrowers that are downgraded in the first quarter after the end of the fiscal year before downgrade. These borrowers have less time in which to change debt

[14] Another concern with specification choice is that a number of observations in our regression analysis have a dependent variable that is censored at 0. In unreported results, we find that estimates from a maximum likelihood Tobit specification produces marginal effects that are larger than the fixed effects linear specification, which suggests that any bias due to censoring is toward zero.

composition and priority before the downgrade. The estimates, although statistically weaker, are similar in magnitude. We also find qualitatively similar results using the origination issue-level data set in which we know the exact date of the origination. This data set allows us to focus more precisely on issues originated before and after the downgrade, but is insufficient for measuring debt composition at any given point in time because of the lack of data on retirements and renegotiations of originated issues.

In Table VIII, we address the concern that our results are only applicable to firms that are in a period of transition from high to low credit quality. To address this concern, Table VIII presents the mean characteristics for a random sample of 50 firms that have been at the same credit rating for four years. To be clear, this is a different sample of firms than the fallen angels examined above: The sampling universe for this sample is comprised of all borrowers that are at the same Moody's rating between A and B for four continuous years. As the means in Table VIII demonstrate, most of the core findings are robust to examination of firms at long run credit quality equilibrium. Arm's length program debt and unused revolvers are sharply lower for lower credit quality firms, and private placements are higher. The "spreading" of the priority structure of debt is also evident for firms of lower credit quality relative to higher credit quality. These results demonstrate that most of our key findings are robust in the cross-section of firms at long run credit quality equilibrium, and are not unique to fallen angels.

There are two main differences in debt composition for the long-run equilibrium sample relative to fallen angels. First, arm's length non-program debt, which includes bonds, is a much smaller fraction of debt capacity for lower credit quality firms. Second, while bank debt as a fraction of debt capacity decreases from Baa or better to Ba, it increases from Ba to B. These findings reflect the fact that fallen angels do not appear to adjust their public bonds immediately after the downgrade, whereas these debt instruments are likely to be replaced upon maturity with other types of debt.

While the overall patterns in Table VIII are an important confirmation that our main findings on fallen angels do not simply reflect the debt structure of firms in transition, the cross-sectional sample suffers from the problem that the firms in the different ratings categories are significantly different on

observable characteristics such as size. This illustrates the benefits of focusing on a panel with firm fixed effects as we do in our main analysis.

C. Results: Relative Monitoring Intensities after the Downgrade

The results in the previous section on the composition and priority of corporate debt of fallen angels are consistent with the theoretical framework by Park (2000). When the threat of asset substitution is more severe, bank exposure shrinks and takes the first claim in the capital structure. In contrast, non-bank debt, and in particular Rule 144A private placements and convertibles, increases and is more likely to be subordinated. These results are consistent with the hypothesis that banks, as chief monitors, must have the most senior claim to appropriate the full return of monitoring. They are also consistent with the hypothesis that a smaller bank share of the capital structure increases the incentives for banks to monitor. While the shift in composition and priority of debt are consistent with these hypotheses, it remains to be seen whether the relative monitoring intensity of bank versus non-bank debt increases post-downgrade.

In this section, we examine monitoring by focusing on the incidence of financial and non-financial covenants in bank and non-bank debt following the downgrade.[15] The main data set employed is the origination issue level dataset, as opposed to the balance sheet issue level dataset used in Section III. We use the origination issue level dataset given that covenants are not always detailed in the 10-K financial footnotes. In contrast, *Dealscan* and *FISD* contain covenant information for loans and bonds, respectively.

Figure 3 examines how the incidence of bank loan covenants changes through the downgrade. Two years before the downgrade, there are relatively few non-financial restrictive covenants. Less than 5% of agreements contain a capital expenditure restriction and only 20% of agreements contain a sweeps covenant.[16] In addition, borrowing bases, which make the aggregate availability of a credit facility

[15] Since the seminal work on covenants by Smith and Warner (1979), several articles argue that the existence and enforcement of covenants is indicative of monitoring by creditors. See Rajan and Winton (1995), Diamond (1991), and Park (2000) for theoretical evidence and Chava and Roberts (2007), Nini, Smith, and Sufi (2007), Roberts and Sufi (2007), and Sufi (2007b) for empirical evidence.

[16] Capital expenditure restriction data come from the intersection of our sample of loans and the contracts collected from 10-K filings in Nini, Smith, and Sufi (2007). There are 153 loans for which we have these data.

contingent on collateral values such as accounts receivable and inventories, are almost never employed.[17] In the year before the downgrade, the incidence of covenants begins to rise, but there is a sharp jump upward in the year following the downgrade. The incidence of capital expenditure and dividend restrictions increases by more than 20 percentage points, and borrowing bases and sweeps covenants increase by 5 percentage points.

Table IX examines financial covenant violations, which are collected from annual 10-K SEC filings at the firm-year level.[18] Table IX demonstrates that the incidence of financial covenant violations increases sharply after the downgrade. The coefficient estimate in Column 1 suggests that the likelihood of violating a financial covenant increases by 14 percentage points after the downgrade relative to two years before the downgrade. Consistent with earlier research (Sweeney (1994)), Table IX demonstrates that almost every covenant violation is associated with bank credit agreements, as opposed to public bonds or private placements.

The findings that bank covenants tighten following a downgrade are neither surprising or novel. However, the key innovation of our study is to examine the relative monitoring intensity of bondholders versus banks after the downgrade. Figure 4 examines the corresponding increase in bond covenants, using groupings similar to those in Billet, King, and Mauer (2007). Restrictions on the issuance of secured debt, cross-default provisions, and sale-leaseback restrictions actually decline from two years before the downgrade to the year after the downgrade. In contrast, there is an increase in the incidence of dividend/repurchase restrictions, stock issue restrictions, and prohibitions on asset sales.[19]

The results in Figure 4 demonstrate that the incidence of some bond covenants increases after the downgrade. While this evidence could be interpreted as additional monitoring by bondholders on some

[17] A sweeps covenant mandates that proceeds from asset sales or free cash flows be used to pay amounts outstanding under the bank credit facility (see Asquith, Beatty, and Weber (2005)).
[18] See Sufi (2007b) for more information on the regulations that require the reporting of financial covenant violations, and how these data are collected from the SEC filings.
[19] Many bond covenant terms considered by Billet, King and Mauer (2007) occur very infrequently in our sample. We only examine those that appear in more than 2% of issues. Merger restrictions of some sort appear in almost every bond covenant in our sample, both before and after the downgrade, so variation in those is also not considered in Figure 4.

margins, extant research suggests that bond covenants are weaker and less likely to encourage monitoring than bank covenants. For example, Kahan and Tuckman (1993) find that, relative to bond indentures, loan agreements "more aggressively control the actions of equity holders by setting various covenants more tightly," and "provide lenders with the means to monitor borrowers more carefully." Kahan and Yermack (1998) document the almost complete absence of covenants in convertible issues, a fact which we confirm in our data. Verde (1999) compares bonds to loans for the same borrowers and notes that "… the scope of [bond] restrictions and the level of compliance required of the borrower are generally loose and add little value in protecting bondholders." Also, "… explicit protections afforded high-yield bondholders are weak in comparison to those provided to leverage loan creditors."

These findings suggest that the relative monitoring intensity of bank debt versus bonds increases sharply following the downgrade. While the incidence of certain bond covenants also increases, previous research suggests that these bond covenants provide fewer protections and lower incentives to monitor than bank loan covenants. Together with the results on composition and priority, these results suggest that banks simultaneously increase monitoring, reduce exposure, and acquire the first claim on assets in the event of default. These patterns are consistent with the hypotheses in Park (2000): banks are more likely to exert monitoring effort if they have a small claim with first priority.

