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

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Abstract

We examine the composition and priority of corporate debt for fallen angels, which are firms that are downgraded from investment grade to speculative grade by Moody's Investors Services. Our unique data set includes the source, priority, interest spread, and covenants of all individual debt issues that constitute a sample firm's balance sheet debt. We find that post-downgrade, there is a sharp reduction in discretionary, flexible sources of debt finance, such as bank revolving credit facilities, commercial paper, and medium-term notes. While almost all firms continue to rely on bank financing after the downgrade, bank credit availability declines and the covenants of new bank issues tighten substantially. In contrast, there is an increase in the use of private placements and convertible debt. We also find that a substantial fraction of firms "spread" their capital structure after the downgrade: they simultaneously issue secured bank debt with tight covenants and subordinated non-bank debt. Our findings are consistent with theoretical models in which the composition and priority of debt claims are structured to encourage bank monitoring.

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, empirical research in the area is limited. There are relatively few empirical studies that examine why firms simultaneously use different types, sources, and priorities of corporate debt. Even fewer examine why firms of different credit quality use debt with different priority structures.

In this study, we attempt to answer these questions by examining 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. We focus on fallen angels for two reasons. First, the primary source of variation in theoretical models that explore optimal debt structure is a firm's credit quality (e.g., Diamond (1991) and Bolton and Freixas (2000)). By focusing on 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 more precisely assess the relation between credit quality and debt structure. Second, empirical research suggests that credit ratings themselves have an important impact on a variety of corporate finance issues, such as firms' securities prices, debt agreements, financial policy, and investment policy (Hand, Holthausen, and Leftwich (1992); Asquith, Beatty, and Weber (2005); Kisgen (2006); Faulkender and Petersen (2006); and Sufi (2007a)). The importance of credit ratings in these settings suggests that rating changes may also have an important impact on corporate 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 corporate 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 beyond what is available from origination-based datasets alone.

We are motivated by two stands of theoretical research that reach different hypotheses on the relation between credit quality and debt composition. The first strand argues that firms should move from non-bank debt to bank debt as credit quality deteriorates (Diamond (1991), Chemmanur and Fulghieri (1994), Bolton and Freixas (2000)). The general intuition from these models is that banks offer a unique ability to monitor or renegotiate, and this ability is particularly valuable to borrowers with low credit ratings. The second strand of the literature argues that, when incentive conflicts are most severe, firms should simultaneously rely on different types of debt with different priorities, monitoring intensities, or structures (Diamond (1993), Park (2000), DeMarzo and Fishman (2007), DeMarzo and Sannikov (2006)). In these models, the multiplicity of debt instruments can improve managerial and lender incentives. In particular, Park (2000) argues that the primary purpose of using multiple priority classes of debt is to encourage socially optimal bank monitoring.

We begin our investigation of these hypotheses by examining how the types and sources of corporate debt change before and after the downgrade. We find that downgraded firms experience a sharp reduction in the availability of "discretionary" debt financing, such as commercial paper, medium-term notes, shelf registration debt, 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 revolving credit facilities—

[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.

declines after the downgrade. However, the decline in total bank debt capacity is driven by the large decrease in the unused portion of revolving credit facilities (revolvers). In contrast, bank term debt and the used portion of 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 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.

In our second set of results, we examine how the priority of debt changes following a downgrade. We document a "spreading" of the capital structure: while most debt is at the same 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. Our findings also dispute the notion that bank debt is always senior to all other debt: it is only after the downgrade that banks take a secured claim.

In our third set of results, we examine how the monitoring intensity of various creditors increases after the downgrade. In addition to becoming more secured, bank debt after the downgrade is more likely to contain restrictive covenants, such as dividend and capital expenditure restrictions. In addition, bank debt is more likely to contain borrowing bases, which make the total amount of the credit facility a function of collateral values, and sweeps covenants, which mandate that funds obtained through asset sales or other free cash flows must be used to pay back outstanding borrowings. Furthermore,

downgraded firms are more likely to violate covenants. 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, which represents a 150% increase in the likelihood at the mean. 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.

Overall, our findings suggest that fallen angels experience dramatic changes in debt structure. Before the downgrade, firms utilize discretionary debt programs such as commercial paper and shelf registrations and maintain large unused bank revolving credit facilities. Almost all debt is at the same priority level, and there are fewer covenants in both bank and non-bank debt. After the downgrade, firms have reduced access to discretionary debt programs and experience a reduction in bank revolving credit availability. A substantial fraction of firms "spread" their capital structure, simultaneously obtaining secured bank debt with tight covenants and subordinated private placements and convertibles.

These findings represent a significant contribution to three areas of research. Our primary contribution is to the literature on debt priority and composition. In particular, our findings strongly support the central theoretical result by Park (2000): 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 capital 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 exert socially valuable monitoring effort.

Our findings may at first appear to contradict models in which firms move from non-bank to bank debt after credit quality deterioration. 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.

Second, our findings contribute to research on the importance of credit ratings in corporate finance (Kisgen (2006), Faulkender and Petersen (2006), Sufi (2007a)). Our findings suggest that there are potentially large costs in terms of tighter covenants, increased spreads, and reduced access to discretionary debt finance when a firm moves from investment grade to speculative grade.

Third, 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.

While there are existing empirical studies on debt composition (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 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. Finally, some of the previous studies employ empirical methods that assume that firms *choose* one type of debt over another. Our findings suggest that firms *simultaneously* obtain different types of debt, which suggests caution when employing choice models for debt issuance decisions.

