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## Bank risk and effectiveness of insider ownership: the case of Korean banks

### Abstract

This paper examines how the effectiveness of insider ownership in inducing the managers of the banks to take on riskier strategies, and therefore, aligning the interests of managers with those of outside stockholders is related to the degree of the firm's current exposure to risk. Using the panel regression analysis of Korean banking industry over the period of 2000-2008, the authors find very consistent and strong evidences that the effectiveness of insider ownership in inducing the managers of the banks to take on riskier strategies is stronger when the bank's current exposure to risk or risk characteristic is lower (the bank belongs to lower risk category groups). These findings are intuitively clear considering that for the managers of the banks in safer positions, the expected gain of increased risk taking from the insider ownership would be greater than the expected cost associated with it such as the loss of their jobs from failure and acquiring bad reputation for their incompetent management abilities, and the loss of perquisite consumption.

The findings in this paper suggest the effectiveness of insider ownership in aligning the interests of managers and outside stockholders could be understood in terms of cost-benefit relationship associated with insider ownership. This paper finds a very strong and consistent evidence that the greater the risk, the greater the cost relative to benefit will be. Not only the level of insider managerial ownership but also the level of current exposure to risk of the firm needs to be considered as another very important factor to reduce agency problem caused by the conflict of interest between stockholders and managers and to increase firm value.

**Keywords:** insider ownership, agency problem, principal agent problem, bank risk, profitability.

**JEL Classification:** G 21.

### Introduction

Principal-agent problem or agency problem in the literature of corporate finance is known to be caused by the differences in the interests between stockholders who own the firm and managers who control the firm. Limited liability would give the firm's stockholders the incentives to increase risk to maximize the expected cash flow from the projects. That is, limited liability protection makes it less likely that the possible losses from risk-taking will be ultimately borne by stockholders, while the benefit from high risk-taking is more likely to be captured by stockholders. Thus, stockholders would have great risk pursuing incentives to maximize the firm value. On the other hand, managers may act relatively in a risk-averse manner to preserve their jobs and control over the firm, rather than just following the value-maximizing manner of stockholders. The loss of firm value or stock price decrease resulted from this conflict of interests between stockholders and managers are expected to decrease through managerial or insider ownership of the firm's stock. By offering stock or stock options to the managers, managers are expected to align their interests and goals to those of stockholders.

Many previous studies examined the relationship between risk-taking and the degree of insider ownership. Leland and Pyle (1977), based on signaling theory, found that insider owners (the managers with ownership) tend to use their ownership to sig-

nal that the firm pursues profitable and high value projects and has sufficient financial capacity to carry out these projects. Therefore, the managers of the firm with higher insider ownership tend to maintain higher debt ratio. Amihud and Lev (1981) found that the managers of the firm with lower insider ownership tend to take lower risk by maintaining lower debt ratio mainly to minimize their employment risk. Morck, Shleifer and Vishny (1988) found that there exist a nonlinear relationship between insider ownership and risk-taking. They found that risk-taking increases as insider ownership increases up to 5% level. Then risk-taking falls as insider ownership increases up to 25%, and finally it increases again at higher levels. McConnell and Servaes (1990) found a similar nonlinear relationship. Saunders, Strock and Travlos (1990) found that the banks whose managers hold a relatively large proportion of the bank's stocks have greater incentives to take risk than the banks whose managers hold a relatively small proportion of the bank's stocks. Chen, Guo, and Mande (2003) found a positive relationship between insider ownership and firm performance if they control for fixed effects. Their results are stable to the treatment of insider ownership and Tobin's Q (as a measure of firm performance) as endogenous variables in a simultaneous equation system. Beiner, Drobetz, Schmid, and Zimmermann (2006) also found a significantly positive effect of managerial ownership on firm valuation. Their findings also remain stable, if insider ownership is integrated in a simultaneous equation system.

