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Transaction Date: 10/25/2018 11:00:32 AM

Journal Title: Institutional and policy reforms to enhance corporate efficiency in Korea /

Article Author:

Article Title: Relationship between Bank Monitoring and Firm Value Creation: A Survey

Volume: 
Issue: 
Month/Year: 2007
Pages: 91-106
4. Relationship between Bank Monitoring and Firm Value Creation: A Survey
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Introduction

In this essay, we survey both theoretical and empirical studies to establish the relationship between financial institutions’ monitoring activities and the value of client firms. By centralizing costly monitoring and avoiding the duplication of the monitoring effort, banks reduce monitoring costs and offer monitoring services to the firms at a competitive price (Ramakrishnan and Thakor 1984; Diamond 1984). Seminal work by Fama (1985) theoretically suggests that banks may be special as financial institutions because of their access to private information about borrowing firms. The value of bank monitoring is confirmed by studies that document the signaling effects of loan announcements to the capital market.

Earlier studies report evidence consistent with the unique value of bank monitoring by documenting different degrees of market reaction to bank loans, public debt, or even other private institutions’ loans (James 1987; Lummer and McConnell 1989). However, follow-up studies fail to discover a significant difference between bank loans and nonbank loans in terms of capital market reaction (Preece and Mullineaux 1994; Billett et al. 1995). Based on the credit market hierarchy proposed by Carey et al. (1993), which links firm information problems and choice of credit market, Carey et al. (1998) conclude that financial institutions in general are intensive monitors but due to regulatory and reputational factors, compared to finance companies banks lend to less risky firms. The value of bank monitoring is also confirmed by the existence of switching costs of funding (Slovin, Sushka, and Polonchek 1993), increased debt capacity (Schokley 1995; Johnson 1998), and holdup costs (Sharpe 1990; Rajan 1992; Houston and James 1996). Financial intermediaries start the monitoring process with a credit analysis to deal with credit risk, which is the source of the biggest risk facing financial institutions. Credit risk measurement techniques as an early warning system have been switched from subjective judgment of credit risk to an objective credit-scoring system over the past twenty years (Altman and Saunders 1998). As financial institutions are entities operating in a highly regulated industry, any change in regulation affects their operations. Possible barriers to a bank’s monitoring activities could arise with changes in banking regulations. Banking regulators implement various initiatives to control moral hazard behavior in the form

In this study, we focus on why financial intermediaries exist and why bank financing is considered among many different sources of funds. We then review the studies that empirically test theoretical implications of the uniqueness of banks' role. We also review the studies that examine the role of nonbank financial institutions. Studies on the early warning system of credit risk are included as part of the discussion about the internal mechanism of bank monitoring. Finally, we discuss research covering bank assets and liabilities management activities when regulators ask them to calculate capital ratio on the basis of the level of asset risk.

**Theoretical Background of Financial Institutions**

The existence of financial institutions is justified by the resolution of information asymmetry between borrowers and lenders. Under information asymmetry, individuals face two major difficulties in the resolution process: (1) credibility problems (e.g., the individual cannot sell the information because of the credibility of the information and the seller); and (2) cost problems (e.g., the information production costs so much to the individual that no benefit results).

Financial intermediaries attempt to resolve these difficulties by committing a significant portion of a holder's equity stake as a signal (Leland and Pyle 1977) or by forming a coalition with other individuals or institutions, which generates cross-subsidies between "good" and "bad" borrowers (Ramakrishnan and Thakor 1984; Diamond 1984). In addition, the coalition of information producers can reduce information production costs by centralizing information production. Because the intermediaries produce credible information at lower cost, in dealing with borrowers they have a comparative advantage over securities issued in the capital markets when screening and monitoring corporate clients. As long as financial institutions can produce credible information through diligent monitoring, their loans certify the viability of borrowers in the capital market under information asymmetry (Ramakrishnan and Thakor 1984).

What, then, is the link between the formation of a financial intermediary and its monitoring quality? Monitoring activities likely will improve the efficiency of lender-borrower contracts, increasing the return-to-scale under asymmetric information. With scattered debt holders, the public good nature of monitoring causes the "free-rider" problem. By delegating monitoring work to a financial intermediary, individual debt holders may avoid costly duplication of monitoring activities and this free-rider problem (Diamond 1984). Consolidation of the delegated responsibilities of many lenders enables financial institutions to economize on the cost of monitoring via economies of scale. One notable caveat of this theory of
delegated monitoring, however, is delegation to the institution that introduces the agency problem. Specifically, the incentive of the agent (the intermediary) is different from that of the principal (the depositor or insurance claim holder) and results in a credibility problem for the agent. Diamond suggests a nonpecuniary penalty to make the institution’s interest commensurate with that of the principal.