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. Sections III and IV present the results, and Section V concludes.

I. Data and Summary Statistics

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.

We make the following three additional restrictions. 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 in counted 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

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

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. 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, medium term notes, and shelf registrations.[4] These programs are often exempted 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 often exempted from SEC registration requirements, they are often registered shortly after issuance. As a result, they tend to be similar to public non-program debt (Gomes and Phillips (2005)).

(4) *Bank debt:* Consists of two main categories. Revolving bank debt includes committed revolving credit facilities or lines of credit. Total unused capacity of revolving credit facilities

[4] Shelf debt is often not distinguished from non-shelf debt in debt financial footnotes. As a result, we rely on the origination issue-level data set for shelf program sizes. While *SDC Platinum* records the aggregate size of shelf programs, it does not provide information on individual issues.

[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.

is reduced by outstanding borrowings, commercial paper, and letters of credit.[6] Term bank debt 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.

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 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. There are a total of 1,282 issues (613 from *SDC Platinum* and 669 from *Dealscan*) for 130 of our 133 borrowers. 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 1 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

[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).

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 1 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 unused bank revolving credit capacity. The unused bank revolving credit capacity represents funds committed by banks, but not drawn by the firm.[7] 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 access to public debt markets.

Column 1 of Table 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 only 5% of total debt capacity. The residual category is senior unsecured debt, which represents about 80% of total debt capacity.

Table 2 shows the composition of debt capacity across the credit rating distribution. Overall debt capacity increases from 39% of assets to 45% of assets when firms move from A to Baa or lower. Arm's length program debt, which consists of commercial paper and medium term notes, drops sharply at the investment grade/speculative grade split. Private placements and convertibles increase as credit quality deteriorates, while overall bank debt capacity declines. The unused portion of bank revolving credit

[7] 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.

facilities drops sharply as credit quality deteriorates, going from almost 40% of debt capacity for firms rated A or better to only 17% of debt capacity for firms rated B or worse.

Table 2 also documents a preliminary look at one of the core findings of our analysis: the priority structure of corporate debt "spreads" as firms experience credit quality deterioration. Secured debt increases from less than 10% of debt capacity to over 30% as credit quality deteriorates, and subordinated debt capacity increases from 0% to almost 10% of debt capacity. Secured and subordinated debt capacity includes the unused secured or subordinated portion of revolving credit facilities, respectively, although no firm in our sample ever has a subordinated bank revolving credit facility.

II. Theoretical Motivation

The summary statistics in Table II suggest that there is important variation across the credit quality distribution in the composition and priority of debt. In this section, we motivate our empirical analysis with two areas of theoretical research that develop hypotheses concerning optimal debt structure.

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.[8]

[8] 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 arm's length debt and bank debt. 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.[9]

The second group of theories examines why firms structure debt into multiple classes based on priority, maturity, or type (Diamond (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.[10] 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 debt-holders, which reduces the bank's incentive to monitor.[11]

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*.[12] 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

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

[10] DeMarzo and Fishman (2007) and DeMarzo and Sannikov (2006) examine dynamic contracts in a setting where cash flows are unobservable, and find that the optimal capital structure can be implemented via a line of credit, long-term debt, and equity. However, the priority of the line of credit versus long term debt is indeterminate in the model. Diamond (1993) hypothesizes that short-term debt should be senior to long-term debt, but there is no role for monitoring.

[11] This hypothesis is not obvious: See Fama (1990).

[12] Obviously, if the bank is to have any incentive to monitor, its claim must be large enough to be impaired if the borrower selects the risky, negative NPV project.

> 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 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.

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 threat 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. Results: The Effect of Credit Quality Deterioration on Debt Composition and Priority

In this section, we examine how credit quality deterioration affects the composition and priority of debt financing. In particular, we focus on whether firms appear to move from non-bank debt to bank debt after a downgrade, and whether bank debt becomes secured after the downgrade.

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 in sub-section D, 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 the sources and priority structure of corporate debt. 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.

B. Debt Composition after Credit Quality Deterioration

Tables 3 and 4 present the coefficient estimates relating the type of debt to the indicator variables for fiscal years around the downgrade. As the results in Table 3 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 of the downgrade relative to the year before the downgrade. It is important to emphasize that almost 30% of the firms are downgraded from A to Baa in the year before the downgrade to Ba, which explains why some of the patterns in our results begin in the year before an angel falls.

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

Table 4 presents the coefficient estimates for non-bank debt. There is a sharp drop in arm's length program debt, which includes commercial paper, medium term notes, and shelf registrations. 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 bottom panels of Tables 3 and 4 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 1.7% 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 3 and 4 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 the used portion of revolving credit facilities slightly increase 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.

C. Debt Priority after Credit Quality Deterioration

Table 5 presents the coefficient estimates relating the priority of corporate debt to indicator variables for the fiscal years around the downgrade. More specifically, Table 5 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.

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.

Panel E shows the relation between the deterioration in credit quality and priority/collateralization in origination issue-level data from *Dealscan* (for bank issues) and *SDC Platinum* (for non-bank issues). Origination-based data suffer from the drawback that they do not allow us to measure the change in financing net of issue retirements, as we do in our main sample based on 10-K filings. However, origination data do allow for us to analyze the effect of the credit quality deterioration on new issues, which may be particularly useful if the instruments involved tend to be longer maturity as is the case with the non-bank debt in our sample.[14] The specifications in Panel E are estimated with linear probability models on binary dependent variables.

