

The Effects of Bank Monitoring on Firm Value: The Role of Default Risk and Ownership Structure

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Abstract

This paper investigates the effects of bank financing on firm value through the study of KOSPI listed companies from 2003 to 2013. Using the bank loan ratio as a proxy variable for the level of bank monitoring, our analysis shows that a higher bank loan ratio negatively affects firm value for financially troubled companies with an interest coverage ratio below one. On the other hand, for companies with a centralized ownership structure, where controlling shareholders own 35% or more shares, a higher bank loan ratio positively affects firm value. We also confirm that the effects of bank monitoring can differ between firms with high default risk and those with a concentrated ownership structure through an event study analysis that examines the announcement impact on stock prices of the unique Korean bank monitoring system called the main debtor group designation. Negative effects are observed in the case of firms with high default risk, whereas positive effects are observed for firms with a concentrated ownership structure. The results of our analysis are generally in line with previous studies that use a bank loan ratio variable.

Keywords: Bank Monitoring, Bank Loan Ratio, Event Study

JEL Classification: G14, G21

I. Introduction

There are varying views regarding the primary goal of a corporation, such as profit maximization, or the pursuit of shareholder value and interests of stakeholders, among others. In the analysis of corporate finance, the primary goal is typically to maximize the corporate value, in market terms, of the company. Hence, the validity of a company's investment and funding decisions is determined by whether they lead to an increase in corporate value. In addition, the capital structure of a company depends on the specific funding method used for investment. According to the Modigliani-Miller theorem (Modigliani & Miller, 1963) and the pecking order theory (Myers & Majluf, 1984), several factors—e.g. corporate tax, default risks, or the presence or absence of agency problems—influence the impact of debt financing on corporate value. Bank loans and corporate bonds are the two most commonly used methods of debt financing. Previous studies show that both borrowing from banks and the issuance of bonds have comparative advantages in terms of the monitoring effect (De Fiore & Uhlig, 2011; Diamond, 1984; Fama, 1985) and the effect of price information provision (Allen, 1993; Boot & Thaker, 1997; Russ & Valderrama, 2012). In practice, various factors such as the development stage of the financial institutions and the financial markets influences both the operation of the financial system and the impact of financing on firm value.

The financial system contributes to economic performance through a capital allocation function, as evidenced by the high correlation between economic growth and financial development (Levine, 2005). Although the role and importance of banks varies from country to country, the banking system is crucial for the success and efficiency of capital allocation because banks play an important role in examining a firm's quality and installing discipline via creditor rights enforcement. The degree of influence that banks as creditors have on the debtors

may vary depending on the specific economic and legal environment it operates. For example, in an environment where financing in the capital market is extremely difficult, there will be an over-reliance by companies on bank borrowing, giving banks greater disciplinary power. Immature capital markets with weak investor protection laws can also lead to banks having more bargaining power than the bondholders. In addition, when there is chronic excess demand for money due to rapid economic expansion, banks may exercise disciplinary power over the debtors more effectively.

Korea has a relatively bank-friendly financial system where banks comprise an overwhelmingly large proportion of the financial system. Furthermore, the legal and institutional systems in place have given banks a strong oversight authority over the debtors. However, the development of and improved access by firms to the capital markets have reduced the disciplinary power of banks. Large firms with access to the bond market have an incentive to repay their bank loans and replace them by issuing bonds in order to avoid interference by the main creditor bank. This implies that as capital markets develop, the role of banks becomes weaker.

Nevertheless, there is a consensus that indirect financing through a financial intermediary such as banks is more effective in reducing information asymmetry than direct financing from the market. De Fiore and Uhlig (2011) emphasize that banks have an advantage over bondholders as they benefit from economies of scale and has access to private information on firms, whereas bondholders have to rely solely on public information. In addition, banks tend to hold a relatively larger stake in firms compared to bondholders, which allows banks to acquire private information on the firms. By acknowledging the relative strength of the

screening and monitoring functions of bank loans, we can expect a positive relationship to exist between firm performance and bank loans.

On the other hand, many believe that the issuance of bonds has a more positive effect on firm value than bank loans. Russ and Valderrama (2012) argue that firms prefer to finance through bonds due to the lower cost of financing. Prior research by Bliss and Flannery (2000) and Ioannidou and de Dreu (2006) values the importance of bondholders because they promote better decision making by management given the bondholders' emphasis on market surveillance and the participation of credit rating agencies in the bond issuance process.

Other research suggests that there might be different implications of bank loans and corporate bonds across countries depending on the state of the economy. De Fiore and Uhlig (2012) find that while bank loans shrink during an economic downturn, bond financing stays relatively stable during a crisis. According to De Fiore and Uhlig (2011), Europe tends to rely more on bank financing while bond financing is more common in the U.S. By comparing the two markets, they find that although the cost of bank financing is higher in the U.S. than that in Europe, there is no significant difference in the cost of bond financing. Market discipline also does not work well in countries where market infrastructure is weak or when there is heavy government intervention.

