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REGULATION, SIZE AND CHANGING INCENTIVES OF BANKS: STOCK MARKET-BASED APPROACH

This paper empirically examines the relationship between banking industry's regulation, bank asset size and risk-taking incentives in Korean banking industry. By partitioning the whole sample period (1994-2008) into 3 subperiods based on the degree of banking industry's regulations and employing stock market-derived measures as banks' ex-ante risk-taking incentives, we investigate whether larger banks have greater risk-taking incentives than smaller ones. Overall, we found that larger banks had greater risk-taking incentives than smaller ones. More importantly, we found that larger banks concentrate on systematic, market-related risk-taking when banking regulations are loose, however, they appear to change their risk-taking strategies into increasing more non-market related, firm specific risk-taking when regulations become tightened.

Keywords: *regulation; bank asset size; ex-ante risk-taking incentives; fixed effect model; random effect model.*

Сйок Вон Лі

РЕГУЛЮВАННЯ, РОЗМІР І СТИМУЛЮВАННЯ ЗМІН У БАНКАХ: БІРЖОВИЙ ПІДХІД

У статті емпірично досліджено залежність між регулюванням банківської галузі, розміром банківських активів і стимулами до ризиків у корейській банківській сфері. Досліджено стимули до ризиків у великих банках у порівнянні з малими шляхом розділення всього оглядового періоду (1994-2008) на три підперіоди на основі рівня банківського регулювання і вживання біржових заходів як передбачуваних стимулів до ризиків. У цілому, стимулів до ризиків у великих банків більше, ніж у малих. До того ж, великі банки зосереджені на систематичному, ринковому прийнятті ризиків у тому випадку, коли регулювання банківської сфери ослаблене. Якщо воно посилюється, то банки змінюють стратегії ризиків на менш пов'язані з ринком, орієнтовані на фірми.

Ключові слова: *регулювання; розмір банківських активів; передбачувані стимули до ризиків; модель із фіксованими ефектами; модель із випадковими ефектами.*

Сйок Вон Ли

РЕГУЛИРОВАНИЕ, РАЗМЕР И СТИМУЛИРОВАНИЕ ИЗМЕНЕНИЙ В БАНКАХ: БИРЖЕВОЙ ПОДХОД

В статье эмпирически исследуется зависимость между регулированием банковской отрасли, размером банковских активов и стимулами к рискам в корейской банковской сфере. Исследованы стимулы к рискам в крупных банках по сравнению с малыми путем разделения всего обзорного периода (1994-2008) на три подпериода на основе уровня банковского регулирования и применения биржевых мер в качестве предполагаемых стимулов к рискам. В целом, стимулов к рискам у крупных банков больше, чем у малых. К тому же, крупные банки сосредоточены на систематическом, рыночном принятии рисков в том случае, когда регулирование банковской сферы ослаблено, если оно ужесточается, то банки изменяют стратегии риска на менее связанные с рынком, ориентированные на фирмы.

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Ключевые слова: *регулирование; размер банковских активов; предполагаемые стимулы к рискам; модель с фиксированными эффектами; модель со случайными эффектами.*

1. Introduction. It may be generally agreed by the researchers in banking literature that the probability of bankruptcy would be lower for larger banks than smaller ones due to several reasons. Investors would believe that government and bank regulator tend to be very reluctant to let large banks to be bankrupt because the bankruptcy of large banks could cause a big damage to the entire economy. Instead, when large banks are getting riskier and insolvent, bank regulator tends to let them remain open in the hope that things would eventually turn out all right practicing what is called "forbearance policy". Also, larger banks are expected to hold better diversified asset and liability portfolios than smaller ones, and therefore, they are better protected from the uncertainties and fluctuations associated with economic shocks. Furthermore, larger banks could realize an advantage of lower cost of funds over smaller banks in various aspects of their business because they have better capacity and resources to attract large amount of funds at lower interest rates from investors, and also, they have better ability to operate with less equity capital (more debt) which would result in lower cost of funds.