The results in the first column of Panel E show a very substantial increase in the issuance of secured bank debt, with the increase measuring roughly 70 percentage points in the 12 months following

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

[14] The average maturity of non-bank debt issues in our sample is 13.91 years and the median is 10 years based on *SDC* data. Bank debt originated by our sample observations has much shorter stated maturities, 2.67 years at the mean and 3 years at the median according to *Dealscan* data.

the downgrade. The second column of Panel E demonstrates a more modest increase of 19 percentage points in secured finance for non-bank debt. The third column of Panel E shows the decline in senior unsecured issues, while the last column documents a 14 percentage point increase in the incidence of subordination for non-bank debt, a large effect compared to a mean of 4.0% of issues before the downgrade.

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.

Figure 3 highlights the dramatic increase in bank collateralization rates. It maps the fraction of secured bank debt to total bank debt and the fraction of secured non-bank debt to total bank debt for the years around the downgrade. The fraction of bank debt that is secured goes from 10% to over 40% in the year of the downgrade, whereas the fraction of non-bank debt that is secured rises only from 5% to 8%.

Overall, our results on the composition and priority of corporate debt following the downgrade strongly support 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 socially valuable 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 monitoring function of banks increases after the downgrade. We turn to this question in Section IV.

D. Robustness

In Table 6, we present coefficients from a variety of robustness tests to demonstrate that the core findings above are consistent with our economic interpretations. More specifically, 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 3 through 5.

Another concern is that a substantial number of observations in our regression analysis have a dependent variable that is censored at 0. In Panel D, we report estimates from a maximum likelihood Tobit estimation, which explicitly models both the extensive and intensive margin of the dependent variable. The coefficient estimates in Panel D are actually larger in magnitude for all of our key results, which suggests that any bias from using fixed effects linear regressions is a bias toward 0.

In Panels E and F, 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 E, 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. Even in this sample of only 53 borrowers, the coefficient estimates are almost identical and actually larger for subordinated debt. In Panel F, 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 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 the originated issues.

Finally, one concern is that our results are affected by the fact that different types of debt have different maturities. To examine this concern, we isolate the sample to firms that violate financial covenants in the fiscal year before the downgrade of their bank debt and are therefore forced to renegotiate with banks or find other sources of finance (See Sufi (2007b), Chava and Roberts (2007), and Roberts and Sufi (2007)). In unreported results, we find similar results for secured and subordinated debt of covenant violators, and we find stronger results for bank debt capacity and private placements. In other words, covenant violators reduce their bank debt capacity and increase issuance of private placements more than non-covenant violators. Our results are therefore robust to situations in which there is a "shock" to the maturity structure that induces renegotiation.

IV. Results: The Effect of Credit Quality Deterioration on Monitoring Intensity

The results in Section III are consistent with the hypothesis that the composition and priority of corporate debt following a downgrade are structured to maximize bank monitoring. In this section, we examine monitoring explicitly 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 in this section 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.

A. Loan and Bond Covenants

Figure 4 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 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.

Panel A of Table 7 reports linear probability coefficient estimates of the relation between the incidence of each type of covenant and indicator variables for the year relative to the downgrade.[18] Consistent with evidence in Figure 4, there is a sharp increase in all 4 covenants after the downgrade. The

[15] 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 Sufi (2007b), Chava and Roberts (2007), and Roberts and Sufi (2007) 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.
[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] We find similar results when using maximum likelihood probit estimations (unreported).

magnitudes of the increases in capital expenditure restrictions, dividend restrictions, and sweep covenants are large. For example, capital expenditure restrictions are 46 percentage points more likely to be contained in an agreement in the year following the downgrade relative to two years before the downgrade, which is consistent with the findings of Nini, Smith, and Sufi (2007).

Panel B of Table 7 examines financial covenant violations, which are collected from annual 10-K SEC filings.[19] Panel B demonstrates that the incidence of financial covenant violations increases sharply after the downgrade. The coefficient estimate in Column 1 of Panel B 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)), Panel B demonstrates that almost every covenant violation is associated with bank credit agreements, as opposed to public bonds or private placements.

The results in Table 7 demonstrate that the incidence of bank non-financial covenants and financial covenant violations increases sharply after the downgrade. Table 7 also demonstrates that financial covenant violations are associated almost exclusively with bank debt. These findings suggest that bank monitoring intensity increases sharply after credit quality deterioration.

Figure 5 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. Table 8 examines the change in bond covenants in linear probability regressions and finds similar results. Restrictions on new secured debt decrease while dividend/repurchase restrictions, stock issue restrictions, and prohibitions on asset sales increase.[20]

[19] 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.

[20] 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 Table 8 or Figure 5.

The results in Figure 5 and Table 8 demonstrate that the incidence of some bond covenants increases after the downgrade. While this evidence could be interpreted as additional monitoring by bondholders, 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."

Furthermore, the incidence of financial covenant violations on non-bank debt which we showed in Table 7 is consistent with previous research. We only find one example of a covenant violation in a private placement and no violations of financial covenants in bond agreements.

These findings suggest that the monitoring intensity of bank debt 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 loan covenants. Together with the results in Section III, 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.

B. Interest Spreads

The results above demonstrate that important debt terms such as quantities, collateralization, and covenants change after the downgrade. In Table 9, 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.[21] 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 9 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 10 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

[21] 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.

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.

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)). However, 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)). These findings dispute the notion that banks inefficiently hold up borrowers after credit quality deterioration.

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 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.