In the literature of corporate finance in Korea, there are some studies dealing with non-financial firms as the sample. But like the above previous studies, most of them analyzed the determinants of insider ownership itself, or more generally on ownership structure, rather than directly focusing on whether insider ownership or managerial ownership is effective in reducing agency problem. The first study is by Unggi Lim (1989). He found that the firm's business risk is positively related to the shares owned by large shareholders. Firm size has a positive effect on to the shares owned by large shareholders, too, but the effect was very limited. Seokyeong Kim (1991) found that the degree of concentrated ownership is significantly negatively related to the firm size and positively related to the firm risk. Chanpyo Kuk and Kyunwha Chung (1996), and Chuljung Kim (1996) regarded the ownership structure as a variable that is determined together with capital structure and dividend policy simultaneously, and analyzed the interrelationships among these variables. Hwiyoung Chang and Jongkap Park (1999) examined the relationship between ownership structure and financial structure, and growth policy. Byung Kim and Ho Song (2003) found that during the period of IMF (International Monetary Fund) financial crisis (1997-1998) there was a negative relationship between insider ownership and debt ratio, but the relationship was insignificant during the economy recovery period of 1999-2000. Ho Cho and Chun Kim (2005) found no evidence between insider ownership and capital structure, but through the indirect relationship between these two variables, firm's financing policy and ownership structure are related.

As cited above, even though there are many studies in the literature of corporate finance dealing with the general issues such as the effectiveness of insider ownership, there are very few studies focusing on the interrelationships between the firm's risk or operational characteristics and the effectiveness of insider ownership. Using the data on banking industry, Saunders, Strock and Travlos (1990), and Cebeyan, Cooperman and Register (1999) examined the interaction relationship between the effect of insider ownership and banking regulations. Both found that insider ownership has a more powerful effect on the risk-taking behavior of banks during the periods of loose regulation relative to the periods of tight regulation.

This paper continues the previous line of research in the literature by examining how the effectiveness of insider ownership in aligning the interests of managers with those of outside stockholders is related to the degree of the firm's current exposure to risk or risk characteristics. Even though offering ownership

to the managers and inducing the managers to be more aggressive and riskier, and therefore, aligning the managers' interests with those of stockholders is possible, the degree to which insider ownership scheme is effective in reducing agency problem would depend on the specific circumstances surrounding the firm such as the firm's financial, operational risk and profitability, etc. We may hypothesize that, other things being equal, the managers of the firm in a riskier position would have relatively less incentives to increase risk when they are offered ownership, because they would perceive that the expected cost or loss associated higher risk-taking (such as the loss of their jobs in the event of failure and acquiring bad reputation for their incompetent management abilities, and the loss of perquisite consumption) is fairly high, compared to the expected gain from the increased risk-taking. That is, the effectiveness of insider ownership would be less for the firms in higher-risk positions.

The next section describes the sample of banks. Section 2 describes the testing model and hypotheses. In section 3, we present the empirical results and the final section offers concluding remarks.

## 1. Sample and data

The data for this study are collected for each bank from the Statistics of Bank Management for each year, from 2000 to 2008, published by the Korean Financial Supervisory Service. From all the commercial banks available for each year, we obtained the variables such as asset size, equity capital, loans, investment securities, common stock, government bonds, nonperforming loans, fixed assets, and insider ownership, and return on asset. In total there were 17 banks in 2000, 15 banks in 2001, 14 banks 2002 through 2005, and 13 banks afterwards.

The summary statistics of all the variables used in this study are presented in Table 1. All the values are year-end values. The loan ratio is measured by the total loans divided by total asset and averages 53%. The ratio of investment securities is measured by total investment securities divided by total asset, and averages 25%. The ratio of common stock to government bonds averages 36%. Insider ownership measured by the fraction of all the shares outstanding held by officers and directors averages 9.9%. The average asset size is 614,874 million won. The averages nonperforming loan ratio is 2.3%. The capital ratio measured by the total equity divided by total asset averages 4.7%. The ROA (return on asset) averages 0.53.