Despite the above implications from banking literature and the practices prevailing in real banking market, it is very questionable whether larger banks have truly lower probability of bankruptcy and pursue safer strategies than smaller ones. Some researchers found opposite evidence that larger banks appear to take the above-mentioned advantages to pursue riskier strategies than smaller banks, and it is doubtful whether larger banks are truly safer. They argue that larger banks tend to connect the advantages of better diversification and weaker monitoring pressures from depositors and investors to greater risk-taking. Demsetz and Strahan (1997) found that larger banks do not translate the advantage of their better asset portfolio's diversification into less risk but pursue riskier strategies with lower capital ratios than smaller ones. Akhavein, Berger and Humphrey (1997) found that main motivation for bank mergers is profit enhancement expected from larger banks' riskier strategies. Saunders, Strock and Travlos (1990) found a positive relationship between bank asset size and risk-taking measured by the systematic risk of stock returns. Liang and Stephen (1991) also found a negative relationship between bank asset size and capital-to-asset ratio, interpreting this result as a positive association between asset size and risk-taking.

Furthermore, deposit insurance system and forbearance policy by a banking regulator are ready to back up the banking industry, and therefore, investors may not have great incentives to monitor the behavior of large banks. Depositors and investors view their deposits as virtually riskless and do not require higher deposit interest rates on their deposits. That is, traditional market discipline of risk-high cost relationship may not be an effective restraint for large banks' risk-taking behavior.

In this study, we empirically examine the relationship between bank asset size and risk-taking incentives by employing the recent Korean banking industry's data, and investigate whether larger banks have greater risk-taking incentives than smaller ones. This study adds two important contributions to the previous studies. First, it examines how banks' risk-taking behavior associated with asset size is affected by dif-

ferent degree of regulation of banking industry. We partition the whole sample period 1994-2008 into 3 subperiods (1994-1997, 1998-2002 and 2003-2008) basing on the degree of regulations in Korean banking industry, and examine the interaction effects between the above issues and regulatory regimes[2]. It could be presumed that the incentives and abilities of larger banks for greater risk-taking and higher profit, if any, would be maximized in the periods of loose regulations and regulatory forbearance. It was empirically observed by some researchers such as Saunders, Strock and Travlos (1990), and Cebenoyan, Cooperman and Register (1999) that banks tend to pursue riskier strategies during the periods of deregulation. Secondly, unlike most previous studies, this study focuses on evaluating banks' ex-ante risk-taking incentives based on various stock market-derived variables. Specifically, based on portfolio theory in finance, we examine the above issues by decomposing the measure of banks' total risk-taking incentives into two components: market-related (systematic) risk-taking incentives and non-market-related (firm specific or unsystematic) incentives to find some important policy implications for the soundness of the banking industry. Finally, to evaluate the performance of risk-taking behavior of larger banks, we compare the relationship between risk-taking and profitability between larger and smaller banks.

II. Sample, data and summary statistics. The sample of this study consists of all the commercial banks in Korea from 1994 to 2008. Both stock price and balance sheet data are used for empirical analysis. Balance sheet data are obtained from the Statistics of Bank Management published by the Korean Financial Supervisory Service. Stock return data are obtained from the Korea Securities Research Institute-Stock database (KSRI-SD). The sample consists of 24 banks in 1994, 25 banks in 1995 and 1996, 26 banks in 1997, 20 banks in 1998, 17 banks in 1999 and 2000, 15 banks in 2001, 14 banks from 2002 to 2005, and 13 banks afterwards. All the balance sheet variables are year-end values. Stock return data are used to derive 3 ex-ante risk measures (total risk, systematic risk and unsystematic risk) for each bank. We use 4th quarter's daily stock returns to calculate these 3 risk measures.