V. 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. 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 incidence of bank covenants and bank financial covenant violations 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. While there are exceptions, most research in these areas continues to treat all debt uniformly. 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)). 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 1: 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 2: Debt Composition and Priority by Credit Rating

The observations in our sample of fallen angels are grouped by Moody's Investor Services credit rating. 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). The ratios *Total Debt / Assets* and *EBITDA / Assets* are calculated from Compustat as (data9+data34)/data6 and data13/data6 respectively. 19 observations in the sample of 511 observations are excluded from this table as the firm was unrated at the time; in 13 cases these observations are in the first fiscal year of the sample, at least two calendar years before the downgrade.

	A and Above	Baa	Ba	B and Below
Count	15	237	180	60
Debt Capacity	0.387	0.458	0.452	0.459
Arm's Length Program Debt	0.099	0.090	0.034	0.035
Arm's Length Non-Program Debt	0.294	0.290	0.279	0.305
Private Placements	0.014	0.102	0.163	0.171
Bank Debt	0.476	0.404	0.390	0.333
Used Revolver	0.062	0.036	0.051	0.085
Term Loan	0.027	0.110	0.099	0.078
Unused Revolver	0.387	0.259	0.240	0.170
Convertibles	0.061	0.058	0.081	0.104
Secured Debt Capacity	0.067	0.067	0.196	0.316
Subordinated Debt Capacity	0.002	0.036	0.067	0.098
Assets ($ millions)	13170	6171	6667	7292
Total Debt / Assets	0.253	0.340	0.350	0.385
EBITDA / Assets	0.169	0.115	0.099	0.058
Market-to-Book	2.561	1.292	1.296	1.150

Table 3: 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 4: 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. The amount of debt from shelf registration programs is from *SDC Platinum* and represents the dollar amount of new shelf program initiations. 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	Shelf	Rule 144a	Non-Rule 144a		Convertible
Year Before Downgrade	0.001	0.002	-0.001	0.024	0.012*	0.004	0.022**	0.021**
	(0.009)	(0.009)	(0.003)	(0.025)	(0.006)	(0.007)	(0.011)	(0.010)
Year of Downgrade	-0.048***	-0.034***	-0.014**	-0.012	0.036***	0.000	0.016	0.047***
	(0.009)	(0.007)	(0.006)	(0.025)	(0.010)	(0.007)	(0.016)	(0.017)
Year After Downgrade	-0.047***	-0.036***	-0.011**	-0.078***	0.058***	-0.004	0.015	0.048**
	(0.009)	(0.007)	(0.004)	(0.026)	(0.013)	(0.010)	(0.020)	(0.022)
Observations	510	510	510	510	510	510	510	510
R-squared	0.16	0.14	0.08	0.06	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	Shelf	Rule 144a	Non-Rule 144a		Convertible
Year Before Downgrade	0.002	0.002	0.000	0.008	0.004	-0.001	0.008	0.007**
	(0.004)	(0.004)	(0.001)	(0.017)	(0.003)	(0.003)	(0.007)	(0.003)
Year of Downgrade	-0.017***	-0.013***	-0.005**	-0.025	0.019***	-0.002	0.002	0.014***
	(0.003)	(0.002)	(0.002)	(0.026)	(0.005)	(0.004)	(0.010)	(0.005)
Year After Downgrade	-0.018***	-0.014***	-0.004**	-0.062*	0.028***	-0.004	0.001	0.015*
	(0.004)	(0.003)	(0.002)	(0.037)	(0.007)	(0.005)	(0.016)	(0.008)
Observations	511	511	511	511	511	511	511	511
R-squared	0.17	0.15	0.08	0.1	0.15	0.05	0.05	0.06

Table 5: 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. Panel E shows the analysis in origination data from *Dealscan* and *SDC Platinum*, in contrast to Panels A through D which are at the firm-year level and based on the firm-year level data collection. Panels A through D contain firm and year fixed effects. Panel E is estimated by linear probability models and its specifications contain year fixed effects only. 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

Panel E: Origination Issue-Level Analysis

	Bank Secured	Non-Bank Secured	Non-Bank Senior Unsecured	Non-Bank Subordinated
Year Before Downgrade	0.259***	0.140*	-0.189***	0.048**
	(0.090)	(0.076)	(0.073)	(0.022)
Year of Downgrade	0.702***	0.185**	-0.326***	0.141***
	(0.073)	(0.089)	(0.083)	(0.044)
Year After Downgrade	0.681***	0.220**	-0.289***	0.069*
	(0.086)	(0.090)	(0.096)	(0.041)
Observations	402	496	496	496
R-squared	0.35	0.16	0.17	0.08
Mean of Dependent Variable Before Dowgnrade	0.295	0.133	0.826	0.040

Table 6: 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 presents the results of Tobit regressions to account for the fact that the debt components cannot fall below zero. Panel E 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 F 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: Tobit, Scaled by Debt Capacity

	Unused Bank Revolver	Arm's Length Program Debt	Private Placements	Subordinated Debt	Secured Debt Capacity
Year Before Downgrade	-0.068***	-0.040	0.034	0.069	0.067
	(0.022)	(0.043)	(0.049)	(0.062)	(0.057)
Year of Downgrade	-0.113***	-0.191***	0.089*	0.165***	0.314***
	(0.023)	(0.047)	(0.049)	(0.062)	(0.056)
Year After Downgrade	-0.112***	-0.241***	0.118**	0.265***	0.378***
	(0.024)	(0.053)	(0.051)	(0.065)	(0.060)
Observations	510	510	510	510	510

Panel E: 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 F: 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 7: Terms of New Bank Issues and Covenant Violations

