Credit Rating Changes of Peer Firms and Corporate Capital Structure

Chi-Hsiou D. Hung
Adam Smith Business School
University of Glasgow
Email: chi-hsiou.hung@glasgow.ac.uk

Shammyla Naeem
Adam Smith Business School
University of Glasgow
Email: shammyla.naeem@glasgow.ac.uk

K.C. John Wei
School of Business Management
Hong Kong University of Science and Technology
Email: johnwei@ust.hk

This version: May 7, 2016

Abstract

Firms reduce leverage when industry peers with the same credit rating were downgraded in the previous year. Firms with the highest investment- or speculative-grade rating exhibit the strongest reductions in net debt issuance by 2.13% and 1.90% of total assets, respectively. The peer effect is ubiquitous, but is particularly strong for smaller firms, investment-grade firms, and firms operating in more concentrated industries and during the earlier periods. We also document a lower-than-average effect where firms reduce leverage when their ratings are lower than the industry average. Importantly, the peer effect is distinct from this lower-than-average effect.

JEL Classification: G2, G32
Keywords: Capital structure; Peer firms; Credit ratings; Upgrades; Downgrades

---

* We appreciate the helpful comments and suggestions from seminar participants at the Hong Kong University of Science and Technology and University of Glasgow and conference participants at the 2015 Theories and Practices of Securities and Financial Markets (SFM) in Kaohsiung, Taiwan. Chi-Hsiou Hung acknowledges financial support by the grants in 2014 and 2015 from the Wards Trust Fund. John Wei acknowledges financial support in the form of a Research Infrastructure Grant from Hong Kong's Research Grants Council (RI/93/94.BM02). All remaining errors are ours.

*__Corresponding author__: K.C. John Wei, Department of Finance, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong. Tel: (852) -2358-7676; Fax: (852) -2358-1749. Email: johnwei@ust.hk.

1. Introduction

In this paper, we contribute to the capital structure literature by examining whether credit rating changes of peer firms affect the capital structure decision of a firm. The credit rating downgrades or upgrades of firms in an industry can generate influential externalities to a firm in the same industry.[1] Firms with a higher credit quality enjoy a lower cost of debt capital than their peers. We posit that firms are likely to take their rivals' credit rating changes into consideration when deciding on the capital structure of their own companies. The goal of this paper is to analyze whether, how, and why changes in the credit ratings of peer firms affect the corporate capital structure of firms in the same industry.

Recent research shows that peer firms' financing decisions and characteristics affect a firm's corporate capital structure (Leary and Roberts (2014)). More importantly, many chief financial officers (CFOs) consider peer firms' financing decisions important for making their own financing decisions (Graham and Harvey (2001)). Financial distress of a firm also has a negative impact on the stock price of its suppliers (Hertzel, Li, Officer, and Rodgers (2008)). The peer effect not only appears in capital structure decisions, it also exists in corporate executive compensation (Bizjak, Lemmon, and Naveen (2008)). Our study offers new insight into the motives of capital structure changes and the related actions firms take upon changes in the credit ratings of peer firms.

Credit ratings are one of the most important factors affecting corporate debt policy (Graham and Harvey (2001)). To the extent that different credit ratings are associated with different costs and benefits, a change in a firm's credit rating may influence its capital structure (Kisgen (2006; 2009)). A rating upgrade or downgrade also leads to adjustments in security

[1] Well-known examples include credit rating downgrades of top-tier firms like GM and Ford (see, e.g., Acharya, Schaefer, and Zhang (2015)), and collapses of Enron, WorldCom, and United Airlines.

prices and the cost of capital (e.g., Hand, Holthausen, and Leftwich (1992); Kliger and Sarig (2000)), and affects the firm's access to the commercial paper market, disclosure requirements, as well as third party relationships (Kisgen (2006)).

We develop and test hypotheses on how the externality effect makes peer firms' rating upgrades or downgrades important for the firm when deciding on its capital structure for the next year. We identify firms as peers if they are in the same industry and have an identical credit rating in a given year. The rating change effect we analyze pertains to the changes in capital structure, in a given year, of a firm whose peers' credit ratings were either upgraded or downgraded in the previous year but whose own credit rating remained unchanged.

Leary and Roberts (2014) argue, from a learning motive perspective, that firms may consider the financial health of their peers when determining their own capital structures. We argue, instead, from the motive of maintaining the now higher credit quality relative to the peers due to both competition and contagion considerations, and examine whether the credit rating downgrades of peer firms affect the net debt issuance of a firm.

We are mindful to mitigate common industry effects such as a common negative shock to the industry causing a wave of industry-wide deleveraging. To this end, in all our analyses we first control for the effect of an overall industry-wide credit rating downgrade and secondly, the effect of an overall industry-wide leveraging (or deleveraging). Importantly, we demonstrate that our findings are a distinct externality effect of credit rating downgrades of peer firms, given the industry-wide deleveraging or an overall average rating downgrades in an industry.

We use a sample of U.S. firms over the period 1985-2013 and find strong evidence that peer firms' credit rating downgrades are an important determinant of a firm's financing decision. Firms witnessing peer rating downgrades significantly reduce the amount of debt and increase

the amount of equity in their capital structure. Such firms, on average, decrease their net debt issuance (*NDI*) by 1.40% or more. This *NDI* reduction comes mainly from the reduction in long-term debt rather than from the reduction in short-term debt. The peer effect is prevalent across firms and over time, and time-varying external financing costs do not drive our findings. However, the peer effect in reducing net debt is stronger for investment-grade firms (1.51%) than for speculative-grade firms (1.29%), for firms in concentrated industries (1.48%) than for those in competitive industries (0.56%), and for small firms (1.70%) than for large firms (1.21%). The peer effect is also stronger before than after the recent financial crisis culminated around the period 2008-2009. The evidence strongly supports our hypothesis that credit rating downgrades of peer firms affect financing activities of a firm. Firms that are not downgraded have incentives to reduce debt in their capital structure and try to reap the benefit of their now relatively higher credit quality.

Moreover, we find stronger and more pronounced reductions in net debt issuance of firms in the highest investment- and speculative-grade categories. Top investment-grade firms with (ratings in AAA through to A-) react strongly to both upgrades and downgrades of peer firms: They reduce net debt issuance by 0.85% and 2.13% to total assets when peer firms are upgraded and downgraded, respectively. In addition, firms with the highest speculative grades of BB+, BB and BB- (i.e., those whose credit ratings are in the immediate boundary separating investment-grade and speculative-grade firms) reduce their net debt issuance by 1.90% to total assets when peer firms are downgraded. Speculative-grade firms witnessing peer firms' rating upgrades do not make significant capital structure changes.

Next, we ask the following questions: if a firm's credit rating is lower than the industry average, would the firm be prone to reduce leverage to improve its rating? How the pressure of

having a lower-than-average rating would play out when peer firms are receiving rating upgrades or downgrades? We first show the evidence of a significant lower-than-average effect in that the average credit rating of an industry serves as a reference point for all firms in that industry. When a firm's rating is below this reference point, it tends to reduce its debt. We find that firms, on average, reduce their net debt issuance by 2.13% if their rating is below the industry average in the previous year. Moreover, the leverage reduction in the light of peer firms' rating changes is a distinct effect from the effect of firms having a below-average rating. A firm that faced downgraded peers reduces its net debt issuance by 1.68% even after controlling for the lower-than-average effect.

No prior research has examined the important effect of credit rating changes of peer firms on the capital structure of a firm as we do. The extant trade-off theory of capital structure argues that a firm's optimal leverage ratio is determined by trading off between the benefits and costs of debt.[2] Other branches of the literature analyze information asymmetry between managers and outside investors and posit the signaling effect of debt (Ross (1977); Leland and Pyle (1977); Noe (1988)), or propose the pecking-order theory (Myers (1984); Myers and Majluf (1984); Leary and Roberts (2010)). Kisgen (2006; 2009) studies the effect of a firm's own credit rating on its capital structure.

The implicit assumption of these theories, to a large extent, has been that a firm's leverage is affected only by its own characteristics.[3] The role of peer firms' characteristics and actions is either unimportant or works through some firm-level factors or is captured by market frictions surrounding the sources of capital. For example, Leary and Roberts (2005) demonstrate that

[2] Korteweg (2010) tests the net benefits of debt. Earlier research considers agency costs and benefits of debt in relation to conflicts of interest between shareholders and managers (Harris and Raviv (1990); Stulz (1990)) and between equity holders and debtholders (e.g., Jensen and Meckling (1976); Jensen (1986)).

[3] Titman (1984) relates industry characteristics to capital structure and demonstrates that firms that produce unique or durable products have less debt.

adjustment costs dictate the speed at which the corporate capital structure responds to leverage shocks. Lemmon, Roberts, and Zender (2008) show that a firm's capital structure is persistent. Baker and Wurgler (2002) posit that firms time the market when issuing equity. Dittmar and Thakor (2007) assert that the issuance decision is driven by what the manager thinks his firm is worth. Other research relates product market strategies and industry characteristics to the capital structure. These studies, however, do not consider the between-firm effect within the same industry. For example, Brander and Lewis (1986) show that, due to the limited liability of equity holders, firms choose positive debt levels to pursue aggressive output strategies. Maksimovic (1988) derives debt capacity as a function of industry and firm characteristics.

The rest of the paper is organized as follows. Section 2 provides the literature review and develops hypotheses for our analyses. Section 3 describes our ratings data and explains the sample and methodology employed in this study. Section 4 discusses summary statistics and reports our main results on the effects of peer firms' rating changes on a firm's financing policies. Section 5 conducts cross-sectional analyses to examine whether cross-sectional variations exist in the peer rating effect. Section 6 performs addition analyses to determine whether there is interplay between the peer effect and the below-average credit quality effect and whether the peer effect varies over time. Section 7 concludes the paper.

2. Hypothesis Development

Firms in an industry with the same credit rating level are perceived to have a similar credit quality. The level of default risk and the associated cost of debt capital, therefore, would also be similar for these firms. A credit rating downgrade to a firm reflects an increase in its probability of default and may affect industry peers through two channels. First, the business relations

channel gives rise to counterparty risk (e.g., Jarrow and Yu (2001); Jorion and Zhang (2009)). Second, there exists an information channel where peers are impacted by the emergence of negative shocks, even without business relations with the downgraded firm, leading to investors' revision of required risk premiums. Lang and Stulz (1992) find that negative news announcements of Chapter 11 filings by bankrupt firms result in stock price declines of the firm's competitors. Hertzel and Officer (2012) show that loan spreads widen surrounding industry bankruptcy waves. Jorion and Zhang (2007) find evidence of contagion effects for Chapter 11 bankruptcies. Cautious managers will therefore take actions to safeguard from this contagion effect occurring to their own firm.

On the other hand, a credit rating downgrade of peer firms is an opptunity of a firm to gain competitive advantage over its peers by standing at a higher credit quality, enjoying lower costs of debt and lower discrete costs (Kisgen (2006), having a better access to the debt market and higher market equity value, while the downgraded peer firm may find itself becoming more difficult to finance with debt. Grinblatt and Titman (2002) discuss the clientele effect that institutional investors often are restricted by statutory constraints and cannot invest in debt securities with credit rating levels lower than a certain threshold. This competition effect drives firms to reduce leverage in order to maintain a higher credit rating than their downgraded competitors.

