MORAL HAZARD, AGENCY PROBLEM AND OWNERSHIP STRUCTURE*

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Abstract

Using a sample of recent Korean banking industry for 1994-2000, we examine how the effectiveness of managerial ownership is affected by the regulatory regimes in banking industry and the banks' moral hazard incentives. We found that the managers of the banks in the higher moral-hazard group (the group of banks that are known to have greater moral hazard incentives in the literature such as the banks with lower charter value, greater asset size and lower equity capital) tend to have greater incentives to align their interests to those of stockholders by taking on more risk as managerial ownership rises, compared to the banks in the lower moral-hazard group, but only over the relatively deregulated period 1994-1997. Thus, in terms of only addressing the owner/manager agency problem, the owner/manager agency problem of banks can be easily addressed by changing their insider holdings or ownership structure, in particular when the banks have relatively higher moral-hazard incentives and banking regulations are loose. But we also found that this increased risk-taking has not ultimately resulted in better performance of the bank. This result may suggest a very important policy implication regarding the safety of the banking industry. If the increased risk-taking with greater managerial ownership does not contribute to improving the bank profitability, taking on more risk could end up with only increasing the possibility of failure of the bank. Therefore, the increase in insider holdings to address the owner/manager agency problem may have to be associated with closer and more frequent monitoring of the banks' risk-taking behavior.

Keywords: ownership structue, agency problem, managerial ownership

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1. Introduction

The moral hazard hypothesis associated with stockholders' limited liability suggests that stockholders have a strong incentive to increase risk because limited liability allows stockholders to capture all upside gains while sharing their losses with debtholders. Many researches, however, suggest that the incentives of managers may differ from those of outside stockholders. Managers whose compensation packages are predetermined in many cases, and who stand to lose invested wealth or nondiversifiable (firm-specific) human capital may act in a risk-averse rather than a value maximizing manner of stockholders. In this case their optimal degree of risk taking would be less than that desired by stockholders (Jensen & Meckling, 1976; Benston et al., 1986; Saunders, Strock & Travlos, 1990). This is known as principle-agent problem (agency problem) and has been widely analyzed in the literature of corporate finance[1]. This owner/ manager agency problem or the conflicts between stockholders and managers, however, is expected to reduce through managerial ownership of the firm's stock, since managerial ownership is expected to align the interests of managers with those of stockholders. Several previous studies examined the effectiveness of managerial ownership in reducing owner/manager agency problems by examining the relationship between risk taking and the degree of

[1] Demsetz and Strahan (1997) find a contemporaneously significantly negative relationship between capital-to-asset ratio and risk-taking (standard deviation of stock returns). Gunther and Robinson (1990) find a significantly negative relationship between capital growth and loan growth, interpreting this result as a negative relationship between capital adequacy and risk-taking. Mckenzie, Cole and Brown (1992) find that low capital thrifts undertake projects with low net present value to increase the variance of the return.

managerial ownership. These include Mork, Shleifer and Vishny (1988), Saunders, Strock and Travlos (1990), McConnel and Servaes (1990), Gorton and Rosen (1995), Galloway, Lee and Roden (1997), Cebenoyan, Cooperman and Register (1999), etc. [2].

Unlike non-banking industry, however, as Saunders, Strock & Travlos (1990), Cevenoyan, Cooperman & Register (1999), and Hassan, Wolfe & Maroney (2004) point out, the banking industry presents a more complicated set of principle/agent problem, mainly because it is subject to a great degree of regulatory oversight[3]. Thus, in investigating the principle/agent problem in banking industry, we may need to consider the effect of the regulatory regimes surrounding banking industry on the change in risk-taking behavior as well. Saunders, Strock and Travlos (1990), and Cevenoyan, Cooperman and Register (1999) point out, increasing insider ownership may have a more powerful effect on inducing the managers of the banks to take on more risk during the periods of deregulation relative to periods of regulation. Another very important, banking-specific issue that should be considered is the moral hazard problem associated with deposit insurance system. By insulating the depositors of banks against declines of bank-asset values, deposit insurance enables banks to have perverse moral hazard incentives by undertaking risky operations without paying higher deposit rates. That is, the effectiveness of market discipline is limited in the banking sector because of government-backed deposit insurance. Demsetz, Saidenberg and Strahan (1997) estimated the interaction effect of managerial ownership and franchise or charter value on the risk taking of banks. They found that the relationship between ownership and risk taking is significant only at low franchise value banks-those where moral hazard problems are most severe and where conflicts between owner and manager risk preferences are therefore strongest. However, very few researchers have examined the interaction effects of the regulatory regimes and the degree of the moral hazard incentives banks have on the effectiveness of insider ownership in reducing agency problem.

