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A Study on the Association between Credit Ratings and Capital Structure Decision in Korea*

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—〈Abstract〉—

The objective of this paper is to examine to what extent credit ratings directly affect capital structure decisions and to analyze the effect of credit ratings of firms and how managers use information about credit rating in determining or changing the capital structure of firms in Korea. I examine discrete costs and benefits associated with firm credit rating level differences and empirically test whether managers' concerns for these costs and benefits directly affect debt and equity financing decisions. According to my empirical result, firms near a credit rating upgrade issue less debt relative to equity than firms not near a change in a credit rating. This capital structure decision making behavior by managers is generally consistent with discrete costs and benefits of rating changes but has not been fully explained by traditional capital structure theories. Overall, the results of this paper is associated with previous empirical tests of the pecking order and tradeoff capital structure theories. In conclusion, this paper will contribute to the theoretical and empirical capital structure decision frameworks by examining the influence of credit ratings on capital structure decisions in Korea.

<Key words> credit ratings, capital structure, debt and equity financing decisions

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I . Introduction

The objective of this paper is to examine whether credit ratings influence on a firm's capital structure in Korea. Managers seem to depend on credit ratings when making capital structure decisions. The motivation of this paper is based on the importance of implications of credit rating and its impact on capital structure decisions, which has not been formally investigated in the capital structure papers to date. Although there have been extensive researches on examining how credit ratings affect stock and bond valuations, not much has been on the effect of credit ratings on firm's behavior. The characteristics of this paper lie in measuring the significance of credit ratings in capital structure decision making behavior by firms. In this paper, I argue that credit ratings play a significant role for capital structure decisions and managers' concern because credit rating is related to various benefits and costs related with different rating levels. Therefore, I examine whether credit ratings directly affect capital structure decision making and analyze the effect of credit ratings of Korean firms and how managers use information about a firm's credit rating when determining or changing the capital structure of a firm in Korea. My major concern is about what extent credit ratings directly affect capital structure decisions and outline various costs and benefits associated with firm credit rating level differences and empirically examine whether concerns for these costs and benefits directly affect debt and equity financing decisions. I extend this paper on the pecking order and trade-off capital structure theories. I find that the results of the paper are persistent with these two capital structure theories as well. According to Graham and Harvey(2001), credit ratings are regarded as one of the highest concern for CFOs when determining capital structure. Overall, this paper contributes to the theoretical and empirical capital structure decision frameworks by examining the influence of credit ratings on capital structure decisions.

II . Credit Ratings and Capital Structure

I provide several reasons for the significance of credit ratings for capital structure : regulation on bond investment, information content of credit ratings, and costs directly imposed on firm. Essential is the belief that credit ratings are important due to the discrete costs and benefits associated with different rating levels. The impact of credit rating changes directly influences capital structure decision making, in case of firms near a ratings change less net debt relative to

net equity are issued in comparison with firms not near a ratings change. This argument is somewhat different from the financial distress argument that firms of a given rating level will issue more debt on average if near an upgrade caused by their better credit quality. However, the Credit Rating–Capital Structure Hypothesis (hereafter CR–CS), states that firms near either an upgrade or a downgrade in rating will issue less debt on average than firms not near a change in rating. CR–CS implies discrete costs (benefits) associated with a change in rating as well as a discontinuous relationship between leverage and firm value, while financial distress concerns shows no such discontinuity. However, CR–CS and distress concerns have similar empirical implications in some cases and therefore variables that control for the financial condition of the firm are included in order to separate credit rating effects from any financial distress effects.

1. Regulations on Bond Investment

Regulations on bond investment is considered as one of primary reasons for bond rating to be an important decision making factor in capital structure decision. To the extent that regulations affect discrete cost of investing in a particular class of bond, yields on bonds with higher regulatory costs will be higher than bonds with lower regulatory costs. Also, when the demand curve for bonds is sloping downward, the restriction on certain investors of a particular bond market will show the higher yield in that market. Therefore, although a firm itself may not have any higher default risk, I argue that it may have to pay a higher interest rate on its debt merely as a result of its credit rating. Also, regulations may affect the bond liquidity depending on rating. Patel, Evans, and Burnett(1998) found that liquidity affects whether speculative–grade bonds experience abnormal positive or negative returns. If firms incur higher interest rates in less liquid markets by credit rating, there may be incentives to change credit ratings levels to avoid costs. Also, at certain credit rating levels such as speculative–grade or during difficult economic situation, a firm has difficulty in raising debt capital. This makes firms with those credit ratings meet more additional costs. I expect the effects of regulation to be greater especially in case of changes in broader ratings categories. (ex. From BBB to A, rather than from AA– to AA as regulations generally do not distinguish between firms with and without notch ratings) Also, due to several regulations specific to the investment grade versus speculative grade designation, the effects of regulations are expected be the greatest around this change if these regulations are significant for decision making. As for speculative–grade bond rating levels, liquidity issues are much more significant. Therefore such firms with speculative–grade are more concerned with their credit ratings than firms with investment–grade firms.