The summary statistics are presented in Table 1. Average asset size is 405,710 mln won. Capital-to-asset ratio averages 4.6%. The ratio of fixed asset to-total asset averages 4.63%. Charter value measured by the ratio of 4th quarter's market value to book value of shares averages 1.03. Loan-to-asset ratio averages 47%. The ratio of commercial loans-to-total loans averages 49.9%. The ratio of consumer loans-to-total loans averages 24.5%. ROA (return on asset) averages -0.19. Total risk measured by the standard deviation of daily stock returns averages 8.51%. Market-related or systematic risk measured by the slope (beta) coefficient of the market model regression

[2] To promote the efficiency, competitiveness, and global standards of banking, Korean government removed the restrictions on various types of activities and operations such as establishment and reorganization of banks, interest rate control, inflow of foreign funds into domestic financial market etc., and carried out significant deregulatory policies from the early 1990s. However, Korean banking industry underwent severe financial crisis from the end of 1997. It is agreed that the financial crisis and failure of Korean banking industry in 1997 are attributed to the moral hazard incentives of banks caused by significant deregulations prevailing in banking from the early of 1990s, fixed-rate deposit insurance system introduced in the mid 1990s, and the implicit forbearance policy regarding bank closure etc. To strengthen financial health and reorganize the entire banking system, Korean government made substantial regulatory reforms 1998 through the early of 2000s. The main regulatory reforms enforced with the Core Principles for Effective Banking Supervision of December 1997 included stricter BIS (Bank for International Settlement) capital standards, Prompt Corrective Actions, and the change of deposit insurance system into partial and gradually risk-based deposit insurance system etc.

averages 0.9673. Unsystematic or firm-specific risk measured by the variance of the residuals of the market model regression averages 5.27%. In measuring both systematic and unsystematic risks, KOSPI (Korean Stock Price Index) is used as the market portfolio.

III. Testable Hypotheses and Testing Models. To examine the relationship between bank asset size, regulatory regimes and risk-taking incentives, we estimate the following panel regression equation (1) over 3 different subperiods (1994-1997, 1998-2002, 2003-2008). We define the 1994-1997 as a loose regulation period (prefinancial crisis period), 1998-2002 as the period of regulatory reforms or tightened regulation period to overcome the Asian financial crisis, and finally 2003-2008 is the post-financial crisis period when the banking regulations started getting a bit looser to recover the efficiency of the banking system.

We pool the cross-sectional and time-series data of the sample banks and estimate fixed effects regression equation. Fixed effects specification avoids a potential omitted variable problem that could occur when the individual-specific component of the error term is correlated with the regressors in the model such as in the above estimation, and simple OLS regression is estimated without remedying the omitted variable problem[3]. Fixed-effects regression technique is known to generate unbiased estimates in this case.

$$(\text{Risk-taking incentives})_{i,t} = \beta_0 + \beta_1 (\text{Log Asset})_{i,t} + \beta_2 (\text{Capital-to-asset})_{i,t} + \beta_3 (\text{Fixed asset})_{i,t} + \beta_4 (\text{Charter value})_{i,t} + \beta_5 (\text{GDP growth})_{i,t} + \varepsilon_{i,t} \quad (1)$$

The 3 main dependent variables for bank's ex-ante risk-taking incentives are measured from the banks' daily stock price movements. They are total risk, systematic risk and unsystematic risk. Total risk is measured by the standard deviation of daily stock returns. Systematic and unsystematic risks are estimated from the one factor market model regression using the 4th quarter daily stock returns, with market portfolio represented by the KOSPI (Korean stock price index). Systematic risk is measured by the slope coefficient, and unsystematic risk is measured by the variance of the residuals of the market model regression, respectively. We believe that stock market is very efficient, and therefore, it can capture and reflect ongoing ex-ante risk-taking incentives of firms most accurately.