Banks’ Uniqueness in Creating Value through Monitoring

Theories
The status of financial institutions as delegated monitors and superior information processors facilitates self-selection by firms with high-quality projects that tend to assist in avoiding the “lemon” problem in security issues in the capital market. This problem may occur when firms with low-quality projects minimize unnecessarily harsh punishment beyond their risk level from the capital market. In essence, a bank loan certifies managerial quality and counters adverse selection and moral hazard problems associated with external financing. Regarding the certification effect of loans, theories in banking are not clear as to whether it is only bank loans or loans from any financial institution. In the Ramakrishnan and Thakor (1984) model, any financial institution can certify and signal the firm value through a loan grant as long as the institution is able to produce credible information for resale. Diamond (1984), however, does not differentiate banks from other private institutions as long as an intermediary can delegate on its asset side and diversify the risk on the liability side (asset transformation).

Theoretical justification of a bank loan’s certification effect on the borrowing firms has been investigated by Fama (1985). He contends that there must be something unique about bank loans since a reserve tax on certificates of deposit is borne by bank borrowers, yet those borrowers are still willing to pay higher rates than on securities of equivalent risk.

Bank debt, along with other types of privately placed fixed-payoff securities, is classified as inside debt. Inside debt is a contract where the debt holder will have access to information on internal decision making that would not be publicly available. Bank loans as inside debt are also short-term debts that may trigger periodic evaluation of the firm. Furthermore, bank loans typically have a low priority among fixed-payoff claims. Renewing this low-priority inside debt, banks effectively signal the firm’s credibility to other agents of outside debt and allow them to avoid a similar costly evaluation of the firm. Consequently, the monitoring costs of the firm’s other claimants are reduced.
Empirical Research Using Event Studies

As an inside debt holder, a bank has the incentive to monitor firm behavior and invest in information-gathering technology that leads to more efficient evaluation of risky lending opportunities than outside monitors. Under the assumption that the bank acquires and produces information that is not available to the capital market through the process of evaluating credit risk of a loan applicant, the bank's lending decision conveys valuable information about a borrower's true risk. Therefore, loan announcements are believed to carry signaling effects of firm value to the capital market. Hence, an evaluation of the market reaction to bank loan announcements is an appropriate way of illustrating the value of bank monitoring services.

James (1987) examines whether bank and nonbank credits extract significantly different market reactions on loan announcement day, especially when compared to public debt financing. He confirms Fama's (1985) finding that bank borrowers, not certificate of deposit (CD) holders, bear the cost of reserve requirements on CDs. He also finds that significant abnormal returns accrue to stockholders of firms announcing bank credit agreements, while negative abnormal returns accrue to stockholders of firms announcing private placements. As Table 4.1 shows, this finding of significant positive reaction to loan announcement is in contrast with nonpositive responses to the announcements of other types of funding through the capital market as documented by Mikkelson and Partch (1986). James interprets these findings as supporting evidence of the hypothesis that banks are special types of monitors. An analysis of differences in the maturity, borrower default risk, borrower size, and the purpose of borrowing indicates that differences in abnormal performance are not due solely to differences in characteristics of the loan or characteristics of the borrowers. This confirms that banks provide some special service not available from other lenders.

Table 4.1. Average two-day stock price response on various types of corporate funding announcements

<table>
<thead>
<tr>
<th>Type of funding</th>
<th>Average two-day common stock prediction error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common stock</td>
<td>−3.96% (−9.81)***</td>
</tr>
<tr>
<td>Straight debt</td>
<td>−0.23% (−1.40)</td>
</tr>
<tr>
<td>Convertible debt</td>
<td>−1.97% (4.94)***</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>−0.26% (−0.55)</td>
</tr>
<tr>
<td>Bank loan agreement</td>
<td>1.93% (3.96)***</td>
</tr>
<tr>
<td>Private placement</td>
<td>−0.91% (−1.87)*</td>
</tr>
</tbody>
</table>