Panel A of this table presents specifications that examine the relation between the terms of new bank issues by sample firms and time relative to the credit downgrade. Analysis is conducted in the issue-level sample. Terms of new bank issues are collected from *Dealscan*, with the exception of capital expenditure restrictions which were taken from contracts in Nini, Smith, and Sufi (2007). In Panel B, the incidence of covenant violations is examined with respect to time relative to the credit downgrade. Analysis is conducted in the firm-year level sample. Covenant violations were identified 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. 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: Terms of New Bank Issues, Issue-Level Sample with Year Fixed Effects

	Capital Expenditure Restriction	Dividend Restriction	Sweep	Borrowing Base
Pre-Downgrade Mean	0.190	0.602	0.279	0.015
Year Before Downgrade	0.129*	0.082	0.142**	-0.003
	(0.076)	(0.083)	(0.070)	(0.018)
Year Following Downgrade	0.464***	0.352***	0.273***	0.041*
	(0.087)	(0.068)	(0.076)	(0.021)
2nd Year Following Downgrade	0.383***	0.291***	0.302***	0.064**
	(0.126)	(0.083)	(0.082)	(0.027)
Observations	153	440	669	669
Firms	101	113	129	129
R-squared	0.26	0.15	0.13	0.05

Panel B: Covenant Violations, Firm-Year Level Sample with Firm and Year Fixed Effects

	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 8: Terms of Non-Bank Debt Issues

This table presents coefficient estimates from regressions relating the covenant terms in bonds to indicator variables for the time relative to the downgrade. Analysis is conducted in the issue-level sample. Covenant terms were obtained from the *Mergent Fixed Income Securities Database (FISD*) and were available for 152 of the 496 issues in our issue level data from *SDC Platinum*, covering at least one issue by each of 59 firms. All dependent variables are binary, taking on values of either zero or one, and the specifications are estimated with linear probability models. All regressions contain year effects. Standard errors clustered by firm are in parentheses.

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

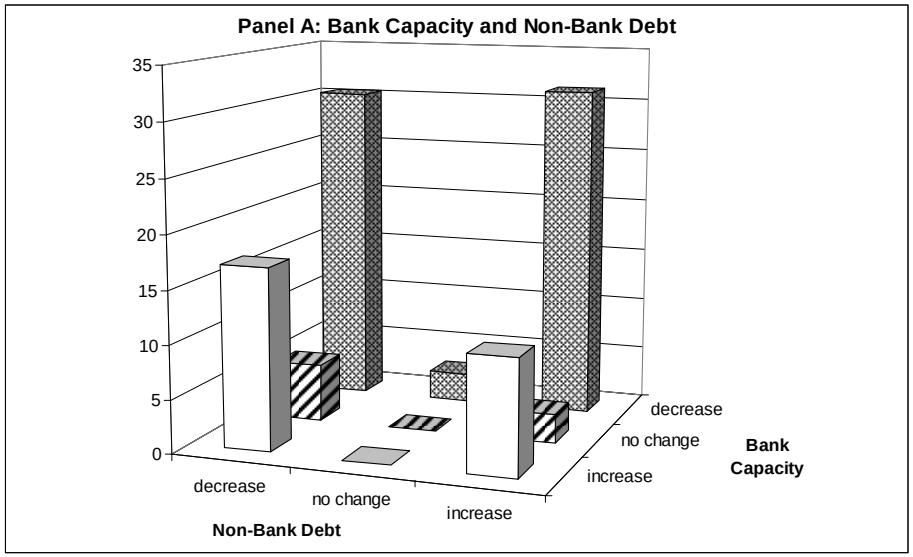
	Covenant Terms, Issue-Level Sample					
	Dividend or Repurchase Covenant	Restriction On New Secured	Sale Leaseback Restriction	Restricts Common Stock Issue	Cross-Default Provision	Asset Sales
Mean of Dependent Variable	0.118	0.776	0.691	0.118	0.539	0.072
Year Before Downgrade	-0.028	-0.256**	-0.348***	0.005	-0.193	-0.075
	(0.086)	(0.113)	(0.132)	(0.079)	(0.153)	(0.064)
Year Following Downgrade	0.255**	-0.342**	-0.262	0.226*	-0.112	0.205*
	(0.126)	(0.165)	(0.166)	(0.124)	(0.205)	(0.108)
2nd Year Following Downgrade	-0.017	-0.223	-0.371*	-0.070	0.062	0.031
	(0.138)	(0.150)	(0.194)	(0.098)	(0.183)	(0.116)
Observations	152	152	152	152	152	152
R-Squared	0.23	0.22	0.28	0.23	0.07	0.17

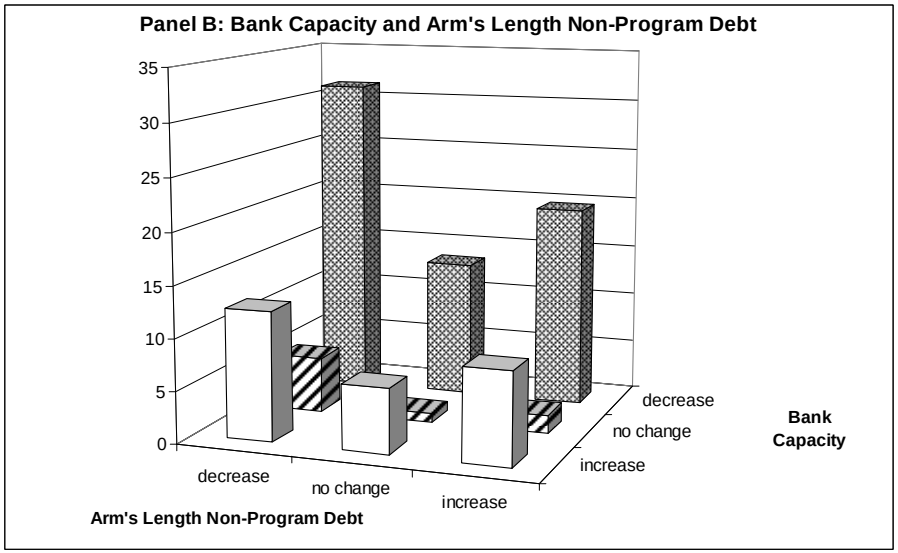
Table 9: Spreads on Bank and Non-Bank Debt

