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The Influence of the Affiliate Factor on Firms' Credit Rating: Necessity of Stand-Alone Rating System

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Abstract

The influence of the affiliate factor on firms' credit rating:

Necessity of stand-alone rating system

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To verify the necessity of stand-alone rating system, I investigate that whether a firm belongs to the affiliates or not (affiliate factor) affects on the relationship between bond rating and financial information. The first result documents that raters' adjustment about the affiliates does not much infringe explanatory power of financial ratios for bond rating except liability and the weight of each financial variable that rater generally reflect on credit rating is rather higher in the subsample of affiliates rather than that of non-affiliates. However, it may be the result caused by the vast difference in size of two samples. So, secondly, I divide the sample of affiliated company into two groups which has strong features of group-company and which is similar to non-group company with weak group-integration according to intensity of integration. The result from main ordered logistic regression, slightly different with the result from OLS regression, documents that credit raters evaluate financial ratios such as debt ratio and asset size of the affiliates with strong group integration more positively. That is, affiliate factor

influences on bond rating explicitly by analyst's notching point on the affiliate's financial attributes. Additionally, I use OLS and ordered logistic regression model including both subsidiary's and its parent company's financial attributes for observing how much parent firm's financial peculiaritiesinfluence on the target firm's credit rating apart from the target firm's financial variables. The last result gives evidence that parent firm's financial attributes affect on bond rating significantly as well as the firm's financial attributes which means that the bond rating of affiliates can be inflated caused by raters' subjective opinion apart from its financial status. Especially, the finding shows that raters generally consider asset stability, profitability, and liability and profitability of the parent firm positively when they evaluate affiliate's creditworthiness regardless default risk or risk of tunneling, implying that credit raters prefer group-company unconditionally and they are aggressive and positive to affiliated company's credit rating rather than conservative.

Taken together, affiliate factor influences on firm's credit rating significantly in diverse ways. So, credit rating of the affiliates after adopting stand-alone rating system will be much changed from present rating and it is necessary to adopt stand-alone rating system to evaluate firm's creditworthiness more concretely.

Keywords: The affiliates, bond rating, financial ratio, parent firm and subsidiary, group-integration

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I. Introduction

The Financial Supervisory Service is considering the introduction of stand-alone ratings to weed out nonviable chaebol affiliates which have inflated their corporate ratings through their links with parent firms with better ratings.The FSS has not revealed the timetable for the stand-alone rating system yet, with its officials hinting at the possibility that both the existing and new ratings would be publicly announced.

Korean investors have long been familiar with the inflated ratings in a market dominated by large-scale conglomerates with their sprawling affiliates through interlocking governance structures.

The distorted ratings system, however, has spawned skepticism about the fairness and credibility of local ratings agencies. Last year, the FSS investigated the top three ratings agencies — NICE Investors Service, Korea Investors Service and Korea Ratings — in response to the growing public criticism over their dubious decisions that inflated the ratings of several debt-laden companies to investment levels. And it decides to adopt "stand-alone credit rating system" after the bankruptcy of LIG Constructions and Jin-Heung Corporation.

Conglomerate units are expected to suffer a ratings cut following the introduction of the system, as many of them rely heavily on their parent firms to bolster their status. It is estimated that the credit ratings for such firms have been inflated by two to three notches. In worst cases, some companies with slashed low ratings would find it virtually

impossible to issue corporate bonds. So, Conglomerates are reacting against to adoption of stand-alone rating system, insisting that credit rating ignoring group's network and ability of information sharing cannot reflect true credit ability of companies. And some also argue that present bond rating does not distorted as public concern, so the firm's creditworthiness is rather under-evaluated if adoption of stand-alone system makes credit raters much more conservative or strict about for affiliates. This misrepresented credit rating brings hindrance for group affiliates to raise capital and it can be connect to shrink of market investment and employment.

However, the new rating system is expected to help investors better check the viability of listed companies in general, heralding the imminent implementation of a program that alarms Korean conglomerates. And it's also the system most developed countries have already adopted.

Even though there is some controversy in terms of introducing stand-alone credit rating above, there is no clarified evidence whether adopting of stand-alone rating affects group-affiliates' credit rating in practice. That is, there are lots of papers which shows financial and non-financial determinants of corporate bond ratings (e.g.,Horrigan, 1996; Kaplan and Urwitz, 1979; Boardman and mcEnally ,1981) and propping effects of chaebol groups(Friedmand, Johnson and Milltons, 2003; Williamson, 1975), but there's no paper including whether the propping effects and halo effects of Korean conglomerates are significantly reflected in credit ratingbesides accounting determinants,

as to bring the differences between all-in credit rating and stand-alone rating of group affiliates.

To investigate this issue, I use multiple regression model adopted in Horrigan, 1966 with fivedeterminants especially in the form of financial ratios, which were commonly verified as most important variables for predicting bond ratings in prior research. In addition, I also insert a 0-1dummy variable, with 0 representing non-group companies to the existing model and investigate how the intensity of relationship between accounting data and credit rating of non-group companies is distinct from that of group affiliates by looking at interaction variables. For clarifying the result from OLS including interactions variables, I use ordered logistic analysis again with the same model of OLS as a main analysis and investigate coefficientsin both regression with divided sub-sample: affiliates and non-affiliates. To observe the effect of affiliate factor on financial information specifically, I investigate how the intensity of relationship between accounting information and bond rating is changed according to group-integration with subsample of affiliates, because it is generally known that degree of group- integration is the most important factor for raters to decide how much incentive they give to the affiliated firms. And I also investigate the effect of parent firm's financial attributes on subsidiary's credit rating because financial statusof the parent firm can influence on the target firm's credit rating apart from the target firm's financial attributes and it is connected to the effect of affiliate factor. The firm's financial ratios and its parent firm's

financial ratios are all involved in a model, and the relationship between them and credit rating is investigated.

Prima facie, affiliate factor influences on firm's credit rating significantly in diverse way, and it is necessary to adopt stand-alone rating system to evaluate firm's creditworthiness more concretely. My analysis yields several key findings. First, I find that explanatory power of financial ratios for bond rating is not muchinfringed by analysts' adjustment about the affiliates except debt ratios. The financial situation of the firm is rather reflected more on credit rating regardless it belongs to conglomerate when I compare two subsample, affiliates and non-affiliates, separately. However, there is possibility of distortion because of too small sample size of non-affiliates compared with affiliated companies. So, I divide the sample of affiliates into two groups according to intensity of integration; one which has strong affiliates' attributes and the other which is similar to non-affiliates because of weak integration of group. Although the result from OLS regression and ordered logistic regression are slightly different, it is judged that raters evaluate debt ratio and asset size more positively when the firm has strong characteristics of affiliated company with strong integration. It implies that raters not always look debt negatively because affiliated company such as chaebol commonly has a lot of debt with diverse forms for reinvestment or financial strategy. In addition, the last result gives evidence that parent firm's financial attributes affect on bond rating significantly as well as the firm's financial attributes which means that the bond rating of affiliates can be inflated or deflated caused by raters' subjective opinion apart from its

financial status. Especially, the result shows that credit raters tend to consider default risk (LEV), profitability (ROA), and asset stability (SIZE) of the parent firm positively in terms of evaluating affiliate's creditworthiness. I guess that this result caused by credit rater's aggressive attitude and preference favoring massive group company and its stable supporting ability in terms of credit rating.

My study makes several contributions to the extant literature on bond(credit) ratings and inter-group transaction. Much of prior research focuses on that which determinants have significant relation with credit rating, and how conglomerates' propping or tunneling effects influence on market price. However, extent to prior research, I investigate how much credit rating agencies reflect advantage and disadvantage of business group to credit rating by looking at the different intensity of relationships between accounting determinants and credit rating according to conglomeratefactor and the effect of parent firm's financial attribute on credit rating. Secondly,clarifying that which determinants related with affiliate factor are reflected in credit rating significantly and credit raters' general attitude toward each financial ratios, this study verifies the effectiveness of new credit rating system at the point to be adopted as a new regulation and gives practical evidence to interested parties, for example the new system setters in government or banks, creditors, and debtor, especially conglomerates who will face huge change by adopting stand-alone rating system.