Source: Table 4 in Mikkelson and Partch (1986) and Table 4 in James (1987).
Note: Asterisks indicate that the estimated coefficient is significantly different from zero at the following levels: * = 0.10; *** = 0.01.
Lummer and McConnell (1989) extend James’ (1987) pioneering empirical investigation by distinguishing between new and revisions to existing credit agreements. They find that bank loan announcements concerning new credit agreements have little impact on stock prices, while those concerning revisions to existing agreements have a significant excess return. This supports the argument that new loans reflect no information that is not already available to market investors, while with positive inside information, loan renewals provide the certification effect of the borrowing firm’s true risk to the market. This finding leads to a conclusion that banks gain an information advantage not by possessing some inherent competitive advantage at the loan origination stage but by a continual monitoring of the borrower. Through continuous monitoring of the borrowing firm, a bank gradually accumulates inside information on the firm that is not available to other holders of financial claims and serves as a transmitter of information in capital markets. The positive reaction to loan announcements originates from the reusability of information rather than the bank loan’s inherent uniqueness per se, when compared to other types of debts.

Both James (1987) and Lummer and McConnell (1989) implicitly assume the market reaction to announcements of bank loans is homogeneous regardless of the characteristics of borrowing firms. Slovin et al. (1992) question this assumption and examine stock price responses to announcements of bank credit agreements between small- and large-capitalization firms. They report that both renewals and initiations of loan agreements generate significantly positive stock price effects for small firms but not for large firms. They contend that the driving force of market reaction is not whether the loan is an origination or a renewal. Their findings are consistent with the views of Fama (1984) and Diamond (1989) that small and less prestigious firms gain greater value from bank monitoring; hence, the certification effect of bank loans is stronger for the firms that are subjected to severe information.

Early studies have focused on the relation between the certification effects and information characteristics of borrowing firms under the assumption that all banks are homogeneous and substitutable in certification. Billett et al. (1995) relax this assumption by distinguishing lenders according to both their institutional status (banks vs. nonbanks) and their credit rating. In contrast to the findings of James (1987), they report no difference between the market’s response to bank and nonbank loans, and they find that the borrower’s abnormal return is positively related to the lender’s credit quality—proof that high-quality lenders are able to carry an enhanced capacity to signal creditworthiness of firms to the market. They discover no difference in market reaction between loan origination and renewal, but they detect a significantly positive response for both origination and renewal. They conclude that not all bank loans are homogeneous and the certification effect of a bank loan is dependent on the lender’s
creditworthiness. The conclusion that there is no difference in capital market reaction to bank and nonbank loans is also supported by Preece and Mullineaux (1994). Interestingly, these studies find that a positive market reaction to the nonbank loan announcement is more significant than that of the bank loan announcement, which indicates that both banks and nonbanks collect and analyze the information in a similar way and also employ covenants to protect loans in an analogous way. The incentives to develop strong customer relationships, as in banks, drive nonbank lenders to learn more about borrowers as they develop some history of transacting in the credit market. Thus there is no reason to expect that the announcement effect of nonbank loans should be different from that of bank loans if the bank’s unique monitoring ability arises from the information advantage of a continuing working relationship with a borrower rather than from possessing some inherent competitive advantage.

Similarly, Best and Zhang (1993) find that bank loans supply more information when the forecast errors of financial analysts are high. If the information from other monitoring agencies is reliable, banks do little further investigation. However, if this information is unreliable, banks have incentives to thoroughly scrutinize the borrowers. Their results are generally in line with Lummer and McConnell’s (1989) finding that, as far as new loans are concerned, banks do not have any information advantage on the borrowers.

Early studies that employed a short-term event study approach largely support the unique monitoring ability of banks, which is in contrast to the announcement effects of public security issues. Using 1,468 loan announcements over the period 1980 through 1989, Billett et al. (2003), on the other hand, examine the long-run equity performance of bank borrowers. Surprisingly, they find that typical bank borrowers significantly underperform relevant benchmarks. They conclude that the signaling effect of bank loans is only applicable to short-term market reactions. In the longer run, private loans fail to reveal quality certification of the borrowing firm.