The above evidence, taken together, suggests that, in light of credit rating downgrads of peer firms, a firm may want to seize the benefit from competition effect and safeguard itself from the contagion effects. The immediate implication, and our first hypothesis, is that credit rating downgrades of peer firms lead firms to cut back on debt financing.

Hypothesis 1 (H1): C*redit rating downgrades of peer firms lead firms to reduce their leverage.*

Conversely, extant empirical evidence shows that a credit rating upgrade to a firm contains little incremental information content due to the relatively transparent nature of positive news of a firm. Prior studies, in general, do not find a significant market response to bond upgrades (e.g., Holthausen and Leftwich (1986); Hand, Holthausen, and Leftwich (1992); Goh and Ederington (1993)). The evidence suggests that rating upgrades of peer firms are not perceived as a significant information signal. Thus, we conjecture that credit rating upgrades of peer firms do not lead to any significant adjustments in capital structure. This leads to our second hypothesis in the form of a null hypothesis as follows.

Hypothesis 2 (H2): C*redit rating upgrades of peer firms do not lead firms to change their leverage.*

Our credit ratings are based on a debt issuer's ratings, which place more weight on long-term debt than short-term debt. As a result, if firms want to maintain their ratings when peer firms' ratings are downgraded, reducing long-term debt would be more effective than reducing short-term debt. The above discussion leads to our third hypothesis.

Hypothesis 3 (H3): *The effect of credit rating downgrades of peer firms on a firm's debt reduction mainly works through long-term debt.*

All else equal, firms in concentrated industries would be under heavier pressure than firms in competitive industries to maintain good credit ratings when peer firms experience rating changes. This is because of the relatively smaller number of firms within a concentrated industry in which the rating upgrade (or downgrade) of one firm directly results in a competitive

disadvantage (or advantage) of other firms. As such, these firms would reduce their leverage more aggressively than firms in competitive industries.

Similarly, small firms will also be subject to more pressure than large firms to maintain good existing credit quality when peer firms' ratings are downgraded. The reason is that smaller firms are more vulnerable and it is relatively costlier for them to secure finance than it is for larger firms if they lose their existing credit rating status. Hence, small firms would reduce their net debt more aggressively than large firms. Finally, investment-grade firms have better access to the debt and equity market than speculative-grade firms. Therefore, when credit ratings of peer firms are downgraded, investment-grade firms are able to reduce their net debt more easily than speculative firms. In addition, investment-grade firms are relatively exposed to counter-party risks than speculative-grade firms, which aggravate the effect of a peer-firm downgrade. The above discussions lead to our last hypothesis.

Hypothesis 4 (H4): *The effect of peer firms' credit rating downgrades on firms' debt reduction is more pronounced for firms in concentrated industries, investment-grade firms, and small firms.*

3. Sample and Methodology

3.1 Sample construction

The sample covers all firms with a credit rating in Compustat at the beginning of a year over the period from 1985, when ratings first became available in Compustat, to 2013. From the Compustat Ratings File, we collect the annual data on firm credit ratings issued by Standard and Poor's (S&P) for all rated firms, as in Kisgen (2006) and Baghai, Servaes, and Tamayo (2014). We use the S&P long-term domestic *issuer* credit ratings (Compustat data item SPLTICRM),

which reflect the opinion of an issuer's overall creditworthiness. To construct our peer rating dummies, we use the ratings at the start of a fiscal year.

S&P issues 22 alphanumeric ratings from the highest creditworthiness category to the lowest: AAA, AA+, AA, AA−, A+, A, A−, BBB+, BBB, BBB−, BB+, BB, BB−, B+, B, B−, CCC+, CCC, CCC−, CC, C, and D and SD (Selective Default). Firms rated BBB− and above are typically considered as investment grade, and those rated below BBB− as speculative grade. For the purpose of estimating regression models, we transform the S&P alphanumeric rating codes into ordinal numerical codes (e.g., Baghai, Servaes, and Tamayo (2014); Dimitrov, Palia, and Tang (2015)). Our numerical transformation assigns 22 to AAA, 21 to AA+, 20 to AA, …, and 1 to D and SD.

We match the ratings data with firm-level annual financial statement data obtained from Compustat, and end up with one observation per firm-year. As is common in the prior literature on capital structure, we exclude from the sample utility firms as they are highly regulated, and financial firms, because regulations impose specific restrictions, such as the minimum capital requirement for banks and investor insurance for insurance firms, on their asset and liability structures. Following Kisgen (2006), we repeat our analyses by including utility firms and our results, as shown in Internet Appendix A, remain robust. We exclude firm-years that have missing observations for calculating variables for the empirical analyses. The resulting sample consists of 2,648 firms with 22,616 firm-year observations, among which 9,587 are classified as investment grade (BBB- and above) and 13,029 as speculative grade (BB+ and below).

3.2 Variables used in the firm-level regression

Our proposition predicts future capital structure changes of a firm when peer firms experience credit rating changes. To address the possibility that an industry-wide deleveraging may be affecting the net debt issuance of the firm, regardless of whether peer firms are downgraded, in all our regression analyses we include a variable NDI_{ind}, which is the average net debt issuance of all firms within the industry excluding the firm. We further control for overall credit rating downgrades in an industry by including a dummy variable $CRind_t < CRind_{t-1}$ that takes the value of one if average industry credit rating in time *t* is one-standard-deviation lower than average industry rating in time *t-1* and zero otherwise.

We estimate a model of a firm's financing decision following rating changes of peer firms. The measures of a firm's financing activities are computed for the subsequent 12 months following the peer credit rating changes. The main dependent variable, net debt issuance (*NDI*), in the regressions measures net debt minus net equity issued each year (e.g., Kisgen (2006)) and is defined as:

$NDI_{i,t}$ = net debt issuance = $\Delta Debt_{i,t} - \Delta Equity_{i,t}$.

where $\Delta Debt_{i,t}$ is long-term debt issuance (Compustat data item DLTISY) minus long-term debt reduction (Compustat data item DLTRY) plus changes in current debt (Compustat data item DLCCHY) for the firm *i* from year *t*–1 to *t*, scaled by total assets in the previous year (Compustat item AT). The last letter 'Y' in Compustat data items indicates that the variable is year-to-date. $\Delta Equity_{i,t}$ is sales of common and preferred stocks (Compustat data item SSTKY) minus purchases of common and preferred stocks (data item PRSTKCY) for the firm *i* from year *t*–1 to *t*, scaled by total assets in the previous year.

We further separately examine the effects on short-term and long-term debt.

$\Delta STD_{i,t}$ = the ratio of the change in short-term debt (Compustat data item DLCCHY) to total assets in the previous year.

$\Delta LTD_{i,t}$ = the difference in long-term debt issuance and long-term debt reduction (Compustat data item DLTISY minus data item DLTRY), scaled by total assets in the previous year.

We construct two credit rating dummies, peer rating upgrade ($UG^P_{i,k,t-1}$) and peer rating downgrade ($DG^P_{i,k,t-1}$), for each firm at the beginning of each fiscal year *t*. Specifically, the peer upgrades dummy of the firm *i* within industry *k* in year *t*–1 takes the value of one (i.e., $UG^P_{i,k,t-1} = 1$) if the firm is not upgraded or downgraded in year *t*–1 from year *t*–2 and there is one or more same-industry peer firms (indexed by *j*), with whom firm *i* shared the same credit rating (*CR*) in year *t*–2, are upgraded in year *t*–1. Mathematically, we have

$$UG^P_{i,k,t-1} = 1, if\ CR_{i,k,t-2} = CR_{j,k,t-2}, CR_{i,k,t-1} = CR_{i,k,t-2},$$
$$and\ CR_{j,k,t-1} > CR_{j,k,t-2}\ with\ j\ \neq i\ and\ j \in (1,2,\dots,l|l \geq 1);$$
$$= 0, otherwise.$$

Likewise, DG^P takes the value of one if the firm shares the same credit rating with one or more peer firms within a particular industry in a specific year and these firms are downgraded in the subsequent year, and zero otherwise. In the following discussions, we suppress subscripts *i*, *j*, *k* and *t* in the two dummy variables for notational convenience.

We illustrate our definition of a peer firm credit rating upgrade with an example. Suppose that there are three firms in the telecom industry, A, B, and C with an identical credit rating of AA in year 2000 (fiscal year). If firms B and C are upgraded in the subsequent year 2001 but firm A maintains the same rating from years 2000 to 2001, then the UG^P dummy for firm A takes the value 1 in the year 2001. In contrast, UG^P takes the value 0 for firms B and C as these

firms are themselves upgraded, despite having another peer firm being upgraded. We distinguish the effect of the rating changes of peer firms from a firm's own rating change.

We include in our regression specification a set of conventional explanatory variables (all lagged by one year), for both firm-level and industry-level, as controls as they have been analyzed in many tests and have conventional interpretations.[4] These variables include *Leverage*, *Size*, *Liquidity*, *Profitability*, *Dividends*, *REarnings* (retained earnings), *Tobin's Q* (growth opportunities), *Tangibility*, and non-debt tax shields (*NDTS*), which are defined below. We also control for yearly industry averages of these variables in all regressions unless otherwise stated.

$Leverage_{i,t-1}$ is the ratio of the sum of short-term debt (Compustat data item DLC) and long-term debt (Compustat data item DLTT) scaled by the sum of short-term debt, long-term debt and stockholders' equity (Compustat data item LSE minus data item LT) for firm *i* in year *t*–1.

$Size_{i,t-1}$ is the logarithm of sales (Compustat data item SALE) for firm *i* in year *t*–1.

$Liquidity_{i,t-1}$ is the ratio of cash and cash equivalent (Compustat data item CHE) to total assets (Compustat data item AT) for firm *i* in year *t*–1.

$Profitability_{i,t-1}$ is the ratio of earnings before interest, taxation, depreciation and amortization (Compustat data item EBITDA) to total assets (Compustat data item AT) for firm *i* in year *t*–1.

$Dividends_{i,t-1}$ is the ratio of dividends (Compustat data item DV) to total assets (Compustat data item AT) for firm *i* in year *t*–1.

[4] Kisgen (2006) shows a significant negative relation between leverage and debt financing. Titman and Wessels (1988) show that firm size is one of the crucial determinants of the capital structure. Myers (2001) and Fama and French (2002) demonstrate that profit is an important factor affecting the capital structure. Growth options (defined as Tobin's Q in our study) and tangibility are variables affecting the leverage ratio in Rajan and Zingales (1995). Dividend policy and earnings relate to the increase in debt and equity sales (Titman and Wessels, 1988). We include liquidity (see Kim, Mauer, and Sherman (1998)) to control for possible impacts on leverage from firms' cash positions and non-debt tax shields (DeAngelo and Masulis (1980); Bradley, Jarrell, and Kim (1984)).

REarnings$_{i,t-1}$ is the ratio of retained earnings (Compustat data item RE) to total assets (Compustat data item AT) for firm *i* in year *t*–1.