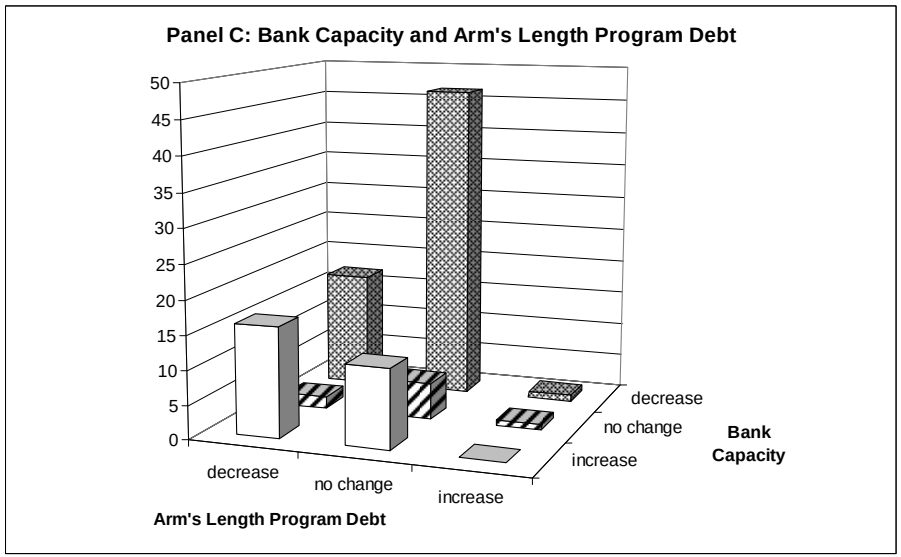
The specifications in this table relate the spreads on corporate bank and non-bank debt to indicators for the time period around the downgrade. All regressions contain year fixed effects. Standard errors are clustered by firm are in parentheses. In the spreads analysis, the spread for bank debt is the 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*.
*** 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	0.1	0.31	0.3781	0.6008

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







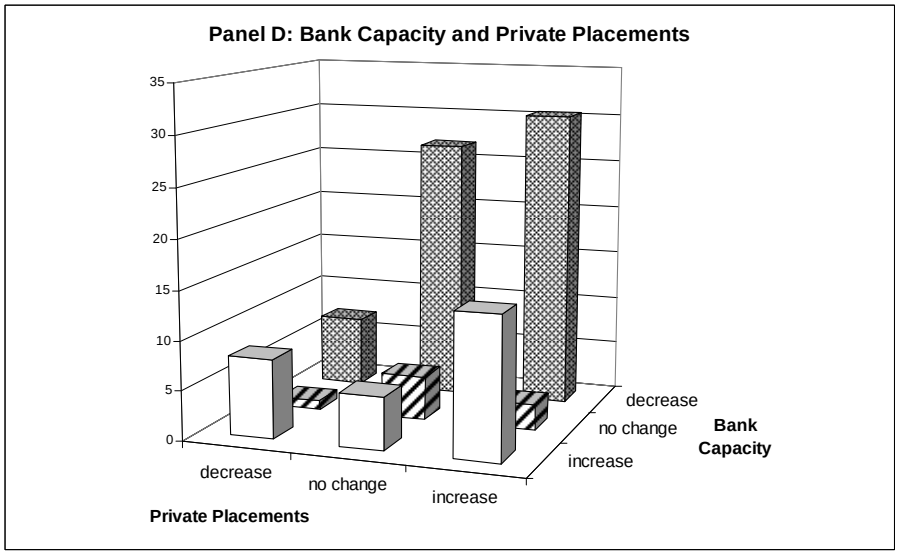


Figure 2: Fraction of Firms that Have Different Priorities of Debt Year Before and Year After Downgrade