2. Information Content of Credit Ratings

The second significance of credit ratings lies in the information content of credit ratings. Credit ratings provide more information on the quality of a firm than other publicly available information because credit rating agencies may receive significant information about firms that is not publicly available. More specifically, firms may be reluctant to release strategically important information to the market. Credit agencies may gather such information to have more insight on the intrinsic value and potential growth of firms and provide more reliable measures of a firm's credit ratings. Previous study argued that credit rating agencies play an important role as screening agents (Millon and Thakor 1985). Prior literature has also regarded rating agencies as information-processing agencies that may stimulate the disclosure of significant information about firms to financial markets. The information content of credit rating theory suggests that firms in the same rating category may signal similar overall firm quality. In other words, firms within the same credit ratings group would be assessed with similar default risk and associated with similar yield spreads for their bonds. Therefore, in order to sustain their credit rating levels (not to be pooled with firms that are of lower credit rating, thus regarded to be of lower quality), firms near a downgrade in credit rating may have a more incentive to maintain the higher credit rating. Likewise, firms near an upgrade will have a more incentive to obtain that upgrade to belong to the higher credit ratings category. In sum, if credit ratings contain information about the quality of firms, any changes in credit ratings are significant to consider for making capital structure decisions.

3. Costs Directly Imposed on Firm

Costs directly imposed on a firm are another important aspect of credit ratings. Different bond rating levels cause direct costs on a firm. A firm's credit rating is important as it affects financing of the firm, in other financial markets such as commercial paper, disclosure requirements for bonds, and bond covenants, which may contain special with changes in coupon rates or a forced repurchase of the bonds. Besides, credit ratings can influence business operations of the firm in several ways. Firms with long-term supply contracts may require specific credit ratings from their counterpart firms and entering into swap arrangements or asset-backed securities transactions may require a particular credit rating accordingly, and mergers can be influenced by credit ratings as well. Furthermore, lower credit ratings levels may negatively produce employee royalty or customer relationship as well. The commercial paper market is also affected by long-

term bond ratings, depending on a strong relationship between a firm's long-term rating and its commercial paper rating by Standard and Poor's(2001b). According to normal business practice, an investment grade BBB long-term rating generally is required for commercial paper market, and an A long-term bond rating generally is required to meet commercial paper investors. Firms can face discrete costs from ratings-triggered events such as a required repurchase of bonds. For example, Enron paid \$3.9 billion in accelerated debt payments as a result of a credit rating downgrade. Standard and Poor's(2002) survey found approximately 1,000 U.S. and European investment grade issues and found that 23 companies show serious vulnerability to ratings triggers or other contingent calls on liquidity. This shows that a downgrade entails provisions such as ratings triggers or covenants that could cause a liquidity crisis. Therefore, costs for a firm triggered by credit ratings changes generally are closely related to broad ratings levels and the most prominent phenomena around the investment-grade to speculative-grade bond distinction are broad rating levels.

III. Capital Structure Theories

1. Tradeoff Theory

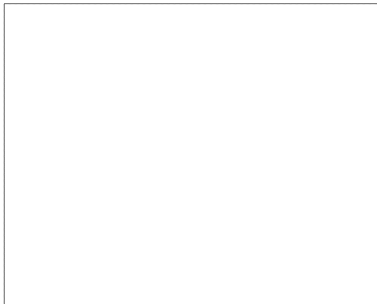
Tradeoff theory as well as pecking order theory is used to test the hypothesis on credit ratings and manager's incentives and behavior to avoid downgrade. The tradeoff theory of capital structure argues that a value-maximizing firm will balance the value of interest tax shields and other benefits of debt against the costs of bankruptcy and other costs of debt to determine an optimal level of leverage for the firm. The tradeoff theory implies that a firm will tend to move back toward its optimal leverage to the extent that it departs from its optimum (Fama and French(2002)). Whether the CR-CS model fits into this framework is about the fact that different credit rating levels are associated with discrete costs(benefits) to the firm. Therefore, if the rating-dependent cost(benefit) is material, managers will balance that cost(benefit) against the traditional costs and benefits implied by the tradeoff theory. There may be cases in which firms may display different behavior inconsistent with tradeoff theory : this is well displayed in the below <Figure 1>. If there is no discrete cost related to credit ratings when there is a change from investment-grade to speculative-grade rating status, a firm may meet the situation depicted in Panel A. This graph describes firm value as a function of leverage and illustrates the tradeoff between the benefits and

the costs of higher leverage. A value-maximizing manager in this situation will choose the leverage implying firm value shown as T^* . In contrast, a firm with faces a discrete cost(benefit) at the change from investment-grade to speculative-grade status due to credit rating effects will show a different behavior. (Refer to Figure 1) A firm in a position with a high rating within speculative-grade bond ratings will choose a smaller leverage than that implied by traditional tradeoff theory factors to obtain an investment-grade rating, which is depicted in Panel B. The benefits from the better credit rating outweigh the traditional tradeoff theory factor benefits of remaining at T^* , the optimal capital structure considering only traditional tradeoff effects. C^* is the new optimum, taking into account credit rating effects as well. The graph also illustrates how a firm at C^* , near a downgrade, will be less likely to issue debt relative to equity to avoid a downgrade. Likewise, a firm at the lower rating slightly to the right of C^* , near an upgrade to the higher rating, will be more likely to issue equity relative to debt to obtain the upgrade.