In addition to bank asset size as the main explanatory variable, we include capital-to-asset ratio, fixed asset ratio and charter value as the control variables. We include GDP growth rate to control for the impact of economic conditions on the banks' risk-taking incentives. Capital-to-asset ratio and fixed asset ratio are used to represent the effect of financial and operational leverages on the bank risk-taking incentives, respectively. It is generally agreed that the higher the financial and operational leverage, the greater risk-taking incentive the firm would have to maximize the potential upward gain from risk-taking. Thus, the greater the financial leverage, i.e., the lower the capital-to-asset ratio, the greater the risk-taking incentives will be. Thus, a negative coefficient is expected on capital-to-asset ratio. McKenzie, Cole

[3] Either fixed effects or random 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. Random effects model is appropriate to control for time-invariant bank-specific factors relating to risk. We have estimated random effect regression, too. The results are nearly the same as those from fixed effect regression, and are available from the author.

and Brown (1992) found that the thrift with lower capital ratio undertook the projects with lower NPV (net present value) to maximize profits. Demsetz and Strahan (1997) also found a negative relationship between capital ratio and risk-taking measured by the standard deviation of stock returns. Similarly, the greater the operational leverage, i.e., the greater the fixed asset ratio, the greater the risk-taking incentives will be. Thus, a positive coefficient is expected on the fixed asset ratio. Charter value is measured by the ratio of market value to book value of shares. Charter value capturing the economic value of future growth opportunity is lost if a bank is declared insolvent. Therefore, a bank with a high charter value will have incentives to avoid riskier strategies. Thus, a negative coefficient is expected on charter value. Keeley (1990) argued that increased competition in the US banking industry in the late 1980s reduced the charter value of banks, and this is the main cause of the banks' great risk-taking incentives. He found a positive relationship between charter value and capital-to-asset ratio, and interpreted this as a negative relationship between charter value and risk-taking. Galloway, Lee and Roden (1997) found a significantly negative relationship between charter value and risk-taking incentives measured by standard deviation of stock returns.

IV. Results for Empirical Analysis.

4.1. Results for risk-taking behavior. Table 2 presents the results for the fixed panel regression analysis over the periods of 3 different regulatory regimes with the dependent variable measured as the bank total risk. It is shown that the coefficient on asset size is positive at the 1% significance level during 1994-1997 indicating that Korean banks had great incentives to take more risk as the bank asset size increases when banking regulation is very loose. However, over the period 1998-2002 when banking regulation was tightened, this phenomenon disappeared. Over the period of post-financial crisis (2003-2008), after the banks have adjusted to new banking regulatory regime and environment through financial crisis, this tendency seems to have reoccurred, however, the magnitude and level of significance of the coefficient were weaker.

As for the control variables, both capital-to-asset ratio and charter value are significantly negative as expected under loose regulation. However, over the 1998-2002 period, capital-to-asset ratio has a significantly positive coefficient. This result is understandable because the primary target of imposing stricter regulations to overcome financial crisis was on strengthening banks' capital. Thus, the banks with lower capital ratio had to decrease their risk substantially. Over the period of post financial crisis, the coefficient is still positive, however, not significant. Charter value is insignificant, too, after the financial crisis period. The fixed asset ratio is insignificant throughout the whole periods.

In Tables 3 and 4, we decompose the total risk into systematic and unsystematic risk, and examine the above issues. Most interestingly, it is shown that the coefficient on asset size is significantly positive only for the systematic risk-taking during the period of loose regulation (1994-1997). It is insignificant for the unsystematic risk-taking incentives. This result indicates that the banks had great incentives to pursue especially market-related risk-taking strategies to maximize profit when banking regulation is loose. Based on the portfolio theory in finance, only systematic risk is related to expecting more profit, and therefore, systematic risk

may be a more germane risk measure to the fundamental ideas of the study examined.