This paper analyzes the effect of bank lending on firm value for listed companies in Korea. In particular, it analyzes how bank lending affects firm value under different conditions. We assume for our analysis that when bank lending takes up a larger proportion of a company's debt financing, the bank will have greater influence on the company. This will in turn typically lead to an increase in firm value through stronger external monitoring and deterrence of moral hazard by large shareholders or management. However, a negative impact on firm value can

occur when the bank is the main creditor bank because the bank may be in a conflicting or competitive position with the company's shareholders.

Our empirical results show that for companies with a centralized ownership (where the controlling shareholder holds 35% or more of the shares outstanding), a higher proportion of financing via bank lending leads to greater firm value, presumably because the company is subject to stronger monitoring and disciplinary action by the bank. Hence, the presence of the bank has a positive effect as it prevents the controlling shareholder from engaging in improper activities, such as pursuit of personal gains. However, during the period after the 2008 global financial crisis, a higher proportion of bank lending had a negative impact on firm value for financially distressed companies, companies with an interest coverage ratio of 100% or below, as reflected in their share prices for the short term. This is presumably because when default risk rises, creditor banks will put pressure on these companies in order to reduce the probability of losses on their loan portfolios.

We also analyze the short-term movement of stock prices via an event study on the bank-led credit risk evaluation results announcement which uses a proxy for bank monitoring based on the unique Korean bank monitoring system called the Main Debtor Group (MDG). Our event study analysis produced similar results to those we obtained from the yearly panel data analysis. Essentially, firms in the MDG with risk of insolvency receive negative impacts on their stock prices compared to non-MDG firms by virtue of their MDG designation and the announcement of their credit risk evaluation results. Companies with a concentrated ownership structure show positive impact on their stock prices after the MDG designation, regardless of whether or not they belong to the MDG.

The rest of the paper is structured as follows. Section II develops our testable hypotheses. Section III describes data and presents empirical results of the panel data analysis. Section IV examines the cumulative abnormal returns (CAR) following the release of the MDG and the large corporate credit evaluation results using an event study, and Section V provides concluding remarks.

II. Hypotheses

Banks have an advantage when determining the risks of a firm as they can accumulate private information during the loan transaction process that other investors are unable to access. In addition, banks may impose collateral conditions on their loans and have the ability to monitor and control changes in debtor risk through post-lending surveillance (e.g., loan review after initiation). All of these factors may help to reduce the moral hazard of debtors. Moreover, banks are able to facilitate a more productive allocation of limited resources through a screening and monitoring function that aids in the identification of profitable projects and the prevention of any morally hazardous activities that debtors might participate in after the loan initiation. As long as the bank's screening and monitoring functions work efficiently, and market participants trust that they work, firms with a higher proportion of bank lending would receive an evaluation that is more favorable, all else being equal. Datta et al. (1999) argue that firms with bank financing may issue bonds at a lower interest rate, which arises from the positive effect that bank monitoring provides as well as the reputation-building effect that bank financing has on firms.

If these roles of bank financing do not function efficiently, however, bank financing may hamper a firm's ability to optimize its capital structure, and it may be forced to raise most of

its necessary funds through bond issuance. According to the pecking order theory (Myers & Majluf, 1984), a firm will finance its investment in the order of retained earnings, debt and then equity. The theory suggests that this is mostly due to information asymmetry and issuance costs. Bank loans and bonds are both debt-financing instruments but they differ in many aspects. Bolton and Freixas (2000) suggest a theoretical model in which firms with lower credit risk prefer bond issuance, as it provides a lower interest rate, but firms with higher credit risk usually resort to bank financing even though it requires a higher interest rate. In terms of the feedback-effect, banks fall behind capital markets. Most market participants evaluate firms that issue bonds by their degree of risk, and this is reflected in the official daily bond rates that firms use in their management decision making process. Since there is a time delay before the management implements the bank's monitoring results, the effects of bank monitoring on firm performance might be weakened.

Companies that have a larger proportion of its debt financing in bank loans is subject to stronger monitoring by banks. However, the effect of this stronger monitoring on firm value could be either positive or negative, depending on the firm's characteristics or the financial market conditions. Gorton and Schmid (2000) report a positive relation between the controlling power of banks and corporate performance in a test using a sample of German companies. In contrast, Weinstein and Yafeh's (1998) research on the main creditor banks in Japan suggests that the discouragement of high risk and high return investments by the banks did not result in an improvement in corporate profitability. Most of the existing literature regarding bank monitoring argues that external monitoring by banks induces improvement in the corporate governance structure and enhances firm value, particularly in the case of companies with weak governance structures (Ahn & Choi, 2009; Byers et al., 2008; Ozelge, 2008). Meanwhile, there are other studies that show that firm value is damaged if the influence of banks on companies

becomes stronger, due to the distortion in resource distribution (Sharpe, 1990) and decreased efficiency in business activity (Kroszner & Strahan, 2001; Rajan, 1992). In the case of Korea, there exists a system of corporate restructuring that banks lead, which in effect stimulates the distribution of limited resources to more productive sectors by liquidating insolvent companies. Hence, in the case of insolvent companies, the influence of banks can be larger compared to those that are not since they are more likely to receive stronger bank control or be forced to undergo restructuring by the banks. This will have a negative impact on stock prices for these companies in the short term.