Tobin's Q$_{i,t-1}$ is growth options and is defined as the ratio of the total book value of debt plus market value of equity (Compustat data item CSHO × data item PRCC) to total assets (Compustat data item AT)) for firm *i* in year *t*–1.

Tangibility$_{i,t-1}$ is the ratio of property, plant, and equipment (Compustat data item PPENT) to total assets (Compustat data item AT) for firm *i* in year *t*–1.

NDTS$_{i,t-1}$ is the non-debt tax shields and is defined as the ratio of deferred taxes and investment tax credit (Compustat data item TXDITC) to total assets (Compustat data item AT) for firm *i* in year *t*–1.

4. Summary Statistics and Main Regression Results

4.1. Summary statistics

Panel A of Table 1 shows firms' net debt issuance (*NDI*) behavior across credit rating categories. It is interesting to note that over time, high credit-quality firms issue more debt than equity, while low-rated firms reduce leverage, on average. The result suggests that high credit-quality firms are more able to access the debt market than low-quality firms. This has important implications for our study as we want to examine whether or not firms, especially investment-grade firms, reduce their leverage when peer firms experience credit rating downgrades.

[Insert Table 1 here]

Panel B in Table 1 reports the yearly total number of credit rating upgrades and downgrades as well as the distribution of credit rating changes across two categories of firms: investment-grade firms and speculative-grade firms. In this study, we refer to investment-grade ratings as all

ratings equal to or above BBB- and speculative-grade ratings as all ratings equal to or below BB+. We observe some interesting patterns in Panel B. First, the majority of credit rating upgrades and downgrades occur in investment-grade firms. Second, the number of credit rating downgrades surged in 2001 and 2002, and increased sharply in 2008 and 2009, which are likely due to the dot-com bubble burst in the year 2000 and the recent global financial crisis over the period 2007-2009. Third, the proportion of speculative-grade firms that are downgraded varies over time and increases toward the later part of our sample period, with a noticeable jump in 1999 and reaching more than 55% of all downgrades in 2011. Finally, the proportion of investment-grade firms that are upgraded stood at a high of nearly 76% in 1986, but dropped to a historical low of approximately 41% in 2004 and approximately 43% in 2010, which is then followed by a gradual recovery to reach a new high of 80% in 2014. Overall, these time-varying patterns suggest that the effect of credit rating changes of peer firms may vary over time due to the occurrences of major events in the history.

Table 2 presents summary statistics of variables in this study. Panel A shows summary statistics for the whole sample, while Panel B separates the sample into two parts with one sub-sample containing investment-grade firms and the other containing speculative-grade firms. On the financing activities, Panel A shows that rated firms issue more debt than equity, on average. The average change in debt ($\Delta Debt$) is 2.4% and the average change in equity ($\Delta Equity$) is 0%, suggesting that firms, on average, issue 2.4% more debt than equity (i.e., $NDI = (\Delta Debt - \Delta Equity)$) relative to total assets in the previous year. In addition, cross-sectional variation in $\Delta Debt$ is higher than variation in $\Delta Equity$. Firms also tend to have more net increases in long-term debt (ΔLTD) than net increases in short-term debt (ΔSTD) (2.3% versus 0.10%). Overall,

firms adjust their capital structure via using the debt market than going through the equity market.

[Insert Table 2 here]

On average, firms finance 56% of total assets by debt (*Leverage*) and are generally profitable with a mean profitability of 13.5% and paying dividends equivalent to 1.5% of their total assets. A significant 34% of firms' assets are fixed. Standard deviations of most variables, however, show considerable cross-sectional variations, which may explain the differences in firm leverage. It is therefore necessary to control for such characteristics when examining the relative importance of credit ratings changes of peer firms on capital structure. In our empirical analyses, we also control for industry characteristics in our models and the results remain robust in all specifications. Panel B of Table 2 shows that investment-grade firms are larger in size than speculative-grade firms and have lower leverage, higher profitability, higher retained earnings, higher dividends, higher growth options as proxied by Tobin's *Q*, and higher net debt issuance. These differences suggest that lowly rated firms may have less flexibility to adjust their debt financing when the ratings of peer firms are changed.[5] The evidence echoes our finding in Panel A of Table 1 that high credit-quality firms tend to have better access to the debt market than low-quality firms.

4.2. The effects of credit rating changes of peer firms on net debt issuance: Baseline results

Our hypotheses predict an insignificant relation between debt financing and UG^P and a significant negative relation between debt financing and DG^P. To examine the impacts of peer rating upgrades and downgrades on firm financing, we estimate the following model:

[5] In an unreported test, we find that firms with a B+ rating or below are more financially constrained than other speculative-grade firms.

$$NDI_{i,t} = \beta_0 + \beta_1 UG^P_{i,t-1} + \beta_2 DG^P_{i,t-1} + \beta_3 X_{i,t-1} + \varepsilon_{i,t-1}, \quad (1)$$

where $NDI_{i,t,}$ is the net debt issuance of firm *i* in year *t*. The peer rating upgrade UG^P takes place in year *t*-1 and takes the value of 1 if one or more peer firms experienced upgrades between year *t*-2 and year *t*-1, while the firm itself was not upgraded. Likewise, the peer rating downgrade DG^P takes place in year *t*-1 and takes the value of 1 if one or more peer firms experienced downgrades between year *t*-2 and year *t*-1, while the firm itself was not downgraded. We classify the sample firms into 17 industries based on the industry classification of Kenneth French.[6] Excluding utility and financial firms, we are left with 15 industries. $X_{i,t-1}$ is a set of control variables and is observable at the end of year *t*-1. The regression equation tests whether net issuance of debt versus equity for a particular firm-year is affected by changes in peer firms' credit ratings in the previous firm-year. The slope coefficients β_1 and β_2 capture the effects of adjustments in net debt issuance due to peer rating upgrades and downgrades, respectively. Standard errors in all regressions are clustered across firms and time.

The main results for the effect of credit rating downgrades of peer firms (DG^P) reported in Columns 1 through 5 of Table 3 are significant, both economically and statistically, and are robust to the controls of industry characteristics. The results are similar without any controls as in Column 1 and with controls of firm-level characteristics as in Column 2. For example, Column 2 reveals that firms witnessing peer rating downgrades reduce more debt than equity, of approximately −1.21% (*t*-stat = −3.95) of total assets, after controlling for firm-level characteristics. In the sample, this translates into an average reduction in net debt issuance of 88.9 million dollars (the average total assets of the sample firms are 7.352 billion dollars). This supports our proposition that firms become more cautious when their peers are downgraded,

[6] We also use the classification of 30 industries. The relevant coefficient estimates show lower magnitudes due to the fewer number of firms available and eligible for analysis within an industry, but the overall results remain qualitatively similar and do not change our conclusions.

even if their own credit ratings remain unchanged. We do not find credit rating upgrades of peer firms (UG^P) to have any significant impact on firm financing even after controlling for firm-level and industry characteristics. Since the regression coefficients on UG^P are all insignificant in the remaining tests, we only discuss the results from DG^P.

[Insert Table 3 here]

As discussed earlier, we control for the effect of an overall industry-wide credit rating downgrade by including a dummy variable $CRind_t < CRind_{t-1}$. We also control for the effect of an overall industry-wide leveraging (or deleveraging) by adding a dummy variable NDI_{ind} that captures industry average net debt issuance excluding the firm. Importantly, our findings remain unchanged. Column 3 and 4 of Table 3 report the results. The coefficient on DG^P is only slightly reduced from –1.33 in Column 3 to –1.25 in Column 4, and is still highly significant with a *t*-stat of –4.82 and the coefficient on UG^P remains statistically insignificant.

We find that $CRind_t < CRind_{t-1}$ is negative and significant (coeff. = -1.26; *t*-stat = 1.81), suggesting that, when the level of average industry credit rating is lower than previous year, firms tend to reduce the amount of debt in the subsequent year. On the other hand, industry average net debt issuance NDI_{ind} is significantly and positively associated with the firm's net debt issuance (coeff. = 53.29; *t*-stat = 7.06). This result is consistent with the finding of Leary and Roberts (2014) that a firm's own financing policy is affected by peer firms' financial policy. In all the remaining tests, we always control for both $CRind_t < CRind_{t-1}$ and NDI_{ind}.

In Column 5 of Table 3, we further control for other industry-level characteristics: leverage, size, liquidity, profit, dividends, growth options, tangibility, and *NDTS* (non-debt tax shields), where industry averages are calculated for each fiscal year (lagged by one year, which is the same year as rating changes of peer firms) for each variable. We find that the peer firm downgrade

effect on leverage remains the same. Overall, the results in Table 3 are consistent with Hypotheses 1 and 2. Similar to Kisgen (2006), we also perform the tests by including utility firms. The result reported in Internet Appendix A is essentially consistent with our baseline findings presented in Table 3.

4.3. The effect of credit rating changes of peer firms on debt and equity adjustments

We take a closer look into the capital structure adjustments by evaluating the decisions to increase or reduce debt or/and equity in the subsequent year following credit rating upgrades and downgrades of peer firms. The results are presented in Table 4. We find that, following peer firms' rating downgrades, firms are more likely to deleverage. The results in Column 1 show that, when witnessing peer firms' rating downgrades, firms reduce net debt ($\Delta Debt$) by −1.24% (*t*-stat = −4.83) of total assets after controlling for firm-level characteristics. Column 2 shows that firms do not make significant changes in equity when peer firms are downgraded. Looking at individual increases and decreases in debt and equity in Column 3 through to Column 6, the coefficient on DG^P observed in Column 1 is mainly attributable to the reduction of debt issuance (-1.45% with a *t*-stat = −3.29) following peer firms' rating downgrades.

[Insert Table 4 here]

4.4. The effect of peer firms' rating changes on debt maturity: Short-term vs. long-term debt

We further consider the heterogeneity in the debt maturity of capital structures by decomposing debt changes into changes in short-term debt ($\Delta STD_{i,t}$) and changes in long-term debt ($\Delta LTD_{i,t}$) as defined earlier:

$$\Delta STD_{i,t}\ (or\ \Delta LTD_{i,t}) = \beta_0 + \beta_1 UG^P_{i,t-1} + \beta_2 DG^P_{i,t-1} + \beta_3 X_{i,t-1} + \varepsilon_{i,t-1}, \quad (2)$$

Table 5 reports the regression results following peer firms' rating changes. As shown in Columns 1 and 2, we find that it is mainly the long-term debt that is affected by peer firms' rating downgrades. More specifically, the coefficient on DG^P is −1.21 (*t*-stat = −4.87), suggesting that when peer firms' credit ratings are downgraded, firms reduce their long-term debt by 1.21% of total assets. Although they also reduce their short-term debt, the reduction is small (0.06%) and statistically insignificant. As expected, we also find that the industry-wide net debt issuance exerts a strong effect on both the long-term and short-term debt: the coefficient on NDI_{ind} is significantly positive (coeff. = 33.44; *t*-stat = 5.49) for changes in long-term debt and is -8.40% for changes in short-term debt. Our finding that firms mainly reduce their long-term debt rather than short-term debt following peer firms' rating downgrades implies that reducing long-term debt is likely to be a more effective strategy for maintaining good credit ratings. This firm behavior is consistent with the practices of rating agencies. In sum, the results in Table 5 are consistent with Hypothesis 3.