Using a sample of recent Korean banking industry for 1994-2000, we examine how the effectiveness of managerial ownership is affected by the regulatory regimes in banking industry and the banks' moral hazard incentives. The period 1994-2000 has been a period of important regulatory changes in recent Korean banking industry, transition from a deregulated period of pre-1997 to a more regulated period of post-1997 after the financial crisis in the late 1997, and therefore, is considered to be a very good sample to examine the above issue[4]. We found that the managers of the banks in the higher moral-hazard group (the group of banks that are known to have greater moral hazard incentives in the literature such as the banks with lower charter value, greater asset size and lower equity capital) tend to have greater incentives to align their interests to those of stockholders by taking on more risk as managerial ownership rises, compared to the banks in the lower moral-hazard group, but only over the relatively deregulated period 1994-1997. Thus, in terms of only addressing the owner/manager agency problem, the owner/manager agency problem of banks can be easily addressed by changing their insider holdings or ownership structure, in particular when the banks have relatively higher moral-hazard incentives and banking regulations are loose. But we also found that this increased risk-taking has not ultimately resulted in better performance of the bank. This result may suggest a very important policy implication regarding the safety of the banking industry. If the increased risk-taking with greater managerial ownership does not contribute to improving the bank profitability, taking on more risk could end up with only increasing the possibility of failure of the bank. Therefore, the increase in insider holdings to address

[2] Saunders, Strock and Travlos (1990) found that stockholder controlled banks have greater incentives to take risk than managerially controlled banks. Several other studies of non-banking firms found a nonlinear relationship between insider ownership and risk taking. Mork, Shleifer and Vishny (1988) found that Tobin's q increases as insider ownership increases up to 5%, then q falls as insider ownership grows up to 25%, and finally it again rises at higher insider ownership levels. McConnel and Servaes (1990) found a similar result. Researchers (including Gorton & Rosen, 1995) interpret these results in terms of the entrenchment power of managers. 20 Galloway, Lee and Roden (1997) find the banks with lower charter value assumed significantly more risk beginning around 1983, and this behavior continued into the early 1990s. Cebenoyan, Cooperman and Register (1999) find manager-owned thrifts exhibit unprofitable risk-taking in the mid-1980s, years of regulatory laxity and low charter values, but demonstrate profitable risk-taking in the mid-1990s, a period of regulatory stringency and high charter values.

[3] See Hassan, Wolfe & Maroney (2004) for a good summary for the corporate control and governance in banking.

[4] The early 1990s of the Korean banking industry is widely acknowledged to have been a period of significant deregulations in terms of bank activity, interest rates and the reorganization of financial industries including banking sector. Moreover, with implicit guarantee regarding survival of banks by the government, banks were able to pursue excessively risky strategies to maximize their values between the early and mid 1990s. This risk-taking associated with significant deregulations and implicit forbearance ragarding bank closure is attributed to be one of the main reasons for the failure and crisis of the Korean banking industry around 1997. The regulatory reforms enforced with the Core Principles for Effective Banking Supervision of December 1997 include a more tightened BIS (Bank for International Settlement) capital standards, Prompt Corrective Actions and a modest step toward risk-based insurance premiums, etc..

the owner/manager agency problem may have to be associated with closer and more frequent monitoring of the banks' risk-taking behavior.

In the next section, we describe the sample of banks used in empirical test. Section 3 describes the testing model of the hypotheses and the variables previously found to play an important role in the moral hazard in the banking literature. Section 4 presents the empirical results, and section 5 offers concluding comments.

2. Sample and Data

We collect the balance sheet data of banks such as capital-to-asset ratio, book value of share, asset portfolio shares, and asset size from the Statistics of Bank Management from 1994-2000, which is published by the Korean Financial supervisory Service. Ownership data are collected from the TS-2000 data file provided by the Korea Committee of Traded Company. Stock return data are collected from the KIS-SMAT data file provided by the Korea Credit Analysis Company. The sample consists of all banks in Korea during the sample period: 26 from 1994 to 1997, 21 in 1998, and 17 in 1999 and 2000.