In this paper, we examine the role of the firm's ownership structure in the effects of bank monitoring on firm value. Previous studies that examine a relation between executive share ownership and firm value show mixed results of a positive relationship (Jensen & Meckling, 1976), a negative relationship (Demsetz, 1983; Fama, 1980), and a nonlinear relationship (Morck et al., 1988; Stulz, 1988). A positive relationship means that there is a stress on responsibility management, while a negative relationship points out the problems caused by dominant stockholders pursuing their private interests. Studies that examine a relationship between ownership structure and firm value also report controversial results. While Edmans and Manso (2011) and Dhillon and Rossetto (2009) support a dispersed ownership structure, La Porta, Lopez-de-Silanes, and Shleifer (1999) raise a negative impact on firm value arising from agency conflict between controlling owners and minority shareholders.

In an analysis using a sample of Korean listed companies, Lee et al. (2014) report a nonlinear relationship between the dominant stockholder share holdings and the bank loan ratio. In their study, the bank loan ratio significantly decreases for companies with a centralized ownership structure, which implies that there is motivation for dominant stockholders to avoid

bank monitoring. Lin et al. (2013) also state that firms with greater differences between control rights and cash-flow rights for block shareholders prefer bond financing in order to avoid close monitoring by banks. These results highlight the notion that banks are more likely to monitor its debtors than the bondholders. In fact, bondholders are unable to intervene actively in the management of the firm's operations due to the dispersed nature of the bondholders' ownership structure. Bondholders have relatively little incentive to monitor the firms once a debt contract has been initiated (Diamond, 1984). On the other hand, banks have more incentive to monitor the firms as they have greater exposure to risk. However, the maturity terms for bank loans tend to be shorter and banks can impose additional conditions to control this risk and by instituting contingency processes (such as a periodic loan review). In effect, these mechanisms allow the bank to monitor its debtor risk continuously and provides them with the ability to terminate a contract when needed. This also implies that bank monitoring can be more effective for firms with poorer corporate governance or a more concentrated ownership structure. Our first testable hypothesis is based on these prior findings and arguments, and it is presented below.

***Hypothesis 1.** For companies with a centralized ownership structure, a higher proportion of financing in bank lending positively affects firm value due to stronger monitoring by banks and effective checks on the controlling shareholders.*

We also investigate whether the effects of bank monitoring on firm value is different for companies with a higher risk of default. If creditor banks focus on reducing the probability of losses on their loan portfolios, the monitoring activity done by the banks might negatively affect firm value by discouraging risky investment in capital-intensive projects that could considerably increase firm value. This is a direct result of the asymmetric pay-off relationship between banks and shareholders. Many previous studies identify the conflict of interest that

arises when a creditor bank gets involved in the management of the borrowing company. That is, if a creditor bank gets a seat on the company board, it could make decisions for the bank's benefit rather than for the company's (Kroszner & Strahan, 2001). The prediction that banks would more likely exert its influence in a way that is more beneficial to the bank than to shareholders is made under market conditions with a higher risk of default and for companies facing a higher risk of insolvency. In a situation where of the risk of insolvency increases, banks will make decisions in order to maximize loan recovery (or minimize loan losses). In other words, banks will likely seek to reduce loan losses by limiting new investments in high risk and high return projects and encouraging restructuring through asset disposal (Weinstein & Yafeh, 1998). This will serve to increase the difference in firm value between financially sound and financially distressed firms. In essence, firm value differences will increase with higher bank loan ratios and stronger influence by banks on firms. Our second testable hypothesis is based on these arguments and it is presented below.

***Hypothesis 2.** For financially distressed companies, the creditor bank exercises its influence in a way that reduces the risk of loan loss, and thus a higher proportion of debt financing in bank lending negatively affects firm value.*

III. Panel Data Analysis

3.1. Data

Our empirical analysis uses the unbalanced annual panel data for the KOSPI (Korea Composite Stock Price Index) listed firms from 2003 to 2013. We select this particular survey period because most of the bank-led massive corporate restructuring in the aftermath of the 1997 Asian financial crisis had been completed by early 2000s. Hence, firms' reliance on bank financing had steadily decreased along with the rapid growth of the Korean capital market. Our

sample includes 611 non-financial companies with December fiscal year-end. Data on the largest shareholders and shareholders with special interests—used as a proxy for ownership structure—is retrieved from *FnGuide*, while all other data is obtained from *KIS-value*. We winsorize the data at the 1% level at both tails in order to exclude potential distortion from outliers or erroneous data points.

