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Consolidation of Cooperative Banks (*Shinkin*) in Japan: Causes and Consequences

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Abstract

We investigate the motives and consequences of the consolidation of cooperative banks (*Shinkin*) in Japan during the period 1984-2002. Our major findings are as follows. First, acquiring banks and target banks were less profitable and less cost efficient than peers, though the acquiring banks were more profitable, cost efficient and larger than target banks. Second, acquiring banks improved cost efficiency after the consolidation. M&As also raised the loan interest rate and improved profitability particularly since the latter half of the 1990s. Nonetheless, the improvement of ROA after the merger was not sufficient to fill in the initial gap of the capital ratio between merging banks and peers, resulting in the deterioration of the capital ratio of consolidated banks relative to peers. These results are consistent both with the acquirer's value-maximizing motive and the regulators' bailout policy, though the M&As did not contribute to sufficiently stabilize the local banking system. Third, the consolidation tended to improve the profitability of merging banks when the difference in profitability and healthiness between acquiring banks and target banks were large, which is consistent with the relative efficiency hypothesis (e.g., Akhavein, Berger, and Humphrey, 1997).

Key Words: Bank Mergers, Efficiency, Stability, Japan

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1. Introduction

Mergers and acquisitions among financial institutions have been accelerating over the last two decades across the world. In the U.S., a large number of commercial and savings banks were taken over by other depository institutions during the 1980s and especially after restrictions on intrastate and interstate banking were removed by the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994. Recently, financial conglomerate have emerged through a series of M&As after restrictions on securities and insurance businesses by banks were lifted by Gramm-Leach-Bliley Financial Service Modernization Act. In Europe, the emergence of European Union in 1999 seems to have spurred consolidation of the financial services industry. In the crisis-hit Asian countries, foreign capital entry into the banking industry and government recapitalization promoted bank consolidation. In Japan, a variety of banks were merged during the 1990s when most banks suffered from a huge amount of non-performing loans.

These waves of mergers and acquisitions in the banking industries across the world raise important questions of whether mergers enhance the efficiency of surviving banks and contribute to the stabilization of the banking sector or just increase their market power in setting prices. A large number of studies attempt to resolve these questions by examining profitability, cost efficiency and market performance of merger survivors. Berger, Demsetz and Strahan (1999) review existing researches concerning the causes and consequences of the consolidation of the financial services industry. They point out that the evidence is consistent with increases in market power especially in the case of consolidation within the same market, improvements in profit efficiency and diversification of risks, but little or no cost efficiency improvement on average and potential costs on the financial system from increases in systemic risk or expansion of the financial safety net. However, most of the existing studies examine the consolidation among the U.S. or European financial institutions and little is known about the causes and consequences of financial consolidation outside the U.S. or Europe.

This paper investigates the causes and consequences of the consolidation among Japanese banks. Yamori (2005) reports that in Japan, the number of large, city banks remained 13 during the 1980s but decreased almost by half to 7 in 2005.

He also reports that while the number of first-tier regional banks did not virtually change over the last two decades (63 in 1980 and 64 in 2005), the number of second-tier regional banks also decreased from 71 in 1980 to 48 in 2005. The number of credit banks (*shinkin*) also dropped from 462 in 1980 to 301 in 2005.

Okada (2005) studied 10 mega-mergers among city banks during 1989-2000. She estimated X-inefficiency and analyzed stock market and credit derivatives market responses and profit measures (ROE and ROA), concluding that no improvement in X-inefficiency was observed but increases in cumulative excess return to stocks and decreases in default probability were found. Her results suggest that the motivation of mega-mergers was not to improve efficiency but to take advantage of the government's too-big-to-fail policy. Yamori, Harimaya and Kondo (2005) studied financial holding companies of regional banks and found that profit efficiency tended to increase when the market share in the region increased. Inoue (2003) and Yamori and Harimaya (2005) estimated the cost efficiency of *shinkin* banks. Using the observations of 33 mergers by *shinkin* banks over the period 1989-98, Inoue (2003) found: 1) the cost efficiency of the acquirer was lower than the average of all *shinkin* banks, 2) it took 6 years to catch up with the cost efficiency, and 3) the improvement of cost efficiency after the merger was achieved by the reduction of personnel costs rather than the reduction of branches. Yamori and Harimaya (2005) used the *shinkin* bank data during 1998-2003 and analyzed the cost efficiency as of 2002. They found that the cost efficiency of those banks that had merged with other banks one year before was significantly lower than those banks that had not merged, while the cost efficiency of those banks that had merged two years and more before was higher but not significantly.