3. Specification of the testing model

We use the following model to examine the relations among the managerial ownership, moral hazard incentives, regulatory regimes and the risk-taking of banks:

Risk = f(managerial ownership, managerial ownership×dummy variable for moral hazard incentives, financial leverage, operational leverage, economic growth)

We assume that ownership structure is exogenous and the level of risk-taking is endogenously determined. We use alternative proxies for bank's ex-ante risk-taking incentives (the dependent variable in regression equation). The first one is the volatility (measured by the standard deviation) of daily stock returns. This is based on our belief that stock market is pretty efficient in capturing the change in bank's risk-taking incentives. The other two are the ratio of loans to asset and the ratio of risky investment securities to risk-free investment securities: A higher proportion of loans generally tend to increase the risk of the bank. The higher the current loan-to-asset ratio is, the more vulnerable the future performance of the bank is to future economic conditions. Loans are assigned higher risk weight at the calculation of risk-adjusted asset and BIS capital ratio. The risky investment securities include the stock and corporate bonds the bank holds and the risk-free investment securities include the government bond and monetary-stabilizing bond.

Managerial ownership is the percentage of the equity held by officers and directors of a bank. We include financial leverage, operational leverage, and economic growth as control variables affecting the risk taking behavior of banks. We use the bank's book value of capital-to-asset ratio as the measure of financial leverage since this is the financial-leverage measure most commonly monitored by regulators. Operational leverage is measured by the ratio of fixed assets to total assets. Operational leverage may act in an analogous fashion to financial leverage in increasing firm risk.

To examine the interaction effects of the moral hazard incentives and the effectiveness of managerial-stock ownership, we include the managerial ownership×dummy variable representing higher moral-hazard incentives. Depending on the measure of moral hazard incentives, the dummy variable takes one if the bank belongs to the group of higher moral-hazard group and zero if it does not: The dummy variable takes one if charter value is lower than the median for all banks (and zero if it is higher), or if the asset size is larger than the median for all banks (and zero if it is smaller), or if the capital ratio is lower than the median for all banks (and zero if it is higher). Charter value is measured by the market-to-book ratio of share price

The variables previously found to play an important role in the moral hazard in the banking literature are charter value, firm size and bank equity capital:

Charter value and moral hazard incentive

In addition to tangible assets, firms have charter value, which may be defined as the economic value of the future growth opportunity. If a bank fails, it loses its charter value, i.e. the owners of the bank cannot sell the charter value once the bank is declared insolvent. Thus, a bank with a high charter value has an incentive to avoid a riskier strategy. Instead, a bank that is insolvent on a book-value basis still has a valuable charter that the FDIC could sell in a purchase and assumption (P & A). This may explain why P & A's are typically less costly than liquidation. Effective restrictions on entry and competition raise charter value. When there is less competition, the probability to make higher profits would be high. Keeley (1990) argues that the increased competition in the banking sector in the 1980s reduces the charter value of banks, and hence, increases their incentives to take risk. He finds that the banks with higher charter value follow lower risk strategies by holding higher capital-to-asset ratios. Using a sample of 85 bank holding companies over 1971-1986, he finds a contemporaneous positive relation between bank charter value and bank capital-to-asset ratio, and he interprets this as a

negative relation between charter value and risk [5]. Galloway, Lee and Roden (1997), using a sample of 86 bank holding companies over 1977-1994, find that the banks with high ex-ante charter value (at time t-1) take a significantly low ex-post risk (low standard deviation of stock returns at time t).

Firm size and moral hazard incentive

In testimony to Congress in September 1984, the Comptroller of the Currency of the U.S.A. declared that the 11 largest banks would not be allowed to fail because of the potential damage to the economy, though the names of the included banks were not explicitly specified. In the event of insolvency, the FDIC would bail them out, and no depositor or creditor would take a loss, implying that for those banks total deposit insurance would be provided. This policy came to be known as the "too-big-to-fail doctrine". With their costs of funds (deposit interest rates) no longer tied to their riskinesses, those banks would have incentives to increase the risk of their operations. Although the too-big-to-fail policy was originally applied to the 11 largest banks, if investors and bankers themselves believe that regulators are unwilling to let larger banks fail, then larger banks would have greater risk-taking incentives. Using 38 bank holding companies over 1978-1985, Saunders, Strock and Travlos (1990) find that systematic equity risk is positively related to total asset size, though insignificant [6]. Demsetz and Strahan (1997) find that, though larger bank holding companies are better diversified than smaller ones, they do not translate this advantage into less risk. Or rather, larger banks use their diversification advantage to operate with lower capital ratios and pursue riskier strategies with higher concentrations on consumer & industry loans. Akhavein, Berger and Humphrey (1997) argue that the profit enhancing associated with larger banks' riskier strategies (shift in outputs from lower risk securities to higher risk loans) is the major motivation for bank-mergers.

Equity capital and moral hazard incentive

As in non-financial corporations, limited liability gives bank stockholders an incentive to expropriate wealth from bondholders by increasing risk. Furthermore, since the government protects bondholders (depositors) from the consequences of bank risk-taking, their incentive to monitor and constrain risk-taking is weak.