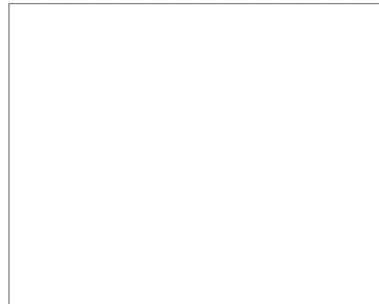
<Figure 1> Firm value and optimal capital structure under tradeoff theory and credit rating effects

Panel A shows without credit rating change and Panel B shows with credit rating change. That caused optimal point change from T^* to C^* . Panel E has many credit rating differences.

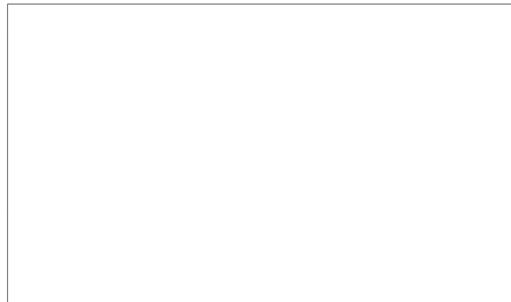
Panel A : No credit rating level costs(benefits)



Panel B : One rating cost, firm near rating change



Panel E : Tradeoff theory and discrete costs(benefits) at multiple credit rating levels



The <Figure 1> shows a complete picture of the tradeoff theory combined with credit ratings effects by showing several jumps. Panel E depicts the case in which discrete costs and benefits exist for credit rating level differences in which T^* denotes the optimal value with tradeoff effects alone and C^* is the optimal value with tradeoff theory and credit rating effects (when C^* and T^* differ). It is possible that credit rating effects will be relevant to a firm of any quality, but the extent of the effects will depend on how near that firm is to a change in rating in this case as well. Firms that are relatively farther away from a downgrade will be less concerned about a small offering of debt. However, they will still be concerned about the potential effects of a large debt offering since a large offering could generate a downgrade for them. Likewise, firms that are relatively far from an upgrade may consider a large equity offering to obtain an upgrade; however, they are less likely to issue smaller equity offerings relative to firms very close to an upgrade.

2. Pecking Order Theory

The second traditional capital structure theory is the pecking order theory. I suggest that firm's managers should show behavior inconsistent with the pecking order theory as they may choose to issue equity instead of debt although issuance of debt is less costly in order to avoid a downgrade in the credit rating. Following is further detail regarding the argument, beginning with the main idea of the pecking order theory. The pecking order theory states that firms will generally prefer not to issue equity due to asymmetric information costs (Myers (1984)). It suggests that firms prefer to fund projects first with internal funds and then with debt, and only when internal funds have been exhausted and a firm has reached its debt capacity, a firm will issue equity. The pecking order theory implies firms will increase debt when investment exceeds internally generated funds and debt will fall when investment is lower than internally generated funds. The pecking order predicts a strong short-term response of leverage to short-term variations in earnings and investment. CR-CS implies that for some incremental change in leverage, a discrete cost (benefit) will be incurred due to a credit rating change. Assuming that for some level of leverage both CR-CS and pecking order effects, a firm will face a tradeoff between the costs of issuing equity and the discrete cost associated with a potential change in credit rating. This conflict will exist most strongly for firms near a change in rating, whether it is an upgrade or a downgrade. Therefore, in contrast to the implications of the pecking order theory, firms near an upgrade may choose to issue equity instead of debt in order to obtain the benefits of a higher rating, and firms near a downgrade may avoid issuing debt to prevent the discrete costs from a downgrade.

3. Credit Rating Systems in Korea

The general principles of credit rating system in Korea are almost the same in US. The only difference exists in the grade of C. In case of CCC+, CCC and CCC- grades, Korean credit ratings did not attach a+ or to a C grade, using only the CCC, CC and C grades. In addition, I used only one parameter, the S&P credit ratings, but I refer to the data given by three Korean credit rating institutions ; 1) National Information & Credit Evaluation Inc. 2) Korean Information Service Inc. 3) Korea Ratings, taking a conservative approach, using the lowest credit rating among them. Prior to the application of this study, I consider the historical perspective upon Credit Ratings of the Korean firms. Due to the Asian financial crisis in late 1990s, I examined closely around the years 1997~1998, but no significant structural changes in credit rating systems were found. Therefore, I conclude that Korean credit rating systems have not been much developed in the 1990s and hasn't been influenced much during the financial crisis. As a result, I use yearly data without any intermission or distinction. The number of sample firms before 1997 was small, which lead me to conclude that credit rating systems were in fact quite primitive prior to the Korean economic crisis. The robustness of my test may not be assured due to the short history of the Korean credit rating systems.