**Empirical Studies Using Cross-Sectional Approaches**

Many studies rely on an event study methodology to examine the relationship between bank monitoring and the client firm’s value. However, empirical evidence compiled by various event studies is mixed on the issue of whether the monitoring ability is unique to commercial banks. Nonbank lenders also engage in similar lending and monitoring activities as banks. Other private lenders also achieve economies of scale and scope in intermediation similar to commercial banks. Nonbank lenders generally base their lending decisions on the same factors that influence bank lenders. For closer scrutiny of the relationship between bank monitoring and valuation of borrowing firms, recent studies highlight (1) the charac-
teristics of bank liabilities that make the bank lending behavior unique, and (2) the resulting self-selection process by borrowing firms to reduce the cost of externality under information asymmetry. One simple prediction is that firms with information problems prefer bank financing over other sources of financing.

Several recent studies suggest that credit markets can be sorted by the specialization achieved by financial institutions in handling client firms’ information problems through monitoring. According to Carey et al. (1993), depending on their information problems, borrowing firms have access to three choices of credit markets: private debt, private placement, and public debt. The borrowing firms choose the type of credit market on the basis of their information costs. In the presence of the borrower’s information problem, the financial institutions enhance their monitoring ability through sector specialization. They suggest that the degree of specialization of financial institutions is determined by the following factors: (1) difference in covenants and collateral requirement across institutions; (2) the size of borrowing; (3) the liability structure of institutions; (4) differences in asset operation; and (5) differences in regulation. They further suggest that borrowing firms examine interheterogeneity of all three different types of credit market in terms of monitoring capacity and contractual flexibility. As a result, the lender’s specialization and the borrower’s information problems tend to line up with one another and determine the latter’s credit market choice. They provide empirical evidence in support of the association between a firm’s choice of credit market and their degree of information problems. This proves the existence of a credit market hierarchy—the matching-up process between the choice of credit market and the borrowing firm’s information problems.

Johnson (1997) and Krishnaswami et al. (1999) report similar results. Accessibility to the public debt market can affect a firm’s choice between public debt (bond issues) and private debt (bank loans). The presence of public debt in a firm’s book indicates that the firm is less susceptible to information problems and that certification of financial institutions is of lesser importance. In this regard, Johnson (1997) documents that a firm with lower information and bankruptcy costs tends to use more public debt. As the level of leverage increases in the capital structure of a firm, its probability of financial distress and agency costs of debt also increase. With higher debt in the capital structure, the firm searches for private debt instead of public debt, which is more costly in case of financial distress. Naturally, a firm with possible high bankruptcy costs looks for financial institutions with stronger monitoring ability.

Krishnaswami et al. (1999) reach similar conclusions regarding the choice between public and private debt. Holding firm size constant, information-sensitive firms choose private debt over public debt in the belief that private debtors are better monitors and more flexible in imposing and
handling debt covenants and potential financial distress. Accordingly, firms with greater agency costs of debt rely more on private debt than otherwise.

One caveat with credit market hierarchy suggested by Carey et al. (1993) is that it is implicitly assumed that debts in each individual credit market are homogeneous in monitoring ability and contract flexibility. As demonstrated by Billett et al. (1995) and Preece and Mullineaux (1994), monitoring ability and the degree of certification effects differ with the types of financial institution. The lenders with relatively higher monitoring skills and ability (generally banks) can charge a lower price for their services to borrowing firms with high information cost. Interestingly, Carey et al. (1998) do not find that banks are superior in monitoring ability to other financial institutions. Applying the credit market hierarchy envisioned by Carey et al. (1993), they compare loans made by banks and by finance companies to find that both types of intermediaries are equally likely to finance information-problematic firms. However, firms that borrowed from finance companies tend to have higher risk levels than those borrowing from banks, possibly indicating that while lenders in the private debt market are generally indifferent in handling information problem of borrowers, lenders are not the same in serving risk levels of the borrowers. They attribute the evidence of specialization among private lenders to regulatory and reputational differences between finance companies and banks.