## 2. Testing model and variables

As the main method of the empirical analysis in this study, we use the following fixed effects regression

model to examine how the bank risk characteristics are related to the effectiveness of insider ownership on increasing bank risk-taking. In the estimation of panel data combining both cross-sectional and time-series data such as this study, the use of OLS regression may result in omitted variable problem. This

$$(Ex\text{-}ante\ Risk)_{i,t} = \beta_0 + \beta_1 (Insider\ ownership \times Risk\ characteristic)_{i,t} + \beta_2 \times (Log\ asset)_{i,t} + \beta_3 (Capital\ ratio)_{i,t} + \beta_4 \times (National\ dummy)_{i,t} + \varepsilon_{i,t} \tag{1}$$

We believe that the degree of bank’s risk-taking should be captured by its ex-ante risk-taking incentives rather than the ex-post measures of the consequences of the bank’s past risk-taking behavior such as the ratio of nonperforming loans or capital ratio. These measures are the ex-post measures for the bank’s past risk-taking behavior, and just reflect how the bank’s past loans have been deteriorated, and therefore, how much financially and operationally healthy the current assets are, rather than measuring the bank’s current incentives for risk-taking. Or rather, it would be more logical to use these variables as the control variables to determine the bank’s current level of risk-taking incentives. As the measures of the bank’s ex-ante risk-taking incentives, and therefore, as the dependent variables for regression estimation, we use the bank’s loans-to-asset ratio, the investment securities-to-asset ratio, and the ratio of common stock-to-government bonds. The intuitions for using these three variables as the ex-ante risk-taking incentives are pretty clear. The greater the ratio of loans to total asset, the more exposed the bank’s future performance to the future economic conditions. Furthermore, of the categories for asset portfolio composition, loans are generally considered the highest risk category assets, and are assigned the highest risk weight of 100% in the calculation of BIS capital ratio and risk-adjusted asset value. Thus, we expect the banks with greater risk-taking incentives to have a larger portion of loans in their asset portfolio. On the other hand, investment securities are generally considered safer, especially compared to loans. Furthermore, on average, more than 90% of investment securities in the sample of this study are accounted for by relatively safe non-common stock type securities. That is, the investment securities in the sample of this study mainly consist of very safe ones, and we expect the banks with greater risk-taking incentives to have a smaller portion of investment securities in their asset portfolio. In addition to loans and investment securities, we use another very transparent proxy for risk-taking incentives; the ratio of common stock to government bonds.

### 3. Hypotheses

The main objective of this paper is to examine the effectiveness of insider ownership on increasing bank risks-taking that is the bank risk characteristic

problem occurs when the individual bank-specific component of the error is correlated with the regressors in the model. In this case, the use of fixed-effects regression technique can avoid the omitted variable problem and generate unbiased results.

and is the main explanatory variable for this objective, the interaction term ‘*Insider ownership × Risk characteristic*’ is included. The hypothesis for this interaction term is as follows. Other things being equal, the managers of the firm in a riskier position would have relatively less incentives to increase risk when they are offered ownership, because they would perceive that the expected cost or loss associated higher risk-taking (such as the loss of their jobs in the event of failure and acquiring bad reputation for their incompetent management abilities, and the loss of perquisite consumption) is fairly high, compared to the expected gain from the increased risk-taking. That is, the effectiveness of insider ownership would be less for the firms in higher-risk positions. Therefore, as the bank’s risk characteristic belongs to a higher risk category, the coefficient on the interaction term ‘*Insider ownership × Risk characteristic*’ would be more significantly negative.

As the bank’s risk characteristic variables, we use the nonperforming loans ratio, capital-to-asset ratio and the ratio of fixed asset to total asset. Other things being equal, higher nonperforming loan ratio represents a bad quality of loans, lower capital-to-asset ratio represents a higher possibility of bankruptcy, and higher ratio of fixed asset to total asset represents a higher operational leverage of the bank. Thus, higher nonperforming loans ratio, lower capital ratio, and higher fixed asset ratio represent higher risk categories. Based on the above intuition, the following tables summarize our main hypotheses.