The remainder of the paper is organized as follows. Section II briefly describes credit rating system, reviews previous research evidence on issues, and discusses a

hypothesis. Section IIIdescribes empirical models and sample including descriptive. Section IV shows the main empirical results and section V, finally, concludes and offers suggestion for future research.

II. Prior research and hypothesis

II-1. Bond rating and Factors related with conglomerates

Entities that issue unsecured corporate bonds to raise long-term financing for more than a year are obliged to get credit ratings from licensed credit rating agencies and submit the ratings. The goal of such system is to protect investors who lack information about issuers and to induce appropriate bond prices in the capital market. So, three major ratings services in Korea- NICE Investors Service, Korea Investors Service and Korea Ratings evaluate the long-term creditworthiness of corporate bond issuers and assigns ratings accordingly.

Bond rating services provide invaluable guidance for investors by making risk estimates easily accessible. Ratings also have an important influence on bond prices. If a bond rating is reduced, the price of the bond normally falls in response because investors are not as willing to purchase higher risk securities, at least at the existing price. Based on these functions of bond rating, it provides adequate standard of the terms of debt to credit providers, makes the market allocate financial assets effectively, and attracts corporate to

try improving of their financial structure. Consequently, it has meaning to look at the credit rating and its determinants at the point of introducing new rating system; stand-alone credit rating.

Korean top three ratings services in Korea; NICE Investors Service, Korea Investors Service and Korea Ratings have each own methodology for credit rating performance, but they are very similar. They evaluate companies' capability of debt solvency considering five risk factors; risk of management, risk of affiliation, risk of industry, risk of business, and risk of finance and these five risk factors are included in specific checklist factors. That is, credit ratings reflect diverse accounting and non-accounting factors, including factors related with affiliation officially, even though a number of studies demonstrate that about two-thirds of bond ratings can be predicted with simple models using financial information (Horrigan, 1966; Kaplan and Urwitz, 1979). Especially, the risk of affiliation which I focus on this study is composed of risk of group-business and group-finance, reliability on the affiliates, financial support, payment guarantees or ability of offering securities, and so on.

II-2. Prior research

This study analyzes that whether the company belongs to conglomerates or not affects credit rating. So, reviewing prior research can be divided into two parts. One is related with corporate bond rating, and another is related with the affiliates' advantage or disadvantage.

Credit agencies have rating methodologiesthat consider non-financial factors as well as financial informationaccording to the open source[1] on their homepage. There are some prior research finding the relation between credit rating and various non-financial factors. Ashbaugh-Skaife et al.(2006) present evidence that a variety of governance attributes such as the number of block-holders, CEO power, takeover defenses and so on explain firm credit ratings after controlling for firm's financial characteristics that prior research as shown to be related to credit ratings. That is, they investigate that firms with strong corporate governance benefit from higher credit ratings relative to firms with weaker governance. And Cheng and Subramanyam(2008) investigate the relation between a firm's rater following and its credit rating. By using OLS, 3SLS, and cross-sectional test, they find that a firm's credit rating significantly decreases in raterfollowing, suggesting that increased rater following reduces default risk. In addition, Park et al.(2011) examines the effect of earnings quality on credit ratings with Korean sample. They use income smoothing, accounting conservatism, and discretionary accruals as proxies for earnings quality and find that earning quality as well as level of earnings is a important factor in determining a credit rating of a firm. Taken together, there are diverse approaches to find factors, which affect on credit rating. However, there is no research about whether the affiliate factor has effect on the relationship between financial attributes and credit rating, and influence of parent firms' financial attributes on subsidiary's credit rating which is practically connected to the necessity of "stand-alone

[1]www.kisrating.com, www.korearating.com, www.nicerating.com

rating system”, even though the analysis about the affiliates is obviously involved in rating methodology.

In general, it is believed that raters evaluate the firms belong to the affiliates more favorably than the others. In practice,it is important to consider factors related with the affiliated companies, especially in Korea where massive companies get a large share of economy, when ratings services practice bond rating.

According to Issue report of Korea Rating(2012), when the raters judge the affiliates as a group sharing a common destiny, the amount of direct debt-guarantee between the affiliates is analyzed first. And debt-guarantee between the affiliates, which was general way to raise money for conglomerates was more of security than a simple trade in the past. So it was natural to evaluate the credit rating of firms based on the consolidated rating and the rating of firms belong to conglomerates tends to be inflated. This practice makes people naturally think that rating services pretty much inflates the group-affiliates’ bond rating, expecting support at group level about the lack of redemption capital to this day.

In addition to the benefit of financial support, there are more financial and non-financial advantages of the group-affiliated companies according to previous research. Chang and Hong (2000) examine the economic performance of the firms associated with Korean business groups by explicitly addressing group-wide resource sharing and internal business transactions. The results show that group-affiliated firms benefit from group membership through sharing intangible and financial resources with other member firms.

Furthermore, they show that various forms of internal business transactions, such as debt guarantee, equity investment, and internal trade, are extensively used for the purpose of cross-subsidization. In addition, according to the theory of transaction cost, internal capital market of business group affects total profit of group positively reducing transaction cost and increasing efficiency of resource allocation. Stein(1997) points out, the creation of an internal capital market in which headquarters (e.g. the holding company) allocates capital across diverse projects can create value and limit the distortions arising from the costs of raising funds externally, so the affiliated firms get benefits of financial or non-financial aspects compared with non-group companies.

Contrary to positive perspectives of group-affiliated companies, there are also risks and negative views in terms of credit evaluation. There is a possibility that bondholders are damaged when one affiliated company is immensely shocked because the other affiliated companies in the same group easily can take money and run (Friedman et al. 2003). For example, LIG Indemnity Insurance and Hyosung group abandoned LIG Construction and Jin-heung Corporation when they go under and start workout each in 2012. And related with debt-guarantee among the affiliates, Kim(2010) investigate that credit agencies recognize debt-guarantee more negatively than positively because debt-guarantee undertakes indirect liability. And the effect of debt-guarantee on bond rating has been ease off after 1998 when the government prohibits debt-guarantee among the affiliates of one group. Furthermore, Kang(1998) and Oh(2001) investigate that whether the company belongs to the affiliates or not had effect positively on credit

rating, but its effects oppositely after 1997 financial crisis because the rating agencies are forced to rating the affiliates and their affiliates more strictly than before. Furthermore, there are some finance literatures investigating diversification discount. Even though those research documents the change of market value according to conglomerate-factor, the results which show investor's negative perspective about group-affiliates can connect to credit rater's perspective of affiliates. Ammann and Verhofen (2006) use a credit risk model based on the value of the firm's assets and verify conglomerate discount. Especially they explain that the magnitude of the conglomerate discount depends on the number of business units and their correlation, as well as their volatility, among other factors. And Ammann et al.(2011) also research about the existence of a conglomerate discount. They find that the discount to increase in leverage and no discount for all-equity firm. Hence, the diversification discount occurs in levered firms and stems from conflicts of interest between managers and shareholders over corporate risk taking

There are also some studies which investigate both sides: benefits and risk of group-affiliated companies. Friedman et al.(2003) also show that there is positive perspective on group companies besides negative ones. Affiliated firms belong to conglomerates that have pyramid or multilevel structures are easy to do tunneling or propping[2] And, according to Shim(1996), the external stakeholders of the affiliated firms of conglomerates can gain either benefits or loss because one affiliated firm doesn't bear

[2]Tunneling is the phenomenon that wealth transfers from low to high company in terms of ownership structure. Contrary to tunneling, propping is the case that wealth transfers from high to low ownership company in group structure.

the risk independently, but all affiliated companies of conglomerates burden the risk together with mutual supports. In addition, Although Martinez and Ricks(1989) don't show perspective of business group, but show the influence of parent firm on its subsidiary. They provide empirical evidence for the relationship between the degree of influence U.S.parent companies have over the human resource decision of their affiliates and the affiliates' resource dependencies on the parent company and importance to the parent company.