However, over the 2003-2008 period after the regulation became tightened, the coefficient on asset size with respect to the systematic risk-taking incentives is no more significantly positive. Instead, asset size becomes significantly positive with respect to the unsystematic risk-taking incentives after financial crisis. Overall, these results indicate that when banking regulations are loose, large banks concentrate on systematic, market-related risk-taking, however, when regulations become tight, they tend to change their risk-taking behavior into increasing more non-market related, firm specific risk-taking strategies. This result suggests that banks, especially large ones, may assume that the bank regulator is likely to monitor banks' systematic risk-taking behavior more closely, and that higher explicit and implicit costs would be imposed on greater systematic risk-taking behavior. Thus, under a tight regulatory regime, to avoid higher regulatory costs, large banks would decrease systematic risk-taking significantly, however, they intend to shift the costs of decrease in systematic risk-taking into taking more non-market related firm-specific risk and try to compensate for the loss of expected profit. This change in the pattern of risk-taking incentives of large banks may provide a very important policy implication to bank regulator in terms of maintaining a safe and sound banking environment. Unlike capital market investors who can diversify and virtually eliminate unsystematic risks away by holding well-diversified portfolios, the probability of bankruptcy of individual banks, and therefore, ultimately that of the entire banking system, would get equally higher even with the increase of unsystematic risk-taking as well as systematic risk-taking. Thus, to maintain a safe and sound banking system, bank regulator may need to develop very comprehensive monitoring schemes evaluating and pricing both market and non-market-related risk-taking behavior of large banks effectively and accurately.

4.2. Results for profitability. In this section, to evaluate the performance of the risk-taking behavior of banks associated with asset size, we employ the ROA (return on asset) as the dependent variable of the above panel regression equation (1), and estimate the relationship between asset size and performance. Table 5 shows that during the period of 1994-1997, asset size and ROA are in an insignificant relationship. Combined with the results found in the previous sections, this result represents that when banking regulation is loose, large banks take significantly greater market-related risk, however, this did not contribute to greater profit at all. This could be interpreted as some evidence for larger banks' moral-hazard incentives for (especially market-related) risk-taking under loose banking regulations. After banking regulations became tight during 2003-2008, asset size and ROA turn to a positive sign, however, it is still insignificant.

4.3. Policy implication from the empirical results. Overall, the results in Tables 2 through 5 represent that large banks in Korean banking industry appear to have greater risk-taking incentives than smaller ones. More specifically, they have greater systematic (unsystematic) risk-taking incentives than smaller banks when banking regulations are loose (tight). However, none of these is related to better performance. From these findings, we suggest the following policy implications for the soundness and profitability of banking industry. Large banks might have greater risk-taking incentives by

nature to maximize profit by taking various advantages they have over small banks. Moreover, these days, bank regulators seem to have the tendency to let risky and failing institutions to be acquired by larger ones rather than letting them go out of the industry. In the recent banking practice of, especially after the financial crisis of many Asian countries in the late 1990s, consolidation and M&A (merger and acquisition) between riskier and safer banks seem to be recognized by bank regulator as one of the most efficient and effective ways to resolve the problem and to maintain the soundness of banking. Theoretically and politically, formation of super-size banks is becoming the most appealing policy and trend for bank regulators. Even market investors and banks themselves that believe that increase of asset size would be the easiest and most efficient way to capture larger market share and expect more profits may view such policy and trend as the most appropriate and effective strategy to make a stable and sound banking system. However, as presumed by some previous researchers and supported by additional findings in this study, if the increase of bank asset size is associated with perverse risk-taking incentives (moral-hazard incentives), the above regulatory approach and strategy may not ultimately contribute to stable and safe banking environment. Greater risk-taking incentives of larger banks, if they are not carefully designed and properly monitored by regulator, could just end up with making banking industry more insecure, uncertain and less profitable. More specifically, this study suggests that bank regulator needs to examine banks' market-related risk-taking behavior more closely when regulations are loose, and non-market-related risk-taking behavior as well when regulations are tight.

4.4. Robustness test. We perform robustness test by using more balance sheet variables for risk-taking; the ratio of total loans to total asset, the ratio of commercial loans to total loans, and the ratio of consumer loans to total loans. These 3 variables would be considered to be consistent with our main dependent variables employed in the previous sections for risk-taking.