These findings also provide insight into models in which firms move from non-bank to bank sources of finance following credit quality deterioration (e.g., Diamond (1991), Bolton and Freixas (2000)). While the result that firms reduce their bank debt capacity and increase non-bank debt after a downgrade at first appears to contradict these models, there is an important caveat. The models are not about bank debt *per se*, but about debt from creditors that exert monitoring effort. Our results suggest that bank debt fulfills a *liquidity* role before the downgrade: firms keep large unused revolvers and face few covenants. After the downgrade, bank debt fulfills primarily a *monitoring* role: the provision of bank liquidity declines and the incidence of covenants and covenant violations increase. Our results suggest that firms do not move from non-bank debt to bank debt, but instead move from unmonitored bank debt to monitored bank debt.

D. Results: Interest Spreads

The results above demonstrate that important debt terms such as quantities, collateralization, and covenants change after the downgrade. In Table X, we examine the correlation between credit quality deterioration and interest spreads. Both interest rates (column 1 and column 3) and interest spreads relative to a benchmark (column 2 and column 4) increase for bank debt and non-bank debt following the downgrade.[20] The coefficient estimates imply an increase in the interest spread of about 166 and 112 basis points in the year after the downgrade for bank and non-bank debt, respectively.

The last two columns of Table X examine whether the interest spreads increase differentially for bank versus non-bank debt after the downgrade. The non-bank indicator variable demonstrates that non-bank debt has a higher interest spread on average, and the coefficient estimates on the indicators for years relative to downgrade show that the interest spread on both types of debt increases after an angel falls. However, as the coefficient estimates on the interaction of the indicators for non-bank and years relative to downgrade demonstrate, we cannot reject the hypothesis that the increases in spreads on non-bank and bank debt are the same after the downgrade. The last column includes firm fixed effects: these estimates demonstrate that bank and non-bank debt for the same firm are not experiencing statistically significant changes in interest spreads after the downgrade.

Combined with earlier findings, the results in Table X suggest that bank debt after credit deterioration is more likely to be collateralized, more likely to contain tight covenants, yet has an increase in the interest spread that is similar to the interest spread increase for non-bank debt. The similarity in the spread increases for bank and non-bank debt occurs despite the fact that non-bank debt is more likely to be subordinated after the downgrade. These findings are consistent with the hypothesis that banks are being compensated for monitoring effort in addition to increased risk.

While our examination of interest spreads is consistent with the costly monitoring hypothesis, we are cautious in this interpretation given regulatory capital requirements faced by banks. Given these

[20] In the spreads analysis, the spread for bank debt is the spread to LIBOR on drawn funds, from *Dealscan*. The spread for non-bank debt is the spread to maturity-matched Treasury bonds, from SDC Platinum.

requirements, bank capital tends to be more expensive after a borrower's credit quality deteriorates. As a result, interest spreads on bank debt may increase at the same rate as non-bank debt given regulation, as opposed to costly monitoring.

E. Alternative Hypotheses

One of the main contributions of the above findings is to help explain why firms simultaneously use different types, sources, and priorities of debt. As mentioned above, we believe that our main findings above are most consistent with the theoretical framework by Park (2000). First, total bank debt capacity decreases after a downgrade, whereas arm's length private placements and convertibles increase. Simultaneously, new bank debt is more likely to be secured and therefore senior to existing debt, while new private placements and convertibles are more likely to be subordinated and therefore junior to existing debt. Finally, the relative monitoring intensity of bank versus non-bank debt increases sharply after the downgrade. These findings are consistent with Park's (2000) hypothesis that bank debt must have the most senior claim and must be relatively small in order to encourage valuable bank monitoring. Alternative explanations for these results would have to simultaneously explain these three findings.

In this section, we address three potential alternative explanations. First, an alternative hypothesis for our results is that, after the downgrade, banks use their information advantage relative to outsiders to extract surplus through higher interest rates, more collateral, and tighter covenants (Rajan (1992)). Two facts dispute this interpretation. First, junior non-bank claimants would be less willing to provide subordinated and convertible debt if the senior claimant is extracting a significant portion of surplus from profitable borrower projects. To the contrary, we find that subordinated and convertible non-bank debt increases following the downgrade, which is difficult to reconcile with the bank extraction hypothesis. Second, previous research suggests that the announcement of a new bank credit facility elicits a positive equity price response, and the imposition of tighter covenants after credit quality deterioration improves the borrower's market valuations and cash flow performance (James (1987), Nini, Smith, and Sufi (2007), Demiroglu and James (2007)). These findings dispute the notion that banks inefficiently hold up borrowers after credit quality deterioration.

Second, perhaps our results are explained by the fact that regulated commercial banks tend to be excessively conservative. This bank conservatism hypothesis could potentially explain why bank capacity declines, interest spreads increase, and covenants and collateral incidence increases. It is important to emphasize that almost every single fallen angel in our sample continues to employ bank debt after the downgrade, which is difficult to reconcile with the view that excessively conservative banks impose unnecessary covenants and excessive interest spreads. We show that fallen angels are able to raise additional private placement and convertible debt, which suggests that they would be able to eliminate bank debt from their capital structure in response to excessively conservative commercial banks. The fact that almost every fallen angel maintains a bank credit facility after the downgrade supports models in which bank debt with tight covenants is an important component of optimal debt structure. In these models, banks will endogenously appear "conservative."

Finally, an alternative explanation is that firms change the composition of debt in order to obtain a different maturity structure. In unreported results, we find evidence that bank debt tends to become longer maturity after the downgrade, whereas non-bank debt tends to become shorter maturity. One potential concern is that our results are driven by firms' desire for an intermediate maturity structure after the downgrade, which would be consistent with models by Flannery (1986) and Diamond (1991). There are two responses to this concern. First, models that focus uniquely on maturity cannot explain why firms simultaneously use different types of debt with different priorities and monitoring intensities. While firms move to an intermediate maturity structure, an explanation using maturity alone cannot explain why they do so using both bank and non-bank debt. Second, both Park (2000) and Rajan and Winton (1995) show that debt maturity cannot be separated from considerations of monitoring. The maturity structure of debt may well follow from priority and monitoring considerations, not vice versa.

IV. Conclusion

We examine the composition and priority of corporate debt for fallen angels, which we define as firms that are downgraded from investment grade to speculative grade by Moody's Investors Services.

We begin by showing that debt heterogeneity is a first order aspect of firm capital structure. Almost every firm in our sample simultaneously uses bank and non-bank debt, and we show that a unique focus on leverage ratios misses important variation in security issuance decisions.

We then examine debt structure through the downgrade, with a particular emphasis on explaining how and why firms use different types, sources, and priorities of corporate debt. Before the downgrade, firms maintain large unused bank revolving credit facilities with loose covenants, and have access to discretionary, flexible sources of debt finance such as medium-term notes and commercial paper. After the downgrade, total bank debt capacity declines and the use of Rule 144A private placements and convertibles increases. Firms reduce the use of discretionary bank and non-bank debt financing, and they experience a "spreading" of the capital structure: relative to existing debt, new bank debt is more likely to be secured whereas new issues of private placements are more likely to be subordinated. The relative monitoring intensity of bank versus non-bank debt increases sharply after the downgrade.

Our findings are consistent with the hypothesis that the composition and priority of corporate debt is structured primarily to encourage bank monitoring. We find that banks reduce the size of their claim, obtain first priority, and increase the use of covenants, all of which improve the bank's incentives to monitor. We also show that firms do not switch from non-bank to bank debt following the downgrade. Instead, firms switch from more flexible, discretionary sources of debt finance to less discretionary sources, and switch from bank finance with a primary liquidity role to bank finance with a primary monitoring role. Finally, our findings dispute the notion that firms "choose" to use either bank debt or non-bank debt. Every firm in our sample simultaneously employs both types of financing.