To sum up, it is no doubt that whether the firm is group-affiliated or not is a crucial factor which reflects the condition of firms and it is qualified to be considered in the evaluation of creditworthiness. However, it is hard to beg the question that group-affiliated companies get inflated bond rating because benefit and risk of the affiliates can be offset when the group agencies evaluate creditworthiness and the stance of credit services on the issues related with the affiliates has been changed historically.

Furthermore, there are lots of papers that show that most part of bond rating is explained by accounting information. That is, they give evidence that the part where the differences of affiliated firms or non-affiliated firms can be reflected is too small to affect bond rating significantly.First, the early studies about credit rating using financial ratio interest on rating prediction. Horrigan(1966) and Pouge and Slodofsky(1969) insist that financial ratios and accounting data can be useful in long-term credit administration. Theyuse multiple regression setting diverse financial ratios as in dependent variable and 9 level of credit rating as dependent variables.Horrigan(1966) finds that accounting

information such as total assets, a long-term solvency ratio, a profit-margin ratio, plus a dummy legal-status variable are sufficient to correctly predict over one-half of samples of bond ratings and Pouge(1969) finds total assets, profit coefficient of variation, long-term debt-to-equity ratio are critical variables predicting 80% of samples of ratings. These studies have limitation, though, that using regression with ordinal scale as dependent variables cannot satisfy basic assumption of OLS(Mckelevy and Zonovia, 1975).To solve this problem, Pinches and Mingo(1973) use multivariate discriminant analysis and develop a prediction model of bond rating with 5 factors such as dependence on long-term liability and Return on Assets(ROA) showing 69.7% prediction capability. Furthermore, Kaplan and Urwitz(1979) also try to predict bond rating using N-Probit model with maximum likelihood estimation. This model assumes that dependent variables are ordinal version as well as there is linear correlation between independent and dependent variables. This study results that cash-flow, long-term liability, net income, and market B have 72% predictable power for bond rating. There arealso several research that focus on Korean market using Korean samples. Jeon(1986) investigates usefulness of balance sheet for bond rating with 88 Korean corporations as a sample by using logistic multiple regressions.In this study, the model consisted of 32 financial ratios as independent variables shows 46.15%-73.07% predictive power. In addition, Na-young and Jin (2003) shows accounting information including dividend rate and total assets is very useful to predict bond rating with bigger sample size, 596 listed companies, than prior study. When put together, we can conclude that financial information takes most

part of decision-making in terms of corporate bond rating, even though there are several non-financial factors considered by ratings services officially.

II-3. Hypothesis for Empirical analysis

II-3.1. Influence on financial information: affiliated firms vs. non-affiliated firms

Overall, it seems that several unique characteristics or conditions of conglomeratesshould be considered evaluating creditworthiness of the affiliated firms and there are some explainable reasons why it is generally known that the bond rating of group-affiliated firms are inflated. However, it is questionable that whether the affiliate factor affect credit rating significantly in the situation that financial information plays major role in credit rating. As two-third factors of credit rating are explained by accounting information according to prior research and diverse non-financial factors including affiliate firm share one-third part of decision-making factors, involving in the group-company or not cannot affects bond rating practically as much as generally thinking. Furthermore, there are many controversial effects of financial or non-financial trade among the affiliates, so that it is possible that both benefits and risk of conglomerates offset each other and the explainable power of determinant; whether the firm is the affiliated firm or notis slight in credit rating.This issue is connected to the necessity of “stand-alone rating system” because its advocators claim that raters give incentive about the affiliate as much as violating importance of financial attributes on

bond rating, so the credit rating of the firm will be changed significantly if the affiliate factor is excluded.

To get an answer for this question,first of all, I hypothesize that the relationship between accounting information and credit rating of the sample, which belongs to the affiliates is not significantly different with that of non-group sample. If credit raters give pretty much incentive to group-affiliated firms as being generally accepted, the significance of financial ratio in terms of bond rating must go down. And if the raters give more or less point on evaluating financial ratios, the coefficient on financial ratios of affiliates and non-affiliates will show very different features. But I chose null hypothesis that the group incentives cannot be reflected significantly on bond rating due to the relative amount compared with financial factors because this study focuses on empirical test.

II-3.2. Integration effects on bond rating with subsample of the affiliates

Korean major credit agencies include magnitude of integration of group-affiliated firms as a considering factor when they evaluate bond rating of the affiliates. Cho(2012) says that the integration of the affiliates, denoted supports among the affiliate, and the status of the firm in the group are significantly considered by raters when they decide the range of notching for bond rating of the affiliates. This trend is deeply related with the history of Korean economy. The market imperfections faced by Korean firms increased transaction costs and encouraged firms to pursue internalization (KhannaandPalepu, 1997; Leff, 1978). Korea suffered from Japanese colonization and the subsequent Korean War.

Various components of business infrastructures, such as an adequate capital market, dependable parts suppliers, and competent managers, which are generally taken for granted in developed countries, were simply nonexistent (Sakon& Jones, 1980). Consequently, postwar entrepreneurs in Korea had to rely on internal markets to acquire necessary inputs for their businesses, and business groups found diversification attractive and vertical integration necessary. So, the vertical integration is critical attributes to classify business group in terms of credit rating.

Even though, there are more attributes for grouping business group such as debt-guarantee or percentage of shareholding, they have some limitations to be a standard in terms of bond rating analysis because, government adopt to regulation that prohibiting debt-guarantee among the same business group over 200% of equity capital, and structure of shareholding of affiliated firm such as chaebol group is very complex to standardize for analysis.

So, it is hard to confirm that there is no effect of affiliate factor on the relationship between bond rating and financial ratios just comparing subsamples of affiliates and non-affiliates becausethere is, although, different evaluation on financial ratios according to group-integration, it is possible that the effects can be offset each other and do not appear in whole sample of affiliates.Therefore, it is necessary to investigate how rater's evaluation on financial attributes changes with more specific subsample as well as a whole sample to verify influence of affiliate factor. However, it is questionable whether degree of group-integration affects explicitly on the intensity of relationship

between accounting information and bond rating of affiliated firms if there is no big difference between the relationship of affiliates and non-affiliates. Kobrin(1991) represents that integration is operationalized as intra-firm flows of resources. And intra-firm trade as a proportion of all international sales is used as an index of integration across 56 manufacturing industries containing U.S.-based firms. So, following Kobrin(1991) I use inter-companies transaction as an index of group-integration and hypothesize that there may not be distinct difference in the relationship between financial ratios and bond rating according to the degree of integration in group-affiliated sample.

II-3.3. Influence of parent firm's financial attributes on credit rating

Even though the financial information predict bond rating mostly, itshould not be ignored that there can be significant factors representing the effect of affiliate factor and influencing on bond rating significantly, apart from financial attributes because about 20-30% of non financial part consisting bond rating is remained.In other words, it is necessary to investigate whether affiliate factor influence on bond rating apart from financial information as well as within financial information. According to the prior research, creditors, investors, and credit raters tend to consider business group as one economic community and the group-affiliates, especially parent firm influence on the other in the same group financially or non financially beyond a reasonable doubt. However, in the same vein of II-3.1., I wonder the parent firms' financial attributes explicitly affect subsidiaries' credit rating regardless tiny portion it can be reflected in for bond rating and the fact that parent firms' financial supports, transaction, or etc. are

already reflected to the subsidiaries' financial attributes. So, it needs to investigate the influence of parent firm with the subsample of the conglomerates specifically for deciding necessity of stand-alone rating system. Hence, I chose null hypothesis that the effect of parent firm's financial ratios on subsidiary's credit rating along with subsidiary's financial ratios is not significant, in the same context of II-3.1.