This paper focuses on the consolidations among Japanese *shinkin* banks, which are deposit-taking cooperatives of small business whose objectives are to accept deposits from and make loans to member small firms. Compared with the preceding studies on the consolidation of Japanese banks, this paper comprehensively analyzes the causes and consequences of *shinkin* mergers in the following ways. First, we analyze motives of *shinkin* mergers as well as their consequences. Using a multinominal logit model, we investigate what type of a shinkin bank was more likely to be a target or an acquirer. Second, we investigate the effects of mergers on the profitability and healthiness as well as cost efficiency. If bank consolidation is motivated at least partly to restore the safety and soundness of the banking system, it is important to examine whether bank consolidation improved bank healthiness or not. Finally, our observations are

comprehensive. We use all the *shinkin* data over the period 1984-2002, the so-called bubble and post-bubble periods. There were 109 M&As by *shinkin* banks from 1984 to 2002, of which 65 M&As data were available.

The rest of the paper is organized as follows. Section 2 discusses the motivation of bank mergers. Section 3 describes our data set. Section 4 presents the estimation results of the motivation of *shinkin* mergers. Section 5 shows the estimation results of the impacts mergers on profitability, market power, cost efficiency, healthiness and portfolio. Section 6 analyzes the link between the ex ante characteristics of acquires and targets and the consequences of consolidation. Section 7 concludes.

2. Hypotheses on the motives of bank consolidation

This section reviews the hypothesis on the motives of bank consolidation.

As Berger et al., (1999) points out, the primary motive for consolidation would be maximizing the value of shares owned by existing shareholders. Banks can maximize value either by increasing their market power in setting prices or by increasing their efficiency. Market power can be strengthened if two or more banks operating in the same market are consolidated and consequently market becomes more concentrated. The improvement of efficiency can be achieved either by improving cost efficiency or changing product mix, given the market power. Cost efficiency will be improved if an efficient bank spreads its superior managerial skills to an inefficient bank by acquiring the latter. Profitability will be enhanced by superior risk management.

Because most of the consolidation of *shinkin* banks were within the same prefecture (i.e., in-market M&As), market power may be a potential benefit of *shinkin* consolidation. However, a caveat is necessary to apply the value-maximization hypothesis to the *shinkin* M&As. *Shinkin* banks are not corporations but cooperatives of small business. Therefore, a *shinkin* bank may not exert its market power to raise loan interest rates even if bank consolidations make the loan market more concentrated.

Besides the shareholders' value-maximization motive, bank managers and regulatory authorities have different motives for consolidation. When corporate governance structures are weak, managers may be willing to acquire other banks for the purpose of empire-building. They may gain personal financial and non-financial gains from consolidated institutions. Perhaps more importantly,

managers may attempt to reduce insolvency risk either by diversifying risk or taking advantage of the government's too-big-to-fail policy through M&A activity.

The government also plays a role in consolidation decisions from the viewpoint of competition policy or prudential regulation policy. The regulatory authorities may prevent the exploitation of too-big-to-fail policy on the part of banks. On the other hand, during the periods of financial crisis, the government may promote bank consolidation to restore the stability of banking system. In that case, the government purses a too-big-to-fail policy and banks respond to that policy by M&A activities. Because our sample periods cover Japan's banking crisis period of the 1990s, it is of particular interest whether bank consolidations were made so as to take advantage of the government's too-big-to-fail policy.

3. Data and overview of *shinkin* mergers

The data source of financial statements and mergers and acquisitions is *Financial Statements of Shinkin Banks in Japan,* edited by Financial Book Consultants, Ltd. (*Kinyu tosho konsarutanto sha*). We identify an acquirer if the bank is legally surviving and a target if the bank has legally disappeared. Our dataset covers the period 1984-2002. For the details of the variables we use, see Appendix 1.