Our findings provide several avenues for future research, two of which we highlight here. First, our findings suggest that recognition of debt heterogeneity can provide important insights into important issues in empirical corporate finance. For example, recognizing differences in debt structure may be useful in examining the determinants of capital structure or the effect of financing on investment. Second, our results documenting an increase in both convertible and subordinated debt after credit quality deterioration warrant further investigation. While Park (2000) suggests that bank debt should be secured

relative to non-bank debt, his model does not predict that new non-bank debt issues must be subordinated to existing non-bank debt or convertible to equity. Theoretical research suggests that the use of convertibles can mitigate risk shifting by making the security's value less sensitive to the volatility of cash flows (Brennan and Schwartz (1988)). Alternatively, downgraded firms may use convertibles as a form of "backdoor" equity when information problems are severe (Stein (1996)). Further empirical research on the use of subordinated and convertible debt after credit quality deterioration will improve our understanding of debt structure.

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Data Appendix
Classification of Debt Issues from 10-K Financial Footnotes

Example 1: Ashland Inc., 10-K filing dated September 30, 2005.

Website: http://sec.gov/Archives/edgar/data/1305014/000130501405000152/form10k2005.txt

The financial footnote on debt has the following information:

NOTE G - DEBT

Medium-term notes, due 2005-2019, interest at a weighted average rate of 7.9% at September 30, 2005 (7.1% to 9.4%)	$ 42
8.80% debentures, due 2012	20
6.86% medium-term notes, Series H, due 2009	17
6.625% senior notes, due 2008	3
Other	12
Total long-term debt	94
Current portion of long-term debt	(12)
Long-term debt (less current portion)	$ 82

Aggregate maturities of long-term debt are $12 million in 2006, $12 million in 2007, $5 million in 2008, $20 million in 2009 and $3 million in 2010. The weighted average interest rate on short-term borrowings outstanding was 2.7% at September 30, 2004. No short-term borrowings were outstanding at September 30, 2005.

Ashland has a revolving credit agreement that expires on March 21, 2010, which provides for up to $350 million in borrowings. The borrowing capacity under this facility was reduced by $102 million of letters of credit outstanding at September 30, 2005. While the revolving credit agreement contains a covenant limiting new borrowings based on Ashland's stockholders' equity, the agreement would have permitted an additional $5.5 billion of borrowings at September 30, 2005. Additional permissible borrowings are increased (decreased) by 150% of any increase (decrease) in stockholders' equity.

Our classification of the debt of Ashland, Inc. for this year is as follows:

FINANCIAL FOOTNOTE DESCRIPTION	AMOUNT	OUR CLASSIFICATION	PRIORITY	CROSS-REFERENCE
Medium-term notes, due 2005-2019	42	MTNs	Senior Uns	
8.80% debentures, due 2012	20	Public debt	Senior Uns	SDC Platinum
6.86% medium-term notes, due 2009	17	MTNs	Senior Uns	
6.625% senior notes, due 2008	3	Private placement 144A	Senior Uns	SDC Platinum
Other	12	Unclassified	Senior Uns	
Revolving credit agreement-used	0	Bank revolver	Senior Uns	
Revolving credit agreement-unused	248	Bank revolver	Senior Uns	

Example 2: Mastec Inc., 10-K filing dated December 31, 2000.

Website: http://sec.gov/Archives/edgar/data/15615/000001561501000001/0000015615-01-000001.txt

The financial footnote on debt has the following information:

	2000
Revolving credit facility at LIBOR plus 1.25% for 1999 and 1.0% for 2000 (6.98% at December 31, 1999 and 7.64% at December 31, 2000)	7,000
Other bank facilities at LIBOR plus 1.50% (7.32% at December 31, 1999 and 8.06% at December 31, 2000)	517
Notes payable for equipment, at interest rates from 7.5% to 8.5% due in installments through the year 2004	6,161
Notes payable for acquisitions, at interest rates from 7.0% to 8.0% due in installments through February 2001	2,362
7.75% senior subordinated notes due February 2008	195,805
Total debt	211,845
Less current maturities	(5,685)
Long-term debt	$ 206,160

We have a credit facility that provides for borrowings up to an aggregate of $100 million. Amounts outstanding under the revolving credit facility mature on June 9, 2002. We are required to pay an unused facility fee ranging from .25% to .50% per annum on the facility, depending upon certain financial covenants. The credit facility is secured by a pledge of shares of certain of our subsidiaries. Interest under the credit facility accrues at rates based, at our option, on the agent bank's base rate plus a margin of up to .50% depending on certain financial covenants or 1% above the overnight federal funds effective rate, whichever is higher, or its LIBOR Rate (as defined in the credit facility) plus a margin of 1.00% to 2.25%, depending on certain financial covenants. As of December 31, 2000, we had outstanding $8.4 million in standby letters of credit.

Our classification of the debt of Mastec Inc. for this year is as follows:

FINANCIAL FOOTNOTE DESCRIPTION	AMOUNT	OUR CLASSIFICATION	PRIORITY	CROSS-REFERENCE
Revolving credit facility	7	Bank revolver	Secured	
Other bank facilities	0.517	Bank term	Senior Uns	
Notes payable for equipment	6.161	Equipment notes	Senior Uns	
Notes payable for acquisitions	2.362	Acquisition notes	Senior Uns	
7.75% senior subordinated notes	195.805	Private placement 144A	Subordinated	SDC Platinum
Revolving credit agreement-unused	84.6	Bank revolver	Secured	

Table I: Summary Statistics on Debt Composition and Priority of Fallen Angels

This table presents summary statistics on debt composition and priority for a sample of 511 observations on 133 firms that were downgraded by Moody's Investor Services from investment grade (Baa3 or better) to speculative grade (Ba1 or worse) at some point between 1996 and 2005. There were a total of 149 such firms with sufficient Compustat data to compute the market to book ratio, total sales, EBITDA, tangible assets, cash balances, and long- and short-term debt. Firms that file for Chapter 11 bankruptcy in the year of the downgrade (6 firms), firms for which the debt financial footnotes to the firms' 10-K filings do not provide sufficient detail on debt issues (5 firms), and firms that have over 50% of their debt issued by financial subsidiaries two years before the downgrade (5 firms) were excluded. Debt composition data were collected from the debt financial footnotes contained in the annual report of the firms' 10-K filings for two fiscal years before the downgrade, the fiscal year of the downgrade, and the fiscal year after the downgrade. To aid in the categorization, issue level data from *Dealscan* and *SDC Platinum* were employed. Debt capacity is defined as total debt plus unused lines of credit.