Loans are generally considered the riskiest category of the asset portfolio composition. A higher proportion of loans represents a higher degree of the bank-profit's exposure to future economic fluctuations, and therefore, generally represents a higher risk for a bank. In the actual calculation of risk-adjusted asset and BIS capital ratio, loans are assigned the highest risk weight. Thus, the ratio of loans to asset may be a good proxy for banks' total risk-taking incentives.

Among the various categories of loans, commercial loans may be interpreted as those that are very closely related to banks' systematic risk-taking behavior. The return on commercial loans is determined by performance of business sector, which is basically determined by economic conditions. Thus, the ratio of commercial loans to total loans may be a good proxy for the banks' systematic risk-taking incentives. On the other hand, the return on consumer loans may be relatively less dependent on economic conditions, and considered to be more stable source of profit for the banks than commercial loans. Thus, the ratio of consumer loans to total loans may be a good proxy for banks' unsystematic risk-taking incentives.

The empirical results are presented in Tables 6-8. It is shown in Tables 6 and 7 that the coefficient on asset size is positive at the 1% significance level during 1994-1997 for both the ratio of total loans to total asset and the ratio of commercial loans to total loans. It is not significant for the ratio of consumer loans to total loans. Thus,

Korean banks had great incentive to take more risk, especially systematic risk as the bank asset size increases when banking regulation is loose. These results are very consistent with our findings in the previous section. However, over the period 1998-2002 when banking regulation was tightened, this phenomenon disappeared. As shown in Tables 6 and 8, over the period of post-financial crisis (2003-2008), as it is consistent with our earlier finding, the tendency of larger banks to take more risk is observed only with respect to the ratio of total loans to total asset and the ratio of consumer loans to total loans, which is the measure of the banks' unsystematic risk-taking incentives, but not with respect to the ratio of commercial loans to total loans, which is the measure of the banks' systematic risk-taking incentives.

V. Concluding Comments. This paper empirically examines the relationship between banking industry's regulation, bank asset size and risk-taking incentives in Korean banking industry recently. By partitioning the whole sample period (1994-2008) into 3 subperiods based on the degree of banking industry's regulations and employing stock market-derived measures as banks' ex-ante risk-taking incentives, we investigate whether larger banks have greater risk-taking incentives than smaller ones. Overall, we found that larger banks had greater risk-taking incentives than smaller ones. More importantly, we found that larger banks concentrated on systematic, market-related risk-taking when banking regulations are loose, however, they appeared to change their risk-taking strategies into increasing more non-market related, firm specific risk-taking when regulations became tightened. This result may be interpreted as larger banks' change in risk-taking incentives to avoid higher regulatory costs under tightened regulations, shift the costs of decrease in systematic risk-taking and compensate for the loss of expected profit by taking more non-market related firm-specific risks. This change in the pattern of risk-taking of larger banks may suggest that bank regulator develop very comprehensive monitoring schemes evaluating and pricing both market and non-market-related risk-taking patterns of large banks effectively and accurately. More specifically, this study suggests that bank regulator needs to examine banks' market-related risk-taking behavior more closely when regulations are loose, and non-market-related risk-taking behavior as well when regulations are tight.

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Appendices:

In all the table one, two, or three asterisks indicate statistical significance at the 10, 5, or 1% significance level, respectively.

This table is the summary statistics for all the variables used in the study over the period of 1994-2008.

Table 1. **Sample descriptive statistics. The summary statistics for all the variables used in the study**

	Mean	Median	Standard deviation
Asset	405,710	212,141	516,384
Capital-to-asset	0.046	0.044	0.021
Fixed asset-to-asset	0.046	0.028	0.159
Charter value	1.032	0.897	0.024
Loan-to-asset	0.473	0.464	0.092
Commercial loans-to-total loans	0.499	0.495	0.136
Consumer loans-to-total loans	0.245	0.202	0.172
ROA	-0.19	0.37	1.98
Total risk (Standard deviation of stock returns)	0.085	0.068	0.043
Systematic risk (Beta coefficient of market model regression)	0.967	0.928	0.311
Unsystematic risk (Residual variance of market model regression)	0.052	0.053	0.039
Number of observations: 264			

This table shows the slope coefficients and t-statistics from the panel regression with the dependent variable measured as the bank total risk. One, two, or three asterisks indicate statistical significance at the 10, 5, or 1% significance level, respectively.