With limited liability, stockholders of a corporation can walk away without further losses when the net worth of the firm falls below zero. Stockholders can thus increase their wealth at the expense of debtholders, by pursuing risky strategies. With high level of risk, it is more likely that the return from assets will turn out to be very high. High level of risk also increases the possibility of an extremely low return. Limited liability, however, protects stockholders from incurring additional losses when once net worth falls below zero. In other words, with limited liability, it is more likely that losses from high risk-taking will be borne ultimately by debtholders, while the benefit from it will be captured by stockholders. Furthermore, government-backed deposit insurance makes the incentives of debtholders to monitor stockholders' behavior weak, and hence, banks could enjoy risk-insensitive funding costs and have greater risk-taking incentives than they would have if deposits were not insured.

Galloway, Lee and Roden (1997) find that the banks with low ex-ante book value of capital ratio (at time t-1) take a significantly high ex-post risk (high standard deviation of stock returns at time t), indicating the existence of the moral hazard risk-taking incentives of stockholders. Demsetz and Strahan (1997) find a contemporaneously significantly negative relationship between capital-to-asset ratio and risk-taking (standard deviation of stock returns), Gunther and Robinson (1990) find a significantly negative relationship between capital growth and loan growth, interpreting this result as a negative relationship between capital adequacy and risk-taking. McKenzie, Cole and Brown (1992) find that low capital thrifts undertake projects with low net present value to increase the variance of the return.

We estimate the following panel regression equation over the two different regulatory regimes, a relatively deregulated period 1994-1997 and a more regulated period 1998-2000, respectively, including the dummy variable D that takes the value of 1 if the bank currently belongs to the higher moral-hazard group and 0 otherwise. We pool the cross-sectional and time-series data of the sample banks and include time fixed effects to control for changes in average level of risk common to all banks in the sample and estimate a random effects model to control for time-invariant bank-specific factors relating to risk.[7] We

[5] However, as Galloway, Lee and Roden (1997) note, a contemporaneous relation might simply reflect a bank's superior performance and not necessarily its intentions to take on less risk.

[6] However, with respect to nonsystematic risks (standard deviation of stock returns and unsystematic risk), the results are somewhat mixed, though generally insignificant.

[7] Either random effects or fixed effects model would be appropriate for the analysis of panel data sets such as this study because they contain multiple observations on the same individuals. We have also estimated fixed effects model rather than random effects model. This specification avoids a potential omitted variable problem that could occur when the individual-specific component of the error is correlated with the regressors in the model. The main results are very similar to those of the random effects estimation. The results are available from the author.

include the GDP growth rate to control for the impact of economic conditions on the bank's risk-taking incentives.

$$(\text{Risk})_{i,t}=a_0+a_{11}(\text{Insider ownership})_{i,t}+a_{12}D\times(\text{Insider ownership})_{i,t}+a_2(\text{Financial leverage})_{i,t}+a_3(\text{Operational leverage})_{i,tt}+a_4(\text{GDP growth})_t+\varepsilon_{i,t} \quad (1)$$

where, all the explanatory variables are year-end values. Of the three different dependent variables, the volatility (measured by standard deviation) of stock returns is estimated from the bank's daily stock returns of the whole year. The other two are year-end values. We test how the effectiveness of managerial ownership is affected by the regulatory regimes in banking industry and the banks' moral hazard incentives by examining the sign and statistical significance of the coefficient a_{12} .

4. Empirical Results

4.1. Empirical Results for Risk-taking Incentives

4.1.1. Results for the case in which the moral-hazard-incentive of a bank is measured by the bank charter value

Table 1 presents the results for the case where the moral-hazard-incentive of a bank is measured by its charter value. In this case, the dummy variable D takes one if the charter value of a bank is lower than the median for all banks, and zero if it is higher. Thus, the coefficient a_{12} indicates how much more (or less) the set of banks with lower charter value (or, higher moral hazard incentive) increase their risk-taking than the set of banks with higher charter value (or, lower moral hazard incentive) as managerial ownership rises. The coefficient a_{11}, of course, indicates how the banks with higher charter value change their risk-taking as managerial ownership change.

As shown in table 1, the coefficient on D×(insider ownership) is positive for all the three different risk measures (the dependent variable) over relatively deregulated period 1994-1997, of which two cases (with respect to the volatility of stock returns and the ratio of risky investment securities to risk-free investment securities) are statistically significant. However, these relations become weaker over more regulated period 1998-2000. These results suggest that the banks with lower charter value take on significantly more risk than those with higher charter value as managerial ownership rises, but only if the banking regulations are loose. For control variables, the coefficient on capital-to-asset ratio is significantly negative for all the three dependent variables over the deregulated period, but it becomes insignificantly positive over the latter period. This result suggests that the greater risk-taking incentives of the banks with lower capital ratio appeared only when regulations are loose. Operational leverage has consistently positive relation with risk for the sample period.