The main variables used in our analysis are Tobin's Q and the bank loan ratio. Tobin's Q is calculated by dividing the sum of the market value of shares outstanding (ordinary and preference shares) and total debt by total assets. Essentially, the change in equity will determine the value of Tobin's Q since total debt and total assets are book values. Strictly speaking, we are using the change in shareholder value of the firm, determined by the stock market, as a dependent variable. Hence, we examine the effects of bank monitoring on changes in equity value rather than the debt value itself. We calculate the bank loan ratio as the long-term debt divided by total debt. We also use two dummy variables for grouping purposes. These are the symptoms of insolvency dummy (SID) variable, which is one if interest coverage ratio is less than one and zero otherwise, and the concentrated ownership dummy (COD), which one if the proportion of common shares held by controlling shareholders and its affiliates exceeds 36% and zero otherwise. The simple criterion of interest coverage ratio being less than one used for the SID allows us to determine the insolvency of Korean financial firms in a practical manner. Discussed in more detail in Section IV, the Main Debtor Group (MDG), a unique Korean bank monitoring system, uses this criterion as an important quantitative credit risk evaluation measure along with the debt ratio. The 36% cut-off criteria used for the COD is based on the study conducted by Lee et al. (2014). Lee et al. (2014) examined the difference in the means of debt issuance associated with the ownership structure. Lee et al. (2014) report that the bank

loan ratio starts to decrease at a share ratio exceeding 36%, due to the controlling shareholders' aversion to bank intervention in the firms they own,

The five additional explanatory variables used for the estimation of Tobin's Q are as follows. First, the ROA, which is EBITDA divided by total assets¹, is used as a measure of profitability. Second, the equity ratio, which is total capital divided by total assets, is used as a measure of financial stability. Third variable is the tangible fixed asset ratio, which is tangible fixed assets divided by total assets. Fourth variable is the R&D expenditure ratio, which is R&D expenditure divided by total sales. Fifth variable is the log of total assets². Table 1 below reports the descriptive statistics for the variables used in our panel data analysis.

[INSERT TABLE 1 HERE]

3.2. Methodology

We use a panel fixed effect model in the empirical analysis, which enables us to control for the unique characteristics of individual firms. However, the estimated Tobin's Q may be endogenous with bank loans as firms with higher firm value will be in a position to obtain financing at better terms from external lenders. Since the primary focus of this paper is to examine the effect of bank loans on firm value, we use a fixed effect two-stage least squares regression (FE2SLS) in order to mitigate the endogeneity problem. As an instrumental variable for the endogenous bank loans explanatory variable, we use the industry mean value of the bank loan ratio. Support for the use of the industry mean value of the bank loan ratio as the

¹ Servaes (1996) argues that firms with low profitability have a positive relationship with firm value as they are traded at a discount in the market.

² We expect larger companies to have higher economies of scale, which means that firm size should have a positive relationship with firm value. However, Berger and Ofek (1995) argues that a negative relationship is also possible when overinvestment and cross-subsidization leads to a loss of firmvalue.

instrumental variable comes from the fact that a firm's competitors and the particular nature of the industry it is in affects the financing decision of the firm. This means that our chosen instrumental variable will have a high correlation with the bank loan ratio of the individual firm but a low correlation with the individual firm value. We group the firms by their line of industry by using the sub-category of the Korean Standard Industrial Classification. We include all KOSPI-listed companies as well as companies that are subject to external audit for our analysis using data obtained from *KIS-value*.

We conduct the FE2SLS regression as follows. In the first stage, the within estimator is calculated using the bank loan ratio as the dependent variable, the industry mean value of the bank loan ratio as the instrumental variable and other control variables as explanatory variables. In the second stage, another within estimator is calculated by using the previously projected estimator as an explanatory variable for bank loan ratio with Tobin's Q as a dependent variable. Below is a summary of the FE2SLS regression methodology:

- (1st stage)** Bank loan ratio = F (industry mean value of the bank loan ratio, ROA, Equity ratio, Tangible fixed asset ratio, R&D Expenditure ratio, Log transformed Total Asset, year dummy)
- (2nd stage)** Tobin's Q = F (Bank loan ratio estimate from the 1st stage, ROA, Equity ratio, Tangible fixed asset ratio, R&D Expenditure ratio, Log transformed Total Asset, year dummy)

3.3. Results

Table 2 shows the results of both the initial fixed effect (FE) and the endogeneity controlled fixed effect two-stage least squares (FE2SLS) regression analysis. We conduct our analysis initially without controlling for the endogeneity problem (Model (1) and Model (2)). The results indicate that firm value decreases as the bank loan ratio increases prior to the 2008 global financial crisis (Model (2)). This result could be due to the self-selection based

endogeneity problem. Troubled companies might have no choice but to raise capital using the comparatively cheaper bank loans as they are subject to the possibility of misvaluation in the capital market, which will restrict their ability to issue bonds. This will inadvertently lead to an increase in their bank loan ratio.

[INSERT TABLE 2 HERE]

Next, we conduct the FE2SLS estimation using the industry mean value of the bank loan ratio as an instrumental variable for the bank loan ratio (Table 2, Models (3) to (5)). The results of the FE2SLS estimations show a statistically significant negative relation between the bank loan ratio and firm value in the period after the 2008 global financial crisis (Model (5)). This is in contrast to the results of the FE estimation. The pre-crisis period did not produce any significant results. In the post-2010 period, the financial market conditions were such that there were many bank initiated business restructurings amid heightened default risks. The results for Model (5), where firm value is lower for a firm with a higher bank loan ratio, reflect this line of thought, as banks' influence on firms has a negative effect on firm value. This means that when default risks escalate, not only do the creditor banks have greater influence on firms with a higher bank loan ratio, but the banks use this influence to reduce the risk of their loan losses. As banks pursue their own goals ahead of the firm's, the enhanced bank monitoring function brought about by the higher bank loan ratio has a negative impact on firm value.