Table 1. Hypothesis 1

Interaction variable	Dependent variable	Hypothesis
<i>Insider ownership × Nonperforming loan ratio</i>	Loan-to-asset ratio	$\beta_1 < 0$
<i>Insider ownership × Nonperforming loan ratio</i>	Investment securities-to-asset ratio	$\beta_1 > 0$
<i>Insider ownership × Nonperforming loan ratio</i>	Common stock-to-government bond ratio	$\beta_1 < 0$

Table 2. Hypothesis 2

Interaction variable	Dependent variable	Hypothesis
<i>Insider ownership × Capital-to-asset ratio</i>	Loan-to-asset ratio	$\beta_1 > 0$
<i>Insider ownership × Capital-to-asset ratio</i>	Investment securities-to-asset ratio	$\beta_1 < 0$
<i>Insider ownership × Capital-to-asset ratio</i>	Common stock-to-government bond ratio	$\beta_1 > 0$

Table 3. Hypothesis 3

Interaction variable	Dependent variable	Hypothesis
<i>Insider ownership</i> × <i>Fixed asset ratio</i>	Loan-to-asset ratio	$\beta_1 < 0$
<i>Insider ownership</i> × <i>Fixed asset ratio</i>	Investment securities-to-asset ratio	$\beta_1 > 0$
<i>Insider ownership</i> × <i>Fixed asset ratio</i>	Common stock-to-government bond ratio	$\beta_1 < 0$

As the control variables for bank risk-taking, we use the two very frequently used variables that are known to affect bank's risk-taking incentives in the literature; bank asset size and capital-to-asset ratio. The implication of the too-big-to-fail hypothesis and the moral hazard incentives of stockholders associated with limited liability under the protection of government's deposit insurance system expect the level of risk-taking to be positively related to the bank asset size and negatively related to the capital ratio of the bank. We use the bank's book value of capital-to-asset ratio because this is the leverage measure most commonly monitored by regulators.

#### 4. Empirical results

**4.1. Correlation test.** Before estimating the above panel regression model, we examine the correlation coefficients among the variables used in the study as a prerequisite test. Table 1 presents the Pearson correlation coefficients. Firstly, it is shown that the loan-to-asset ratio and the investment securities-to-asset ratio have a significantly positive and negative correlation with the insider ownership, respectively. Thus, as the insider ownership increases, the bank tends to increase riskier loans and decrease safer investment securities. This could be some evidence of the effectiveness of insider ownership in inducing the firm's managers to pursue more aggressive and riskier strategies. The ratio of common stock-to-government bonds has a positive correlation with insider ownership as expected. However, it is statistically significant. Regarding the control variables, the insider ownership has a positive correlation with capital ratio, and a negative correlation with the nonperforming loan ratio.

**4.2. Risk characteristic measured by the ratio of nonperforming loans to asset.** In the first estimation, the bank risk characteristic is measured by the nonperforming loan ratio. The greater the nonperforming loan ratio, the riskier the bank is. Therefore, the effectiveness of insider ownership in inducing the firm's manager to take on more risk that is hypothesized to be less as the nonperforming loan ratio gets higher. Thus, the coefficient on the interaction term '*Insider ownership* × *Risk characteristic*' is expected to be significantly negative for the risky dependent variable, and significantly positive for the safe dependent

variable, respectively. Table 3 shows the results for the three dependent variables; loan-to-asset ratio, investment securities-to-asset ratio, and the ratio of common stock-to-government bonds. The first part shows a significantly negative coefficient on the interaction term '*Insider ownership* × *Risk characteristic*' when the loan-to-asset ratio is used as the dependent variable. The second part shows a significantly positive coefficient on the interaction term when the investment securities-to-asset ratio is used as the dependent variable. The third part shows a negative coefficient on the interaction term as expected when the ratio of common stock-to-government bonds is used as the dependent variable, but it is not statistically significant. Therefore, as the insider ownership increases, the bank with higher nonperforming loan ratio increases risky dependent variable such as the ratio of common stock-to-government bonds significantly less, and increases safe dependent variable such as the ratio of investment securities significantly more than the banks with lower nonperforming loan ratio. These results indicate that the effectiveness of insider ownership on inducing the firm's manager to take on more risk, would be less for the higher risk category banks. The managers of the banks in these higher risk categories would presume that the expected benefit of increased risk taking from the insider ownership would be less than the expected cost associated with it. Therefore, the effectiveness of insider ownership would be weaker than otherwise.