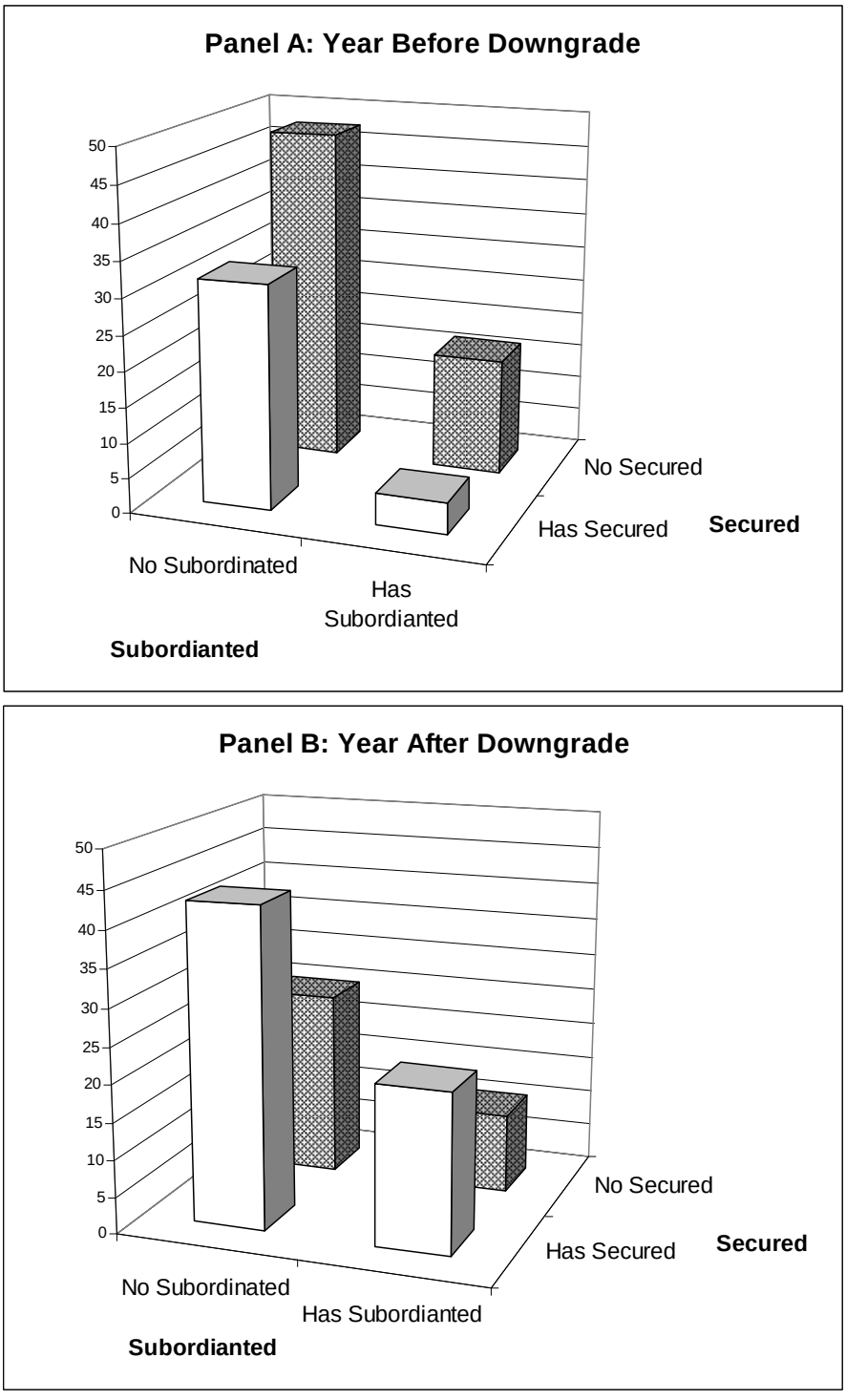


Figure 3: Share of Bank and Non-Bank Debt that is Secured, by Time Relative to Downgrade