[Insert Table 5 here]

5. Cross-firm Variation in the Peer Firm Effect

5.1. The effect of peer firms' rating changes on net debt issuance: Investment-grade firms versus speculative-grade firms

In this section we examine whether speculative-grade and investment-grade firms would respond differently to peer firms' rating changes. In general, we find that precautious deleveraging triggered by peer firms' rating changes is prevalent across both speculative-grade and investment-grade firms, although investment-grade firms have relatively higher debt reduction than speculative-grade firms.

In Columns 1 and 2 of Table 6, we control for the credit rating levels (*Rating*) and the status of investment grades (*IG*), respectively. The variable *Rating* is the credit rating of the firm in the previous year in numerical codes (22 for AAA, 21 for AA+…, etc.), and the dummy variable *IG* is one if a firm's credit rating is an investment grade in the previous year and zero otherwise. The positive coefficient on *Rating* in the net debt issuance regression in Column 1 indicates that highly rated firms tend to issue more debt than lowly rated firms. In Column 2, the dummy variable *IG* has a strong and positive coefficient, indicating that investment-grade firms tend to issue more debt than non-investment-grade firms and that investment-grade firms issue 1.47% more debt than they do equity. These results are consistent with those reported in Panel A of Table 1. Importantly in Columns 1 and 2, the coefficients on DG^P are −1.49 (*t*-stat = −5.40) and −1.42 (*t*-stat = −5.30), respectively, suggesting that firms reduce leverage, even after controlling for the credit ratings or the investment-grade dummy.

[Insert Table 6 here]

The results in Columns 3 and 4 of Table 6 show that following peer firms' rating downgrades, investment-grade firms and speculative-grade firms both significantly reduce net debt issuance. Our results indicate that both groups grow concerned when peer firms' credit ratings are downgraded and in response take precautions to avoid a similar fate. Consistent with our findings reported earlier, peer firms' rating upgrades do not exert any significant effect on a firm's capital structure, regardless of whether the firm is of investment or speculative grade. However, we also notice that investment-grade firms reduce net debt to a greater extent than do speculative-grade firms as evidenced by the regression coefficient on DG^P of −1.51(*t*-stat = −4.00) for speculative-grade firms and of −1.29 (*t*-stat = −2.91) for investment-grade firms. The result might suggest that investment-grade firms are more concerned about the spillover effect

from peer firms' rating downgrades than are speculative-grade firms or that investment-grade firms enjoy better access to the debt market than do speculative-grade firms. The results in Table 6 support Hypothesis 4.

5.2. Firms close to the boundary between investment grades and speculative-grades

If peer firms' rating changes are important, top-rated firms will be most sensitive to the rating changes of their peers. As these top-rated firms typically do not have cash flow problems, they are likely to embark on debt reductions. Similarly, speculative-grade firms near the boundary of moving up to investment grades should exhibit a particularly strong effect. We examine these issues and report results in Table 7. We find that, as shown in Column 1, firms with a credit rating of A- or above reduce 2.13% (*t*-stat = −4.44) of their net debt issuance of total assets when their peer firms were downgraded. Further, when peer firms were upgraded in the credit rating, top-rated firms also reduce 0.85% (*t*-stat = −2.03) of their net debt issuance of total assets. Column 2 reports that firms with credit ratings between BBB+ and BB- reduce 1.43% (*t*-stat = −3.00) more debt than equity.

[Insert Table 7 here]

Columns 3 and 4 look at these rating categories separately. The results in Column 3 show that firms with the ratings of BBB+, BBB and BBB- (i.e., near the bottom end of investment grade) reduce net debt issuance to a lesser extent than firms with the ratings of BB+, BB, and BB- (i.e., near the top end of speculative grade) (0.98% vs. 1.90%). This suggests that those firms near the top end of speculative grade are more concerned about peer firms' rating downgrades than those firms near the bottom end of investment grade.

We then further restrict our analysis to those firms with the ratings of BBB- and BB+ (i.e., the bottom investment grade and the top speculative grade, respectively). This analysis allows us to further look into the effect of 'falling peer angels', i.e., when peer firms are downgraded from investment grade to speculative grade. The results in Column 5 report that firms show a debt reduction of 1.30%, albeit marginally significant, when their peer firms' ratings are downgraded from BBB- (the lowest investment grade) to BB+ (the highest speculative grade). On the other hand, we do not find any significant effect of 'rising peer stars', i.e., when peer firms' credit rating are upgraded from the highest speculative grade of BB+ to the lowest investment grade of BBB-.

We also test whether these results are influenced by proximity to rating changes. In unreported regression results, we control for firms with their ratings having '+' (proximity to rating upgrade) or '–' (proximity to rating downgrade) as suggested by Kisgen (2006) and find that our results hold. We note that firms below B+, however, do not significantly reduce net debt issuance following peer firms' rating downgrades. Our results highlighted in Panel B of Table 2 show that these firms have cash flow problems and poor profitability, which limit the ability of these firms to access financial markets and reduce debt.

5.3. The effect of peer firms' rating changes on net debt issuance: Large vs. small firms

We now turn to the analysis of whether peer firms' rating changes affect large or small firms differently. We use the median value of total assets in each year and each industry, and classify a firm as a large (small) firm if its total assets are greater (less) than the median of the industry in that year.

In Columns 1 and 2 of Table 8 for the whole sample, we find that, both small and large firms respond strongly negatively to peer firms' rating downgrades, by reducing net debt by 1.70% (*t*-stat = −3.33) and 1.21% (*t*-stat = −4.10), respectively. Small firms reduce their net debt to a greater extent than do large firms. When we classify firms into two size subgroups within the group of investment-grade firms and within the group of speculative-grade firms, we find an interesting difference in the results. Investment-grade firms, regardless of size, tend to reduce leverage significantly in the subsequent year of observing their peer firms' rating downgrades. In contrast, among speculative-grade firms, only the small ones significantly reduce net debt in the subsequent year. These results point toward the reputational concerns of investment-grade firms, regardless of firm size. However, the results imply more serious consequences of potential downgrades for small, speculative-grade firms. The results also indicate that, regardless of credit rating, small firms reduce net debt to a much larger extent than large firms in response to peer firms' rating downgrades. The results in Table 8 are consistent with Hypothesis 4.

[Insert Table 8 here]

5.4. The peer firm effect: Firms in competitive vs. concentrated industries

Next, we analyze whether peer firms' rating changes affect firms in competitive industries and concentrated industries differently. We use the Herfindahl–Hirschman Index (or HHI) based on sales as our measure of competitiveness in an industry. We classify firms as operating in competitive (concentrated) industries if the HHI index is below (above) the 33rd (67th) percentile. Table 9 reports the results. Columns 1 and 2 are based on the percentile computed over the entire sample, while Columns 3 and 4 are based on individual years. Overall, the results indicate that firms in concentrated industries reduce their net debt much more aggressively than firms in competitive industries when peer firms experience credit rating downgrades. For

example, when the classification of firms operating in competitive versus concentrated industries is based on the entire sample (Column 1), firms operating in competitive industries reduce their net debt issuance by only 0.56%. In contrast, the reduction in net debt for firms in concentrated industries (Column 2) is 1.48% and statistically significant (*t*-stat = −2.92). The pattern of results is also strong when the classification of firms operating in competitive versus concentrated industries is based on individual years. The corresponding reductions are, respectively, 1.54% (*t*-stat = −2.63) for firms in concentrated industries (Column 4) and 0.69% (*t*-stat = −1.03) for firms in competitive industries (Column 3). Overall, the results in Table 9 support Hypothesis 4.

[Insert Table 9 here]

6. Further Analyses

6.1. Industry-average rating, peer firms' rating changes, and the capital structure

In this section we address the questions of whether and how the average credit rating of an industry affects a firm's capital structure in relation to peer firms' credit rating changes. To this end, we first compute the average industry rating for each year and then compare this with the firm's credit rating. We next construct a dummy variable, (CR<IND), which takes the value of one if the firm's rating is lower than the average credit rating of the industry, and zero otherwise. We then include this dummy variable in our analysis.

Table 10 reports the results. Column 1 shows that firms on average reduce net debt by 2.13% (*t*-stat = −3.72) if their credit rating in the previous year is lower than the industry average (i.e., the dummy variable (CR<IND) = 1). This finding suggests a 'lower-than-average effect' where the average credit rating of an industry serves as a reference point for a firm. When the firm's credit rating is lower than this reference point, it tends to reduce its net debt.

[Insert Table 10 here]

Moreover, Column 2 of Table 10 shows that when peers firms are downgraded, the firm reduces its net debt issuance by 1.46% (the coefficient on DG^P = −1.46 with *t*-stat = −5.41) after controlling for the lower-than-average credit quality effect. It is also interesting to see that the lower-than-average effect remains strong and statistically significant: the coefficient on (CR<IND) is equal to −2.15 (*t*-stat = −3.76). On the other hand, peer firms' rating upgrades continue to show a statistically insignificant effect. We also consider the interaction terms between the lower-than-average effect and the peer rating effect. The result in Column 3 of Table 11 shows that these interaction terms are statistically insignificant, suggesting that there is no complementary or substitution effect between the lower-than-average effect and the peer rating effect.

Column 4 shows that, speculative-grade firms take significant actions to reduce net debt issuance when their credit quality is lower than average (coefficient on (CR<IND) = −2.94 with *t*-stat = −3.74) and when peer firms are downgraded (coefficient on DG^P = −1.31 with *t*-stat = −2.92). Investment-grade firms (as shown in Column 5) exhibit a strong reduction in their net debt issuance with a coefficient of −1.49 (*t*-stat = −3.96) on DG^P. However, we find that the effect of lower-than-average credit quality is insignificant for investment-grade firms. This suggests that peer firms' downgrades bring down the industry average, which lessens this particular industry pressure, while the fact that five or more peer firms are downgraded does prompt the firm to take pre-emptive actions to reduce its net debt issuance.

6.2. Time-series patterns: Sub-period analyses

Finally, we analyze whether in different economic environments firms react differently to peer firms' rating changes, especially during the financial crisis. We conduct analysis for various

periods: before 2001, from 2001 to 2007, after 2007, and after 2009. Our results reported in Table 11 remain consistent over these subsample periods. In the years before 2001 (Column 1), firms reduce their net debt issuance following peer firms' rating downgrades. This pattern continues to hold for the next three subsample periods, although the coefficient on DG^P becomes insignificant for the sub-sample after 2007. Firms reduced net debt issuance by 1.41% before 2001 (Column 1), by 1.81% between 2001 and 2007 (Column 2), and by 0.71% after the recent financial crisis starting from 2007 (Column 3), when peer firms are downgraded.[7] The coefficient estimate on DG^P after 2007 is much lower (and is insignificant) than those for the other two sub-periods. This might be attributable to the state of financial markets with liquidity and lending dried up making deleveraging difficult for firms. This finding is consistent with that of Mclean and Zhao (2014), who show that external financing costs are high during recessions. By excluding the financial crisis period (2008-2009) (i.e., after 2009), again, the coefficient on DG^P becomes significant and negative, which is also consistent with the findings in Mclean and Zhao (2014).