Other Studies Documenting the Value Creation of Bank Monitoring
The analyses of the effect of lender monitoring on the valuation of borrowers have been extended to highlight the role of (1) switching costs of funding, (2) increased debt capacity, and (3) holdup costs. A bank failure can be a severe blow to client firms in acquiring needed funds on time. When a major lending bank is in trouble, a client firm must look for other sources of funds to fill the funding gap caused by the troubled bank. Switching to other banks or other sources of funds is difficult and costly. Given a long history of a lending relationship, the lending bank would have built up significant information about the client firm. This accumulation of information would allow borrowing firms to acquire funds without being subjected to the information costs in raising the external funds or adverse selection problems in initiating loans from other financial institutions. In that sense, client firms are stakeholders in their lending bank and may suffer when the bank fails. Slovin et al. (1993) examine how client firms' stock prices reacted to Continental Illinois Bank's insolvency procedures and the eventual rescue by the Federal Deposit Insurance Company (FDIC). They find the bank's insolvency had negative effects and the FDIC's rescue positive effects on client firm share prices.
The dependence on a better-informed monitor also frees up the debt capacity of information-sensitive firms and allows them to carry more debt in their capital structure. Theoretically, the existence of bank loans (or loan commitments) attenuates ex ante and ex post contractual problems of information. Schokley (1995) shows that loan commitments ease the Myers' (1977) underinvestment problem, making debt a cheaper and more attractive source of financing and increasing the borrowing firm's debt capacity. Johnson (1997) reports that a firm with bank debt carries more debts in its capital structure because the high monitoring ability of banks reduces the problems associated with external financing under asymmetric information and frees up room to keep more debt in the capital structure. His results are robust even after controlling for maturity and collateral differences in the firms' debt structures.

Even with the benefit of informed debt, especially to information-sensitive firms that value the certification effect of bank monitoring, the relatively high costs of informed debt and the information monopoly costs deter borrowing firms' preference for informed debt. The costs of information monopoly and subsequent rent extraction by banks, which are called holdup costs of informed debt, are theorized by Sharpe (1990) and Rajan (1992). The holdup costs of bank loans are especially severe for firms with high agency costs. Those firms, in some cases, would rather be held up by monitoring debt because the switching costs of debt are higher than the holdup costs. In their examination of the determinant of the mix of private and public debt, Houston and James (1996) document an inverse relation between growth potential and the proportion of bank debt for the firms with either a single lender or without public bonds outstanding, but they observe a positive relation among firms borrowing from multiple banks. They conclude that holdup problems associated with borrowing from a single bank limit a firm's reliance on bank borrowing. As Rajan (1992) predicts, they find that the reliance of bank debt is positively related to growth opportunities among firms with public debt outstanding.

**Mechanism Used in Bank Monitoring**

The monitoring mechanism in the U.S. banking sector is different from that in the bank-centered economies. For example, Japanese financial institutions delegate the duty of monitoring to the main banks to avoid duplication of costly monitoring (Sheard 1994; Berglöf and Perotti 1994). One characteristic of the U.S. monitoring mechanism is a cross-mechanism by multiple stakeholders of the borrowing firm. Instead of a single concentrated monitor, publicly traded firms in the United States are subject to monitoring by security analysis, by regulators through stringent filing requirements, and by public audits (Slovin et al. 1990). By testing monitoring-related contract costs reflected in loans, Booth (1992) shows that cross-
monitoring by other debt holders and equity holders lowers monitoring demand and results in lower loan spreads and less severe covenant requirements. Since bank loan pricing (loan spreads in relation to prime, LIBOR, or CD rates) reflects the monitoring costs, Booth claims that the documentation of lower spreads paid by public firms (compared to private firms) indicates that there are benefits of cross-monitoring done by other stakeholders.

What happens if bankers are on the board of the borrowing firms? In the bank-centered system, it is common that a banker (from main banks in Japan or house banks in Germany) serves on the board of directors of a borrowing firm. The bankers on the client firm’s board of directors symbolize the close relationship between the firm and the bank and can facilitate the bank’s acquisition of information not available otherwise. Bankers on the board of directors also benefit the borrowing firms. The firm may obtain valuable advice from bankers whose bank develops specialized knowledge through lending to firms in the same industry. In an examination of the benefits and costs of having bankers on a client firm’s board, Kroszner and Strahan (2001) find that, due to conflicts of interest between shareholder and creditor rights, the role of U.S. banks in corporate governance is reduced. Nevertheless, they report that one-third of large U.S. firms do have a banker on the board, but this proportion declines to less than 6 percent when officers only from their main banks are counted, which compares with 43 percent in large Japanese firms. Bankers avoid being on the board of firms with high agency costs (small firms with low tangible asset ratio or distressed firms) and firms with high earning volatilities. They also find that a bank maintains balance between possible legal challenge as a creditor and fiduciary duty to shareholder by avoiding firms in which the chance of shareholder-creditor conflicts is high and that it concentrates lending in the industry in which the firm with bank representation belongs.