		Scaled by Assets		Scaled by Debt Capacity	
Type of Debt	Nonzero	mean	standard deviation	mean	standard deviation
Arm's Length Program	0.337	0.026	(0.056)	0.064	(0.135)
Commercial Paper	0.168	0.009	(0.029)	0.023	(0.081)
MTN	0.204	0.017	(0.050)	0.041	(0.114)
Arm's Length Non-Program	0.830	0.133	(0.171)	0.284	(0.232)
Public Debt	0.695	0.118	(0.172)	0.246	(0.236)
Revenue bonds	0.239	0.005	(0.013)	0.012	(0.032)
Acquisition debt	0.078	0.003	(0.016)	0.007	(0.041)
Other	0.155	0.007	(0.030)	0.019	(0.078)
Private Placement	0.566	0.058	(0.087)	0.129	(0.182)
Private Placement Definitely	0.411	0.047	(0.079)	0.103	(0.168)
Rule 144a	0.233	0.030	(0.068)	0.068	(0.150)
Not Rule 144a	0.209	0.017	(0.046)	0.035	(0.096)
Private Placement Likely	0.264	0.012	(0.036)	0.025	(0.074)
Bank Capacity	0.977	0.182	(0.130)	0.399	(0.216)
Used Revolver	0.585	0.050	(0.079)	0.101	(0.151)
Term Loan	0.387	0.024	(0.063)	0.047	(0.105)
Unused Revolver	0.949	0.109	(0.081)	0.251	(0.174)
Mortgage or Equipment Debt	0.151	0.006	(0.024)	0.014	(0.053)
Convertibles	0.295	0.027	(0.059)	0.069	(0.159)
Collateralized Leases	0.323	0.008	(0.030)	0.018	(0.067)
Unclassified	0.685	0.010	(0.019)	0.023	(0.045)
Total Debt		0.342	(0.184)	0.749	(0.174)
Total Debt Capacity		0.451	(0.198)	1.000	(0.003)
Secured Debt	0.395	0.041	(0.090)	0.088	(0.176)
Secured Debt Capacity	0.472	0.065	(0.116)	0.144	(0.232)
Subordinated Debt	0.241	0.027	(0.075)	0.052	(0.129)

Table II: The Importance of Debt Heterogeneity in Capital Structure

Panel A shows summary statistics on debt composition for the 511 sample observations sorted into groups based on the types of debt they have outstanding. Panel B shows the distribution of firms that make an adjustment to total debt against the distribution of firms that make an adjustment to debt structure, i.e. an adjustment to one of the debt components. An adjustment is defined as a change of more than 5 percent of lagged total assets, either positive or negative.

Panel A: Simultaneous Use of Different Types of Debt

	Group				
	1	2	3	4	5
Has Bank Debt?	No	Yes	Yes	Yes	Yes
Has Arms Length Debt?		No	No	Yes	Yes
Has Private Placements?		No	Yes	No	Yes
Observations	12	13	43	204	239
Firms	3	7	7	56	60
Share of Total Debt Capacity					
Arm's Length Debt	0.372	0.000	0.000	0.488	0.308
Private Placements	0.116	0.000	0.407	0.000	0.196
Bank Debt					
Used Revolver	0.000	0.039	0.086	0.109	0.106
Term Loan	0.000	0.013	0.088	0.040	0.049
Unused Revolver	0.000	0.576	0.280	0.260	0.232
Mortgage or Equipment Debt	0.090	0.027	0.015	0.008	0.015
Convertibles	0.380	0.340	0.072	0.046	0.060
Collateralized Leases	0.037	0.003	0.034	0.023	0.011
Unclassified	0.008	0.002	0.020	0.027	0.023

Panel B: Total Debt Adjustments versus Debt Structure Adjustments

			Does Firm Adjust Total Debt?			
	Total		Yes		No	
Total	378		183	48.4%	195	51.6%
Adjusts Arms Length / Assets	95	25.1%	67	36.6%	28	14.4%
Adjusts Convertibles / Assets	41	10.8%	27	14.8%	14	7.2%
Adjusts Bank Debt / Assets	120	31.7%	91	49.7%	29	14.9%
Adjusts Private Placements / Assets	59	15.6%	34	18.6%	25	12.8%
Adjusts At Least One Debt Component	220	58.2%	157	85.8%	63	32.3%

Table III: Debt Composition and Priority by Time Relative to Downgrade

The 511 observations in the sample of fallen angels are grouped by time relative to their downgrade to below investment grade. The table presents summary statistics on debt composition and priority as a share of total debt capacity and several financial variables. Financial variables are calculated from Compustat data. *Assets* are measured at book value (data6). *Total Debt*, *EBITDA*, *Cash*, and *Interest* are from Compustat (data9+data34, data13, data1, and data15 respectively).

	Two Fiscal Years Before Downgrade	Fiscal Year Before Downgrade	Fiscal Year of Downgrade	Fiscal Year After Downgrade
Time Relative to Downgrade	-2	-1	0	1
Median Moody's Rating	Baa2	Baa3	Ba2	Ba2
Count	133	133	133	112
Mean Debt Capacity / Assets	0.448	0.450	0.449	0.457
Mean as % of Debt Capacity				
Arm's Length Program Debt	0.092	0.089	0.038	0.031
Arm's Length Non-Program Debt	0.263	0.291	0.287	0.296
Private Placements	0.091	0.109	0.143	0.178
Bank Debt	0.450	0.395	0.388	0.358
Used Revolver	0.036	0.036	0.060	0.057
Term Loan	0.103	0.111	0.108	0.079
Unused Revolver	0.311	0.248	0.221	0.222
Convertibles	0.049	0.062	0.087	0.082
Secured Debt Capacity	0.053	0.087	0.213	0.238
Subordinated Debt Capacity	0.029	0.039	0.061	0.084
Mean				
Assets ($ millions)	6049	6659	7029	6561
Total Debt / Assets	0.314	0.340	0.356	0.362
EBITDA / Assets	0.131	0.109	0.083	0.096
Market-to-Book	1.525	1.272	1.197	1.316
Cash / Assets	0.050	0.053	0.068	0.079
EBITDA / Interest	15.3	6.4	3.8	4.4

Table IV: Change in Bank Debt in Years Around Downgrade

This table presents coefficient estimates from fixed-effects regressions of bank debt and its components on indicator variables for the fiscal year before, the fiscal year of, and the fiscal year after the firm's downgrade to speculative grade credit quality. The omitted year is two years before the downgrade. Measures of the bank finance components are from 10-K filings and represent levels of the debt instrument. In Panel A, the dependent variables are scaled by debt capacity (total debt plus unused lines of credit). In Panel B, the dependent variables are scaled by total assets at book value. All regressions contain firm and year fixed effects. Standard errors clustered by firm are in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Panel A: Scaled by Debt Capacity

	Total Bank Capacity	Bank Unused Revolver	Bank Used Revolver	Bank Term Loan
Year Before Downgrade	-0.051***	-0.064***	0.014	-0.002
	(0.016)	(0.016)	(0.012)	(0.008)
Year of Downgrade	-0.048**	-0.099***	0.026**	0.025**
	(0.022)	(0.022)	(0.013)	(0.010)
Year After Downgrade	-0.061**	-0.084***	-0.002	0.025**
	(0.027)	(0.023)	(0.017)	(0.011)
Observations	510	510	510	510
R-squared	0.10	0.12	0.10	0.06

Panel B: Scaled by Assets

	Total Bank Capacity	Bank Unused Revolver	Bank Used Revolver	Bank Term Loan
Year Before Downgrade	-0.020**	-0.024***	0.004	0.001
	(0.009)	(0.006)	(0.005)	(0.006)
Year of Downgrade	-0.019	-0.048***	0.013*	0.015**
	(0.013)	(0.010)	(0.007)	(0.006)
Year After Downgrade	-0.026*	-0.044***	0.004	0.014**
	(0.015)	(0.010)	(0.010)	(0.006)
Observations	511	511	511	511
R-squared	0.07	0.15	0.10	0.06

Table V: Change in Non-Bank Debt in Years Around Downgrade

This table presents coefficient estimates from regressions of arm's length debt and private placements on indicator variables for the fiscal year before, the fiscal year of, and the fiscal year after the firm's downgrade to speculative grade credit quality. The omitted year is two years before the downgrade. Measures of the non-bank finance components are from 10-K filings and represent levels of the debt instrument. In Panel A, the dependent variables are scaled by debt capacity (total debt plus unused lines of credit). In Panel B, the dependent variables are scaled by total assets at book value. All regressions contain firm and year fixed effects. Standard errors clustered by firm are in parentheses.