4.1.2. Results for the case in which the moral-hazard-incentive of a bank is measured by the bank asset size

Table 2 presents the results for the case where the moral-hazard-incentive of a bank is measured by its asset size. In this case, the dummy variable D takes one if the asset size of a bank is higher than the median for all banks, and zero if it is lower. Thus, the coefficient a_{12} indicates how much more (or less) the set of banks with greater asset size (or, higher moral hazard incentive) increase their risk-taking than the set of banks with smaller asset size (or, lower moral hazard incentive) as managerial ownership rises. The coefficient a_{11}, of course, indicates how the banks with smaller asset size change their risk-taking as managerial ownership change.

As shown in table 2, the coefficient on D×(insider ownership) is significantly positive over relatively deregulated period 1994-1997 with respect to the volatility of stock returns and the ratio of risky investment securities to risk-free investment securities. However, these relations become insignificant over the latter period 1998-2000. These results suggest that the banks with larger asset size take on significantly more risk than those with smaller asset size as managerial ownership rises, but only if the banking regulations are loose. This result may be attributed to the fact that large banks during the period 1999-2000 are generally those that are newly borne by acquiring problem banks through structural reform of the banking industry, and therefore, regulatory oversight would be imposed more heavily on these banks.

4.1.3. Results for the case in which the moral-hazard-incentive of a bank is measured by the bank equity capital

Table 3 presents the results for the case where the moral-hazard-incentive of a bank is measured by its capital ratio. In this case, the dummy variable D takes one if the capital ratio of a bank is lower than the median for all banks, and zero if it is higher. Thus, the coefficient a_{12} indicates how much more (or less) the set of banks with lower capital ratio (or, higher moral hazard incentive) increase their risk-taking than the set of banks with higher capital ratio (or, lower moral hazard incentive) as managerial ownership rises. The coefficient a_{11}, of course, indicates how the banks with higher capital ratio change their risk-taking as managerial ownership change.

As shown in table 3, the coefficient on D×(insider ownership) is significantly positive over relatively deregulated period 1994-1997 with respect

to the volatility of stock returns, suggesting that the banks with lower capital ratio take on significantly more risk than those with higher capital ratio as managerial ownership rises when regulations are loose. The coefficients for the other two risk measures are also positive, but not significant. However, the coefficients become significantly negative for the case of the volatility of stock returns and the ratio of risky investment securities to risk-free investment securities over more regulated period 1998-2000. This result may be attributed to the fact that the most closely monitored regulatory target under the structural reform of the banking industry over this period was the bank capital ratio.

4.2. Empirical Results for Profitability

In the previous sections, we found that the managers of the banks in the higher-moral-hazard group, such as the banks with lower charter value, greater asset size and lower equity capital, tend to have greater (compared to the banks in the lower-moral-hazard group) incentives to align their interests to those of stockholders by taking on more risk as insider ownership rises when regulations are loose. But we are very interested in whether this effectiveness of insider ownership in inducing the managers to take on more risk has ultimately resulted in better performance of the bank. That is, we want to examine whether the increased risk-taking is profitable.

If so, we may conclude that the managers have optimally taken on more risk than before, which would increase firm value. But if the increased risk-taking was not profitable, we may have to be very cautious in arguing the ultimate effectiveness of insider ownership in aligning the interests of managers and stockholders or reducing agency costs, because taking on more risk could end up with only increasing the possibility of failure of the bank without contributing to increasing the profitability of the bank.

To examine whether the greater risk-taking incentives of the higher moral-hazard group with the increase in insider ownership is appropriate in terms of optimal risk-taking, we estimate the following regression model employing bank profitability measured by the return on asset as the dependent variable.

$$(\text{Profitability})_{i,t}=a_0+a_{11}(\text{Insider ownership})_{i,t}+a_{12}D\times(\text{Insider ownership})_{i,t}+a_2(\text{Financial leverage})_{i,t}+a_3(\text{Operational leverage})_{i,tt}+a_4(\text{GDP growth})_t+\varepsilon_{i,t} \quad (2)$$

where, the dummy variable D takes the value of 1 if the bank belongs to the higher moral-hazard group and 0 otherwise for each of the three measures for moral hazard incentives

As shown in table 4, the coefficient a_{12} is not statistically significant at 10 % significance level for all the three different moral hazard groups, though it is positive.