In order to verify our finding that banks' influence negatively affects firm value when default risks rise, we analyze the relationship between the bank loan ratio and firm value for financially distressed companies. Firms that are financially distressed are defined as those with an interest coverage ratio below one, designated by the symptoms of insolvency dummy (SID)

variable of one. Using the same methods as above, Table 3 shows the results of the FE and FE2SLS estimations for this subset of firms.

[INSERT TABLE 3 HERE]

The estimation results for the entire survey period (2003~2013) show that the coefficient representing the influence of the bank loan ratio on firm value is lower by 0.0014~0.0043³ for financially distressed companies compared to companies that are financially stable. Focusing on the results of the FE2SLS estimation that controls for the endogeneity problem, the discrepancy in the coefficient estimates between these two groups is 0.0043 (Model (3)) for the entire survey period and 0.0078 (Model (4)) for the post-global financial crisis. These results, which serve as a verification of *Hypothesis 2*, show that a higher bank loan ratio negatively affects firm value, particularly for firms with high default risk (i.e. financially distressed companies).

We now turn our attention to the test of *Hypothesis 1*, which tests whether a higher bank loan ratio positively affects firm value for firms with a centralized ownership due to stronger external monitoring done by the controlling shareholder. For companies with a centralized ownership, major shareholders or management have an incentive to pursue personal interests over maximizing firm value. In such instances, stronger monitoring by creditor banks could help to reduce such agency costs. Table 4 shows the estimation results for the FE (Model (1)) and FE2SLS (Model (2)) panel regressions.

[INSERT TABLE 4 HERE]

³ From Table 3, the estimated coefficients for the Interaction Term (A*B) using the entire sample period of 2003 to 2013 are -0.0014 and -0.0043 for the FE Model (1) and FE2SLS Model (3) respectively.

The estimated coefficients are positive and statistically significant for both the FE and FE2SLS models for firms with a centralized ownership, where the largest shareholder and shareholders with special interests have 36% or more of the shares outstanding. More specifically, the estimated coefficient for the influence of the bank loan ratio on firm value is greater by 0.0027~0.0087⁴ for companies with a centralized ownership compared to companies with a more dispersed ownership structure.

IV. Event Study Analysis

The empirical results so far show that the impact of bank loan ratio on firm value can differ depending on default risks and the ownership structure. We now examine this relationship from a different perspective by investigating the impact of the Main Debtor Group (MDG) designation, which is a unique bank monitoring system in Korea. Instead of using the bank loan ratio itself, the identification of whether or not the creditor bank has significant influence in the debtor company is done by whether or not the debtor company is included or excluded in the MDG. Since the companies that belong to the MDG receive much stronger monitoring from creditor banks compared to non-MDG companies, it is surmised that the positive or negative effects of bank monitoring can be more clearly observed based on the MDG designation.

4.1. Main Debtor Group (MDG) System and Corporate Evaluation by Creditor Banks

⁴ From Table 4, the estimated coefficients for the Interaction Term (A*B) using the entire sample period of 2003 to 2013 are 0.0028 and 0.0087 for the FE Model (1) and FE2SLS Model (2) respectively.

The first implementation of the MDG system in Korea was in 1970. The ultimate goal of this core system was to enhance the asset soundness of financial companies. For this purpose, financial institutions, such as banks, act as creditors who monitors the reckless management of companies such as pursuing business expansion through financial institution loans or complex transactions with its affiliates in an effort to achieve rapid growth. In Korea, the restructuring of insolvent companies has been usually led by the creditor banks because of the immature capital market and other factors that made market-driven corporate restructuring difficult. The MDG system was actively used for the implementation of corporate restructuring processes after the Asian financial crisis in 1997, and it also played a significant role for the restructuring of insolvent enterprises in recent years. The MDG selection criterion is based on whether the credit exposure of the firm and all of its affiliates exceeds 0.1% of the credit exposure of all of the financial companies in Korea at the end of the previous year. In early-April of every year, the MDG designated firms are announced. Following the announcement, the Main Bank, a representative bank selected among the various creditors, evaluates the credit risk of the MDG designated firms and executes necessary procedures, such as the signing of MOUs (Memorandum of Understanding), in order to improve the firm's financial condition according to the credit evaluation results.

At the same time, banks conduct credit risk evaluations on individual firms separately from the MDG system. The credit risk evaluation of large companies with a total credit exposure that exceeds 50 billion KRW takes place between April and June of every year, while the credit risk evaluation of small and medium sized companies takes place between June and October of every year. Banks will lead a restructuring process when the evaluation results indicate a need for financial structure improvements in firms with a high risk of insolvency.

In our event study analysis, the main variables of interest are the announcement regarding the MDG designation (made on April 5th) and the announcement of the credit risk evaluation results for large companies with credit exposure exceeding 50 billion KRW (made on June 25th). The public announcement of the MDG designated firms is made on the Financial Supervisory Service (FSS) website every April. However, the results of the MDG credit risk evaluation, which is conducted until late April, are not announced separately. For the credit risk evaluation of large companies with credit exposure exceeding 50 billion KRW is conducted between April and June of every year and the results are announced through a press release by the Financial Supervisory Service (FSS) around June of every year. However, information such as the name of the companies is excluded.