*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Panel A: Scaled by Debt Capacity

	Arm's Length Program			Private Placements		Arm's Length Non-Program	
	All	Commercial Paper	MTN	Rule 144a	Non-Rule 144a		Convertible
Year Before Downgrade	0.001	0.002	-0.001	0.012*	0.004	0.022**	0.021**
	(0.009)	(0.009)	(0.003)	(0.006)	(0.007)	(0.011)	(0.010)
Year of Downgrade	-0.048***	-0.034***	-0.014**	0.036***	0.000	0.016	0.047***
	(0.009)	(0.007)	(0.006)	(0.010)	(0.007)	(0.016)	(0.017)
Year After Downgrade	-0.047***	-0.036***	-0.011**	0.058***	-0.004	0.015	0.048**
	(0.009)	(0.007)	(0.004)	(0.013)	(0.010)	(0.020)	(0.022)
Observations	510	510	510	510	510	510	510
R-squared	0.16	0.14	0.08	0.18	0.05	0.04	0.08

Panel B: Scaled by Assets

	Arm's Length Program			Private Placements		Arm's Length Non-Program	
	All	Commercial Paper	MTN	Rule 144a	Non-Rule 144a		Convertible
Year Before Downgrade	0.002	0.002	0.000	0.004	-0.001	0.008	0.007**
	(0.004)	(0.004)	(0.001)	(0.003)	(0.003)	(0.007)	(0.003)
Year of Downgrade	-0.017***	-0.013***	-0.005**	0.019***	-0.002	0.002	0.014***
	(0.003)	(0.002)	(0.002)	(0.005)	(0.004)	(0.010)	(0.005)
Year After Downgrade	-0.018***	-0.014***	-0.004**	0.028***	-0.004	0.001	0.015*
	(0.004)	(0.003)	(0.002)	(0.007)	(0.005)	(0.016)	(0.008)
Observations	511	511	511	511	511	511	511
R-squared	0.17	0.15	0.08	0.15	0.05	0.05	0.06

Table VI: Priority Structure of Debt and Credit Quality Deterioration

The table presents coefficient estimates regressions relating the priority structure of debt to indicator variables for the fiscal year before, the fiscal year of, and the fiscal year after the downgrade to speculative grade credit quality. The omitted year is two years before the downgrade. Capacity is defined as total debt plus unused lines of credit. Panel A groups debt by whether it is secured or unsecured, regardless of where it is held or whether lines of credit are drawn. Panel B considers whether bank debt is secured, and Panel C considers whether non-bank debt is secured. Panel D shows the relation between the level of non-bank debt designated as subordinate and time indicators for the fiscal years around the downgrade. All specifications contain firm and year fixed effects. Standard errors clustered by firm are in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Panel A: Composition of Debt Capacity

	Secured / Capacity	Subordinated / Capacity	Secured / Assets	Subordinated / Assets
Year Before Downgrade	0.015	0.016**	0.006	0.005
	(0.017)	(0.007)	(0.009)	(0.004)
Year of Downgrade	0.126***	0.041***	0.053***	0.016**
	(0.021)	(0.014)	(0.011)	(0.007)
Year After Downgrade	0.150***	0.068***	0.069***	0.028**
	(0.023)	(0.021)	(0.013)	(0.012)
Observations	510	510	511	511
R-squared	0.32	0.18	0.28	0.13

Panel B: Collateralization of Bank Finance, Scaled by Capacity

	Secured Bank Capacity	Secured Unused Revolvers	Secured Used Revolvers	Secured Term Loans
Year Before Downgrade	0.011	0.002	0.003	0.006
	(0.016)	(0.010)	(0.007)	(0.008)
Year of Downgrade	0.112***	0.056***	0.029***	0.027***
	(0.020)	(0.014)	(0.009)	(0.008)
Year After Downgrade	0.134***	0.074***	0.022**	0.037***
	(0.022)	(0.016)	(0.009)	(0.009)
Observations	510	510	510	510
R-squared	0.3	0.23	0.11	0.11

Panel C: Collateralization of Non-Bank Finance, Scaled by Capacity

	Secured Non-Bank Debt	Mortgage & Equipment Trust Debt	Secured Private Placements	Secured Arm's Length Non-Program Debt
Year Before Downgrade	0.004	0.000	-0.001*	0.006
	(0.006)	(0.002)	(0.001)	(0.004)
Year of Downgrade	0.013***	0.002	0.006*	0.007*
	(0.005)	(0.002)	(0.003)	(0.003)
Year After Downgrade	0.017**	-0.001	0.009*	0.006**
	(0.007)	(0.003)	(0.005)	(0.003)
Observations	510	510	510	510
R-squared	0.05	0.03	0.06	0.03

	Panel D: Subordinated Non-Bank Debt, Scaled by Capacity			
	Subordinated Private Placements	Subordinated Rule 144a Private Placements	Subordinated Convertibles	Subordinated Arm's Length
Year Before Downgrade	0.004	0.003	0.008	0.005
	(0.004)	(0.004)	(0.006)	(0.003)
Year of Downgrade	0.012***	0.009**	0.021*	0.009
	(0.004)	(0.004)	(0.012)	(0.006)
Year After Downgrade	0.018***	0.014***	0.038*	0.012
	(0.005)	(0.005)	(0.020)	(0.009)
Observations	510	510	510	510
R-squared	0.09	0.09	0.14	0.06

Table VII: Debt Composition and Priority Robustness Specifications

The table presents specifications to examine the robustness of the patterns shown in Tables 3-5 to various alternative hypotheses. Panel A includes financial control variables. Panel B scales all quantities by assets as of the beginning of the sample period, which is the beginning of the second fiscal year before the downgrade. Panel C scales all quantities by total debt, as opposed to debt capacity as is done in the baseline regressions. Panel D restricts the sample to firms for whom the Moody's downgrade report mentions only business issues such as market conditions, cash flows, operations, operating performance, competitive environment, weakened demand, terrorism, litigation, or profitability. We exclude firms for which financial weaknesses such as leverage or coverage ratios, lower financial flexibility, and worsened credit metrics are mentioned. Panel E restricts the sample to firms for which the downgrade happened within one quarter after the 10-K issued for the previous reporting period. All regressions year fixed effects, and all regressions except Tobits include firm fixed effects. Standard errors clustered by firm are in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Panel A: Scaled by Debt Capacity, With Controls

	Unused Bank Revolver	Arm's Length Program Debt	Rule 144a Private Placements	Subordinated Debt	Secured Debt Capacity
Year Before Downgrade	-0.052***	-0.003	0.011	0.014*	0.020
	(0.016)	(0.009)	(0.007)	(0.007)	(0.017)
Year of Downgrade	-0.074***	-0.052***	0.031***	0.035***	0.137***
	(0.023)	(0.010)	(0.011)	(0.012)	(0.024)
Year After Downgrade	-0.059**	-0.050***	0.052***	0.064***	0.163***
	(0.024)	(0.010)	(0.012)	(0.019)	(0.026)
Market-to-Book, Lagged	0.005	-0.012	-0.004	0.008	0.018
	(0.018)	(0.011)	(0.008)	(0.011)	(0.017)
Leverage Ratio, Lagged	-0.196*	-0.079	0.093	0.023	0.040
	(0.114)	(0.056)	(0.075)	(0.050)	(0.134)
EBITDA / Lagged Assets	0.243**	-0.005	-0.003	-0.210*	-0.063
	(0.107)	(0.060)	(0.066)	(0.123)	(0.128)
Log Lagged Assets	-0.009	0.009	0.003	-0.021	-0.058
	(0.031)	(0.015)	(0.028)	(0.019)	(0.040)
Observations	507	507	507	507	507
R-squared	0.15	0.18	0.18	0.2	0.33