IV. Empirical Tests

1. Research Design

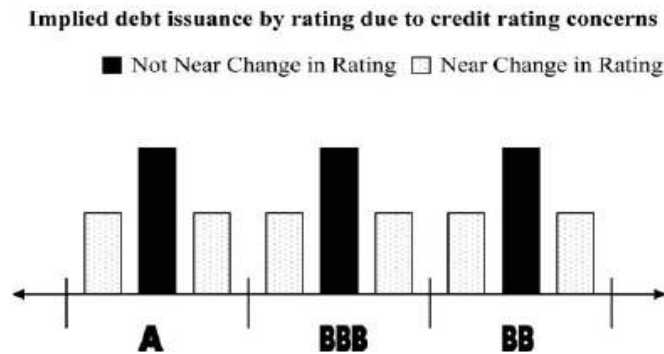
I hypothesize that firms near a credit rating upgrade or downgrade will issue less debt relative to equity—simply, less debt, more equity. The following figure illustrates the implications of the hypothesis for debt offerings.

I examines this implication by regressing measures of net debt issuance relative to net equity issuance on dummy variables that divide firms near a change in credit rating and those that are not. Here, I am more concerned about the Broad Rating changes, which states that firms with either a+ or - grading face higher pressure to reduce debt offering relative to equity offering. For example, firms with a BB+ or BB- grading are defined to be near rating changes, where as a firm with a BB grading is not. A designated set of Plus or Minus tests(or POM test) were conducted to test for this measure. I did not perform the micro rating changes, because it required more precise distinctions, dividing the three classes within one level of credit rating (e.g. within

BB+ there are upper, middle and lower levels). It had to be followed by the reprocessing of market credit ratings by their own standards, but as my major interests lied in observing the general responses of the firms' behavior upon Broad Ratings changes, the latter process was omitted from this study.

〈Figure 2〉 Net debt usage implied by credit rating concerns

This figure depicts debt usage for firms near a change in rating and firms not near a change in rating as implied by CR-CS. CR-CS implies that firms near a rating change will issue less debt than firms not near a rating change.



2. Data and Descriptive Statistics

The sample consists of all firms with a credit rating in the FN Guide Data, covering security issuance from 1998 to 2006, excluding missing values. The sample consists mainly of manufacturing firms enlisted in the Korean Stock Exchange, KOSPI and KOSDAQ, excluding financial companies such as banks and securities. The Credit rating applied was the Long-Term Domestic Issuer Credit Rating, the lowest one among the three Korean credit raters' grades. The sample period is from 1998 to 2006. I exclude firms with March as their fiscal year, in order to achieve consistency for the time periods of the data. Thus, firms with December fiscal year and given credit rating grades at the end of the year are finally included as my final data set. Total final firm years from this data set amount to 1850.

The notation for the empirical test is defined as follows:

Dit = book long-term debt plus book short-term debt for firm i at time t .

ΔD_{it} = long-term debt issuance minus long-term debt reduction plus change in current debt for firm i from time t to $t+1$.

ΔLTD_{it} = long-term debt issuance minus long-term debt reduction for firm i from time t to $t+1$.

E_{it} = book value of shareholders' equity for firm i at time t .

ΔE_{it} = Sale of common and preferred stock minus purchases of common and preferred stock for firm i from time t to $t+1$.

A_{it} = beginning-of-year(Dec. at $t-1$) total asset for firm i at time t .

CR_plus = dummy variables(equal to 1) for firms that have a plus credit rating at the beginning of the period.

CR_minus = dummy variables(equal to 1) for firms that have a minus credit rating at the beginning of the period.

$CR_POM = CR_plus + CR_minus$ = dummy variables(equal to 1) for firms that have a minus or plus credit rating at the beginning of the period, as described above.

K_{it} = set of control variables, including leverage : $D_{i,t-1}/(D_{i,t-1} + E_{i,t-1})$,
profitability : $EBITDA_{i,t-1}/A_{i,t-1}$, and size : $\ln(\text{Sales}_{i,t-1})$

$\text{NetDIss}_{it} = (\Delta D_{it} - \Delta E_{it})/A_{it}$

Summary statistics for the sample are shown in Tables 1 and 2. The sample contains 1850 firm-years. <Table 1> shows statistics for debt to total capitalization ratios by credit rating within the sample, and it also indicates the number of firm-years by rating. <Table 2> shows the capital raising and reducing activity within sample. The figures in <Table 1> include the means, medians and standard deviations of debt/(debt+equity) by credit rating within the sample, and the number of firm-years(out of the total sample of 1849 firm-years) that had received the indicated rating at the beginning of the firm-year.