[Insert Table 11 here]

We further verify whether our results are driven by common macroeconomic factors that could potentially affect both market-wide credit rating changes and the cost of external financing, resulting in changes in firm deleveraging. We follow McLean and Zhao (2014) and define a recession year as a year in which six or more months were in recession as classified by the NBER. There are only three years in our sample period 1985-2013, namely 2001, 2008 and 2009, that satisfy the recession criteria. We then conduct tests for periods in recession and expansion separately. As shown in Columns 4 and 5, our main finding that peer firm rating changes exert an externality effect on a firm's capital structure is much stronger during the expansion years with

[7] Given our criteria for identifying peer firms' rating changes, the number of observations available does not allow us to analyze the effects separately for investment-grade and speculative-grade firms for each of these subsample periods.

the coefficient on DG^P of −1.48 (t-stat = −5.33) than during the recession years with the coefficient of −0.57 (t-stat = −0.85).[8] This result indicates that, while the external financing costs are higher or firms experience more difficulty in accessing external capital markets during recession years, our finding of firms reducing their net debt issuance is not driven by such common macroeconomic factors.

7. Conclusions

In this paper, we show that the credit rating changes of industry peers influence the capital structure of a firm. The preponderance of evidence shows that credit rating downgrades of peer firms create strong externalities for firms in the same industry. In particular, firms embark on significant deleveraging, mainly via the reduction in their long-term debt. The findings are consistent with our hypothesis that firms are mindful of each other's misfortune. When many of their peers are downgraded (which suggests negative shocks to the industry), firms vigilantly manage capital structure in a cautious manner by reducing net debt.

Further, we show a very stronger peer rating effect for investment-grade firms. When peer firms are either upgraded or downgraded, the top-rated firms significantly reduce net debt issuance. In addition, speculative-grade firms that are near the boundary of moving up to investment grades exhibit a particularly strong reduction in net debt issuance when their peers were downgraded. We find an interesting evidence of an effect of 'falling peer angels' in which peer firms are downgraded from the bottom of investment grade to a speculative grade.

We also document a distinct and significant lower-than-average credit quality effect. That is, firms reduce leverage substantially when their credit rating is lower than the average credit rating of the industry. Importantly, the peer rating effect remains strong and statistically

[8] The regression coefficient on DG^P (−0.57) is still large albeit insignificant during the recession period. This is due to the fact that there are only three recession years during our sample period, leading to a less reliable estimate.

significant after controlling for the lower-than-average credit quality effect. The peer effects we document are ubiquitous among investment-grade and speculative-grade firms, prevalent over time, and are widespread across small and large firms. However, we do observe cross-sectional variation in the peer effect. The peer effect is stronger for investment-grade firms, smaller firms, and firms operating in more concentrated industries.

Our findings take the capital structure debate further by highlighting the significance of interactions among firms and how these interactions can play a role in firms' capital structure decisions. In future research, we aim to investigate whether and how the credit rating changes of peer firms impact other corporate financial policies.

References

Acharya, Viral V., Stephen Schaefer, and Yili Zhang, 2015, Liquidity risk and correlation risk: A clinical study of the general motors and ford downgrade of 2005, *Quarterly Journal of Finance* 5, 1-51.

Baghai, Ramin P., Henri Servaes, and A. N. E. Tamayo, 2014, Have rating agencies become more conservative? Implications for capital structure and debt pricing, *Journal of Finance* 69, 1961-2005.

Baker, Malcolm, and Jeffrey Wurgler, 2002, Market timing and capital structure, *Journal of Finance* 57, 1-32.

Bizjak, John, Michael Lemmon, and Lalitha Naveen, 2008, Does the use of peer groups contribute to higher pay and less efficient compensation? *Journal of Financial Economics* 90, 152-168.

Bradley, Michael, Gregg Jarrell and E. Han Kim, 1984, On the Existence of an Optimal Capital Structure: Theory and Evidence, *Journal of Finance* 39, 857-878.

Brander, James A., and Tracy R. Lewis, 1986, Oligopoly and financial structure: The limited liability effect, *American Economic Review* 76, 956-970.

DeAngelo, Harry, and Ronald Masulis, 1980, Optimal capital structure under corporate and personal taxation, *Journal of Financial Economics* 8, 3-29.

Dichev, Ilia D., and Joseph D. Piotroski, 2001, The long-run stock returns following bond ratings changes, *Journal of Finance* 56, 173- 203.

Dimitrov, Valentin, Darius Palia, and Leo Tang, 2015, Impact of the Dodd-frank act on credit ratings, *Journal of Financial Economics* 115, 505-520.

Dittmar, Amy, and Anjan Thakor, 2007, Why do firms issue equity? *Journal of Finance* 62, 1-54.

Fama, Eugene F., and Kenneth R. French, 2002, Testing trade-off and pecking order predictions about dividends and debt, *Review of Financial Studies* 15, 1-33.

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

Graham, John R., and Campbell R. Harvey, 2001, The theory and practice of corporate finance: Evidence from the field, *Journal of Financial Economics* 60, 187-243.

Grinblatt, Mark, and Sheridan Titman, 2002, *Financial Markets and Corporate Strategy*, McGraw-Hill Irwin.

Hand, John R. M., Robert W. Holthausen, and Richard W. Leftwich, 1992, The effect of bond rating agency announcements on bond and stock prices, *Journal of Finance* 47, 733-752.

Harris, Milton, and Artur Raviv, 1990, Capital structure and the informational role of debt, *Journal of Finance* 45, 321-349.

Hertzel, Michael G., Zhi Li, Micah S. Officer, and Kimberly J. Rodgers, 2008, Inter-firm linkages and the wealth effects of financial distress along the supply chain, *Journal of Financial Economics* 87, 374-387.

Hertzel, Michael G., and Micah S. Officer, 2012, Industry contagion in loan spreads, *Journal of Financial Economics* 103, 493-506.

Holthausen, R., and R. Leftwich, 1986, The effect of bond rating changes on common stock prices, Journal *of Financial Economics* 17, 57-89.

Jarrow, Robert, and Fan Yu, 2001, Counterparty risk and the pricing of defaultable securities, *Journal of Finance* 56, 1765–1800.

Jensen, Michael C., 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323-329.

Jensen, Michael C., and William H. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3, 305-360.

Jorion, Philippe, and Gaiyan Zhang, 2007, Good and bad credit contagion: Evidence from credit default swaps, *Journal of Financial Economics* 84, 860–883.

Jorion, Philippe, and Gaiyan Zhang, 2009, Credit contagion from counterparty risk, *Journal of Finance* 64, 2053–2087.

Kim, Chang-Soo, David Mauer, and Ann E. Sherman, 1998, The determinants of corporate liquidity: Theory and evidence, *Journal of Financial and Quantitative Analysis* 33, 335-359.

Kisgen, Darren J, 2009, Do firms target credit ratings or leverage levels? *Journal of Financial and Quantitative Analysis* 44, 1323-1344.

Kisgen, Darren J., 2006, Credit ratings and capital structure, *Journal of Finance* 61, 1035-1072.

Kliger, Doron, and Oded Sarig, 2000, The information value of bond ratings, *Journal of Finance* 55, 2879-2902.

Korteweg, Arthur, 2010, The net benefits to leverage, *Journal of Finance* 65, 2137-2170.

Lang, Larry, and René M. Stulz, 1992, Contagion and competitive intra-industry effects of bankruptcy announcements, *Journal of Financial Economics* 32, 45–60.

Leary, Mark T., and Michael R. Roberts, 2005, Do firms rebalance their capital structures? *Journal of Finance* 60, 2575-2619.

Leary, Mark T., and Michael R. Roberts, 2010, The pecking order, debt capacity, and information asymmetry, *Journal of Financial Economics* 95, 332-355.

Leary, Mark T., and Michael R. Roberts, 2014, Do peer firms affect corporate financial policy? *Journal of Finance* 69, 139-178.

Leland, Hayne E., and David H. Pyle, 1977, Informational asymmetries, financial structure, and financial intermediation, *Journal of Finance* 32, 371-387.

Lemmon, Michael L., Michael R. Roberts, and Jaime F. Zender, 2008, Back to the beginning: Persistence and the cross-section of corporate capital structure, *Journal of Finance* 63, 1575-1608.

Maksimovic, Vojislav, 1988, Capital structure in repeated oligopolies, *RAND Journal of Economics* 19, 389-407.

McLean, R. David, and Mengxin Zhao, 2014, The business cycle, investor sentiment, and costly external finance, *Journal of Finance* 69, 1377-1409.

Myers, Stewart C., 1984, The capital structure puzzle, *Journal of Finance* 39, 574-592.

Myers, Stewart C., 2001, Capital structure, *Journal of Economics Perspectives* 15, 81-102.

Myers, Stewart C., and Nicholas S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187-221.

Noe, Thomas H., 1988, Capital structure and signaling game equilibria, *Review of Financial Studies* 1, 331-355.

Rajan, Raghuram G., and Luigi Zingales, 1995, What do we know about capital structure? Some evidence from international data, *Journal of Finance* 50, 1421-1460.

Ross, Stephen A., 1977, The determination of financial structure: The incentive-signaling approach, *Bell Journal of Economics* 8, 23-40.

Stulz, René M., 1990, Managerial discretion and optimal financing policies, *Journal of Financial Economics* 26, 3-27.

Titman, Sheridan, 1984, The effect of capital structure on a firm's liquidation decision, *Journal of Financial Economics* 13, 137-151.

Titman, Sheridan, and Roberto Wessels, 1988, The determinants of capital structure choice, *Journal of Finance* 43, 1-19.

Table 1. Net debt issuance across credit ratings and the distribution of upgrades and downgrades

Panel A of this table shows the mean value of Net Debt Issuance (NDI) across credit ratings in the sample. The sample of rated firms is from Compustat for 1985-2014 where credit ratings are as of the beginning of each year. Panel B reports the distribution of rating upgrades and downgrades across the sample period. "Investment" denotes investment grade (BBB or above), while "Speculative" denotes speculative grade (BBB- or below) before an upgrade or a downgrade.