**4.3. Risk characteristic measured by the capital-to-asset ratio.** In this section, the bank risk characteristic is measured by the capital-to-asset ratio. The lower the capital ratio, the riskier the bank is. Therefore, the effectiveness of insider ownership is hypothesized to be less as the capital ratio gets lower. Thus, unlike the risk characteristic variable (nonperforming loan ratio) in 4.2, the coefficient on the interaction term '*Insider ownership* × *Risk characteristic*' in this case is expected to be significantly positive for the risky dependent variable, and significantly negative for the safe dependent variable, respectively. Table 4 shows the results for the three dependent variables; loan-to-asset ratio, investment securities-to-asset ratio, and the ratio of common stock-to-government bonds. The first part shows a significantly positive coefficient on the interaction term '*Insider ownership* × *Risk characteristic*' when the loan-to-asset ratio is used as the dependent variable. The second part shows a significantly negative coefficient on the interaction term when the investment securities-to-asset ratio is used as the dependent variable. The third part shows a significantly positive coefficient on the interaction term when the ratio of common stock-to-government bonds is used as the dependent variable. As in the results for 4.2,

all of these represent very strong results that the effectiveness of insider ownership on inducing the firm's manager to take on more risk would be greater (less) for the safer (higher risk) category banks.

**4.4. Risk characteristic measured by the ratio of fixed asset to total asset.** In this section, the bank risk characteristic is measured by the ratio of fixed asset to total asset. The fixed asset ratio is a very frequently used variable for the firm's operational leverage. The greater the fixed asset ratio, the riskier the bank is. Therefore, the effectiveness of insider ownership is hypothesized to be less as the fixed asset ratio gets higher. Thus, as in 4.2, the coefficient on the interaction term is expected to be significantly negative for the risky dependent variable, and significantly positive for the safe dependent variable, respectively. Table 5 shows the results for the three dependent variables. The first part shows a significantly negative coefficient on the interaction term when the loan-to-asset ratio is used as the dependent variable. The second part shows a significantly positive coefficient on the interaction term when the investment securities-to-asset ratio is used as the dependent variable. The result in the third part is not significant when the ratio of common stock-to-government bonds is used as the dependent variable. These results indicate that the effectiveness of insider ownership would be less for the higher risk category banks.

Overall, from the results in Tables 3-5 (in Appendix), we find very strong and consistent evidences supporting our presumptions that effectiveness of insider ownership in inducing the bank's managers to take on more risk is weaker as the current exposure to risk is higher (with higher nonperforming loan ratio, lower capital ratio, and higher fixed asset ratio). It would be obvious that the cost of insider ownership borne by the managers in these positions would be relatively high compared to the gains or benefits from it. This result implies that not only the level of insider managerial ownership but also the level of current exposure to risk of the firm needs to be considered as another very important factor to reduce agency problem caused by the conflict of interest between stockholders and managers and to increase firm value.

**4.5. Profitability test.** To examine how the different responses in risk-taking behavior between higher and lower risk category banks associated with insider ownership result in different profitability between the two groups, we estimate the above panel regression by using the ROA (return on asset) as the dependent variable. As shown in Table 6 (in Appendix), the coefficient is significantly negative on the interaction term '*Insider ownership* × *Nonperform-*

*ing loan ratio*' and '*Insider ownership* × *Fixed asset ratio*', and significantly positive on the term '*Insider ownership* × *Capital-to-asset*'. This lower profitability of higher risk category banks (higher nonperforming loan ratio, lower capital ratio and higher fixed asset ratio) is believed to be resulted from the less aggressive and less risky strategies of these characteristic banks associated with the increase in insider ownership compared to safer characteristic banks.