Panel B: Scaled by Beginning of Period Assets

	Unused Bank Revolver	Arm's Length Program Debt	Rule 144a Private Placements	Subordinated Debt	Secured Debt Capacity
Year Before Downgrade	-0.010	0.004	0.003	0.007*	0.041
	(0.007)	(0.004)	(0.005)	(0.004)	(0.038)
Year of Downgrade	-0.032***	-0.016***	0.030**	0.025***	0.080**
	(0.012)	(0.004)	(0.013)	(0.008)	(0.036)
Year After Downgrade	-0.033***	-0.017***	0.040**	0.030**	0.092**
	(0.012)	(0.004)	(0.018)	(0.012)	(0.039)
Observations	466	466	466	466	466
R-squared	0.08	0.18	0.08	0.11	0.09

Panel C: Scaled by Debt

	Arm's Length Program Debt	Rule 144a Private Placements	Subordinated Debt	Secured Debt
Year Before Downgrade	-0.001	0.017*	0.017**	0.010
	(0.013)	(0.009)	(0.009)	(0.014)
Year of Downgrade	-0.068***	0.040***	0.046***	0.076***
	(0.012)	(0.012)	(0.015)	(0.016)
Year After Downgrade	-0.066***	0.074***	0.081***	0.090***
	(0.013)	(0.017)	(0.023)	(0.018)
Observations	510	510	510	510
R-squared	0.18	0.18	0.17	0.19

Panel D: Sample of Strictly Business Downgrades (55 Firms)

	Unused Bank Revolver	Arm's Length Program Debt	Rule 144a Private Placements	Subordinated Debt	Secured Debt Capacity
Year Before Downgrade	-0.057**	0.009	0.012	0.040***	-0.007
	(0.028)	(0.014)	(0.009)	(0.014)	(0.024)
Year of Downgrade	-0.092***	-0.045***	0.020	0.084***	0.101***
	(0.035)	(0.013)	(0.014)	(0.025)	(0.034)
Year After Downgrade	-0.093**	-0.050***	0.031***	0.133***	0.128***
	(0.042)	(0.015)	(0.011)	(0.038)	(0.043)
Observations	212	212	212	212	212
R-squared	0.16	0.2	0.21	0.42	0.32

Panel E: Firms with Downgrades in Quarter After Report (34 Firms)

	Unused Bank Revolver	Arm's Length Program Debt	Rule 144a Private Placements	Subordinated Debt	Secured Debt Capacity
Year Before Downgrade	-0.086***	-0.010	0.029	0.021	0.019
	(0.022)	(0.015)	(0.019)	(0.017)	(0.032)
Year of Downgrade	-0.070***	-0.047**	0.046*	0.027	0.085***
	(0.025)	(0.020)	(0.025)	(0.018)	(0.032)
Year After Downgrade	-0.072***	-0.033**	0.042***	0.043**	0.132***
	(0.022)	(0.014)	(0.016)	(0.019)	(0.035)
Observations	133	133	133	133	133
R-squared	0.32	0.16	0.26	0.17	0.33

Table VIII: Debt Composition and Priority for Stable Firms, by Credit Rating

The table presents summary statistics on debt composition and priority as a share of total debt capacity and several financial variables for a random sample of 50 firms that remained stable at a Moody's rating category for four years. Statistics are collected and presented for the final year of that period. Financial variables are calculated from Compustat data. *Assets* are measured at book value (data6). *Total Debt*, *EBITDA*, *Cash*, and *Interest* are from Compustat (data9+data34, data13, data1, and data15 respectively).

	Stable at Investment Grade Rating	Stable at Ba Rating	Stable at B Rating
Count	17	12	21
Mean as % of Debt Capacity			
Arm's Length Program Debt	0.057	0.021	0.000
Arm's Length Non-Program Debt	0.330	0.105	0.094
Private Placements	0.074	0.236	0.408
Bank Debt	0.450	0.328	0.424
Used Revolver	0.077	0.112	0.083
Term Loan	0.003	0.050	0.165
Unused Revolver	0.371	0.167	0.175
Convertibles	0.025	0.249	0.031
Secured Debt Capacity	0.011	0.183	0.427
Subordinated Debt Capacity	0.012	0.349	0.154
Mean			
Assets ($ millions)	8050	2277	1414
Total Debt / Assets	0.259	0.346	0.589
Debt Capacity / Assets	0.395	0.407	0.726
EBITDA / Assets	0.149	0.120	0.117
Market-to-Book	1.800	1.413	1.139
Cash / Assets	0.072	0.113	0.068
EBITDA / Interest	16.7	8.0	2.4

Table IX: Covenant Violations

The incidence of covenant violations is examined with respect to time relative to the credit downgrade. Covenant violations were identified for fallen angels through examination of 10-K filings. The dependent variables in all specifications are binary, taking on values of either zero or one, and the specifications are estimated with linear probability models including firm and year fixed effects. Standard errors clustered by firm are in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Covenant Violations

	Covenant Violation	Bank Covenant Violation	Lease Covenant Violation	Private Placement Covenant Violation
Pre-Downgrade Mean	0.056	0.052	0.011	0.000
Year Before Downgrade	0.066**	0.074***	0.009	-0.001
	(0.028)	(0.029)	(0.008)	(0.001)
Year of Downgrade	0.141***	0.141***	-0.007	0.007
	(0.032)	(0.032)	(0.005)	(0.007)
Year After Downgrade	0.098***	0.098***	0.002	-0.002
	(0.032)	(0.032)	(0.007)	(0.002)
Observations	511	511	511	511
Firms	133	133	133	133
R-squared	0.08	0.09	0.02	0.02

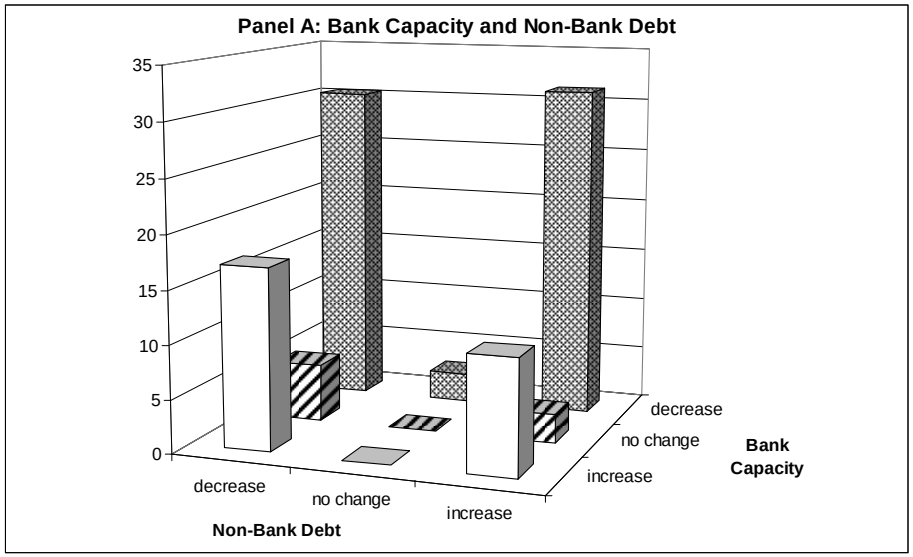
Table X: Spreads on Bank and Non-Bank Debt