Panel A: Net Debt Issuance by credit rating

	AAA	AA+	AA	AA-	A+	A	A-
No. of Firm-Years	282	99	406	432	868	1,479	1,056
Net Debt Issuance (NDI)	4.17%	2.85%	4.49%	4.63%	4.92%	4.28%	4.49%
	BBB+	BBB	BBB-	BB+	BB	BB-	B+
No. of Firm-Years	1,369	1,931	1,658	1,331	1,948	2,603	3,241
Net Debt Issuance (NDI)	4.45%	3.78%	2.81%	2.73%	1.96%	2.39%	1.44%
	B	B-	CCC+	CCC	CCC-	CC &Below	
No. of Firm-Years	1,819	839	365	207	112	430	
Net Debt Issuance (NDI)	0.59%	-2.13%	-3.95%	-1.83%	-2.23%	-0.56%	

Table 1 – Continued

Panel B: Distribution of upgrades and downgrades across years

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Upgrades	0	29	68	69	78	55	68	82	92	64
Investment		75.86%	64.71%	63.77%	67.95%	61.82%	61.76%	53.66%	56.52%	76.56%
Speculative		24.14%	35.29%	36.23%	32.05%	38.18%	38.24%	46.34%	43.48%	23.44%
Downgrades	0	117	108	99	80	102	102	64	62	58
Investment		77.78%	75.93%	70.71%	67.50%	63.73%	60.78%	65.63%	79.03%	79.31%
Speculative		22.22%	24.07%	29.29%	32.50%	36.27%	39.22%	34.38%	20.97%	20.69%

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Upgrades	105	82	93	105	52	62	64	58	91	102
Investment	68.57%	68.29%	67.74%	64.76%	63.46%	69.35%	57.81%	50.00%	59.34%	41.18%
Speculative	31.43%	31.71%	32.26%	35.24%	36.54%	30.65%	42.19%	50.00%	40.66%	58.82%
Downgrades	82	83	75	107	158	176	219	217	173	125
Investment	71.95%	69.88%	68.00%	77.57%	62.03%	72.73%	67.12%	61.29%	65.90%	68.00%
Speculative	28.05%	30.12%	32.00%	22.43%	37.97%	27.27%	32.88%	38.71%	34.10%	32.00%

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Upgrades	97	92	106	95	64	175	149	109	116	10
Investment	62.89%	57.61%	48.11%	61.05%	48.44%	42.86%	56.38%	58.72%	61.21%	80.00%
Speculative	37.11%	42.39%	51.89%	38.95%	51.56%	57.14%	43.62%	41.28%	38.79%	20.00%
Downgrades	156	149	131	171	185	64	67	79	65	3
Investment	66.03%	58.39%	71.76%	59.06%	56.22%	68.75%	44.78%	63.29%	52.31%	66.67%
Speculative	33.97%	41.61%	28.24%	40.94%	43.78%	31.25%	55.22%	36.71%	47.69%	33.33%

Table 2. Summary statistics of variables

This table reports the descriptive statistics of the variables used in regressions. The sample is from Compustat for the period 1985-2013 and excludes financial firms. Δ*Debt* is the change in debt defined as long-term debt issuance minus long-term debt reduction plus the change in current debt scaled by a firm's total assets. Δ*Equity* is sales of common and preferred stock minus purchases of common and preferred stock scaled by a firm's total assets. *NDI* (=Δ*Debt* – Δ*Equity*) is the change in debt minus the change in equity scaled by total assets at the beginning of each year. Δ*STD* is the change in current debt scaled by total assets. Δ*LTD* is long-term debt issuance minus long-term debt reduction scaled by total assets. *Debt Issuance* is long-term debt issuance, *Debt Reduction* is long-term debt reduction, *Equity Issuance* is sales of common and preferred stock, *Equity Reduction* is purchases of common and preferred stock, all normalized by total assets. *Leverage* is the ratio of the sum of short-term debt and long-term debt to the sum of short-term debt, long-term debt, and stockholders' equity. *Size* is the logarithm of sales. *Liquidity* is the ratio of cash and cash equivalent to total assets. *Profitability* is the ratio of earnings before interest, tax, depreciation, and amortization to total assets. *Dividends* are the ratio of dividends to total assets. *REarnings* are the ratio of retained earnings to total assets. *Tobin's Q* is the ratio of the book value of debt plus the market value of equity to total assets. *Tangibility* is the ratio of property, plant, and equipment to total assets. *NDTS i*s the ratio of deferred taxes and investment tax credit to total assets. Panel A shows summary statistics, while Panel B shows the mean values of the variables used in the regressions classifying firms as investment grade or speculate grade in the previous year. **, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Panel A: Summary statistics of variables

Variable	Obs	Mean	Std. Dev.	5th %tile	95th %tile
NDI	22,475	0.024	0.193	-0.157	0.264
ΔDebt	22,278	0.024	0.172	-0.120	0.228
ΔEquity	22,262	0.000	0.094	-0.083	0.079
Debt Issuance	21,436	0.162	0.335	0.000	0.702
Debt Reduction	21,816	0.135	0.271	0.000	0.559
Equity Issuance	21,593	0.020	0.081	0.000	0.096
Equity Reduction	21,253	0.021	0.064	0.000	0.104
ΔSTD	10,791	0.001	0.070	-0.069	0.071
ΔLTD	22,476	0.023	0.166	-0.114	0.220
Leverage	22,475	0.560	2.185	0.117	1.258
Size	22,454	7.430	1.569	4.931	10.027
Liquidity	22,462	0.083	0.110	0.003	0.297
Profitability	22,363	0.135	0.094	0.019	0.265
Dividends	22,372	0.015	0.052	0.000	0.053
REarnings	22,036	0.085	0.636	-0.589	0.595
Tobin's Q	19,704	1.347	1.759	0.535	2.946
Tangibility	22,329	0.340	0.228	0.044	0.789
DTIC	20,794	0.033	0.041	0.000	0.119

Table 2 – Continued

Panel B: Investment-grade firms versus speculative-grade firms: Mean difference

Variable	Speculative grade	Investment grade	Difference (Speculative – Investment)
NDI	0.009	0.044	-0.035***
ΔDebt	0.023	0.025	-0.003
ΔEquity	0.014	-0.019	0.033***
Debt Issuance	0.210	0.099	0.110***
Debt Reduction	0.182	0.073	0.109***
Equity Issuance	0.026	0.012	0.014***
Equity Reduction	0.013	0.032	-0.019***
ΔSTD	0.001	0.001	-0.001
ΔLTD	0.022	0.024	-0.002
Leverage	0.676	0.406	0.270***
Size	6.690	8.407	-1.716***
Liquidity	0.088	0.077	0.083***
Profitability	0.115	0.160	-0.045***
Dividends	0.011	0.022	-0.011***
REarnings	-0.100	0.328	-0.428***
Tobin's Q	1.161	1.553	-0.391***
Tangibility	0.338	0.342	-0.004
NDTS	0.027	0.041	-0.014***

Table 3. Effects of peer firms' rating changes on net debt issuance: Baseline results

This table shows the coefficient estimates from the regression on net debt issuance (in %) with *t*-statistics in the parentheses. Column 1 shows the regression results with UG^P and DG^P as the only explanatory variables and Columns 3 and 4 show the results including other control variables. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). NDI_{ind} is the yearly average Net Debt Issuance (NDI) of peer firms i.e., firms with same credit ratings and in the same industry. The detailed definitions of other control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1	2	3 *Controlling for Average Industry downgrade*	4 *Controlling for Industry NDI & Industry downgrade*	5 *Full Model*
Intercept	2.90***	0.49	0.88	-0.20	-4.50
	(5.19)	(0.29)	(0.52)	(-0.14)	(-1.10)
UG^P	0.71**	0.40	0.47	0.01	-0.06
	(2.47)	(1.28)	(1.49)	(0.04)	(-0.20)
DG^P	-0.85**	-1.21***	-1.33***	-1.25***	-1.40***
	(-2.18)	(-3.95)	(-4.45)	(-4.92)	(-5.19)
$CRind_t < CRind_{t-1}$			-1.26*	-0.59*	-0.58
			(-1.81)	(-1.69)	(-1.61)
NDI_{ind}				52.23***	48.04***
				(7.00)	(6.32)
Leverage		-0.03	-0.03	-0.04	-0.04
		(-0.36)	(-0.37)	(-0.48)	(-0.51)
Size		-0.27	-0.25	-0.31*	-0.31*
		(-1.39)	(-1.31)	(-1.83)	(-1.74)
Liquidity		4.28**	4.65**	4.15**	3.90*
		(1.97)	(2.12)	(2.03)	(1.87)
Profit		24.84***	24.94***	23.31***	22.94***
		(6.6)	(6.61)	(6.49)	(6.38)
Dividends		0.63	0.67	0.24	1.03
		(0.15)	(0.16)	(0.06)	(0.27)
Earnings		2.64***	2.63***	2.68***	2.84***
		(4.88)	(4.86)	(4.80)	(4.82)
Tobin's Q		0.40	0.39	0.34	0.32
		(1.26)	(1.25)	(1.25)	(1.23)
Tangibility		-0.19	-0.40	0.31	0.11
		(-0.21)	(-0.43)	(0.36)	(0.11)
NDTS		7.51**	8.12**	7.35**	3.98
		(2.06)	(2.36)	(2.17)	(1.07)
Industry characteristics	No	No	No	No	Yes
Adj. R^2	0.002	0.027	0.029	0.041	0.042
N	26,130	20,074	20,071	20,071	20,071

Table 4. Effects of peer firms' rating changes on the components of corporate financing

This table shows the regression coefficients and *t*-statistics in the parentheses on the change in debt (Column 1), the change in equity (Column 2), debt issuance (Column 3), debt reduction (Column 4), equity issuance (Column 5), and equity reduction (Column 6), with all variables measured in %. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1 ΔDebt	2 ΔEquity	3 Debt Issuance	4 Debt reduction	5 Equity issuance	6 Equity reduction
Intercept	6.48*	10.93***	1.81	-3.00	5.67***	-5.46**
	(1.82)	(4.29)	(0.20)	(-0.38)	(2.71)	(-2.45)
UG^P	-0.09	-0.04	1.12	1.13**	-0.13	-0.06
	(-0.28)	(-0.19)	(1.62)	(2.04)	(-0.61)	(-0.85)
DG^P	-1.24***	0.16	-1.45***	-0.33	0.05	-0.13
	(-4.83)	(0.92)	(-3.29)	(-0.93)	(0.38)	(-1.24)
$CRind_t < CRind_{t-1}$	-1.07***	-0.47**	-0.88	0.30	-0.39**	0.10
	(-3.61)	(-2.36)	(-1.33)	(0.60)	(-2.23)	(0.73)
NDI_{ind}	38.01***	-10.42***	43.05***	10.67**	2.63	13.47***
	(5.97)	(-4.04)	(4.92)	(2.19)	(1.22)	(5.43)
Leverage	-0.05	0.00	0.15	0.19	-0.02	-0.02
	(-0.80)	(-0.13)	(0.87)	(1.12)	(-0.72)	(-0.91)
Size	-1.17***	-0.86***	-3.13***	-1.89***	-0.65***	0.22***
	(-5.43)	(-7.95)	(-8.69)	(-7.65)	(-5.85)	(4.21)
Liquidity	2.24	-1.68	-34.87***	-35.66***	4.15***	6.22***
	(0.98)	(-1.12)	(-8.37)	(-13.35)	(2.71)	(6.49)
Profit	10.65***	-12.65***	21.05***	11.27**	-0.95	12.3***
	(2.87)	(-5.59)	(3.78)	(2.40)	(-0.55)	(5.80)
Dividends	-2.25	-3.2**	-9.34	-5.82	-1.50*	1.47
	(-0.56)	(-2.29)	(-1.4)	(-0.83)	(-1.92)	(1.24)
Earnings	1.81***	-1.04***	-2.46**	-4.26***	-0.30	0.76***
	(4.19)	(-3.27)	(-2.25)	(-3.91)	(-1.53)	(3.57)
Tobin's Q	0.43	0.11	0.55	0.14	0.33	0.23
	(1.37)	(0.86)	(1.18)	(0.76)	(1.21)	(1.20)
Tangibility	1.38	1.29***	-1.28	-1.79	0.25	-1.02***
	(1.40)	(2.59)	(-0.52)	(-0.83)	(0.57)	(-3.08)
NDTS	-2.45	-6.85**	-16.74*	-14.34**	-8.58***	-1.74
	(-0.61)	(-2.45)	(-1.92)	(-2.24)	(-3.50)	(-1.31)
Adj. R^2	0.036	0.062	0.056	0.055	0.032	0.100
N	19,912	19,902	19,191	19,482	19,257	18,866