Table 1 shows the movements of the numbers of merges and acquisitions for the sample period. In 1984, there were 456 shinkin banks. Though there were only 2 M&As until 1989, there were 52 M&As in the 1990s and 33 M&As from 2000 to 2002. Through such a large number of M&As, the number of shinkin banks decreased to 327 in 2002. Table 2 shows the descriptive sample statistics of the bank and market characteristics that we use in the following analyses.

Figure 1 compares some characteristics of acquirers and targets as compared with peer banks, which were not an acquirer or a target throughout the sample periods. Denoting the year of M&As as period t, we take differences of bank characteristics variables of acquires and targets from peers for period $i = t + i$ $(i = -5,-4,,,,4,5)$. We also calculate differences of bank characteristic variables of weighted averages of acquires and targets from peers for period $i = t + i$ $(i = -5,-4,,,-1)$, where total assets of acquires and targets are used as weights. Those banks whose data is available only at the merger year and a pre-merger year and those banks whose data is available only at the merger year and a post-merger year are included in the sample here. In Figure

1, simple averages of bank characteristics variables for period i are depicted. Because we cannot compare accounting variables as of the year of M&As with the pre-merger or post-merger periods, we just connect a line for period -1 and period 1. For bank characteristics variables, we choose bank efficiency, market power, bank health, and portfolio variables.

First, we examine bank efficiency variables measured by current profits as a proportion of assets (ROA) and personal and non-personal expenses including taxes as a proportion of current profits (cost ratio). The ROA of acquires and targets are lower than peers before M&As, though the ROA of acquires are higher than targets. The ROA did not increase after M&As as compared with the pre-merger acquirer or the pre-merger weighted average. The cost ratio of acquirers is lower than peers one and two years before M&As, while the cost ratio of targets is higher than peers before M&As., The cost ratio decreases one year after the merger comparing with the pre-merger weighted average, but turns to increase afterwards. M&As do not seem to improve the profitability or cost efficiency, though it should be in mind that we do not control for changes in bank portfolios, and hence changes in bank risk or operating costs.

Second, we see market power variables measured by the interest rate of deposits and the interest rate of loans. The interest rate of deposits of acquirers is higher than peers and that of targets is even higher before M&As, possibly reflecting a high risk of insolvency for acquirers and even so for targets. A high deposit interest rate continues after the M&As. The interest rates of loans of acquires and targets are higher than peers before M&As, and that of consolidated banks is low after M&As. Consolidated banks do not seem to exert market power in loan markets, though we do not control for the changes in the deposit interest rate and operating costs.

Third, we investigate bank health measured by total capital (i.e., membership accounts) as a proportion of assets (capital ratio), non-performing loans as a proportion of total loans (bad loan ratio), and gross increases in non-performing loans as a proportion of total loans (new bad loan ratio). The capital ratio of acquires is lower than peers and that of targets is even lower before M&A. The capital ratio does not increase from the pre-merger level of the weighted average after M&As. The bad loan ratio of acquires is higher than peers and that of targets is even higher before M&As. It decreases from the pre-merger level of the weighted average after M&A, but remains higher than peers at least for 5 years after M&As. The new bad loan ratio of acquires is higher than peers and even so for targets before M&As. It

once decreases from the pre-merger weighted average but turns to increase from 3 years after M&As. M&As do not seem to improve bank health.

Finally, we look at the portfolio variables measured by loans as a proportion of total assets (loan ratio) and the growth rate of total loans (loan growth). Generally, a higher loan ratio implies a riskier portfolio, because government bonds and interbank loans as well as loans are primary assets of shinkin banks, though we do not have data on the components of loans (e.g., housing loans, small business loans, etc). The loan ratios of acquirers and targets are higher than peers before M&As. The loan ratio of the consolidated bank tends to increase further two years and more after mergers. The loan growth of acquirers is slightly higher than peers but that of targets is much lower than peers before M&As. The loan growth rate of the consolidated banks remains at a low level relative to peers.

4. Empirical Results on the Motives for Consolidation

If the purpose of consolidation is maximizing the bank value, relatively profitable and efficient bank tends to merge a relatively unprofitable and inefficient bank to spread superior expertise and management skills over the target bank. On the other hand, if the purpose of consolidation is to stabilize the local banking system, relatively unhealthy banks tend to be merged with each other to take advantage of the government's too-big-to-fail policy.