III. Empirical model and sample

III-1. Empirical model

The purpose of this study is verifying that the halo effect of the affiliates affects bond rating significantly in practice. That is, I investigate whether the relationship between financial information and credit rating change considering whether the firm belongs to the affiliates or not. To achieve the purpose, I use multiple regressions as follow and ordered logistic analysis again for robustness.

$$\begin{aligned} RATING_{it+1} = {} & \beta_0 + \beta_1 AC_{it} + \beta_2 INT_{it} + \beta_3 INT_{it} \times AC_{it} + \beta_4 LEV_{it} + \beta_5 LEV_{it} \times \\ & AC_{it} + \beta_6 ROA_{it} + \beta_7 ROA_{it} \times AC_{it} + \beta_8 SIZE_{it} + \beta_9 SIZE_{it} \times AC_{it} + \beta_{10} ROS_{it} + \\ & \beta_{11} ROS_{it} \times AC_{it} + \sum_{k=1}^{4} \beta_{12} kYDk_{it} + \varepsilon_{it} \end{aligned}$$

<Variable definition>

RATING = Score on bond rating

AC = One if the firm belongs to the affiliates, zero otherwise

INT = Operating income before depreciation divided by interest expense

LEV= Total debt divided by total assets

ROA = Net income divided by total assets

SIZE = Natural log of total assets

ROS = Earning before tax divided by sales

YDk = Year dummy

The dependent variable is RATING which is the proxy of bond rating. RATING is defined the first bond rating after March in the year, t+1 when the audit report is submitted because bond ratings is evaluated based on the financial and non-financial achievements in prior year (Ederington and Yawitz, 1986; Shi, 2006; Kim et al., 2007). Following Kaplan and Urwitz(1979), I assign numerical score on bond rating, for example, AAA is 20, AA+ is 19, ... , C is 2, and D is 1.

I include dummy variables which proxy whether the target firm is an affiliated company or not and interaction variables (INT×AC, LEV×AC, ... ROS×AC) to investigate differences of effect whether the firm belongs to conglomerates. The incremental effect of affiliated firm on raters' bond rating is captured by the positive coefficient on those interaction variables. That is, if raters give more incentives on group-affiliated firms than on non-affiliated firms, the incremental coefficient ($\beta_{3,}\beta_{5,}\beta_{7,}\ \beta_{9,}\ \beta_{11)}$ will be positive.

In Korea, the scope of the affiliates[3] is very clear because there is legal and institutional definition refers to the conglomerate: Massive group-companies or major debt-owning affiliation. The standard of conglomerates is follow.

-Massive group-companies: Consolidated sale of all affiliated firms is over 5,000billion won and mutual transaction or debt-guarantee is prohibited. There are 55 business groups in Feb.2012

-Major debt-owning affiliation: A company whose last year's bank-loan is over 0.1% of that of the year before. There are 37 business groups in Jan.2012.

The firm characteristics, especially financial information included in the regression as independent variables are based on a survey of prior research on the determinants of corporate bond ratings (e.g., Horrigan, 1966; Kaplan and Urwitz, 1979; Boradman and McEnally, 1981; Lamy and Thompson, 1988; Ziebart and Reiter, 1992). The accounting-based ratios of Interest coverage (INT), debt-to-assets (LEV), and Return-on-assets (ROA) are used to proxy for firms' default risk and it is predicted that LEV has negative and INT and ROA have positive relation with credit rating. Firm size, SIZE, is also included because larger firms face lower risk, thus,it is expected to have higher credit ratings.Return-on-sales (ROS) is also used to proxy for firms' production efficiencies because three major credit agencies put much weight on ROS in their methodology. I also consider whether SUBORD is appropriate to be included in the

[3]The words, group-affiliated firm, group-company, conglomerate, and parent and subsidiary, are used as the same meaning of the affiliates, here.

model because the debt structure of a firm with subordinated debt is considered to more risky due to the differential claims to assets by debt providers as presented in prior research. However, it is excluded as the sample of this research is restricted to manufacturing industry, and subordinated debt is issued by financial industry only in Korea. And, finally, year dummy is included as a control variable to reflect effects of general economic change on bond rating.

For the second hypothesis, I use similar OLS regression and ordered logit analysis with the first model, replacing AC with INTG that proxy whether the target firm has high degree of integration or not for the third hypothesis.

$$\begin{aligned} RATING_{it+1} = {} & \beta_0 + \beta_{it}\, INTG + \beta_2 INT_{it} + \beta_3 INT_{it} \times INTG_{it} + \beta_4 LEV_{it} + \beta_5 LEV_{it} \times INTG_{it} \\ & + \beta_6 ROA_{it} + \beta_7 ROA_{it} \times INTG_{it} + \beta_8 SIZE_{it} + \beta_9 SIZE_{it} \times INTG_{it} + \beta_{10} ROS_{it} \\ & + \beta_{11} ROS_{it} \times INTG_{it} + \varepsilon_{it} \end{aligned}$$

The dependent variable, RATING, and financial ratios can be defined same as first model. INT is dummy variable where 1 if the inter-company transaction is higher than the average, and 0 otherwise.

Even though there are several factors which show the degree of integration such as overview statement of the group such as the representative, governance structure, and interrelated capital structure, I decide the magnitude of inter-company transaction as a measure of group-integration which is used in Kobrin(1991) and can be estimated by public data. And it is also hard to define interrelated capital structure or governance

structure as a measurement because the structure of Korean group-affiliates is very complex and changed often.

The interaction variables (INT× INTG, LEV×INTG, ... ,ROS×INTG) to investigate differences of effect whether the group-affiliated firm integrates with another firms in the same group tightly or not. The incremental effect of affiliated firm with strong integration on raters' bond rating is captured by the positive coefficient on those interaction variables.

As a further research, I use OLS regression and ordered logistic regression with only sub-sample of the affiliates and investigate influence of parent firm's financial attributes on credit rating besides company's financial ratios themselves. Regression model is follow.

$$RATING_{it+1} = \beta_0 + \beta_1 INT_{it} + \beta_2 LEV_{it} + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \beta_5 ROS_{it} + \beta_6 P\_INT_{it} + \beta_7 P\_LEV_{it} + \beta_8 P\_ROA_{it} + \beta_9 P\_SIZE_{it} + \beta_{10} P\_ROS_{it} + \varepsilon_{it}$$

Financial ratios with "P" represent financial attributes of parent firm. I use the sample which consists of parent firms of 633 affiliates in prior subsample and the definition of parent firm is followed by Financial Accounting Standards 9.2: The relationship between a parent firm and subsidiary is established when 1) between two firms, one has 20% of whole number of stock of another or contribute 20% of another's whole contributions, 2) 50% of stock or equity investments of over two firm's are belong to one person or corporation 3) except 1),2), the one control management right of another

practically. If credit raters consider parent firm's attributes significantly for affiliate's credit rating and give incentives, the financial variables of parent firm will have significant relations with credit rating. Additionally, I exclude ROS variable that the result from first regression finds no significant in this model.

III-2. Sample

I obtain the data of issuer credit rating compiled by three credit Services, NICE Investors Service, Korea Investors Service and Korea Ratings. Financial data of firms and information about affiliates (parent firm and subsidiaries) comes from KIS-Value compiled data of Korean Development Bank. The initial sample, 10,010 firm-years, consists of Korean manufacturing firms that issue bonds rated by NICE Investors Service, Korea Investors Service and Korea Ratings between 2003 and 2007 and is listed on the Korea Stock Exchange, over the 2002-2006 periods. Even though the rating about one firm is almost same in three rating agencies, I remove the observations from the sample, though, if diverse ratings of a firm exist according to the agency. I exclude utilities and finance industries securing homogeneity of sample because bond-rating methodology for those industries slightly differs from the methodology for manufacturing industry. Sample period is determined between 1998 and 2008 because there were specific events influencing on business environment and credit rating. Because governance legislated to prohibit the debt guarantee of the group-affiliated firms in 1998, it was the turning point in terms of the inter transaction of conglomerates and there was huge global financial crisis in 2008 which shocks companies abnormally. I further restrict the sample to firms

with fiscal year-ends on December and remove all firms with no bond rating. To alleviate the effect of extreme observations, the smallest (largest) 1% of observations for each variable is set to the 1% fractile value (ex. Winsorization). As a result, the final sample includes 734 firm-years with 703 subsample of affiliated company and 31 subsample of non-affiliated company.