Table 5. Effects of peer firms' rating changes on short-term versus long-term debt

This table shows the coefficient estimates from the regression on changes in short-term dent (Δ*STD*) and changes in long-term debt (Δ*LTD*) for the full sample and for investment-grade and speculative-grade firms separately. Both Δ*LTD and* Δ*STD* are measured in %. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. The *t*-statistics are in parentheses. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1 Changes in short-term debt (ΔSTD)	2 Changes in long-term debt (ΔLTD)
Intercept	2.73*	4.92
	(1.79)	(1.45)
UG^P	0.02	-0.10
	(0.27)	(-0.31)
DG^P	-0.06	-1.21***
	(-0.46)	(-4.89)
$CRind_t < CRind_{t-1}$	0.28*	-1.18***
	(1.79)	(-4.19)
NDI_{ind}	8.40***	33.34***
	(4.20)	(5.49)
Leverage	-0.01	-0.04
	(-0.72)	(-0.68)
Size	-0.02	-1.16***
	(-0.43)	(-5.32)
Liquidity	-0.40	2.39
	(-0.46)	(1.05)
Profit	0.72	10.07***
	(0.68)	(2.73)
Dividends	1.29	-2.90
	(1.10)	(-0.81)
Earnings	0.16	1.72***
	(1.42)	(4.00)
Tobin's Q	0.02	0.41
	(0.82)	(1.41)
Tangibility	0.49	1.23
	(1.53)	(1.28)
NDTS	-0.75	-2.62
	(-0.61)	(-0.65)
Adj. R^2	0.006	0.034
N	9,367	20,072

Table 6. Effects of peer firms' rating changes on net debt issuance: Investment-grade versus speculative-grade firms

This table shows the coefficient estimates from the regression on net debt issuance (in %) for the full sample and for investment-grade and speculative-grade firms separately. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). *IG* is a dummy variable that equals 1 for investment-grade firms and zero otherwise. *Rating* is a numerical bond rating with AAA = 22… and D/SD = 1. The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. The *t*-statistics are in parentheses. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1	2	3	4
	Net debt issuance (NDI)	Net debt issuance (NDI)	Net debt issuance (NDI): Speculative Grade	Net debt issuance (NDI): Investment Grade
Intercept	-10.05**	-5.62	-6.91	-0.18
	(-2.29)	(-1.35)	(-1.22)	(-0.04)
UG^P	0.15	0.05	0.33	-0.31
	(0.48)	(0.16)	(0.68)	(-1.04)
DG^P	-1.49***	-1.42***	-1.29***	-1.51***
	(-5.40)	(-5.30)	(-2.91)	(-4.00)
Rating	0.35***			
	(4.33)			
IG		1.47***		
		(3.24)		
$CRind_t < CRind_{t-1}$	-0.57	-0.57	-0.85*	-0.18
	(-1.56)	(-1.58)	(-1.84)	(-0.48)
NDI_{ind}	48.52***	48.22***	50.47***	39.81***
	(6.31)	(6.33)	(5.04)	(5.35)
Leverage	-0.03	-0.03	-0.02	-2.68*
	(-0.33)	(-0.38)	(-0.22)	(-1.84)
Size	-0.75***	-0.54***	-0.38	-0.53***
	(-3.83)	(-3.07)	(-1.59)	(-3.72)
Liquidity	3.49*	3.76*	0.60	2.94
	(1.66)	(1.80)	(0.17)	(1.05)
Profit	21.01***	22.4***	15.00***	42.27***
	(5.40)	(6.07)	(3.41)	(7.45)
Dividends	-0.70	0.28	-0.79	-8.55
	(-0.18)	(0.07)	(-0.18)	(-1.38)
REarnings	2.21***	2.59***	2.68***	1.09
	(3.72)	(4.44)	(4.38)	(1.01)
Tobin's Q	0.25	0.29	1.38	0.02
	(1.11)	(1.18)	(1.05)	(0.35)
Tangibility	0.46	0.24	1.67	-2.69
	(0.46)	(0.24)	(1.35)	(-1.58)
NDTS	0.67	2.23	10.69	8.25
	(0.20)	(0.62)	(1.35)	(1.56)
Adj. R^2	0.043	0.042	0.031	0.086
N	20,071	20,071	10,738	9,333

Table 7. Effects of peer firms' rating changes: Near investment grade and speculative grade boundaries

This table shows the coefficient estimates from the regression on net debt issuance (in %) for firms near the bottom end of investment grade or the top end of speculative grade. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. The *t*-statistics are in parentheses. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1	2	3	4	5	6
	AAA thru A-	BBB+ thru BB-	BBB+,BBB and BBB-	BB+, BB and BB-	BBB- and BB+	B+ thru D
Intercept	3.00	-10.73*	-4.38	-11.97	0.73	1.55
	(0.62)	(-1.83)	(-0.70)	(-1.59)	(0.09)	(0.20)
UG^P	-0.85**	-0.06	0.09	-0.05	-0.86	0.65
	(-2.03)	(-0.15)	(0.21)	(-0.09)	(-1.16)	(0.87)
DG^P	-2.13***	-1.43***	-0.98*	-1.90***	-1.30*	-0.35
	(-4.44)	(-3.00)	(-1.72)	(-2.91)	(-1.73)	(-0.44)
$CRind_t < CRind_{t-1}$	-0.67**	-0.19	0.40	-0.63	0.34	-1.01
	(-2.17)	(-0.41)	(0.72)	(-1.05)	(0.52)	(-1.63)
NDI_{ind}	35.93***	53.91***	43.29***	59.16***	58.24***	41.72***
	(5.04)	(5.21)	(3.94)	(5.54)	(4.99)	(2.66)
Leverage	-2.41	0.10	-2.48	0.28	-2.53	-0.02
	(-1.39)	(0.08)	(-1.40)	(0.18)	(-1.28)	(-0.7)
Size	-0.51**	-0.71***	-0.67***	-0.43	-0.65*	-0.69**
	(-2.50)	(-2.65)	(-3.14)	(-0.93)	(-1.87)	(-1.98)
Liquidity	-3.60	5.59*	7.60**	0.12	11.26**	1.19
	(-1.13)	(1.89)	(2.26)	(0.03)	(2.03)	(0.26)
Profit	42.03***	31.68***	37.63***	17.68*	45.99***	9.90**
	(4.72)	(5.03)	(5.02)	(1.72)	(4.33)	(2.08)
Dividends	-5.81	-7.35**	-10.37	-7.93***	-9.21	2.66
	(-0.46)	(-2.05)	(-1.43)	(-2.57)	(-0.96)	(0.55)
REarnings	-1.64	4.65***	2.75**	5.22***	1.89	1.57***
	(-0.97)	(3.56)	(2.06)	(3.08)	(1.12)	(3.21)
Tobin's Q	0.66**	0.13	-0.02	2.85**	-0.03	-0.03
	(2.19)	(1.11)	(-0.51)	(2.18)	(-1.50)	(-0.02)
Tangibility	-4.23**	0.04	-1.29	1.63	1.37	2.71*
	(-2.11)	(0.03)	(-0.58)	(0.91)	(0.44)	(1.81)
NDTS	14.09**	-0.38	4.73	4.56	2.77	12.71
	(2.40)	(-0.06)	(0.68)	(0.30)	(0.25)	(1.38)
Adj. R^2	0.093	0.052	0.082	0.052	0.071	0.018
N	4,533	10,232	4,800	5,432	2,707	5,306

Table 8. Effects of peer firms' rating changes on net debt issuance: Small versus large firms

This table shows the coefficient estimates from the regression on net debt issuance (in %) partitioned by firm size (using yearly industry median) for the full sample and for firms classified as investment-grade firms and speculative-grade firms by S&P separately. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. The *t*-statistics are in parentheses. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	Full sample		Speculative grade		Investment grade	
	1 Less than median	2 Greater than median	3 Less than median	4 Greater than median	5 Less than median	6 Greater than median
Intercept	-8.40	-0.75	-6.82	-0.50	-19.33*	2.32
	(-1.32)	(-0.14)	(-1.02)	(-0.04)	(-1.74)	(0.51)
UG^P	0.96**	-0.79*	1.32***	-2.07*	-0.11	-0.45
	(2.30)	(-1.82)	(2.96)	(-1.91)	(-0.14)	(-1.27)
DG^P	-1.70***	-1.21***	-1.68***	0.01	-1.54*	-1.59***
	(-3.33)	(-4.10)	(-2.93)	(0.01)	(-1.80)	(-4.37)
$CRind_t < CRind_{t-1}$	-0.50	-0.57	-0.78	-0.88	0.36	-0.31
	(-0.95)	(-1.33)	(-1.32)	(-0.87)	(0.52)	(-0.8)
NDI_{ind}	41.43***	50.71***	46.66***	58.72***	18.89	44.02***
	(4.20)	(6.43)	(4.78)	(3.94)	(1.33)	(6.03)
Leverage	0.07	-0.06*	0.12	-0.05	-7.86***	-2.26*
	(0.23)	(-1.70)	(0.45)	(-1.60)	(-3.20)	(-1.66)
Size	-0.69	-1.62***	-0.74*	-3.17***	-2.04***	-0.78***
	(-1.60)	(-5.02)	(-1.73)	(-4.22)	(-3.63)	(-4.51)
Liquidity	0.95	3.26	0.65	-3.82	4.06	1.04
	(0.29)	(1.08)	(0.18)	(-0.51)	(0.68)	(0.32)
Profit	17.91***	34.48***	15.36***	28.9**	46.96***	41.90***
	(4.53)	(6.22)	(3.73)	(2.07)	(4.49)	(6.69)
Dividends	2.98	-8.67**	0.02	-1.74	8.89	-17.79**
	(0.67)	(-1.99)	(0.00)	(-0.34)	(0.77)	(-2.31)
REarnings	2.45***	3.47***	2.15***	5.36***	-0.90	1.64*
	(4.00)	(4.34)	(3.59)	(3.86)	(-0.30)	(1.69)
Tobin's Q	0.89	0.15	0.23	2.10	0.92	0.00
	(0.91)	(0.91)	(0.18)	(1.19)	(1.19)	(-0.06)
Tangibility	1.10	-2.04	1.51	-0.82	-0.94	-2.83
	(0.86)	(-1.24)	(1.10)	(-0.23)	(-0.24)	(-1.58)
NDTS	-0.02	6.14	0.95	15.00	8.01	5.82
	(0.00)	(0.96)	(0.14)	(0.69)	(0.82)	(1.07)
Adj. R^2	0.034	0.056	0.030	0.054	0.097	0.091
N	9,215	10,856	7,431	3,307	1,784	7,549

Table 9. Effects of peer firms' rating changes on net debt issuance: Competitive versus concentrated firms