This result suggests that the increased risk-taking of the banks in higher moral-hazard group with the increase in insider ownership has not resulted in significantly better profitability compared to the banks in lower moral-hazard group. The reason for this result should be more carefully examined. But this result may suggest a very important policy implication regarding the safety of the banking industry as follows. In terms of only addressing the owner/manager agency problem, the owner/manager agency problem of banks can be easily addressed by changing their insider holdings or ownership structure, in particular when the banks have relatively higher moral-hazard incentives and banking regulations are loose. But this policy should be taken very cautiously because if the banks with higher moral hazard incentives take on more than enough or excessive risk with the increase in insider holdings, this could end up with only increasing the possibility of failure of the bank without contributing to increasing the profitability of the bank. Therefore, the increase in insider holdings to address the owner/manager agency problem may have to be associated with closer and more frequent monitoring of the banks' risk-taking behavior.

5. Conclusion

Using a sample of recent Korean banking industry for 1994-2000, we examine how the effectiveness of managerial ownership is affected by the regulatory regimes in banking industry and the banks' moral hazard incentives. We found that the managers of the banks in the higher moral-hazard group (the group of banks that are known to have greater moral hazard incentives in the literature such as the banks with lower charter value, greater asset size and lower equity capital) tend to have greater incentives to align their interests to those of stockholders by taking on more risk as managerial ownership rises, compared to the banks in the lower moral-hazard group, but only over the relatively deregulated period 1994-1997. Thus, in terms of only addressing the owner/manager agency problem, the owner/manager agency problem of banks can be easily addressed by changing their insider holdings or ownership structure, in particular when the banks have relatively higher moral-hazard incentives and banking regulations are loose.

But we also found that this increased risk-taking has not ultimately resulted in better performance of the bank. This result may suggest a very important policy implication regarding the safety of the banking industry. If the increased risk-taking with greater managerial ownership does not contribute to improving the bank profitability, taking on more risk could end up with only increasing the possibility of failure of the bank.

Therefore, the increase in insider holdings to address the owner/manager agency problem may have to be associated with closer and more frequent monitoring of the banks' risk-taking behavior.

References

1. Benston, G., R. Eisenbeis, P. Horvitz, E. Kane, and G. Kaufman. 1986. Perspectives on Safe and Sound Banking: Past, Present, and Future. MIT Press.
2. Cebenoyan, A.S., Cooperman, E.S., and Register, C. A. 1999. Ownership structure, charter value, and risk-taking behavior for thrifts. Financial Management 28 (43-60).
3. Chen, A.H., M. Cornett, S. Mazumdar, and H. Teheranian. 1999. An Empirical Analysis of the Effects of the FDICIA of 1991 on Commercial Banks. Research in Finance 17 (41-64).
4. Chen, A.H. and L. Mervile. 1986. An Analysis of Divestiture Effects Resulting from Deregulation. Journal of Finance December (997-1010).
5. Denis, D. 2001. Twenty-five years of corporate governance research…and accounting. Review of Financial Economics 10 (191-212).
6. Demsetz, R.S., M.R. Saidenberg, and P.E. Strahan. 1997. Agency problems and risk taking at banks. Federal Reserve Bank of New York Economic Review.
7. Demsetz, H. and K. Lehn. 1985. The structure of corporate ownership: causes and Consequences. Journal of Political Economy 93 (1155-1177).
8. Esty, B.C. 1997a. Organizational from and risk-taking in the savings and loan industry. Journal of Financial Economics 44 (25-56).
9. Galloway, T.M., W.B. Lee, and D.M. Roden. 1997. Banks' changing incentives and opportunities for risk taking. Journal of Banking and Finance 21 (509-527).
10. Gorton, G. and R. Rosen. 1995. Corporate control, portfolio choice, and the decline of banking. Journal of Finance 5 (1377-1420).
11. Gunther, J. W., and Robinson, K. J. 1990. Empirically assessing the role of moral hazard in increasing the risk exposure of Texas banks. Federal Reserve Bank of Dallas Economic Review
12. Hasan, K., Wolfe, D., and Maroney, N. 2004. Corporate control and governance in banking. Journal of Corporate Ownership and Control 1 (94-107)
13. Holderness, C.G. 2001. A Survey of blockholders and corporate control. Economic Policy Review.
14. Hughes, J. P., W. Lang, L. Mester, C.G. Moon, M. Pagano. 2003. Do bankers sacrifice values to build empires? Journal of Banking and Finance 27.
15. Jensen, M. and W. Meckling. 1976. The theory of firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3 (305-360).
16. McConnel, J. and H. Servaes. 1990. Additional evidence on equity ownership and corporate value. Journal of Financial Economics 27 (595-612).
17. Mckenzie, J. A., Cole, R. A., and Brown, R. A. 1992. Moral hazard, portfolio allocation, and asset returns for thrift institutions. Journal of Financial Research (315-339)
18. Mork, R, Shleifer, and R. Vishny. 1988. Management ownership and market valuation: An empirical analysis. Journal of Financial Economics 20 (293-316).
19. O'Hara, M. and W. Shaw. 1990. Deposit Insurance and wealth Effects: The Value of Being "Too Big to Fail". Journal of Finance 5 (1587-1600).
20. Saunders A., E. Strock,,and N.G. Travlos. 1990. Ownership Structure, Deregulation, and Bank Risk Taking. Journal of Finance 2 (643-654).