Generally, the scale of bond rating is composed of 10 broad rating categories from AAA to D that indicate different levels of debt service capacity. AAA through BBB ratings are classified as investment grade, which indicates adequate debt service capacity, whereas BB through C ratings are classified as speculative grade, which indicates substantial vulnerability to changes in the external environment. Table 1 shows the definition of credit rating hierarchy.

Table 1. Hierarchy of credit rating

AAA	An 'AAA' rating indicates the strongest capacity for timely repayment.
AA	An 'AA' rating indicates very strong capacity for timely repayment. This capacity may, nevertheless, be slightly inferior than is the case for the highest rating category
A	An 'A' rating indicates strong capacity for timely repayment. This capacity may, nevertheless, be more vulnerable to adverse changes in circumstances or in economic conditions than is the case for higher rating categories.
BBB	A 'BBB' rating indicates that capacity for timely repayment is adequate, but adverse changes in circumstances and in economic conditions are more likely to impair this capacity.
BB	A 'BB' rating indicates that the capacity for timely repayment is currently adequate, but that there are some speculative characteristics that make the repayment uncertain over time.
B	A 'B' rating indicates lack of adequate capacity for repayment and speculative characteristics. Interest payment in time of unfavorable economic conditions is

	uncertain.
CCC	A 'CCC' rating indicates lack of capacity for even current repayment and high risk of default.
CC	A 'CC' rating indicates greater uncertainties than higher ratings.
C	A 'C' rating indicates high credit risk and lack of capacity for timely repayment.
D	A ‘D’ rating indicates insolvency.

※+' or '-' modifier can be attached to ratings through AA to B to differentiate ratings within broader rating categories.

Table 2 shows distribution of bond rating by year. As prior research, the number of firm that has very high or very low bond rating is comparatively smaller than medium-rating firms. It implies that there can be a framing effect on bond rating because personal opinion of rater in rating agencies is included on rating methodology, and most Korean manufacturing firms’ characteristics such as size, profits, and so on are fairly standardized. Over mid-grade is classified as investment-grade and under of it is defined as speculative-grade as explained above.

Table 2. Distribution of sample’s credit rating by year and grade

GRADE	RANK	year					SUM	%
		2003	2004	2005	2006	2007		
AAA	20	5	5	4	3	5	22	3%
AA+	19	1	1	2	3	3	10	1%
AA	18	5	6	7	8	6	32	4%
AA-	17	6	8	12	13	14	53	7%
A+	16	18	15	12	7	9	61	8%
A	15	12	15	16	17	20	80	11%
A-	14	12	18	21	22	23	96	13%
GOOD-GRADE		59	68	74	73	80	354	48%
BBB+	13	20	21	16	15	18	90	12%
BBB	12	17	20	23	23	23	106	14%
BBB-	11	17	19	11	12	15	74	10%

MID-GRADE		54	60	50	50	56	270	36%
BB+	10	9	8	6	2	3	28	4%
BB	9	5	3	2	4	6	20	3%
BB-	8	5	4	3	2	1	15	2%
B+	7	1	7	5	3	5	21	3%
B	6	1	2	2	3	5	13	2%
B-	5	1	1	2	1	1	6	1%
CCC	4	0	0	0	0	1	1	0%
CC	3	1	0	0	0	0	1	0%
C	2	2	1	1	1	0	5	1%
BAD-GRADE		3	1	1	1	1	7	1%
SUM		138	154	145	139	158	734	100%

IV. Results

IV-1. Descriptive statistics

Table 3. Descriptive statistics

Variable	Mean	Median	S.D	Minimum	Maximum
RANK	13.263	13.000	3.285	2.000	20.000
INT	250.136	4.706	3218.170	-38.393	71944.390
LEV	0.546	0.562	0.174	0.063	1.827
ROA	0.034	0.039	0.092	-0.854	0.364
SIZE	20.533	20.497	1.539	15.972	24.875
ROS	5.234	5.285	17.431	-182.870	101.670

Table 4. Additional descriptive statistics of Parent Firm's financial variables

Variable	Mean	Median	S.D	Minimum	Maximum
P_INT	583.969	10.652	8667	-6.3375	158317
P_LEV	0.460	0.435	0.194	0	0.912
P_ROA	0.066	0.068	0.079	-0.8273	0.270
P_SIZE	9.510	9.483	0.7584	7.34184	10.803
P_ROS	6.453	6.475	9.361	-81.520	70.582

Table 3 represents the descriptive statistics for 734 samples. The mean (median) of key variable, RANK, is 13.263(13.000) which is the proxy of BBB+. Considering the number of firm with over A- bond rating are outnumbered by that with under BB+, it implies that rating agencies is generous to evaluate bond rating in Korea[4]. The first decileof INT is 71944.390 and standard deviation of INT is 3218.170 showing that INT is the most widely distributed financial attributes among diverse financial ratios. Because the standard deviation of LEV is not that muchhigh, this large dispersion of INT shows that there is large gap of operating ability between the firms of sample. Furthermore, ROS also shows high standard deviation, indicating that there are diverse capital structures for one company another. Additionally, Table 4 documents the descriptive statistics of parent firm's financial ratio which is used for hypothesis 2. Because some firms located in top level of group pursue administration with no debt, the interest coverage is widely distributed. Even though parent firm's financial structure looks better than whole sample, for example, debt ratio is lower and ROA is higher, the size of them is interestingly smaller than whole sample. It seems that there are some firms which is very large but do not belong to business group, contrary to public common sense that large companies are equal to group-affiliates.

[4]Kim.et al. (2001) shows that bond ratings evaluated by Korean rating services are comparatively higher than that evaluated by US rating services.

Table5. Analysis of variable differences according to the firm's status: Group-affiliated firms vs. Non group-affiliated firms

	Group-affiliates n=703		Non Group-affiliates n=31		t-statistics
	Mean	Median	Mean	Median	
RANK	13.435	14.000	9.355	10.000	6.984***
INT	260.832	4.786	7.582	3.281	0.429
LEV	0.547	0.564	0.513	0.534	1.067
ROA	0.035	0.040	0.002	0.029	1.976**
SIZE	20.610	20.547	18.792	18.760	6.623***
ROS	5.450	5.300	0.346	3.370	1.597

***, **and* indicate statistical significance at the 1%, 5%, and 10% level (two-tailed respectively)

Table 5 documents differenceanalysis of major variables according to affiliate factor. The number of firms which belong to the affiliates is 703 and 31 non-affiliated firms are observed. The mean(Median) RANK is 13.435(14.000) for the affiliates sub-sample and 9.355(10.000) for the non-affiliatessub sample, and the bond rating between two sub-samples is significantly different. INT and LEV are not significantly different between two sub-samples implying that interest coverage and debt-to-asset ratios are not different financial attributes according to affiliate factors and causes of different bond rating between two. However, ROA and SIZE are significantly higher for the affiliates sub-sample than for the non-affiliates sub-sample. It shows that although the bond rating of affiliates is generally high as being acknowledged, it could not just because of raters' incentives on group-affiliated firms, but because of different financial states between the affiliated and non-affiliated firms

Table 6. Correlation Matrix of the Variables

	RANK	INT	LEV	ROA	SIZE	ROS
INT	0.050					
LEV	-0.404***	-0.115***				
ROA	0.446***	0.036	-0.415***			
SIZE	0.657***	-0.067*	0.100***	0.217***		
ROS	0.405***	0.020	-0.377***	0.751***	0.211***	

***, **and* indicate statistical significance at the 1%, 5%, and 10% level (two-tailed respectively)

Table 6 provides the matrix of Pearson (Spearman) correlations among variables. Whether the firm belongs to the affiliates (AC) is significantly correlated with RATING (0.39), a finding that is consistent with first question of this paper. As predicted, most variables are significantly correlated with AC, suggesting the possibility of selection bias. Also, the magnitudes of most correlation coefficients are significantly below 1, implying that there is little possibility of a multicollinearity problem.