Through an event study analysis, we examine the impact of the events that took place in 2010 on the stock price. Given the aggravated macroeconomic environment following the 2008 global financial crisis, a number of firms that focused on construction, shipping and shipbuilding faced economic and financial difficulties. The creditor banks, which had continued to maintain their stance on encouraging autonomous restructuring until 2009, began to signal an intention for active restructuring from 2010 due to the visibly poor financial results. In essence, 2010 was the year that a strengthening of bank monitoring activities occurred. Hence, if the reinforcement of bank monitoring has a negative impact on firm value for firms with a higher risk of insolvency but has a positive impact on firms with a concentrated ownership structure, then the stock prices for such firms should respond to the series of events in the same direction.

4.2. Data and Methodology

We compute the normal rate of returns by using a market model, and calculate the Abnormal Return (AR), which is a difference between the realized returns and the returns predicted by the market model. We define $CAR_i(\tau_1, \tau_2)$, which is a Cumulative Abnormal Return (CAR) from period τ_1 to τ_2 , as shown below (McKinlay, 1997).

$$\widehat{AR}_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{m\tau}$$

$$\widehat{CAR}_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} \widehat{AR}_{it}$$

The period used for estimating the market model returns is set as 160 days. The estimation period used is from mid-July, 2009 to early-March, 2010. There are two reasons for the choice of this estimation period. First, it mitigates the impact of the credit risk evaluation results announcement for large companies in 2009 (which was made on June 25th). Second, it removes the impact of the MDG announcement in 2010 (which was made on April 5th).

Changes in the CAR for three, five, seven, and eleven days after the event are examined using a Cross-Sectional Model (McKinlay, 1997) as shown below.

$$\widehat{CAR}_i = \delta_0 + \delta_1 x_{1j} + \dots + \delta_M x_{Mj} + \eta_j$$

$$E(\eta_j) = 0$$

McKinlay (1997) argues that η_j can be estimated using the usual OLS (Ordinary Least Squares) methodology under the assumptions of no cross-sectional correlation and homoscedasticity.

Table 5 presents the basic statistics for the variables used in the event study analysis. The original sample used in the analysis includes 565 companies with a December fiscal-year end

that were listed on the stock market as of 2010. Among them, 135 were firms that belong to the MDG group, which accounts for approximately 24%. At the same time, we sub-divide the sample into a group of firms with symptoms of insolvency (SID) and a group of firms with a concentrated ownership structure (COD) using the same criteria from the panel regressions. Among the 536 companies for which data is available, 112 companies belong to the SID group, accounting for approximately 21%. And 377 out of the total 565 firms (approximately 67%) belong to the COD group.

[INSERT TABLE 5 HERE]

4.3. Results

Figure 1 shows the movements of the $CAR_i(\tau_1, \tau_2)$ for the MDG and non-MDG designated groups during the period of enhanced bank monitoring around the events of the MDG designation (Event 1) and the credit risk evaluation (Event 2). This figure shows that the stock prices of the firms in the MDG group are negatively affected by the MDG designation event (Event 1) compared to other firms.

[INSERT FIGURE 1 HERE]

Table 6 presents the results of the $CAR_i(\tau_1, \tau_2)$ mean difference test between the MDG and non-MDG designated firms before and after the MDG designation announcement. A statistically significant difference for $CAR_i(\tau_1, \tau_2)$ is observed after the announcement of the MDG designation based on whether or not a firm receives an MDG designation, while no statistically significant difference is observed before the announcement.

[INSERT TABLE 6 HERE]

Next, we examine whether the firms belonging to the MDG group have different stock returns based on the differences default risks or the ownership structure. Firms with a higher

risk of default, defined as those with an interest coverage ratio less than one, accounts for 23 out of the total 135 MDG designated firms (18%). Firms with a concentrated ownership structure, where the ratio of controlling shareholders' rights exceeds 36%, accounts for 81 out of the total 134 companies (60%).

Table 7 presents the results of a regression analysis studying the differential effects that the announcement on MDG designation has on stock prices between the MDG and non-MDG designated firms. Stronger monitoring and influence from creditor banks is expected when a firm is designated as a MDG company. The analysis tests the hypothesis that differential effects can arise for the firms with symptoms of insolvency and those with a concentrated ownership structure.

[INSERT TABLE 7 HERE]

Firms with symptoms of insolvency, show a significantly negative impact on CAR. In contrast, firms with a concentrated ownership structure show a positive impact on stock prices after the MDG announcement event. However, we found no meaningful result on the impact of the announcement of the credit risk evaluation on stock prices, which are large companies that have a credit exposure exceeding 50 billion KRW.

The results from our event-study analysis indicate that stronger monitoring by banks has a positive impact on stock prices in firms that have a concentrated ownership structure and a negative impact on those with symptoms of insolvency. These results are consistent with the previous panel regression results and corroborate our main findings.

V. Conclusion

In this paper, we examine the effects of bank monitoring on firm value by studying KOSPI listed companies from 2003 to 2013. The bank loan ratio is used as a proxy variable for the level of bank monitoring in order to examine whether stronger bank monitoring increases firm value. We conduct various fixed effect (FE) and fixed effect two-stage least squares (FE2SLS) panel regressions, where the FE2SLS uses the industry mean value of the bank loan ratio as an instrumental variable to control for endogeneity.