To analyze the motives for consolidation, we estimate the multinominal logit model:

$$P_j = \frac{\exp(\beta' X_j)}{\sum_{j=1}^{3} \exp(\beta' X_j)} \quad for\ j = 1,2,3 \tag{1}$$

, where p_j is the probability of the bank's choosing the variable j, being an acquirer, a target, or neither. The dependent variable vector X_j consists of bank profitability, efficiency, healthiness and size as well as other control variables including market concentration and macroeconomic variables. We choose the ROA and the cost ratio for the efficiency variables and the capital ratio for bank health measures. For the size variables, we use the logarithm of total assets (size) and the growth rate of total assets (size growth). As a degree of market concentration, we use the Herfindahl index. Finally, to control for

macroeconomic shocks, we add the logarithm of prefectural GDP. All the explanatory variables are lagged by one-year.

Table 3 shows the estimation results. The upper table shows estimated coefficients and the lower table shows estimated marginal effects. First column shows the result for all the sample period. Banks are more likely to be a target if they display a lower ROA, a higher cost ratio, a lower capital ratio, a smaller size, a higher size growth, and operates in a prefecture whose GDP is higher and the Herfindahl index is higher. Banks are more likely to be an acquirer if they display a lower ROA, a higher cost ratio and a larger size. Less profitable and less cost efficient banks are more likely to be an acquirer and a target, though even less profitable and less cost efficient banks are more likely to be a target rather than an acquirer. In addition, a larger bank is more likely to be an acquirer and a smaller one a target. The second and third columns show the estimation results for the sub-periods, 1991-95 and 1996-2002, respectively. In both sub-periods, banks with a lower capital ratio, a smaller size, and a smaller size growth are more likely to be a target. Banks with a larger size are more likely to be an acquirer for both periods.

Our results suggest that acquires are more profitable and cost efficient than targets, presumably to spread the relatively superior expertise and management skills over targets. These results are consistent with the value maximization hypothesis and similar to the U.S. evidences (Berger and Humphrey, 1992; Pilloff and Santomero, 1998; and Peristiani, 1992). However, even acquires are less profitable and less cost efficient than peers. Considering that a larger bank tends to acquire a smaller bank, our evidence is also consistent with the hypothesis that the managers of acquiring banks pursue a too-big-to-fail policy. Regulators may also have promoted mergers among inefficient banks so that inefficient, but still solvent banks could bailout almost insolvent banks.

5. Empirical Results on the Consequences of Consolidation

A. Methodology

We investigate the consequences of M&As by comparing the bank characteristics variables of pre-merger and post-merger periods. From the viewpoint of existing shareholders (members) of acquirers, it is natural to compare pre-merger acquiring banks and post-merger consolidated banks. On

the other hand, from the viewpoint of regulators and the banking system, it is useful to compare pre-merger weighted averages and post-merger consolidated banks. We compare both.

Specifically, let X^A_{t+i} denote a bank characteristics variable X of an acquirer as of $t+i$, where period t is the year of M&A and $i=-5,-4,,,-1$. Similarly, let X^W_{t+i} denote the weighted average of X for an acquirer and a target with assets being weights and X^P_{t+i} the simple average of peers. Next, we take a difference of X^A_{t+i} (or X^W_{t+i}) and X^P_{t+i} for each i and denote the difference by $\hat{X}^A_{t+i}$. Then we take a simple average over i to construct the average pre-merger relative value, $\hat{X}^A_{pre,t}$ (or $X^W_{pre,t}$). For the post-merger value of X, we take the difference of X between the consolidated bank X^A_{t+i} and the peers X^P_{t+i} for $i=1,2,,,5$, denoted by $\hat{X}^A_{t+i}$. Finally, we test whether the difference between the post merger value of $\hat{X}^A_{t+i}$ and the pre-merger average of $\hat{X}^A_{pre,t}$ (or $X^W_{pre,t}$) is zero or not for each $i=1,2,,,5$. We also test whether the simple average of post-merger values of $\hat{X}^A_{t+i}$ over i, denoted by $\hat{X}^A_{post,t}$ is the same as $\hat{X}^A_{pre,t}$ or not. In addition to the t-test for equal means, we also perform Wilcoxon signed-rank test for the null hypothesis that the distribution of $\hat{X}^A_{t+i}-\hat{X}^A_{pre,t}$ has median zero.