The process of technical monitoring starts with the evaluation of credit risk of the borrowing firms in the U.S. credit market. In an excellent overview of credit risk measurement techniques over the past twenty years, Altman and Saunders (1998) point out that the evaluation of credit risk has gained importance in the lending process due to (1) the increase in the number of overall bankruptcies, (2) a trend toward disintermediation, (3) a declining value of collateral or real assets, and (4) a shrinking loan margin. They observe that financial institutions have been improving the sophistication of their early-warning systems so that credit risk can be evaluated in the portfolio context of overall assets. They further mention that financial institutions gradually switched from subjective judgment of credit risk on the basis of the “four Cs” of credit (borrower character or reputation), capital (leverage), capacity (volatility of earnings), and collat-
eral to an objective credit-scoring system using logit models, probit models, and KMV models, which are based on the option valuation model.

**Institutional Barriers and Problems**

The quality of bank assets may deteriorate under poor monitoring, resulting in increased risk for the bank. Over the last two decades, there have been several regulatory reforms aimed at discouraging the excessive risk taking of banks. Critics of the existing system argue that excessive risk taking arises because the existing regulations (flat-rate premium deposit insurance and risk-insensitive capital requirements) do not punish banks for their risk-taking behavior severely enough. Furthermore, deregulation promoted increased competition among banks, which in turn results in further risk-taking behavior in the banking industry. To curb a bank’s moral hazard behavior in the form of excessive risk taking, banking regulators implement the following three major initiatives: (1) risk-based capital requirements, (2) actuarial-based deposit insurance premiums, and (3) more reliance on market discipline.

Since December 1992, with the intention of attenuating the risk-taking behavior of depository institutions, regulators have been assigning risk weights to various asset classes to determine the required capital level where risk weights are determined almost entirely according to perceived credit risk. By imposing risk-based capital requirements, regulators believe that, in addition to reshuffling of banks’ asset composition, banks can become more meticulous in monitoring loans to reduce credit risks. Actually, one way the bank can meet the capital requirements is to decrease the total risk-weighted assets, specifically loans, that appear in the denominators for the calculation of regulatory measures to determine the total risk-based capital ratio. A number of studies investigate the effects of risk-based capital requirements to the risk-taking behavior of banks. In theory, Kim and Santomero (1988) demonstrate that, using a mean-variance model, the traditional uniform capital ratio regulation increases bank asset risk, leading to a higher probability of failure. They suggest that as a solution to problems caused by the uniform capital ratio, the enforcement of a risk-related capital regulation can lead banks to change the composition of an assets portfolio as well as to reduce the total volume of banks’ risky portfolio. Regarding actual effects of the implementation of risk-weighted capital requirements, Avery and Berger (1991) analyze the correlations between the risk weights and various measures of bank performance. Finding that risk weights have explanatory power in predicting bank performance, they conclude that, compared to the old capital standards, the risk-weighted capital requirement defers risk-taking behavior of banks significantly in terms of asset composition and total size of risky assets. Thus, with the adoption of the risk-weighted capital standards, banks have dra-
matically adjusted their portfolios toward lower credit risk assets such as securities and home mortgages by reducing exposure to high credit risk assets like business and commercial real estate loans.

The flat-rate deposit insurance system is considered a put option on banks’ assets (Merton 1977). To increase the value of this put option, banks extend the proportion of risky assets and increase the leverage in their capital structure. One way of deterring a bank’s risk-taking behavior is to void the value of granted put option by correcting the mispricing of deposit insurance. The Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991 requires that the FDIC replace the insurance premium calculated only by the volume of deposits (flat-rate deposit insurance) using an actuarial basis premium that reflects the assets composition of the bank. The last resort of discouraging the risk-taking behavior of financial institutions is to rely on the market discipline of stakeholders. By nature, banks are predominantly financed by deposits, which comprise very short-term, demandable debt. According to Calomiris and Kahn (1991), liquidity in deposit is a major motivation for depositors to monitor the bank’s activities. Withdrawal of funds by a depositor is a sign of no confidence in monitoring activity done by the bank and will subsequently discipline the bank management. But depositors (the biggest stakeholders in a bank) have no incentives to monitor the risk-taking behavior of their banks since their deposits are secured by deposit insurance. This moral hazard behavior of depositors mandates market discipline by other stakeholders. Market discipline would be more effective and orderly if a bank’s actual cost of uninsured funds varied directly with its true risk exposure. Specifically, the increase in bank risk due to neglected monitoring would be immediately reflected in the rates of return demanded by subordinate debt holders. Using the uninsured rates on bank certificates of deposit (CD), Ellis and Flannery (1992) determine whether the market assesses a risk premium on the uninsured liabilities of six money center banks (spreads between the daily rate on certificates of deposit and treasury bill rates). Their results indicate that the information in a bank’s stock return affects its CD rates. Thus, when a bank’s equity value improves, its required CD offering rate declines. With this evidence that a risk premium is a component of CD rates, the authors argue that regulators may increase their reliance on market discipline regulation. Though regulators show an increased willingness to let some bank investors bear default losses, there still exists widespread suspicion of the efficacy of market discipline. If investors incorporate risk premia into debenture rates, market discipline may be able to substitute, at least partially, for government regulatory oversight of large banking firms.