This table shows the coefficient estimates from the regression on net debt issuance (in %) partitioned by market competition. We use the Herfindahl–Hirschman Index (or HHI) based on sales as our measure of competitiveness in an industry. We classify firms as operating in competitive (concentrated) industries if the HHI index is below (above) the 33rd (67th) percentile. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. The *t*-statistics are in parentheses. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1 Competitive firms: HHI less than 33% (calculated over the sample period)	2 Concentrated firms: HHI greater than 67% (calculated over the sample period)	3 Competitive firms: HHI less than 33% (calculated for individual years)	4 Concentrated firms: HHI greater than 67% (calculated for individual years)
Intercept	10.81*	-1.60	4.20	-4.78
	(1.86)	(-0.34)	(0.95)	(-1.24)
UG^P	-0.83	-0.81	-0.39	-0.13
	(-1.28)	(-1.56)	(-0.53)	(-0.24)
DG^P	-0.56	-1.48***	-0.69	-1.54***
	(-0.73)	(-2.92)	(-1.03)	(-2.63)
$CRind_t < CRind_{t-1}$	-0.48	-0.73*	-0.75	-1.04***
	(-0.78)	(-1.88)	(-1.45)	(-2.84)
NDI_{ind}	64.75***	32.84*	60.4***	36.91***
	(8.37)	(1.88)	(7.06)	(3.30)
Leverage	-2.15**	0.47**	-1.10	0.66*
	(-2.46)	(2.34)	(-1.23)	(1.81)
Size	-0.27	-0.45*	-0.23	-0.40*
	(-0.83)	(-1.75)	(-0.64)	(-1.87)
Liquidity	-0.08	3.62	-5.12	11.47**
	(-0.02)	(0.88)	(-1.53)	(2.19)
Profit	22.89***	18.83	16.65***	37.72***
	(4.72)	(1.64)	(4.58)	(3.88)
Dividends	-13.57*	-0.28	-10.08***	-0.15
	(-1.66)	(-0.05)	(-2.63)	(-0.02)
REarnings	1.19*	7.02***	2.11**	5.75***
	(1.86)	(2.71)	(2.15)	(3.17)
Tobin's Q	1.01***	0.04	1.18**	0.01
	(2.75)	(0.36)	(1.99)	(0.35)
Tangibility	2.20	4.35**	2.03	0.55
	(1.12)	(2.42)	(0.90)	(0.29)
NDTS	14.18**	-6.21	6.51	2.91
	(2.18)	(-0.62)	(1.26)	(0.34)
Adj. R^2	0.072	0.051	0.061	0.071
N	3,376	4,804	3,814	3,787

Table 10. Industry-average credit ratings, peer rating changes, and net debt issuance

This table shows the coefficient estimates from the regression on net debt issuance (in %) for the full sample and for investment-grade and speculative-grade firms separately after controlling for average industry ratings. (CR<IND) is a dummy variable which takes the value 1 if the firm's credit rating is less than the industry average in a particular year. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. The *t*-statistics are in parentheses. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1	2	3	4	5
	Net debt issuance (NDI)	Net debt issuance (NDI)	Net debt issuance (NDI)	Net debt issuance (NDI) Speculative grade	Net debt issuance (NDI) Investment grade
Intercept	-5.19	-2.76	-2.79	-2.03	-0.24
	(-1.35)	(-0.68)	(-0.69)	(-0.38)	(-0.05)
(CR<IND)	-2.13***	-2.15***	-2.63***	-2.94***	0.39
	(-3.72)	(-3.76)	(-4.61)	(-3.75)	(0.31)
(CR<IND)×UG^P			0.78		
			(1.52)		
(CR<IND)×DG^P			0.46		
			(0.72)		
UG^P		0.09	-0.34	0.41	-0.31
		(0.30)	(-1.01)	(0.86)	(-1.04)
DG^P		-1.46***	-1.68***	-1.31***	-1.49***
		(-5.41)	(-4.38)	(-2.92)	(-3.96)
$CRind_t < CRind_{t-1}$	-0.49	-0.59*	-0.60*	-0.90**	-0.18
	(-1.32)	(-1.68)	(-1.68)	(-1.97)	(-0.47)
NDI_{ind}	44.67***	48.81***	48.85***	51.68***	39.79***
	(5.80)	(6.52)	(6.54)	(5.18)	(5.34)
Leverage	-0.03	-0.03	-0.03	-0.02	-2.69*
	(-0.36)	(-0.35)	(-0.34)	(-0.20)	(-1.83)
Size	-0.56***	-0.63***	-0.63***	-0.55**	-0.53***
	(-3.31)	(-3.64)	(-3.66)	(-2.33)	(-3.75)
Liquidity	3.38*	3.82*	3.72*	0.72	2.91
	(1.70)	(1.83)	(1.79)	(0.21)	(1.03)
Profit	22.13***	22.16***	22.06***	14.89***	42.28***
	(5.94)	(6.00)	(5.98)	(3.40)	(7.43)
Dividends	0.16	0.12	-0.03	-0.97	-8.54
	(0.04)	(0.03)	(-0.01)	(-0.23)	(-1.37)
REarnings	2.40***	2.43***	2.41***	2.48***	1.14
	(4.10)	(4.17)	(4.16)	(4.19)	(1.07)
Tobin's Q	0.28	0.28	0.28	1.28	0.02
	(1.17)	(1.16)	(1.16)	(0.98)	(0.36)
Tangibility	0.48	0.26	0.26	1.76	-2.67
	(0.50)	(0.26)	(0.27)	(1.43)	(-1.59)
NDTS	-0.15	1.29	1.37	8.35	8.23
	(-0.05)	(0.38)	(0.40)	(1.10)	(1.56)
Adj. R^2	0.040	0.042	0.042	0.031	0.084
N	20,446	20,071	20,071	10,738	9,333

Table 11. Impacts of peer firms' rating changes on firms' leverage: Sub-period analysis

This table shows the coefficient estimates from the regression on net debt issuance (in %) for various sub-periods: before year 2001, from 2001 to 2007, after 2007 and 2009 and for expansion and recession periods seperately. UG^P and DG^P are binary variables which take the value 1 if there are one or more peer upgrades or downgrades, (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. The *t*-statistics are in parentheses. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1 Before 2001	2 2001 to 2007	3 After 2007	4 After 2009	5 Expansion Period	6 Recession Period
Intercept	10.51	-14.77	-13.10	-18.98	-6.46	25.31**
	(0.96)	(-1.24)	(-1.44)	(-1.44)	(-1.53)	(2.09)
UG^P	-0.34	-0.39	0.31	0.91**	-0.18	0.60***
	(-0.60)	(-0.97)	(0.67)	(2.27)	(-0.55)	(5.21)
DG^P	-1.41***	-1.81***	-0.71	-1.37**	-1.48***	-0.57
	(-3.37)	(-4.64)	(-1.40)	(-2.52)	(-5.33)	(-0.85)
$CRind_t < CRind_{t-1}$	-1.50***	-1.01**	0.33	1.69**	-0.99***	-0.06
	(-3.02)	(-2.03)	(0.54)	(2.50)	(-2.69)	(-0.06)
NDI_{ind}	35.54***	61.05***	39.87***	8.62	44.36***	47.32***
	(2.95)	(10.38)	(5.33)	(0.62)	(5.46)	(5.80)
Leverage	0.22	-0.08	-0.78	-0.25	-0.02	-1.19***
	(0.59)	(-1.32)	(-1.13)	(-0.70)	(-0.29)	(-7.83)
Size	-0.60**	-0.26	0.24	0.38***	-0.41**	0.43**
	(-1.97)	(-1.28)	(1.38)	(2.61)	(-2.16)	(2.14)
Liquidity	1.15	6.96	-2.97	-1.66	3.95*	2.51
	(0.30)	(1.64)	(-1.15)	(-0.46)	(1.67)	(0.55)
Profit	17.07***	29.43***	17.8***	15.42***	23.70***	18.15***
	(3.01)	(3.08)	(4.15)	(3.93)	(5.78)	(11.26)
Dividends	-0.01	6.69	-8.47	-3.08	1.21	1.49
	(0.00)	(1.02)	(-1.36)	(-0.19)	(0.28)	(0.17)
REarnings	4.30***	2.07***	2.03***	1.23***	2.97***	1.50**
	(2.93)	(2.76)	(3.04)	(3.54)	(4.31)	(2.24)
Tobin's Q	0.57	0.17	4.45***	3.89***	0.32	0.34
	(0.62)	(1.27)	(3.93)	(4.82)	(1.18)	(0.55)
Tangibility	1.14	-0.71	0.23	-0.76	-0.58	4.47*
	(0.96)	(-0.32)	(0.19)	(-0.60)	(-0.59)	(1.77)
NDTS	0.51	14.46	6.40	8.20	5.50	-6.60
	(0.11)	(1.60)	(1.28)	(1.22)	(1.36)	(-1.64)
Adj. R^2	0.031	0.056	0.108	0.107	0.039	0.085
N	10,031	5,649	5,149	3,641	17,732	2,339

Appendix A. Impacts of peer firms' rating changes on net debt issuance (including utility firms)

This table shows the coefficient estimates from the regression on net debt issuance (in %) with *t-statistics* in the parentheses. UG^P and DG^P take the value 1 if there are one or more peer upgrades or downgrades, respectively (i.e., one or more firms with the same rating within the same industry in the same year that are upgraded or downgraded in the next year). The detailed definitions of control variables are described in Table 2. All regressions include industry characteristics unless otherwise stated. Standard errors are two-way clustered across firms and time. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	1 Net debt issuance (NDI)	2 Speculative grade (NDI)	3 Investment grade (NDI)
Intercept	-4.86	-7.41	-0.18
	(-1.24)	(-1.32)	(-0.04)
UG^P	0.07	0.40	0.05
	(0.26)	(0.84)	(0.19)
DG^P	-1.36***	-1.20***	-1.36***
	(-5.66)	(-2.74)	(-4.68)
$CRind_t < CRind_{t-1}$	-0.41	-0.78*	-0.05
	(-1.44)	(-1.78)	(-0.17)
NDI_{ind}	49.81***	51.25***	41.41***
	(6.79)	(5.13)	(5.69)
Leverage	-0.04	-0.02	-2.63*
	(-0.50)	(-0.22)	(-1.93)
Size	-0.25	-0.42*	-0.42***
	(-1.58)	(-1.73)	(-3.47)
Liquidity	3.73*	0.59	2.07
	(1.81)	(0.17)	(0.74)
Profit	22.93***	15.18***	39.18***
	(6.56)	(3.46)	(7.50)
Dividends	0.41	-0.91	-7.10
	(0.11)	(-0.21)	(-1.20)
Earnings	2.80***	2.66***	1.09
	(4.81)	(4.37)	(1.02)
Tobin's Q	0.32	1.38	0.03
	(1.23)	(1.06)	(0.42)
Tangibility	-0.01	1.57	-1.81
	(-0.01)	(1.33)	(-1.22)
NDTS	0.90	9.14	3.62
	(0.29)	(1.22)	(0.93)
Adj. R^2	0.040	0.030	0.086
N	22,807	10,962	11,845