IV-2. Results from Empirical Tests

IV-2.1. Influence of affiliate-factor on the relationship between bond rating and financial ratios

To investigate the effects of whether firms belong to the affiliates on the relationship between bond rating and accounting information, I examine single-equation regressions with RATING as the dependent variable. Table 7 presents results from OLS estimations for both the full sample without affiliate dummy variable (model 1) and with dummy variable (model 2). In addition, to control for time-varying economic impacts on bond rating, year dummy is included as control variable (model 3).

In model 1, the coefficient on INT, ROA, and SIZE are significantly positive and LEV is significantly negative. Being consistent with prior research, it shows that most financial ratios except ROS affect significantly on bond rating even in Korea.

Secondly, model 2 presents whether the firm belongs to the affiliates has effect on bond rating by including AC and interaction variables with AC to the model. Being different with model 1, INT, LEV, and ROA are insignificant, implying that credit raters don't consider accounting information significant for bond rating evaluating credit rating of non-affiliated firms. AC*financial ratios indicate the difference of influence power of financial information between the affiliated firms and non-affiliated firms.

Table 7. The effect of affiliate-factor on credit rating

Variable		Model 1		Model 2		Model 3	
		Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
Intercept		-12.151	-12.630***	-15.121	-3.130***	-14.940	-3.090***
INT		0.000	2.040**	0.004	0.150	0.005	0.220
LEV		-7.755	-16.900***	-0.064	-0.020	0.119	0.040
ROA		3.867	3.230***	2.087	0.330	2.554	0.400
SIZE		1.436	29.870***	1.302	4.660***	1.293	4.620***
ROS		0.005	0.800	0.023	0.570	0.021	0.520
AC				4.633	0.940	4.601	0.930
AC*INT				-0.004	-0.150	-0.005	-0.220
AC*LEV				-8.119	-2.880***	-8.314	-2.940***
AC*ROA				2.346	0.370	1.950	0.300
AC*SIZE				0.067	0.240	0.075	0.260
AC*ROS				-0.021	-0.520	-0.020	-0.480
YEAR	2004					-0.280	-1.280
	2005					-0.159	-0.710
	2006					-0.093	-0.410
	2007					-0.058	-0.260
		Adjusted R^2 =0.6665		Adjusted R^2 =0.6824		Adjusted R^2 =0.6815	

***,**and* indicate statistical significance at the 1%, 5%, and 10% level (two-tailed respectively)

The incremental coefficients on most variables except AC*LEV are statistically insignificant. This result implies that credit agencies generally do not evaluatefinancial ratios more positively or negatively according to whether the firms belong to the affiliates. That is, the magnitude of considering financial ratios that the raters evaluate for bond rating is similar for both the affiliates and non-affiliates. This result supports the hypothesis that the relationship between accounting information and credit rating of the sample which belongs to the affiliates is not significantly different with that of non-group sample. However, only AC*LEV is significantly negative (-2.880), and it may imply that raters evaluate debt-ratio more negatively for the affiliates than for non-affiliates because there is financial risk for the affiliates as prior research show. In model 3, even though year dummy variable is included, the coefficient on year dummy is statistically not significantindicating time-varying economy doesn't much impact on bond rating.

As several prior research present that OLS cannot be the best methodology for the model of predicting credit rating because of limitation of OLS assumption forward ordinal variable, I useordered logistic regression with the same modelagain.Because credit rating is ordered variables, it would give more concrete results of financial ratios' effects on credit rating rather than OLS regression using continuous variables.

Table 8. Ordered Logistic Regression

Variables	Model 1		Model 2		Model 3	
	B	Wals	B	Wals	B	Wals
INT	-5E-05	6.095**	0.047	0.168	-0.012	0.255
LEV	8.068	249.953***	0.527	0.039	0.317	0.014
ROA	-6.223	20.484***	-0.538	0.008	-1.099	0.033
SIZE	-1.512	511.117***	-1.340	23.919***	-1.339	23.853***
ROS	0.0043	0.491	-0.031	0.630	-0.028	0.506
AC			-2.883	0.355	-2.969	0.377
AC*INT			0.009	0.167	0.012	0.253
AC*LEV			8.161	9.114***	8.380	9.562***
AC*ROA			-7.173	1.344	-6.668	1.156
AC*SIZE			-0.166	0.360	-0.168	0.371
AC*ROS			0.039	0.977	0.036	0.816
year 2004					0.267	1.613
year 2005					0.109	0.258
year 2006					-0.020	0.008
year 2007					0.075	0.128

***, **and* indicate statistical significance at the 1%, 5%, and 10% level (two-tailed respectively)

First, model 1 in logistic regression(Table 8) also shows that the coefficient on INT, LEV, ROA, and SIZE are significantly positive as the result from OLS regression and being consistent with prior research, it shows that most financial ratios except ROS affect significantly on bond rating even in Korea. However, interestingly, LEV has significantly positive relation (9.114) with credit rating, implying that credit rater does not always evaluate debt ratio negatively. It is supposed that credit raters know that many companies who have robust financial structure and good activities also use bank-loan or diverse shaped debt for reinvestment, R&D, or financial strategy, so it is hard to define that high debt ratio cannot always be a negative sign.

In addition, model 2, and 3 show similar result of OLS regression. Only SIZE(23.919 and 23.853 each) is significantly considered for evaluating credit rating of non-affiliated companies, indicating that bigger firms with more assets have more possibility to get interest grade. And the incremental coefficients including LEV(β_5) is statistically significant only among diverse financial ratios which means that credit raters evaluate only LEV discriminately evaluating bond rating of the group-affiliated and non-affiliated companies. The year dummy variable in model 3 is also statistically insignificant.

In addition, I divide the sample into two sub samples: the affiliated and non-affiliated firms and use OLS regression with each sum-sample as a way of robustness test. According to the results of previous regressions, the magnitude of relationship between credit rating and financial ratios in each sub sample should not be much different. If credit raters are notching bond rating for group-affiliated firms with non-financial data, the t-statistics on financial ratios of affiliated firm sub-sample will be less significant than those of non-affiliated firm subsample and coefficient on financial ratios of the affiliated firms are also less than those of non-affiliated firms. The result is documented in Table 9.

Table 9. OLS regression with each sub-sample: group-affiliated and non-group-affiliated firms

Variables	Affiliated firms		Non-affiliated firms	
	Coefficient	t-statistics	Coefficient	t-statistics
Intercept	-10.488	-10.410***	-15.121	-5.680***
INT	0.000	1.750**	0.004	0.270
LEV	-8.183	-17.630***	-0.064	-0.040
ROA	4.433	3.620***	2.087	0.600
SIZE	1.370	27.500***	1.302	8.470***
ROS	0.002	0.260	0.023	1.030
	Adjusted R^2 =0.660		Adjusted R^2 =0.811	

***, **and* indicate statistical significance at the 1%, 5%, and 10% level (two-tailed respectively)

The relations between financial attributes and credit rating in both sub-samples are totally different except SIZE, which is statistically significant in two. Even though sub-sample of affiliated firm's all financial ratios except ROS are significantly related with bond rating, only SIZE is significantly affect bond rating in terms of the sub-sample of non-affiliated firms. That is, credit raters do not reduce importance on financial ratios which show objective status of the firm when they evaluate affiliated company's credit rating for giving more incentives according to affiliate factor. And they reflect accounting status on account of firms' status and do not evaluate financial ratios much differently according to the affiliate factor. The t-statistics on all independent variables in the sub-sample of non-affiliated firm are actually lower slightly than those in the affiliated firm sample, implying that raters consider non-accounting information more when they evaluate bond rating of non-affiliated firms than when they evaluate affiliated firms'

creditworthiness. However, it is possible that this result may be caused because the sample size of non-affiliate is not big enough.