The Debt/(debt+equity) value was calculated both by the book value of both long-term and short-term debt divided by the long-term and short-term book value of debt plus the book value of shareholders' equity, excluding firms with $D/(D+E)$ values greater than 1 or less than 0. <Table 1> indicates that the sample is relatively equally distributed by rating. Although the range is from 2 CCC firm-years to 254 BBB- firm-years, 10 of the 17 rating categories (excepting under CCC+) fall between 100 and 255 firm-years. This indicates that the empirical results in this paper are not likely driven by any specific rating category.

〈Table 1〉 Sample Summary Statistics : Credit Ratings and Leverage

Means, medians, and standard deviations of debt/(debt+equity) by credit rating within the sample, and the number of firm-years(out of the total sample of 1,850 firms-years) that had the indicated rating at the beginning of the firm-year. The sample consists of firms listed in FN Guide from 1998 to 2006, excluding firms with missing values for regularly used variables in the empirical tests of the paper(these include credit ratings, total assets, debt, and equity). Debt/(debt+equity) is book long-term and short-term debt divided by book long-term and short-term debt plus book shareholders' equity(leverage statistics exclude firms with $D/(D+E)$ greater than 1 or less than 0).

lag_rating	Number of	Debt/(Debt+Equity)		
	Firm-Years	Mean	Median	Std Dev.
AAA	44	33.50%	31.40%	24.00%
AA+	22	44.00%	50.10%	22.20%
AA	33	31.40%	32.60%	25.40%
AA-	80	32.60%	31.30%	20.70%
A+	120	30.20%	29.00%	19.30%
A	136	31.30%	32.50%	21.50%
A-	168	29.60%	31.20%	19.00%
BBB+	166	38.90%	38.70%	19.60%
BBB	254	42.60%	43.80%	19.90%
BBB-	252	42.70%	46.10%	19.10%
BB+	153	48.40%	47.10%	17.40%
BB	173	53.20%	55.00%	19.60%
BB-	106	53.90%	55.50%	18.10%
B+	29	48.40%	52.20%	22.60%
B	33	57.30%	65.20%	29.30%
B-	24	52.40%	49.60%	24.00%
CCC+	20	29.50%	30.10%	25.80%
CCC	2	57.20%	57.20%	20.90%
CCC-	333	61.80%	63.90%	22.40%
합 계	1,850			

Within offerings, <Table 2> shows that nearly 30% of the sample raised only debt for the firm—year, compared to approximately 12% issuing only equity, with an offering defined as a net amount greater than 1% of total assets. A small number issued both equity and debt(6%), leaving nearly half of the firm—years with no offerings. The propensities are similar for capital reductions, with approximately 49% reducing debt levels only compared to 6% reducing equity levels only. Once again both debt and equity reduction is rare(4%), with approximately half of the sample not reducing capital.

<Table 2> shows that firms are more likely to use one form of financing, either debt or equity, during a given year as opposed to both debt and equity. For example, conditional on an offering taking place, approximately 40% of all firms will issue debt only or equity only versus issuing both during the year. To the extent that firms follow the tradeoff theory and target a specific debt to capitalization level, this is not to occur on an annual basis using both debt and equity offerings. Similarly, firms are more likely to use one form of financing, either debt or equity during a given year as a means of reduction to achieve target levels of capital. From given statistics, it is derived that where as 54.5% of firms will use either debt or equity as a means of reduction, only a mere 4.0% of total firms will use both debt and equity. It is also noted that though similar results are attainable from both cases, the reliance on debt is much greater for reduction, almost twice as much, where as equity reduction is only half as much. In relations to the tradeoff theory, again, a given firm will not attempt to achieve its optimal debt level in a single year using both debt and equity reduction.

<Table 2> Sample Summary Statistics Capital Activity

Number of firm—years in the sample with the indicated capital activity. A debt or equity offering or reduction is defined as the net amount raised or reduced equal to 1% of total assets or greater for the calendar year. The sample is FN Guide data covering security issuance from 1998 to 2006 and excludes firms with missing values for regularly used variables in the empirical tests of the paper (these include credit ratings, total assets, debt, and equity).