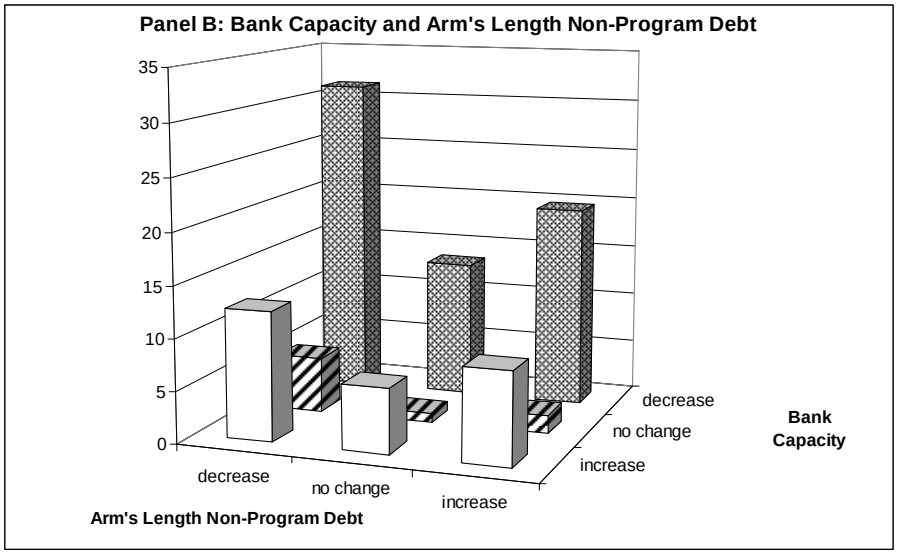
The specifications in this table relate the spreads on corporate bank and non-bank debt to indicators for the time period around the downgrade. All regressions contain year fixed effects. Standard errors are clustered by firm are in parentheses. In the spreads analysis, the spread for bank debt is the spread to LIBOR on drawn funds, from *Dealscan*. The spread for non-bank debt is the spread to maturity-matched Treasury bonds, from *SDC Platinum*. The analysis is conducted at the issue level. The sample consists of all observations from *Dealscan* and *SDC Platinum* that matched to the fallen angels sample and that contained pricing or spread data (869 out of 1,165 issues).

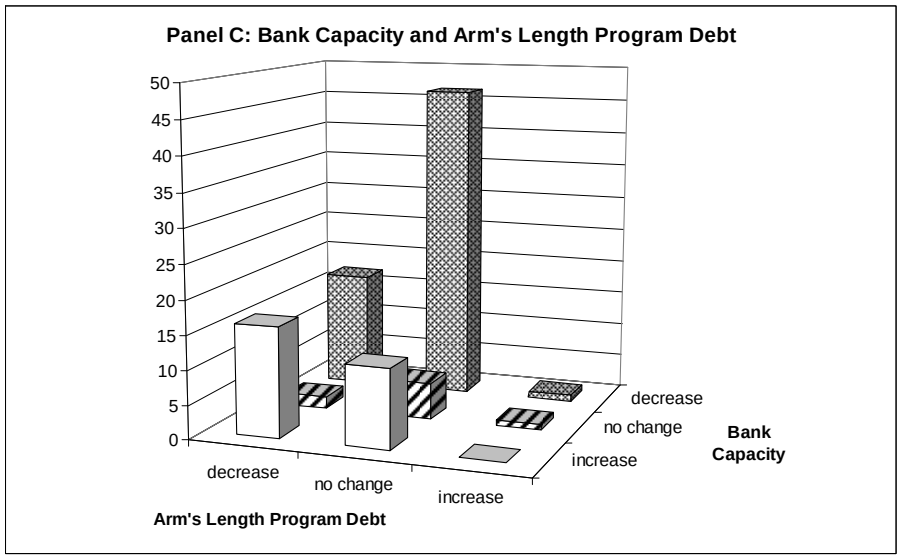
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

	Bank Debt		*Non-Bank Debt*		*Bank and Non-Bank Debt*	
	Drawn Rate	Drawn Spread	Offer Yield	Spread to Benchmark	Spread	
Year Before Downgrade	36**	34**	180*	62**	28*	12
	(18)	(14)	(97)	(25)	(15)	(23)
Year Following Downgrade	157***	147***	149***	149***	140***	122***
	(18)	(16)	(53)	(44)	(16)	(35)
2nd Year Following Downgrade	169***	166***	273	112***	162***	107**
	(24)	(23)	(168)	(39)	(23)	(55)
Year Before Downgrade * Nonbank Issue					39*	26
					(22)	(26)
Year Following Downgrade * Nonbank Issue					20	30
					(39)	(36)
2nd Year Following Downgrade * Nonbank Issues					-44	-13
					(40)	(42)
Non-Bank Indicator					104***	124***
					(18)	(19)
Firm Fixed Effects	N	N	N	N	N	Y
Observations	591	591	327	278	869	869
R-Squared	0.66	0.35	0.10	0.31	0.38	0.60

Figure 1: Percent of Firms that Increase or Decrease Types of Debt from Year Before Through Year After Downgrade







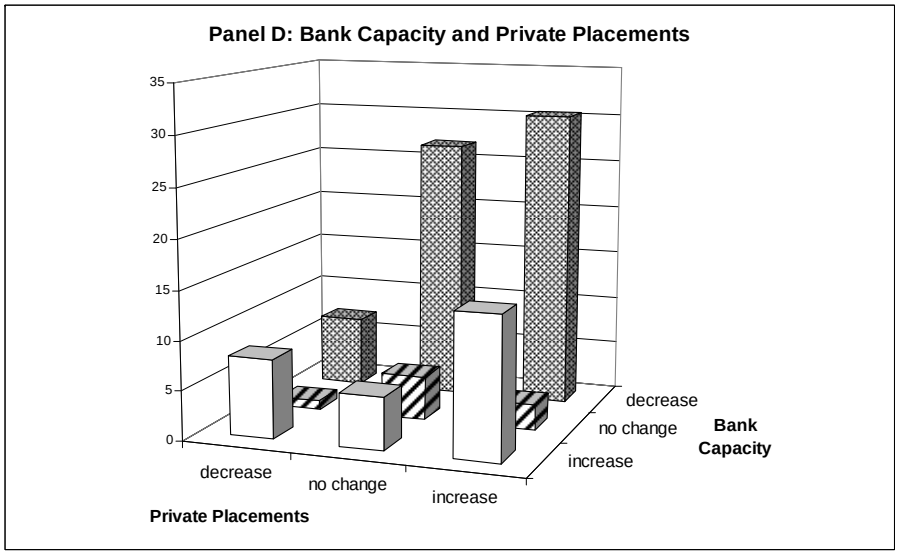
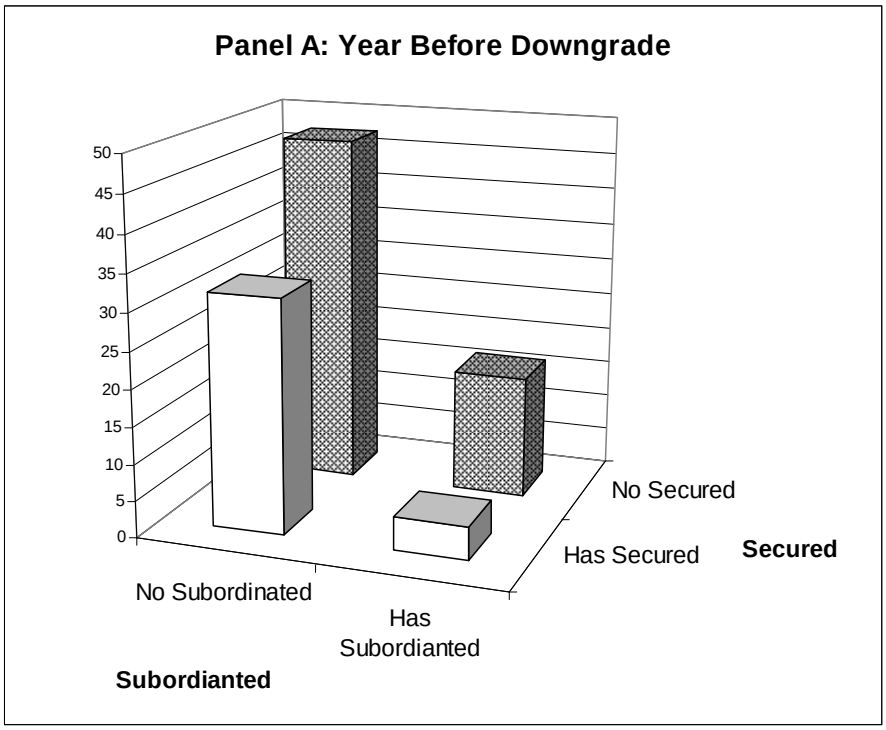