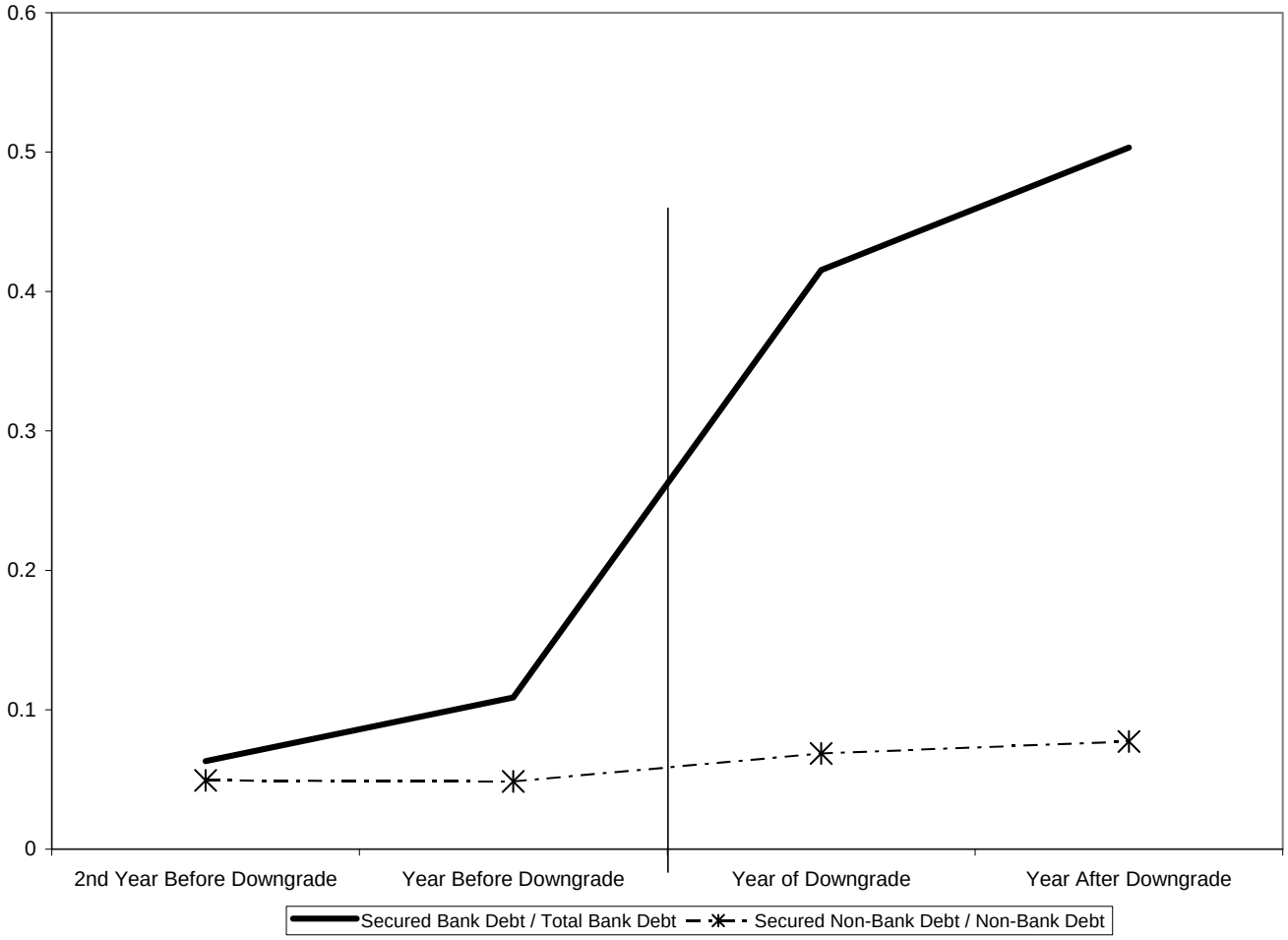


Figure 4: Terms of Bank Debt Issues by Time Relative to Downgrade

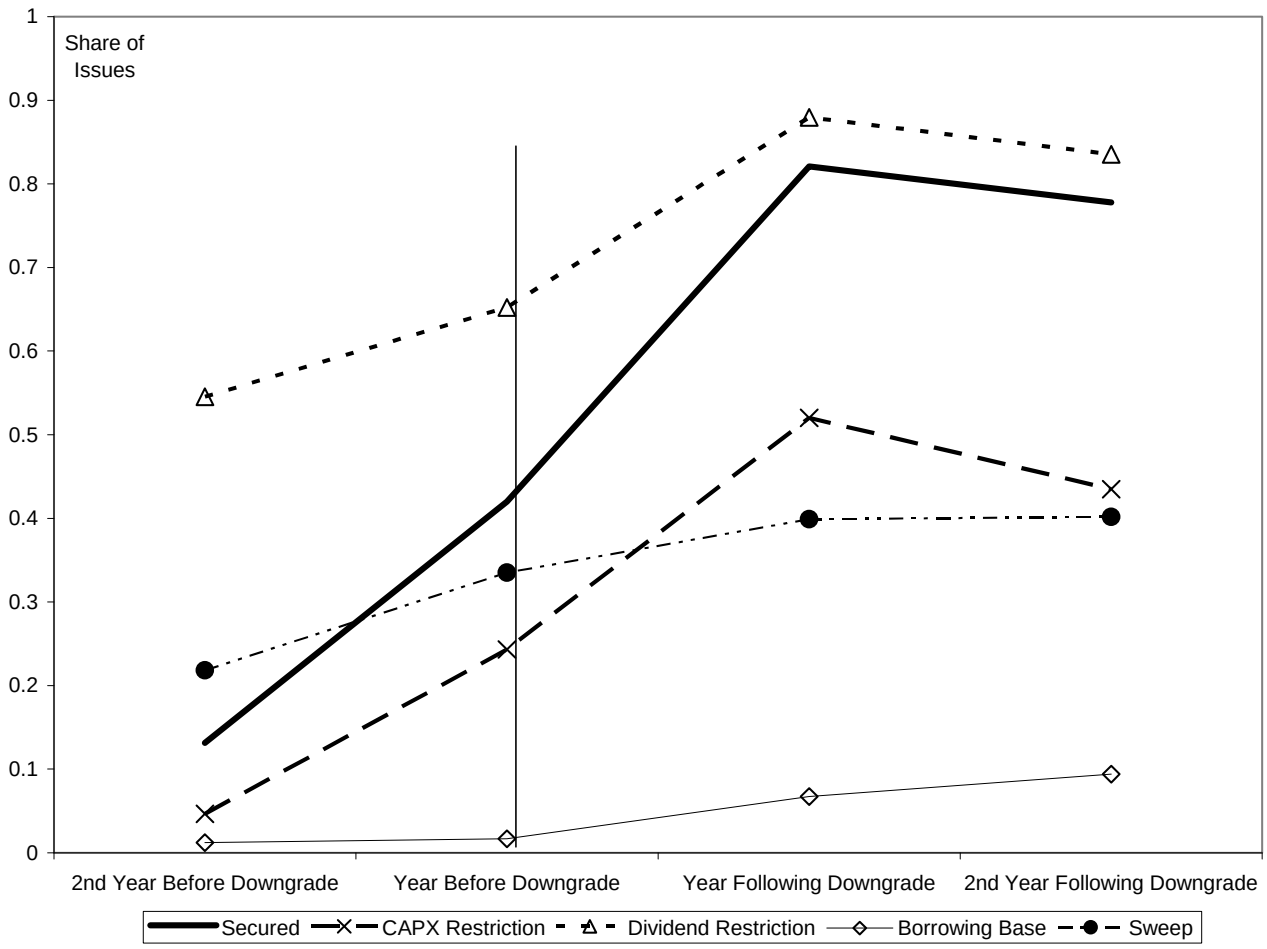


Figure 5: Terms of Non-Bank Debt Issues by Time Relative to Downgrade