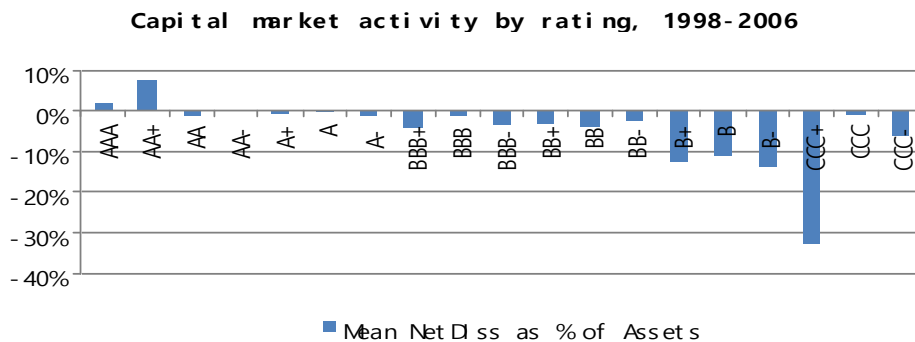
	Offering		Reduction	
	N	%	N	%
Debt only	518	28.00%	900	48.60%
Equity only	220	11.89%	110	5.95%
Debt and equity	112	6.00%	75	4.00%
Neither	1000	54.10%	765	41.45%
Total	1850	100.00%	1850	100.00%

<Figure 3> shows average NetDIss by rating, and <Figure 4> depicts debt and equity offerings by rating. The figures show a general relationship of firms of higher credit quality issuing more debt and less equity than firms of lower credit quality. The empirical tests control for the financial condition of the firm to account for this general relationship. The raw data also indicates that firms near a rating change issues less debt than equity(as depicted in <Figure 2>) for several rating categories. Average NetDIss has the predicted pattern in four of six Broad Ratings categories(A, BBB, B, CCC).

This behavior is not explained by traditional capital structure theories. Hence, the figures indicate that a firm's credit rating situation appears to affect capital structure decisions. However, for debt issues and equity issues, it does not seem to show that firms near a rating change issue less debt or more equity than firms not near a rating change.

<Figure 3> Average net debt issuance minus net equity issuance by rating

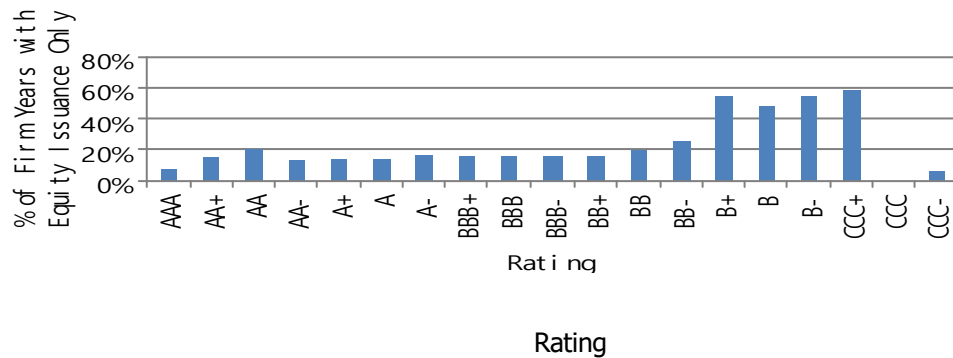
This figure depicts the mean value of NetDIss, $(\Delta D_{i,t} - \Delta E_{i,t})/A_{i,t}$, by rating across firm-years from 1998 to 2006. The sample is all FN guide firms with a credit rating at the beginning of the year, excluding firm-years with a very large debt offering.



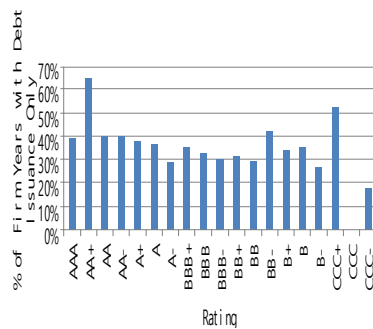
〈Figure 4〉 Debt and equity offerings by rating

This figure depicts the percentage of firm-years within a given rating that have an equity offering (Panel A) or debt offering (Panel B), from 1998 to 2006. The sample is all FN Guide firms with a credit rating at the beginning of the year. An offering is defined as an issuance greater than 1% of total assets for the year.

Panel A. Equity offerings, 1998 to 2006



Panel B. Debt offerings, 1998 to 2006



Rating

3. Plus or Minus Tests

In this session, I evaluate the concern for a change in Broad Rating using the POM test. The following four regressions are the main tests for the hypothesis that firms with a minus or plus rating will issue less debt relative to equity than firms that are in the middle.

- (1) $\text{NetDIss}_{it} = +0 \text{ CR_POM} + K_{it} + it$
- (2) $\text{NetDIss}_{it} = +1 \text{ CR_Plus} + 2 \text{ CR_Minus} + K_{it} + it$
- (3) $\text{NetDIss}_{it} = +3 \text{ CR_POM} + it$
- (4) $\text{NetDIss}_{it} = +4 \text{ CR_Plus} + 5 \text{ CR_Minus} + it$

These equations test whether a firm's net issuance of debt versus equity for a particular year is affected by how near that firm is to an upgrade or a downgrade in their credit rating at the end of the previous period. The implication that firms near a rating change will have more conservative debt financing policies than firms in the middle, as implied by CR-CS, predicts that $\beta_i < 0$, $i=0, 1, 2, 3, 4, 5$. The null hypothesis is $\beta_i \geq 0$. Results of these regressions are shown in Table 3.