Figure 2: Fraction of Firms that Have Different Priorities of Debt Year Before and Year After Downgrade



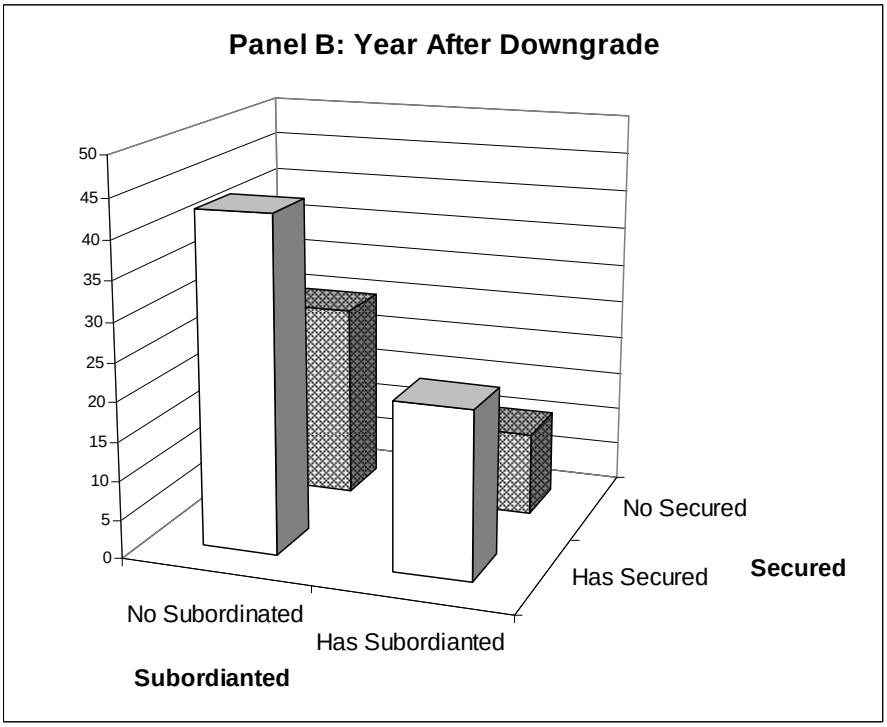


Figure 3: Terms of Bank Debt Issues by Time Relative to Downgrade

This figure presents the relation between terms of new bank issues by sample firms and time relative to the credit downgrade. Analysis begins with the sample of all bank issues found in *Dealscan* for our 133 fallen angel firms, a sample of 669 issues. Data on security, dividend restrictions, borrowing bases, and sweeps covenants were then extracted *Dealscan* for these issues, and the share of issues with these features was calculated for each firm in the two years before and two years after the downgrade date. Capital expenditure restrictions were taken from contracts in Nini, Smith, and Sufi (2007) and are only available for 153 issues.

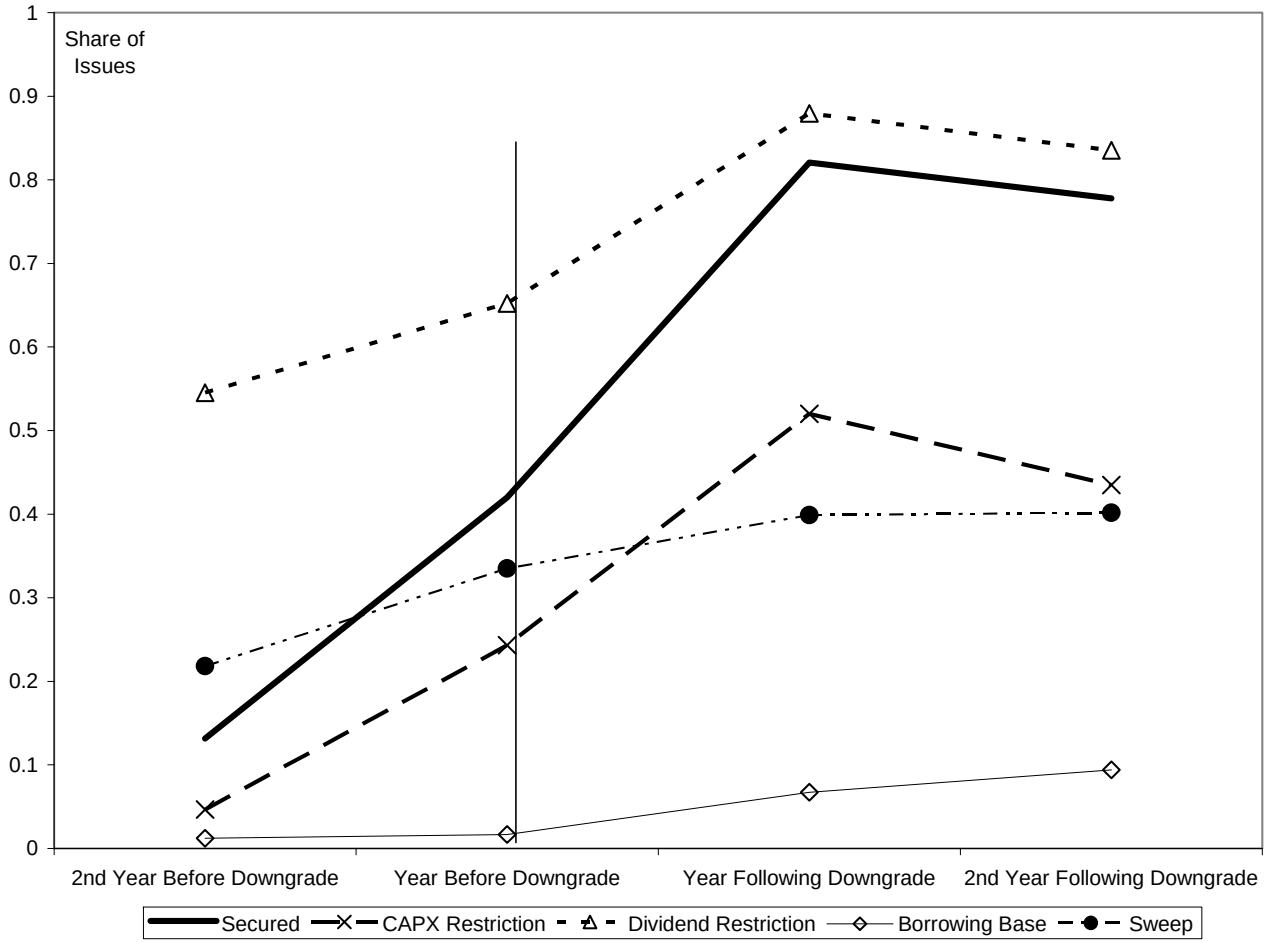


Figure 4: Terms of Non-Bank Debt Issues by Time Relative to Downgrade

This figure examines the relation between terms of new non-bank debt issues by sample firms and time relative to the credit downgrade. Matching our sample firms to *SDC Platinum* resulted 496 issues over the sample period. Bond covenant terms were obtained from the *Mergent Fixed Income Securities Database* (FISD) and were available for 152 of the 496 issues, covering at least one issue by each of 59 firms. The share of issues with these features was calculated for each firm in the two years before and two years after the downgrade date.