Table 1. Random Effects Regression Results for risk-taking in the case where the moral-hazard-incentive of a bank is measured by the bank charter value

The table shows the coefficients and t-statistics.
*** denotes statistical significance at 1% level, ** at 5% level, * 10% level, respectively.
$(Risk)_{i,t}=a_0+a_{11}(\text{Insider ownership})_{i,t}+a_{12}D\times(\text{Insider ownership})_{i,t}+a_2(\text{Financial leverage})_{i,t}+a_3(\text{Operational leverage})_{i,tt}+a_4(\text{GDP growth})_t+\varepsilon_{i,t}$
where D=1 if the charter value of a bank is lower than the median for all banks, and 0 if it is greater

Dependent Variable	Volatility of stock returns		Loan / asset		Risky investment securities / risk-free investment securities	
Sample period	1994~1997	1998~2000	1994~1997	1998~2000	1994~1997	1998~2000
Intercept	0.0031	0.0018	0.3216**	0.2107*	0.4127***	0.2281
	(0.81)	(0.69)	(2.05)	(1.71)	(3.11)	(1.44)
Insider ownership	0.0513	0.0507	-0.0068	-0.0043	0.0085	0.0108
	(0.62)	(0.81)	(-1.52)	(-0.99)	(1.41)	(0.38)
D× Insider ownership	0.0247*	0.0051	0.0529	0.0218	0.0116**	0.0091
	(1.80)	(1.14)	(1.27)	(0.86)	(1.93)	(0.94)
Financial leverage	-0.1152**	0.0342	-0.1024**	0.1644	-0.0342*	0.1038
	(-1.95)	(0.97)	(-1.88)	(0.57)	(-1.66)	(0.55)
Operational leverage	0.0642	0.0499	0.0041	0.0083	0.0193*	0.0072
	(1.22)	(1.31)	(1.37)	(1.07)	(1.71)	(0.97)
GDP growth	-0.9125	-0.7461	-0.6128	0.0516	0.0051	0.0061
	(-0.52)	(-0.74)	(-0.45)	(0.52)	(0.08)	(0.62)
Adjusted R^2	0.10	0.11	0.25	0.31	0.17	0.22

Table 2. Random Effects Regression Results for risk-taking in the case where the moral-hazard-incentive of a bank is measured by the bank asset size

$(Risk)_{i,t}=a_0+a_{11}(\text{Insider ownership})_{i,t}+a_{12}D\times(\text{Insider ownership})_{i,t}+a_2(\text{Financial leverage})_{i,t}+a_3(\text{Operational leverage})_{i,tt}+a_4(\text{GDP growth})_t+\varepsilon_{i,t}$
where D=1 if the asset size of a bank is greater than the median for all banks,
and 0 if it is smaller

Dependent Variable	Volatility of stock returns		Loan / asset		Risky investment securities / risk-free investment securities	
Sample period	1994~1997	1998~2000	1994~1997	1998~2000	1994~1997	1998~2000
Intercept	0.0019	0.0030	0.3315**	0.1643*	0.4316***	0.1953
	(0.69)	(0.80)	(2.11)	(1.61)	(3.13)	(1.45)
Insider ownership	0.0419	0.0442	-0.0059	-0.0073	0.0072	0.0216
	(0.70)	(0.82)	(-1.45)	(-0.81)	(1.39)	(0.51)
D× Insider ownership	0.0304*	0.0091	-0.0018	0.0361	0.0129*	0.0014
	(1.63)	(1.05)	(-0.28)	(0.31)	(1.70)	(0.85)
Financial leverage	-0.1062**	0.0326	-0.0953**	0.1613	-0.0327*	0.1305
	(-1.86)	(1.06)	(-1.87)	(0.55)	(-1.64)	(0.83)
Operational leverage	0.0429	0.0318	0.0035	0.0091	0.0182*	0.0305
	(1.31)	(1.15)	(1.28)	(0.92)	(1.69)	(1.20)
GDP growth	-0.8467	-0.8017	-0.6205	0.0438	0.0046	0.0015
	(-0.39)	(-0.90)	(-0.39)	(0.62)	(0.07)	(0.34)
Adjusted R^2	0.10	0.12	0.24	0.30	0.17	0.20