K_{it} here is controlling variable for the leverage $D/(D+E)$, profitability EBITDA/A , and sales $\ln(\text{Sales})$. I exclude firms that offered large debt during the fiscal year, because it may lead to a firm downgrade. A large debt offering is defined as a debt offering that amounted to more than 10% of total assets held by a firm.

In conducting the tests, I attempt to find the appropriate distinction point upon which Korean firms became sensitive about the credit ratings in making their capital structure decisions. Therefore, I divide the firm-year samples upon various categorizations to distinguish a significant marginal line of cost reduction or cost distress resulting from credit rating change. However, I exclude the AA- rating as it had displayed a significant outcome within the sample. I post the additional table that displays the groupings. I assume that the above AA- company's financial manager would not be sensitive to a credit rating change, because their rating is high enough to ignore minor credit rating changes that affect the cost of capital structure.

〈Table 3〉 Credit Rating Impact on Capital Structure Decisions : Plus or Minus Tests

Coefficients and standard errors from pooled time-series cross-section regressions of net debt raised for the year minus net equity raised for the year divided by beginning-of-year total assets on credit rating dummy variables and on control variables measured at the beginning of each year. CR_POM is a credit rating dummy variable equal to 1 if the firm has either a plus or a minus credit rating and 0 otherwise. CR_Plus and CR_Minus are credit rating dummy variables equal to 1 if the firm has a plus or minus rating, respectively and 0 otherwise. The control variables include $D/(D+E)$, book debt divided by book shareholder's equity plus book debt, EBITDA/A, previous year's EBITDA divided by total assets, and $\ln(\text{Sales})$, the natural log of total sales. The sample covers security issuance from 1998 to 2006 and excludes observations with missing values for any of the variables. ***, ** and * denote significance at the 1%, 5%, and 10% levels, respectively.

	1	2	3	4
Intercept	-0.2148***	-0.2168***	-0.0363***	-0.0362***
(pvalue)	-0.0007	-0.0006	-0.0002	-0.0002
CR_POM	-0.0262**		-0.0251*	
(pvalue)	-0.0425		-0.0794	
CR_Plus		-0.0343**		-0.0319**
(pvalue)		-0.0085		-0.0343
CR_Minus		-0.0086		-0.0095
(pvalue)		-0.4725		-0.4386
$D/(D+E)$	-0.0635***	-0.0712***		
(pvalue)	0.0000	0.0000		
EBITDA/A	0.2308***	0.3107***		
(pvalue)	0.0000	0.0000		
$\ln(\text{Sales})$	0.0085***	0.0087***		
(pvalue)	-0.0032	-0.0035		
Adj.R ²	0.0475	0.0486	0.0025	0.0028
N	1850	1850	1850	1850

These results support CR-CS, with the rejection of the null at the 5% level in which firms are a little different to being near a credit rating change for capital structure decisions. The signs for the coefficients are as predicted as well ; firms near a change in credit rating are less likely

to issue debt relative to equity than firms in the middle. The value for the coefficient 3 of equation (3) in column 3 of Table 3 indicates that firms with a plus or minus rating annually issue approximately 1.4% less debt net of equity as a percentage of total assets (or 1.4% more equity net of debt as a percentage of total assets) than firms in the middle. This indicates that the results are not only statistically significant but also economically significant. However, I can find that CR_Minus does not reject the null. It means that Korean financial managers are more concerned about credit ratings when it is near an upgrade than a downgrade.

<Table 4>, I conduct (1) and (2) regressions with controlling variables Kit, illustrating yearly coefficients 0, 1, and 2 and standard error from cross-sectional regressions by year from the 0 CR_POM, 1 CR_Plus, and 2 CR_Minus independent variables.

Concern for credit ratings is evident on a year-by-year basis as well. <Table 4> shows that for 4 of 9 individual years the coefficient on CR_POM is the correct sign, for 1 of 9 years the coefficient is statistically significant at the 5% level. It shows yearly data but, does not reject null hypothesis except 1999. I think that Korean financial managers consider credit ratings more importantly right after the Asian Crisis.

<Table 4> Credit Rating Impact on Capital Structure Decisions POM

Coefficients by Year Coefficients and standard errors from cross-sectional regressions by year of net debt raised for the year minus net equity raised for the year divided by beginning-of-year total assets on a constant, credit rating dummy variables and control variables measured at the beginning of each year. CR_POM is a credit rating dummy variable equal to 1 if the firm has either a plus or a minus credit rating and 0 otherwise. CR_Plus and CR_Minus are credit rating dummy variables equal to 1 if the firm has a plus or minus rating, respectively and 0 otherwise. Regression 1 includes the CR_POM dummy variable and Regression 2 includes the CR_Plus and CR_Minus credit rating dummy variables. The control variables are $D/(D+E)$, book debt divided by book shareholder's equity plus book debt, $EBITDA/A$, EBITDA divided by total assets, and $\ln(\text{Sales})$, the natural log of total sales. The samples exclude observations with missing values for any of the variables. *, ** and *** denote significance at the 5%, and 10% levels, respectively.