The empirical results show that a higher bank loan ratio negatively affect firm value for financially distressed companies with an interest coverage ratio below one, in the period following the 2008 global financial crisis when default risks escalated. In contrast, firms with a concentrated ownership structure, where the controlling shareholders have 36% or more shares, higher bank loan ratios had a positive impact on firm value. When default risks rise, the higher the bank loan ratio, the more likely are the creditor banks to exercise their influence in a way that reduces the risk of loan losses, which could undermine the shareholder value in the short term. In comparison, for firms with a concentrated ownership structure, which is at risk of controlling shareholders pursuing personal interests over maximizing firm value, higher bank loan ratios could act as a deterrent of mismanagement via stronger monitoring by creditor banks.

Furthermore, we also confirm that the effects of bank monitoring can differ between firms with symptoms of insolvency and those with a concentrated ownership structure via an event study analysis. We find that the impact of the announcement of the MDG designation is negative for firms with symptoms of insolvency, and positive for firms with a concentrated ownership. We use a very simple criterion—interest coverage ratio below one—as the proxy variable for default risk, since this criterion is broadly used and accepted as a simple benchmark

for firms at risk of insolvency. Incorporating the use of more sophisticated measures of default risk instead of a simple dummy variable in our empirical analysis is left for future research.

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Table 1. Summary Statistics for the Variables used in the Panel Data Regression Analysis

Variables	Obs.	Mean	Median	Std. Dev.	Min	Max
Tobin's Q	5897	1.00	0.89	0.46	0.37	3.14
Bank Loan Ratio (%)	5897	8.84	2.64	12.87	0	78.48
Bank Loan Ratio by Industry Mean (%)	5897	12.17	11.34	6.36	0	59.68
Symptoms of Insolvency Dummy(SID)*	5607	0.25	0	0.43	0	1.00
Concentrated Ownership Dummy(COD)**	5897	0.63	1	0.48	0	1.00
ROA (%)	5897	2.96	3.54	8.04	- 34.41	20.72
Equity Ratio (%)	5897	55.98	55.39	19.77	8.01	96.17
Tangible Fixed Asset Ratio (%)	5883	32.17	31.28	18.63	0.08	78.81
R&D Expenditure Ratio (%)	5894	0.72	0.04	1.63	0	10.13
Log (Total Asset)	5897	26.56	26.29	1.50	23.87	30.83

* Assigned as 1 if the Interest Coverage Ratio is less than 1, otherwise 0.

** Assigned as 1 if the controlling shareholders have shares that exceed 36%, otherwise 0.

Table 2. Results of the Fixed Effects (FE) and Fixed Effects Two-Stage Least Squares (FE2SLS) Regression Results for Various Survey Periods Using Tobin's Q as the Dependent Variable

Variable	FE ¹⁾		FE2SLS		
	2003 - 2013 (1)	2003 - 2007 (2)	2003 - 2013 (3)	2003 - 2007 (4)	2008-2013 (5)
Bank Loan Ratio	-0.0002	-0.0025**	-0.0031	-0.0026	-0.0227***
ROA	0.0042***	0.0066***	0.0041***	0.0066***	0.0001
Equity Ratio	-0.0047***	-0.0070***	-0.0051***	-0.0070***	-0.0063***
Fixed Asset Ratio	-0.0014	-0.0002	-0.0012**	-0.0002	0.0017*
Ln (Total asset)	-0.0929***	-0.1103	-0.0857***	-0.1098**	-0.0961***
R&D ratio	0.0267**	0.0417**	0.0292**	0.0417***	0.0202**
Year Dummy	Yes	Yes	Yes	Yes	Yes
Within R ²	0.1488	0.3159	0.1394	0.3159	0.00
Observations (Groups)	5880 (611)	2415 (517)	5880 (611)	2415 (517)	3465 (610)

1) The standard errors allow for intragroup correlation; the observations are independent across firms but not necessarily within firms.

2) *** p<0.01 ** p<0.05 * p<0.1

Table 3. Results of the Fixed Effects (FE) and Fixed Effects Two-Stage Least Squares (FE2SLS) Regression Results for Financially Troubled Firms Using Tobin's Q as the Dependent Variable

Variable	FE (1)	FE ¹⁾ (2)	FE2SLS (3)	FE2SLS (4)
	2003 - 2013	2003 - 2013	2003 - 2013	2008 - 2013
Bank Loan Ratio (A)	0.0003	0.0003	-0.0018	-0.0267***
Symptoms of Insolvency Dummy (SID) (B)	-0.0346**	-0.0346**	-0.0069	0.0378
Interaction Term (A*B)	-0.0014**	-0.0014*	-0.0043***	-0.0078***
ROA	0.0029***	0.0029**	0.0030***	-0.0006
Equity Ratio	-0.0048***	-0.0048***	-0.0053***	-0.0065***
Fixed Asset Ratio	-0.0017***	-0.0017	-0.0015***	0.0020***
Ln(Total asset)	-0.0993***	-0.0993***	-0.0936***	-0.0826***
R&D ratio	0.0302***	0.0302**	0.0331***	0.0422***
Year Dummy	Yes	Yes	Yes	Yes
Within R ²	0.1587	0.1587	0.1593	0.1593
Observations (Groups)	5,593 (604)	5,593 (604)	5,593 (604)	5,593 (604)

1) The standard errors allow for intra group correlation; the observations are independent across firms but not necessarily within firms.