Table 3. Random Effects Regression Results for risk-taking in the case where the moral-hazard-incentive of a bank is measured by the bank equity capital

$(Risk)_{i,t}=a_0+a_{11}(Insider\ ownership)_{i,t}+a_{12}D\times(Insider\ ownership)_{i,t}+a_2(Financial\ leverage)_{i,t}+a_3(Operational\ leverage)_{i,tt}+a_4(GDP\ growth)_t+\varepsilon_{i,t}$
where D=1 if the capital ratio of a bank is lower than the median for all banks, and 0 if it is greater

Dependent Variable	Volatility of stock returns		Loan / asset		Risky investment securities / risk-free investment securities	
Sample period	1994~1997	1998~2000	1994~1997	1998~2000	1994~1997	1998~2000
Intercept	0.0050	0.0043	0.5133**	0.6243*	0.5438**	0.0648
	(0.43)	(0.83)	(2.20)	(1.63)	(2.16)	(1.50)
Insider ownership	0.0138	0.0735	-0.0073	-0.0084	0.0063	0.0315
	(0.40)	(0.42)	(-1.43)	(-0.67)	(1.51)	(0.51)
D× Insider ownership	0.0372**	-0.0036*	0.0429	0.0118	0.0216	-0.0131*
	(1.89)	(-1.65)	(1.27)	(0.86)	(1.03)	(-1.71)
Financial leverage	-0.2043*	0.0831	-0.0463*	0.2641	-0.0416	0.1226
	(-1.64)	(0.73)	(-1.81)	(0.84)	(-1.43)	(0.29)
Operational leverage	0.1027	0.0425	0.0026	0.0043	0.0099*	0.0081
	(1.09)	(1.15)	(1.19)	(0.73)	(1.74)	(0.81)
GDP growth	-0.4386	-0.4389	-0.6455	0.0641	0.0046	0.0053
	(-0.43)	(-0.43)	(-0.63)	(0.93)	(0.32)	(0.48)
Adjusted R^2	0.12	0.09	0.23	0.33	0.18	0.24

Table 4. Random Effects Regression Results for profitability

$(Profitability)_{i,t}=a_0+a_{11}(Insider\ ownership)_{i,t}+a_{12}D\times(Insider\ ownership)_{i,t}+a_2(Financial\ leverage)_{i,t}+a_3(Operational\ leverage)_{i,tt}+a_4(GDP\ growth)_t+\varepsilon_{i,t}$
where D=1 if the bank belongs to the higher moral-hazard group and 0 otherwise for each of the three measures for moral hazard incentives

	D=1 if the bank belongs to the group of lower charter value		D=1 if the bank belongs to the group of greater asset size		D=1 if the bank belongs to the group of lower capital ratio	
Sample period	1994~1997	1998~2000	1994~1997	1998~2000	1994~1997	1998~2000
Intercept	-0.0726	0.0103	-0.0813	0.0253	-0.0436	0.0216
	(-0.76)	(0.76)	(-0.64)	(0.72)	(-0.42)	(0.91)
Insider ownership	-0.0645	0.0138	-0.0519	0.0098	-0.0438	0.0215
	(-1.39)	(0.58)	(-1.28)	(0.47)	(-1.24)	(0.82)
D× Insider ownership	0.0095	0.0108	0.0056	0.0082	0.0106	0.0057
	(1.24)	(0.21)	(1.04)	(0.73)	(0.95)	(0.81)
Financial leverage	-0.0153*	-0.0341	-0.0096*	-0.0256	-0.0356	-0.0835
	(-1.64)	(-1.54)	(-1.63)	(-1.32)	(-1.49)	(-1.07)
Operational leverage	-1.0284*	-1.0027	-1.0317*	-0.8429	-0.8137	-0.8367
	(-1.65)	(-0.79)	(-1.66)	(-0.43)	(-1.33)	(-0.64)
GDP growth	0.0548	0.0426	0.0497	0.0127	0.0341	0.0328
	(1.28)	(0.96)	(1.16)	(0.70)	(0.86)	(0.77)
Adjusted R^2	0.47	0.36	0.39	0.31	0.45	0.29