	Regression (1)		Regression (2)			
	CR_POM		CR_Plus		CR_Minus	
year	PARMS	PVALUE	PARMS	PVALUE	PARMS	PVALUE
1998	0.0023	0.9886	0.0287	0.8157	-0.0328	0.7828
1999	-0.0743**	0.0423	-0.0746*	0.0789	-0.0732*	0.0875
2000	0.0295	0.2457	0.027	0.515	0.0312	0.3648
2001	-0.028	0.1938	-0.0264	0.4428	-0.029	0.3125

〈Table 4〉 Credit Rating Impact on Capital Structure Decisions POM 〈Continued〉

	Regression (1)		Regression (2)			
	CR_POM		CR_Plus		CR_Minus	
year	PARMS	PVALUE	PARMS	PVALUE	PARMS	PVALUE
2002	-0.0096	0.6184	-0.0025	0.9427	-0.0245	0.4016
2003	0.0301	0.1964	0.0235	0.5498	0.0365	0.2423
2004	0.005	0.9265	0.0075	0.7865	-0.0023	0.8586
2005	0.0548	0.2493	0.0232	0.6091	0.0809*	0.0645
2006	-0.0053	0.8817	-0.0225	0.7879	0.0036	0.9417

V. Conclusion

I suppose that managers' concern for credit ratings is significantly related to the discrete costs and benefits associated with different ratings levels. In this paper, I examine the impact of credit ratings on capital structure decisions of firms in Korea. In order to empirically test the hypotheses, I examine whether capital structure decisions are directly influenced by credit ratings concerns of managers. In this paper, two distinct measures are used to distinguish between firms near a downgrade or upgrade versus those not near a downgrade or upgrade. Controlling firm-specific factors, I test whether firms near a change in general rating issue less net debt relative to net equity over a subsequent period compared to other firms. In general, the findings are consistent with the hypotheses. In regressions including dummy variables that account for a firm being close to a ratings change firms near a upgrade ratings change issue approximately 1.4% less net debt relative to net equity annually as a percentage of total assets than firms not near a upgrade ratings change. Main finding in this study is consistent with the hypothesis that managers are concerned with and directly influenced by ratings-triggered events that provide benefits to the firm and the effects of regulations on bond investors. Taken together from the findings, it seems that capital structure decisions are affected by the potential for an upgrade due to the benefits it generates in case of Korea. From this point of view, I infer that Korean managers are more concerned about near a change of credit ratings, especially an upgrade. This is potentially due to the less emphasis on the significance of credit rating compared to U.S. This can be partially explained by the short history of extensive use of credit rating in Korea. The results may

change as the implementation of credit rating policy will be more stabilized and as the use of credit ratings will become more widespread among financial institutions, credit rating agencies, and decision makers of firms in Korea. The implication of this study is that managers' concerns about a change in credit rating may translate into real economic decision-making consequences. This information suggested by this paper can be used to obtain a more comprehensive understanding of capital structure behavior by managers in Korea.

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신용등급과 자본구조의 의사결정에 관한 연구*

송혁준**

<요 약>

본 연구의 목적은 신용등급이 기업의 자본구조 의사결정에 어느 정도 직접적인 영향을 미치는가와 더불어 경영자가 기업의 자본구조를 결정하거나 변경하는 경우에 신용등급정보를 어떻게 이용하는가를 분석하는 것이다. 이를 위해 본 연구에서는 신용등급의 차이와 관련된 경영자의 재량적 효용과 비용을 개괄적으로 확인하고, 이러한 신용등급수준과 관련된 재량적 효익과 비용이 부채와 자본에 의한 재무적 의사결정에 직접적인 영향을 미치는가를 검증하기 위한 실증적 분석을 수행하였다. 본 연구의 주요 결과는 다음과 같다. 신용등급이 상향조정될 가능성 매우 높은 기업의 경우에는 그렇지 않은 기업에 비해 상대적으로 자본에 비해 적은 부채를 통해 자본조달하는 재무적 의사결정행태를 보인다. 이러한 경영자의 의사결정행태는 신용등급의 변화에 관련된 재량적 효용과 비용을 고려할 때 일관성이 있는 결과이지만, 기존의 전통적인 자본구조이론에 의해서는 제대로 설명이 되지 못했던 부분이다. 하지만, 전반적으로 본 연구의 분석 결과는 재무구조에 관한 pecking order theory와 tradeoff theory와 일맥상통한다고 할 수 있으며, 신용등급이 자본구조에 미치는 영향을 실증분석을 통해 검증함으로써 이론적이며 실증적인 자본구조의 의사결정에 대한 개념적 틀을 제공한다는 점에서 의미를 부여할 수 있다.

<주제어> 신용등급, 자본구조, 신용등급의 재량적 효익과 비용, 재무적 의사결정

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