### Concluding remarks

This paper examines how the effectiveness of insider ownership in inducing the managers of the banks to take on riskier strategies, and therefore, aligning the interests of managers with those of outside stockholders is related to the degree of the firm's current exposure to risk. Using the panel regression analysis of Korean banking industry over the period of 2000-2008, we find very consistent and strong evidences that the effectiveness of insider ownership in inducing the managers of the banks to take on riskier strategies is stronger when the bank's current exposure to risk or risk characteristic is lower (the bank belongs to lower risk category groups). These findings are intuitively clear considering that for the managers of the banks in safer positions, the expected gain of increased risk taking from the insider ownership would be greater than the expected cost associated with it such as the loss of their jobs from failure and acquiring bad reputation for their incompetent management abilities, and the loss of perquisite consumption. These results could be interpreted as a consistent one with some of the previous studies such as Saunders, Strock and Travlos (1990), and Cebenoyan, Cooperman and Register (1999) that examined the interaction relationship between the effectiveness of insider ownership and regulatory regimes. Their finding was that insider ownership has a more powerful effect on the risk-taking behavior of banks during the periods of loose regulation relative to the periods of tight regulation. Generally, during the periods of loose regulation, banking industry that is closely controlled and regulated by the government would have lower possibility of failure. Thus, the managers of the banks perceiving lower probability of failure and less risk under these circumstances would have sufficient incentives to align their interests to more aggressive stockholders by increasing risk when they are provided ownership.

The findings in this paper suggest the effectiveness of insider ownership in aligning the interests of managers and outside stockholders could be understood in terms of cost-benefit relationship associated with insider ownership. This paper finds a very strong and consistent evidence that the greater the risk, the greater the cost relative to benefit will be.

Not only the level of insider managerial ownership but also the level of current exposure to risk of the firm needs to be considered as another very important factor to reduce agency problem caused by the conflict of interest between stockholders and managers and to increase firm value.

### Limitations of the study and the suggestions for further study

This paper uses the balance sheet data of banking industry to examine the effectiveness of insider ownership in reducing agency problem of the firm. The main reason is that, unlike most other types of industries, banking industry is very tightly controlled and monitored by the financial supervi-

sor or government, and balance sheet data most frequently examined by the financial supervisor to determine the bank's riskiness or financial healthiness. But, considering that stock market is very efficient in capturing the ongoing profitability and riskiness of the firm, it would be very interesting to extend the data set to stock market variables and compare the results with those in this study. Also, it would be worthy of extending some similar hypotheses of this study to the firms in the other industries to derive more rigorous and meaningful implications to find the effective ways to decrease agency problems. In this case, we presume that using stock market data would be more appropriate rather than using balance sheet data as in this paper.

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## Appendix

Table 1. Sample descriptive statistics

	Mean	Median	Standard deviation
Loan-to-asset	0.53	0.54	0.0773
Investment securities-to-asset	0.25	0.23	0.0653
Common stock-to-government bonds	0.36	0.16	0.4784
Insider ownership	0.09	0.10	0.0041
Asset	614,874	441,055	653,210
Nonperforming loan ratio	2.3	1.3	2.8
Capital-to-asset	0.047	0.046	0.0115
Fixed asset-to-asset	0.33	0.28	0.1730
ROA (return on asset)	0.53	0.79	0.9573

Notes: This table shows the sample descriptive statistics for the sample banks for the period of 2000-2008.

Table 2. Correlations

	<i>IO</i>	<i>LOAN</i>	<i>INV</i>	<i>ST/GB</i>	<i>AST</i>	<i>CAP</i>	<i>NPL</i>	<i>FIXED</i>	<i>ROA</i>
<i>IO</i>	1								
<i>LOAN</i>	0.262	1							
<i>INV</i>	-0.165	-0.643	1						
<i>ST/GB</i>	0.007	0.052	-0.293	1					
<i>AST</i>	-0.066	0.160	-0.433	0.336	1				
<i>CAP</i>	0.334	0.384	-0.480	0.359	0.323	1			
<i>NPL</i>	-0.163	-0.401	0.400	-0.224	-0.189	-0.437	1		
<i>FIXED</i>	-0.014	-0.273	0.422	-0.315	-0.465	-0.597	0.589	1	
<i>ROA</i>	0.170	0.221	-0.189	0.254	0.166	0.560	-0.690	-0.522	1

Notes: This table shows the Pearson correlations for the sample banks for the period of 2000-2008. *IO* is the insider ownership; *LOAN* is the loan-to-asset; *INV* is the investment securities-to-asset; *ST/GB* is the common stock-to-government bonds; *AST* is the asset size; *CAP* is the capital-to-asset; *NPL* is the nonperforming loan ratio; *FIXED* is the fixed asset-to-asset; *ROA* is the return on asset.