Table 10. Ordered logistic regression with each sub-sample

Variables	Affiliated firms		Non-affiliated firms	
	Coefficient	t-statistics	Coefficient	t-statistics
Intercept				
INT	-5E-05	5.1761**	-0.0287	1.0411
LEV	8.5654	258.588***	3.5143	1.1317
ROA	-7.1845	24.8768***	4.0115	0.292
SIZE	-1.4785	465.304***	-3.3181	19.5039***
ROS	0.00747	1.416	-0.116	4.043*
	Adjusted R^2 =0.701		Adjusted R^2 =0.786	

***, **and* indicate statistical significance at the 1%, 5%, and 10% level (two-tailed respectively)

Table 10 show the relations between financial ratios and credit rating in two different sub-sample observed from ordered logistic regression, but the results are very similar with that from OLS results. Taken together with OLS, logistic regression, and regression with divided subsample, I find no evidence that credit raters give more or less notching point on financial attributes of conglomerate except debt ratios and give incentives to group-affiliated companies as much as infringe importance of financial information.

IV-2.2. Influence of group-integration

As noted in section II-3.2, the range of notching for group-affiliated firms in terms of bond rating can be related to group integration. Raters may not consider the affiliates as an object to give incentives of group-advantage if the target firm doesn't have strong relationship with group and it could be considered as independent company even

though it belongs to group-affiliates. Table 11 shows whether credit raters reflect the group-integration on the range of adjustment for group-affiliated firms' bond rating, practically.

Table 11. Regression coefficients of group-affiliated firms according to group-integration

Variables	OLS Regression		Ordered logistic Regression	
	Coefficient	t-statistics	Coefficient	t-statistics
Intercept	-13.694	-13.060***		
INT	0.000	-1.500	9.2E-05	1.9587
LEV	-6.803	-13.080***	7.5808	182.393***
ROA	5.141	3.560***	-5.8231	13.1271***
SIZE	1.487	28.410***	-1.6387	492.728***
ROS	0.002	0.240	0.00345	0.2843
INTG	10.406	3.620***	-11.345	16.3448***
INTG*INT	0.000	1.930**	-0.0001	3.7028
INTG*LEV	-3.856	-3.600***	2.3702	4.656*
INTG*ROA	-7.336	-2.670***	0.3887	0.0115
INTG*SIZE	-0.394	-2.860***	0.488	13.1342***
INTG*ROS	0.034	1.330	-0.0071	0.0602
	Adjusted R^2 =0.6803		Adjusted R^2 =0.7015	

***, **and* indicate statistical significance at the 1%, 5%, and 10% level (two-tailed respectively)

In the result from OLS regression, the coefficients on LEV, ROA, SIZE are statistically significant, indicating that financial ratios of the affiliated firm with not much group-integration are also important variables to evaluating bond rating, consistent with former results in IV-2.1. And the incremental coefficients on INTG*LEV, INTG*ROA, and INTG*SIZE are significantly negative and that on INTG*INT is significantly positive which may imply that the raters evaluate bond rating of group-affiliated firms differently according to group-integration in practice. The negative coefficient on

INTG*LEV means that credit agencies evaluate debt-ratio of group-affiliated firms with strong group-integration more negatively than that with weak group-integration. It may be a reason that the debt of firms that belongs to strong integrated group has more risk as noted in prior research section. Furthermore, contrary to prior researchwhich comment the advantage of business group in terms of transaction and sales, raters assess ROA and SIZE of strong integrated group more negatively than those of weak integrated group.

However, the ordered logistic regression shows different result with that of OLS regression. Incremental coefficients on INTG*INT and INTG*ROA are statistically insignificant and INTG*LEV is also less significant than that from OLS regression. Only INTG*SIZE has strongly positive relations with credit rating which means that credit raters only consider asset size of group according to intensity of group-integration. Because bond rating is ordered variables, the results from ordered logistic regression seems more accurate than that from OLS regression, so it can be concluded that credit raters evaluate large asset belong to group s a good sign especially when they estimate bond rates of affiliated company in tightly integrated group.

Taken IV-2.1, IV-2.2 together,the results show that raters don’t reflect subjective opinion on bond rating as much as violating explanatory power of financial information except few financial ratios, and raters rather consider objective financial information when they evaluate bond rating of affiliated factors contrary to commonly thought. In addition, even though the results from OLS regression and ordered logistic analysis, it becomes clarify that credit raters evaluate financial ratios of group-affiliated firms more

positively or negatively according to intensity of group-integration. Raters consider the advantage and risk of business group practically and reflect them discriminatorily in terms of evaluating financial attributes. The effects of these different raters' attitude on financial rating regarding group-integration factor are offset each other and it looks as if there is no effect of affiliate factor on the relationship between financial ratios and bond rating seeing whole subsample of the affiliates, consequently.

IV-2.3. Influence of parent firm on credit rating

For investigating effect of affiliate factor on credit rating specifically, I examine single-equation regressionswith RATINGasthe dependent variable including parent firm's financial attributes as well as subsidiary's financial ratios. Table 12 presents results from OLS and ordered logistic estimations for affiliate sample analysis.

I find a significant association between RATINGand most financial attributes of the parent firm although the statistical significances of them are slightly weaker than that of the firm's financial attributes. Even though the results in OLS and ordered logistic regression are slightly different, I chose the main result from ordered logistic regression because it considers the characteristics of main ordered variables, credit rating. Debt-ratio of parent firmcoefficient is 4.226 at 42.967 t-statistics and significantly positive in ordered logistic regression contrary to commonly accepted, indicating that credit rater tend to consider group company positively unconditionally regardless default risk of parent firm and has positive attitude to group companies liability considering possibility of reinvestment and financial strategy. And the asset size and profitability of parent firm

influence its subsidiary's bond rating positively, implies that credit rater think financial stability of parent firm shows possibility of financial support on the subsidiary.

It is interesting that the raters do not consider the risk of 'cut-tail' or tunneling which are mentioned in prior research and these results are inconsistent with my prediction that there is no association between firm's bond rating and its parent firm's financial attributes and support the opinion which insists the necessity of new rating system.

Table 12. OLS and Ordered logisticRegression including parent firm's financial attributes

Variables	OLS Regression		Ordered logistic Regression	
	Coefficient	t-statistics	Coefficient	t-statistics
Intercept	-4.1589	-2.16**		
INT	0.000	0.94	-4E-05	2.704
LEV	-7.533	-10.12***	6.737	79.825***
ROA	4.793	3.57***	-8.031	32.239***
SIZE	1.002	9.80***	-1.136	110.903***
ROS	0.018	0.21	0.021	0.176
P_INT	-2.040	-0.02	9.27E-07	0.007
P_LEV	-3.611	-5.34***	4.226	42.967***
P_ROA	-3.397	-2.16**	3.076	4.648*
P_SIZE	0.330	1.91*	-0.380	5.865*
P_ROS	0.031	1.28	0.004	1.30
	Adjusted R^2 =0.576		Adjusted R^2 =0.625	

***, **and* indicate statistical significance at the 1%, 5%, and 10% level (two-tailed respectively)

V. Conclusion and Further suggestion

Extent to prior research that two-third factors of credit rating are explained by accounting information and there are both benefits and risk of the affiliates, I hypothesize that the explainable power of determinant; whether the firm is the affiliated firm or not is not much strong in terms of credit rating. That is, I predict that the relationship between accounting information and credit rating of the subsample of the affiliates is not significantly different with that of non-group sample because weight on non-financial factors including the firm's group structure that raters consider for bond rating is imperceptible compared to weight on financial factors and advantage and risk of the affiliates can be offset before being reflected to credit rating. As a way of robustness test, I predict these unchanged relationship is persistent even regarding factor of group integration. That is, degree of group-integration is also predicted not to affect explicitly on the intensity of relationship between accounting information and bond rating of conglomerates. In the same vein, I hypothesize that parent firms' financial attributes do not influence much on credit rating when I investigate the effect of parent firm's financial ratios apart from firm's financial ratios.