Table 2. **Fixed-effect panel regression results with the dependent variable measured as the bank total risk**

	1994-1997	1998-2002	2003-2008
Constant	0.5083*** (3.01)	0.2894** (2.48)	0.7826*** (3.92)
Log Asset	0.0023*** (3.21)	0.0018 (0.95)	0.0009* (1.66)
Capital-to-asset	-1.9838* (-1.64)	0.8269** (2.01)	0.5293 (1.20)
Fixed asset	0.0818 (0.38)	-0.1749 (-1.17)	-0.0203 (-0.94)
Charter value	-2.1928** (-1.95)	1.4829 (1.26)	-1.1184 (-1.04)
GDP growth	0.0028 (0.22)	-0.0016 (-0.89)	0.6729 (1.27)
F-statistics	15.87***	16.28***	13.29***
Adjusted R^2	0.22	0.21	0.25
Number of observations	100	83	81

This table shows the slope coefficients and t-statistics from panel regression with the dependent variable is the bank systematic risk.

Table 3. **Fixed-effect panel regression results the dependent variable is the bank systematic risk**

	1994-1997	1998-2002	2003-2008
Constant	0.0028* (1.69)	0.0382** (2.03)	0.0018 (0.29)
Log Asset	0.0013*** (2.72)	0.0005 (0.81)	0.0002 (1.11)
Capital-to-asset	-1.1975** (-2.01)	0.6926* (1.72)	0.2975 (1.10)
Fixed asset	0.0184 (0.07)	-0.2104 (-1.01)	-0.0861 (-0.49)
Charter value	-1.0582* (-1.85)	0.2959 (0.38)	-0.9927 (-1.14)
GDP growth	0.0102 (0.48)	0.0749 (0.86)	-0.0927 (-0.51)
F-statistics	9.27***	10.37***	8.28***
Adjusted R^2	0.19	0.21	0.20
Number of observations	100	83	81

This table shows the slope coefficients and t-statistics from the panel regression with the dependent variable — the bank unsystematic risk. One, two, or three asterisks indicate statistical significance at the 10, 5, or 1% significance level, respectively.

Table 4. **Fixed-effect panel regression results, the dependent variable — the bank unsystematic risk**

	1994-1997	1998-2002	2003-2008
Constant	0.0004 (0.28)	0.0001 (1.37)	0.0028 (0.92)
Log Asset	0.0002 (0.68)	-0.0001 (-0.59)	0.0294* (1.70)
Capital-to-asset	-0.0071 (-1.18)	-0.0101 (-0.94)	-0.0028 (-1.10)
Fixed asset	0.0091* (1.68)	0.0284 (1.54)	0.0328 (0.29)
Charter value	-0.0029* (-1.92)	0.0018 (0.57)	0.0104 (0.82)
GDP growth	0.0008 (0.91)	0.0028 (0.29)	0.0009 (0.19)
F-statistic	3.18**	5.28***	3.01**
Adjusted R^2	0.09	0.13	0.11
Number of observations	100	83	81

This table shows the slope coefficients and t-statistics from the panel regression with the dependent variable — ROA. One, two, or three asterisks indicate statistical significance at the 10, 5, or 1% significance level, respectively.