Table 3. Panel regression results

$(Ex\text{-}ante\ risk)_{i,t} = \beta_0 + \beta_1 (Insider\ ownership \times Risk\ characteristic)_{i,t} + \beta_2 \times (Log\ asset)_{i,t} + \beta_3 (Capital\ ratio)_{i,t} + \beta_4 \times (National\ dummy)_{i,t} + \varepsilon_{i,t}$ .

This table shows the panel regression results for the case where the bank's risk characteristic is measured by the nonperforming loan ratio. \*, \*\*, \*\*\* indicate statistical significance at the 10%, 5%, or 1% level, respectively.

Dependent variable: Loan-to-asset ratio			
	Coefficient	Standard error	t-value
Intercept	0.451 ***	0.100	4.515
<i>Insider ownership</i> × <i>Nonperforming loan ratio</i>	-0.006 ***	0.002	-2.542
Log asset	0.002	0.008	0.243
Capital ratio	2.084 ***	0.563	3.697
National dummy	-0.054 **	0.022	-2.466
R <sup>2</sup>	0.31		
Number of observations	127		
F-value	13.81		
Dependent variable: Investment securities-to-asset ratio			
	Coefficient	Standard error	t-value
Intercept	0.251 ***	0.085	2.939
<i>Insider ownership</i> × <i>Nonperforming loan ratio</i>	0.006 ***	0.002	3.139
Log asset	0.007	0.007	1.042
Capital ratio	-2.113 ***	0.482	-4.382
National dummy	-0.032 *	0.018	-1.697
R <sup>2</sup>	0.30		
Number of observations	127		
F-value	12.81		
Dependent variable: Common stock-to-government bonds ratio			
	Coefficient	Standard error	t-value
Intercept	-1.259 *	0.663	-1.899

Table 3 (cont.). Panel regression results

Dependent variable: Loan-to-asset ratio			
	Coefficient	Standard error	t-value
<i>Insider ownership</i> × <i>Nonperforming loan ratio</i>	-0.012	0.016	-0.724
Log asset	0.086	0.056	1.543
Capital ratio	11.153 ***	3.737	2.984
National dummy	0.047	0.146	0.326
R <sup>2</sup>	0.21		
Number of observations	127		
F-value	8.16		

Table 4. Panel regression results

$(Ex\text{-}ante\ risk)_{i,t} = \beta_0 + \beta_1 (Insider\ ownership \times Risk\ characteristic)_{i,t} + \beta_2 \times (Log\ asset)_{i,t} + \beta_3 (Capital\ ratio)_{i,t} + \beta_4 \times (National\ dummy)_{i,t} + \varepsilon_{i,t}$ . This table shows the panel regression results for the case where the bank's risk characteristic is measured by the capital-to-asset ratio. \*, \*\*, \*\*\* indicate statistical significance at the 10%, 5%, or 1% level, respectively.

Dependent variable: Loan-to-asset ratio			
	Coefficient	Standard error	t-value
Intercept	0.325 ***	0.088	3.672
<i>Insider ownership</i> × <i>Capital-to-asset</i>	2.510 ***	0.514	4.882
Log asset	0.010	0.008	1.286
National dummy	-0.073 ***	0.020	-3.517
R <sup>2</sup>	0.28		
Number of observations	127		
F-value	15.72		
Dependent variable: Investment securities-to-asset ratio			
	Coefficient	Standard error	t-value
Intercept	0.385 ***	0.076	5.020
<i>Insider ownership</i> × <i>Capital-to-asset</i>	-2.568 ***	0.445	-5.771
Log asset	-0.001	0.006	-0.164
National dummy	-0.011	0.018	-0.636
R <sup>2</sup>	0.24		
Number of observations	127		
F-value	13.09		
Dependent variable: Common stock-to-government bonds ratio			
	Coefficient	Standard error	t-value
Intercept	-1.498 ***	0.574	-2.607
<i>Insider ownership</i> × <i>Capital-to-asset</i>	11.484 ***	3.336	3.442
Log asset	0.104 **	0.051	2.001
National dummy	0.013	0.136	0.097
R <sup>2</sup>	0.21		
Number of observations	127		
F-value	10.62		