2) *** p<0.01 ** p<0.05 * p<0.1

Table 4. Results of the Fixed Effects (FE) and Fixed Effects Two-Stage Least Squares (FE2SLS) Regression Results for Firms with Concentrated Ownership Using Tobin's Q as the Dependent Variable

Variable	FE ¹⁾ (1)	FE2SLS (2)
	2003 - 2013	2003 - 2013
Bank Loan Ratio (A)	-0.0020**	-0.0082**
Concentrated Ownership Dummy(COD) (B)	-0.1156***	-0.1656***
Interaction Term (A*B)	0.0028**	0.0087***
ROA	0.0042***	0.0042***
Equity Ratio	-0.0046***	-0.0049***
Fixed Asset Ratio	-0.0015	-0.0013***
Ln(Total asset)	-0.0963***	-0.0922**
R&D ratio	0.0241*	0.0280***
Year Dummy	Yes	Yes
Within R ²	0.1581	0.1592
Observations (Groups)	5,880 (611)	5,880 (611)

1) The standard errors allow for intragroup correlation; the observations are independent across firms but not necessarily within firms.

2) *** p<0.01, ** p<0.05, * p<0.1

Table 5. Summary Statistics for the Variables used in the Event Study Analysis

Variables	Obs.	Number (Value=1)	Mean	Median	Std. Dev.	Min	Max	
Main Debtor Group (MDG) Dummy	565	135	0.2389	-	-	-		
Symptoms of Insolvency Dummy(SID) ¹⁾	536	112	0.2090	-	-	-		
Concentrated Ownership Dummy(COD) ²⁾	565	377	0.6673	-	-	-		
	CAR (-1, +1)	559	-	-0.0048	-0.0107	0.0707	-0.2474	0.4449
Event 1 (MDG Release)	CAR (-1, +3)	559	-	0.0065	-0.0022	0.0832	-0.4907	0.5976
	CAR (-1, +5)	559	-	0.0088	0.0029	0.0956	-0.6658	0.7435
	CAR (-1, +9)	559	-	0.0141	0.0018	0.1244	-0.7820	1.0429
	CAR (-1, +1)	559	-	0.0052	0.0009	0.0443	-0.2573	0.3063
Event 2 (Large Corporate Evaluation Release)	CAR (-1, +3)	559	-	0.0072	0.0033	0.0634	-0.2927	0.6103
	CAR (-1, +5)	559	-	0.0154	0.0060	0.0776	-0.2595	0.6635
	CAR (-1, +9)	559	-	0.0114	0.0004	0.1007	-0.3373	0.8583

1) Assigned as 1 if the Interest Coverage Ratio is less than 1, otherwise 0.

2) Assigned as 1 if the controlling shareholders have shares that exceed 36%, otherwise 0.

Table 6. CAR Mean Difference Test between MDG and Non-MDG Designated Firms Before and After the MDG Designation Announcement

	Obs	CAR (-7,-3)	CAR (-3,-1)	CAR (-3,+3)	CAR (-1,+3)	CAR (-1,+9)
Non-MDG (value = 0)	425	0.0063	0.0036	0.0156	0.0107	0.0182
MDG (value=1)	134	0.0037	-0.0077	-0.0086	-0.0069	0.0012
t-value		0.5317	2.1374	3.279	2.8353	1.7125

* t-value for $H_0 : \text{differ} = \text{mean}(0) - \text{mean}(1) = 0$. Bold-faced fonts indicate rejection at 5% level.

Table 7. Results for the Regression Analysis on CAR after the Announcement of the MDG Designation

Dependent Variable	CAR (-1, +3)	CAR (-3, +3)	CAR (-1, +9)
Symptoms of Insolvency Dummy(SID)	-0.0377*** (0.001)	-0.0472*** (0.001)	-0.0358* (0.076)
Concentrated Ownership Dummy(COD)	0.0184* (0.068)	0.0237* (0.058)	0.0394** (0.025)
Ln (Total Trading Volume)	0.0002 (0.936)	0.0010 (0.759)	0.0027 (0.508)
Ln (Average Price)	-0.0007 (0.829)	-0.0012 (0.765)	-0.0101* (0.078)
Constant	-0.0058 (0.912)	-0.0147 (0.825)	0.0528 (0.582)
Observations	131	131	131
Adj. R ²	0.0646	0.0663	0.0626
F-Value	3.24	3.31	3.17

*** p<0.01 ** p<0.05 * p<0.1

Figure 1. CAR movement for the MDG and non-MDG designated groups

Shown here is the movement of the cumulative average return (CAR) for the MDG and non-MDG designated groups along with the standard deviations during the period of enhanced bank monitoring around the events of the MDG designation (April 5th, 2010; Event 1) and the credit risk evaluation (June 25th, 2010; Event 2).