Using more extensive data and an improved regression specification, Flannery and Sorescu (1996) investigate the market’s ability to recognize default risk in subordinated notes and debentures (SNDs). To test the
hypothesis that a bank's spread should be increasing in the amount of risk implied by its accounting reports and to study the effects of governmental conjectural guarantees—the "too-big-to-fail" guarantees—they run regressions with the subsample divided into three periods of analysis by the degree of governmental conjectural guarantees. Their findings suggest that bank investors clearly impound the value of conjectural government guarantees into debentures prices. As the strength of these guarantees changes over time, debenture prices reflect these guarantees. Flannery and Sorescu conclude that SND investors become more diligent about pricing bank default risks when regulators stop protecting large bank holding companies' creditors.

**Regulatory Implications**

Theoretical and empirical studies demonstrate the important role of banks in creating firm value through diligent monitoring. Consequences of bank failure are quite costly to a nation's economy. The unstable banking system in Japan's economy renders a valuable lesson on the regulatory role in monitoring the monitors (banks). The problems of Japanese banks may be traced back to the failure in asset-side operations—the screening and monitoring of prospective and existing borrowers—rather than in the liability side of operations. The highly leveraged capital structure of banks makes them vulnerable to even a small loss, which may force them into default. Furthermore, contrary to nonbank firms, the contagious nature of bank failure places more importance on prudential regulation as a safeguard against the systemic risks of bank failure.

The existence of deposit insurance and the role of the central bank as the lender of last resort, which are considered to be safety nets against systemic bank failure, could distort incentives for risk taking by banks (moral hazard behavior). With the existence of this type of safety net, depositors and some creditors do not seem to play a significant role in scrutinizing the bank riskiness, which results in excessive risk-taking behavior. The role of the regulator is to lead banks on a safe voyage without impeding the rule of economic order. The regulator is required to keep the charter value of a bank high by aligning the bank's incentive benefits to the value creation of client firms via monitoring.

Along with other measures to block the possible moral hazard behavior of banks such as risk-based deposit insurance premiums and prompt corrective action, as shown in Flannery and Sorescu (1996), market discipline by subordinated debt can be an effective way of monitoring bank operations. Subordinated debt has characteristics that can make it a good monitor of bank operations. It usually has a maturity greater than one year so that the holders of subordinated debt cannot ask quick redemption of the value during a banking crisis. In liquidation, subordinated debt is
junior to all claims other than equity. Thus, holders of subordinated debt expect limited upside gains, while they are exposed to downside risk as high as equity holders. These characteristics of subordinated debt force subordinated creditors to serve as strongly motivated monitors against risk-taking behavior. An excessively risky operation of a bank could be penalized by a falling price of subordinated debt traded in the secondary market, increasing funding costs to the bank.

How then can Korea's regulators embrace market discipline via subordinate debt in its banking system? Under the current regime of risk-based capital regulations in the United States, subordinated debt constitutes Tier 2 capital, and a bank can raise funds using the subordinated debt up to a maximum of 50 percent of Tier 1 capital, which is in turn required to be at least 4 percent of risk-weighted assets. Assuming that Korea has a similar regulatory requirement for risk-based capital regulations, we suggest a regulatory regime that requires subordinated debt to constitute a minimum of 50 percent of Tier 1 capital as a means of increasing market discipline by the debt holders. The price reaction of traded subordinated debt to bank operations is expected to be quick and precise. Accordingly, a falling price of subordinated debt can alert other stakeholders and the regulators to the condition of commercial banks.

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