Table 5. Panel regression results

$(Ex\text{-}ante\ Risk)_{i,t} = \beta_0 + \beta_1 (Insider\ ownership \times Risk\ characteristic)_{i,t} + \beta_2 \times (Log\ Asset)_{i,t} + \beta_3 (Capital\ ratio)_{i,t} + \beta_4 \times (National\ dummy)_{i,t} + \varepsilon_{i,t}$ . This table shows the panel regression results for the case where the bank's risk characteristic is measured by the ratio of fixed asset to total asset. \*, \*\*, \*\*\* indicate statistical significance at the 10%, 5%, or 1% level, respectively.

Dependent variable: Loan-to-asset ratio			
	Coefficient	Standard error	t-value
Intercept	0.457 ***	0.117	3.907
<i>Insider ownership</i> × <i>Fixed asset ratio</i>	-0.0008 *	0.0004	-1.713
Log asset	0.003	0.008	0.377
Capital ratio	2.045 ***	0.624	3.276
National dummy	-0.068 ***	0.021	-3.242
R <sup>2</sup>	0.29		
Number of observations	127		
F-value	12.59		

Table 5 (cont.). Panel regression results

Dependent variable: Investment securities-to-asset ratio			
	Coefficient	Standard error	t-value
Intercept	0.248 **	0.101	2.457
<i>Insider ownership</i> × <i>Fixed asset ratio</i>	0.0009 **	0.0004	2.059
Log asset	0.006	0.007	0.792
Capital ratio	-2.083 ***	0.538	-3.872
National dummy	-0.016	0.018	-0.931
R <sup>2</sup>	0.26		
Number of observations	127		
F-value	10.96		
Dependent variable: Common stock-to-Government bonds ratio			
	Coefficient	Standard error	t-value
Intercept	-1.524 **	0.767	-1.986
<i>Insider ownership</i> × <i>Fixed asset ratio</i>	0.0002	0.003	0.049
Log asset	0.101 *	0.058	1.768
Capital ratio	12.236 ***	4.089	2.992
National dummy	0.007	0.138	0.052
R <sup>2</sup>	0.21		
Number of observations	127		
F-value	7.99		

Table 6. Panel regression results

$$(ROA)_{i,t} = \beta_0 + \beta_1 (\text{Insider ownership} \times \text{Risk characteristic})_{i,t} + \beta_2 \times (\text{Log asset})_{i,t} + \beta_3 (\text{Capital ratio})_{i,t} + \beta_4 \times (\text{National dummy})_{i,t} + \varepsilon_{i,t}.$$

This table shows the panel regression results on the *ROA* for the three risk characteristic variables, respectively. \*, \*\*, \*\*\* indicate statistical significance at the 10%, 5%, or 1% level, respectively.

	Coefficient	Standard error	t-value
Intercept	-0.620	1.002	-0.619
<i>Insider ownership</i> × <i>Nonperforming loans</i>	-1.875 ***	0.255	-7.353
Log asset	0.025	0.084	0.297
Capital ratio	27.284 ***	5.646	4.832
National dummy	-0.032	0.221	-0.146
R <sup>2</sup>	0.55		
Number of observations	127		
F-value	37.60		
	Coefficient	Standard error	t-value
Intercept	-4.285 ***	1.045	-4.100
<i>Insider ownership</i> × <i>Capital-to-asset</i>	399.432 ***	60.657	6.585
Log asset	0.262 ***	0.094	2.779
National dummy	-0.616 ***	0.247	-2.491
R <sup>2</sup>	0.35		
Number of observations	127		
F-value	21.80		
	Coefficient	Standard error	t-value
Intercept	-1.967	1.352	-1.454
<i>Insider ownership</i> × <i>Fixed asset ratio</i>	-0.146 ***	0.056	-2.597
Log asset	0.137	0.103	1.346
Capital ratio	32.534 ***	7.209	4.512
National dummy	-0.517 **	0.244	-2.116
R <sup>2</sup>	0.39		
Number of observations	127		
F-value	19.30		