The first result indicates that the affiliate factor does not significantly affect intensity of link between bond rating and financial ratios. Incremental coefficients showing the difference of influence between affiliated firms and non-affiliated firms on bond rating is insignificant except LEV in main OLS regression and ordered logistic

regression. The features of the relationship between bond rating and financial ratios in both sub-samples: the affiliates and non-affiliates look very different, but it may be the result caused by the vast difference in size of two samples. So, I divide the sample of affiliated company into two groups whichhave strong features of group-company or not according to intensity of integration as the second analysis. Even though the results from OLS regression and ordered logistic regression are slightly different, the main result which is from ordered logistic analysis documents that credit raters evaluate financial ratios of the affiliates more positively according to degree of group integration. That is, affiliate factor influences on bond rating explicitly by analyst's notching point on the affiliate's financial attributes such as liability and asset size. Another result from the test including parent firms' financial attributes also shows that parent firms' financial variables significantly influence on subsidiaries' creditworthiness separated with subsidiaries' financial variables.Especially, raters generally consider asset stability, profitability, and liability and profitability of the parent firm positively in terms of evaluating affiliate's creditworthiness regardless default risk, implying that credit raters prefer group-company unconditionally and they are aggressive and positive to affiliated company's credit rating rather than conservative.

Taken together, the results from three regression model show that credit rater evaluate financial attributes differently according to affiliate factor and it also concern parent firm's financial attribute apart from the firm's own financial attributes even though the magnitude of adjustment does not infringe the explanatory power of financial

information about bond rating. Therefore, credit rating of the affiliates after adopting stand-alone rating system will be changed from present rating and it gives practical evidence of necessity of stand-alone rating system.

The more interesting finding in this paper is perspective of raters about accounting information of conglomerates. The intensity of relations between bond rating and financial ratios of non-affiliated firms is less than that of affiliated firms. This result suggests that raters add more subjective opinion on bond rating of non-conglomerates rather than conglomerates contrary to commonly accepted. Meanwhile, raters evaluate debt-ratio of the affiliates more positively than that of non-affiliated firms according to the result from ordered logistic regression and this trend becomes serious as the group-integration is stronger, implying that raters not always negatively evaluate debt ratio of group company and they tend to look with favor on group companies' aggressive business management or financial strategy. Additionally, credit raters consider parent firm's higher liability strongly nevertheless there is possibility of tunneling effect and 'cut-tail'.

There are several limitations. First, adjusted R square of most models used in this paper are about 70% which shows that the models has enough explanatory power and about 70% of bond rating can be explained by those models. However, about 30% of bond rating may be explained by other explainable variables which are not existed in this paper. So, investigating how this 30% is composed with the model including more non-financialvariables is one avenue of future research. Secondly, it is possible that the

advantage of the affiliates is already reflected on accounting information, increasing debt, for example includes debt-guarantee and increasing sales caused by inter-company transactions. That is, raters' incentives for the affiliates have already been reflected on financial ratios, so that it makes the effect of group-affiliated factor on bond rating ambiguous. While I restate that I focus on the incentives generally accepted that raters give to the affiliates besides accounting information, it would be another avenue of future research to investigate effects of the affiliate factorreflected on more specific accounting information if it is possible. Third, a sample size of non-conglomerates is too small compared with that of conglomerates. It could be barrier to compare both sub-samples precisely. However, there is no choice because the firms belong to the affiliates are overwhelmingly more than non-affiliates in manufacturing industry of Korea.

This paper has contribution to the literature of credit rating in the way that it is the first paper focusing on affiliate-factor in terms of credit rating. Especially, it is significant to use sample of Korea whose economy is strongly affected by business groups. So, it would be good starting point for future research regarding effects of the affiliates on credit rating. Secondly, my findings give practical evidence for examining justification of stand-alone system and building new rating methodology considering the affiliates. Third, the results which show how the raters change attitude toward financial determinants when they regard group-integration or consider those of parent firmgive tips for interested parties related with credit rating: government and bank who should announce legitmacy of adopting new system and set new rating methodology following

stand-alone rating system, debtor who should manage financial statement for getting good bond rating and creditor who should judge companies considering credit rating.

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국문요약

계열요소가 신용등급에 미치는 영향: 독자신용등급의 필요성을 중심으로

독자신용등급의 필요성을 검증하기 위하여, 계열사 여부에 따라 재무정보가 신용등급에 미치는 영향에 차이가 있는지를 살펴보았다. 계열사여부에 따른 재무비중의 영향도 차이를 분석해본 결과, 부채비율 외에는 큰 차이가 없는 것으로 나타났으며, 계열사기업과 계열사가 아닌 기업의 샘플을 나누어 실시한 분석에서는 오히려 계열사의 경우 객관적인 재무정보가 신용등급 측정시 중요하게 사용되는 것으로 나타났다. 즉, 계열기업일수록 신용등급측정기관의 주관적인 판단이 많이 개입되어 객관적인 재무정보의 중요성은 줄어들 것이라는 일반적인 생각과는 상반되는 결과가 나타난 것이다.

그러나, 이는 계열사가 아닌 기업 표본이 계열사 표본에 비해 매우 작아서 생긴 사실의 왜곡일 수 있으므로, 계열사 기업들을 그룹 통합도에 따라 나누어 분석을 실시하였다. 즉, 그룹통합도가 높아서 계열사로서의 특성을 강하게 갖춘 기업과, 그룹통합도가 낮아서 실질적인 계열사 특성이 거의 나타나지 않고, 비계열사와 같은 그룹 경영이 되고 있는 기업그룹으로 나뉘어 계열사여부의 영향력을 판단하고 자한것이다. 그 결과, 신용등급 측정자는 통합도가 높은 기업일수록 신용평가자가 부채비율과 자산규모에 대하여 더욱 긍정적으로 평가한다는 사실이 밝혀졌다. 부채비율이 높을수록 긍정적으로 판단한다는 것은 부채비율을 부정적으로 보는 일반적인 상식과는 상반되는 결과인데, 이는 신용평가자가 재벌같은 대기업에 대하여 긍정적인 편견을 갖고 있는 경향이 있음을 보여주며, 큰 규모의 기업이 재투자를 하거나 다양한 종류의 채무를

이용하여 재무적인 전략을 구사할 수 있음을 받아들여 부채를 부정적으로만 평가하지는 않는 다는 것 또한 보여주고 있다. 마지막으로 계열사 기업 표본에서 모기업의 재무정보가 자회사의 신용등급에 미치는 영향력에 대한 분석을 실시한 결과, 부채비율, ROA, 자산규모가 모두 통계적으로 유의하게 나타났으며, 양의 방향을 보였다.

이러한 결과를 종합해보면, 계열사여부가 기업의 신용등급에 분명 중요한 영향력을 끼치고 있음을 알수 있으며, 특히 신용평가자가 계열사 재무정보를 반영하는 데 있어 긍정적으로 평가하는 경향이 있음을 확인할 수 있다. 따라서, 독자신용등급의 도입에 따라 현재 계열사 기업들의 신용등급은 많은 변화를 보일 것으로 판단되며, 보다 정확한 기업의 신용등급 측정을 위해서는 독자신용등급제도의 도입이 필요함을 확인하였다.

주요어 : 계열사, 채권등급, 재무비율, 모기업과자기업, 그룹통합도
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