Table 5. **Fixed-effect panel regression results, the dependent variable — ROA**

	1994-1997	1998-2002	2003-2008
Constant	0.1935*** (3.18)	-0.2810* (-1.82)	0.1193* (1.64)
Log Asset	-0.0284 (-0.28)	-0.0007 (-0.52)	0.0847 (1.10)
Capital-to-asset	-0.1028 (-0.37)	1.0372** (2.01)	0.0284 (0.89)

The End of *Table 5*

	1994-1997	1998-2002	2003-2008
Fixed asset	-0.0927 (-1.28)	0.0028 (0.59)	0.1938* (1.81)
Charter value	-0.1074* (-1.68)	0.2083 (1.19)	0.5837 (0.92)
GDP growth	0.0128 (1.55)	0.0923* (1.66)	0.0284* (1.84)
F-statistic	7.17***	6.69***	6.25***
Adjusted R^2	0.26	0.31	0.27
Number of observations	100	83	81

This table shows the slope coefficients and t-statistics from panel regression with the dependent variable — bank loan-to-asset ratio. One, two, or three asterisks indicate statistical significance at the 10, 5, or 1% significance level, respectively.

Table 6. **Fixed-effect panel regression results, the dependent variable — bank loan-to-asset ratio**

	1994-1997	1998-2002	2003-2008
Constant	0.6298** (2.01)	0.4829*** (4.28)	0.5829** (1.92)
Log Asset	0.8474*** (5.28)	0.2840 (0.47)	0.6284** (1.99)
Capital-to-asset	-1.4780* (-1.69)	0.2947* (1.71)	-0.8956 (-1.29)
Fixed asset	0.3972 (0.11)	1.0937* (1.85)	0.2958 (1.42)
Charter value	-0.0198 (-1.29)	0.3746 (0.08)	0.9632* (1.67)
GDP growth	0.4972*** (3.11)	0.2984 (0.25)	0.7831* (1.86)
F-statistic	20.17***	18.83***	16.04***
Adjusted R^2	0.37	0.31	0.35
Number of observations	100	83	81

This table shows the slope coefficients and t-statistics from panel regression with the dependent variable — bank commercial loans-to-total loans ratio. One, two, or three asterisks indicate statistical significance at the 10, 5, or 1% significance level, respectively.

Table 7. **Fixed-effect panel regression results, the dependent variable — bank commercial loans-to-total loans ratio**

	1994-1997	1998-2002	2003-2008
Constant	0.3892** (3.19)	0.5728* (1.81)	0.2946 (1.59)
Log Asset	0.0428*** (4.08)	-0.0285 (-0.94)	0.0175 (0.68)
Capital-to-asset	0.2947 (1.22)	0.3728* (1.66)	0.3856 (1.58)
Fixed asset	0.0027 (0.44)	0.2849 (0.35)	-1.0345* (-1.80)
Charter value	0.2849 (1.12)	-0.2804 (-1.02)	0.2839* (1.78)
GDP growth	0.0221 (0.93)	0.1947 (1.20)	-0.0274 (-0.84)
F-statistic	17.03***	17.91***	16.71***
Adjusted R^2	0.28	0.19	0.22
Number of observations	100	83	81

This table shows the slope coefficients and t-statistics from panel regression with the dependent variable — bank consumer loans-to-total loans ratio. One, two, or three asterisks indicate statistical significance at the 10, 5, or 1% significance level, respectively.

Table 8. **Fixed-effect panel regression results, the dependent variable — bank consumer loans-to-total loans ratio**

	1994-1997	1998-2002	2003-2008
Constant	0.1103** (2.02)	0.3289** (1.92)	0.2937* (1.68)
Log Asset	-0.1846 (-0.82)	0.0837 (0.28)	0.0647** (1.97)
Capital-to-asset	-1.2381* (-1.81)	0.8292** (1.99)	0.2947 (0.33)
Fixed asset	0.0028 (1.10)	-0.1937 (-0.11)	0.7823 (0.98)
Charter value	0.1930 (1.18)	0.7823 (0.37)	-0.0273 (-0.22)
GDP growth	-0.1129 (-0.78)	0.7824 (1.02)	0.9023 (1.03)
F-statistic	10.82***	11.20***	15.83***
Adjusted R^2	0.15	0.21	0.19
Number of observations	100	83	81

Стаття надійшла до редакції 07.06.2012.