In this section, we select those samples whose data is available at the merger year, one or more pre-merger years, and one or more post-merger years to compare the post-merger performance with the pre-merger performance. On the other hand, in Figure 1, we choose those samples whose data is available at the merger year and one or more pre-merger years but no post-merger years and those samples whose data is available at the merger year and one or more post-merger years but no pre-merger years.

B. Baseline results

In this subsection, we choose as peers all the banks that are not involved with M&As throughout the sample period. Table 4 shows the differences of bank characteristics variables between pre-merger acquirers and post-merger consolidated banks. Looking at the comparison with the post-merger average values over up to 5 years, we see that the cost ratio, the capital ratio and the loan growth rate significantly decrease after M&As. The other variables, including the ROA, the deposit interest rate, the loan interest rate, the bad loan and new bad loan ratios, and the loan ratio do not change significantly. Looking at the comparison with the post-merger periods for each year, we see that the ROA increases two years after M&A (though significantly only for the z-statistics).

Table 5 shows the differences of bank characteristics variables between pre-merger weighted averages and post-merger consolidated banks. Looking at the comparison with the average of post-merger periods up to 5 years, we see that the cost ratio and the capital ratio rate significantly decrease after M&As, while the other variables do not change significantly. Looking at the comparison with the post-merger periods for each year, we see that the ROA increases one and two years after M&As (significantly only for the z-statistics) and the loan ratio also increases three to five years after M&As (significantly either for the t-statistics or z-statistics).

In sum, there is some evidence that the cost efficiency improved by M&As both from pre-merger acquirers and weighted averages. The profitability also tended to improve, though the period of improvement was limited within two years after the merger. These results are consistent with the value-maximization hypothesis, though we do not control for the changes in bank risk or portfolio. On the other hand, the bank health conditions deteriorated by M&As from pre-merger acquirers or weighted averages. It may be surprising that the increase in ROA did not lead to a higher capital ratio. However, as Figure 1 suggests, the ROA of consolidated banks remained lower than peers after M&As, which continued to deteriorate the capital ratio. The improvement of ROA after the merger was not sufficient to fill in the initial gap of the capital ratio between merging banks (i.e., acquirers and targets) and peers. Appendix 2 shows the differences of major components of the capital ratio between pre-merger weighted averages and post-merger consolidated banks, suggesting that the decrease in capital (i.e., membership accounts), in

particular the decrease in special reserves, account most parts of the decrease in the capital ratio. From the viewpoint of borrowers, it is notable that the loan interest rate and the loan growth rate of consolidated banks did not increase as compared with pre-merger weighted averages.

Tables 6 and 7 show the differences of bank characteristics variables between pre-merger weighted averages and post-merger consolidated banks for the two sub-periods: 1991-1995 and 1996-2002. We see that the improvement in the cost ratio and ROA is evident in the latter half of the 1990s (i.e., 1996-2002) but not in the first half of the 1990s (i.e., 1991-95). In addition, the loan interest rate rose after the merger in the latter half of the 1990s. The improvement in profitability seems to have been brought about both by more efficient operation and stronger market power after M&As in the latter half of the 1990s. On the other hand, the deterioration in the capital ratio is clear throughout the 1990s (i.e., both in the 1991-95 and 1996-2002 periods).

B. Robustness check

In the baseline estimation results above, we use as peers those banks that did not merge or were not merged with other banks throughout the period, which may result in some bias. As has been made clear from the previous section, less profitable and less cost efficient banks are more likely to be an acquirer and a target. If a low ROA and a high cost ratio come from a temporary shock and they tend to return to a normal level in the near future, i.e., if the ROA and the cost ratio are mean reverting, we may find that M&As tend to improve the profitability and cost efficiency relative to the peer banks that were not hit by an unfavorable temporary shock, even though M&A activities do not have any impacts on consolidated banks. To avoid for this potential bias, we choose as peers those banks that were likely to be an acquirer or a target but were not actually involved with mergers. We may consider that those banks were hit by a similar unfavorable shock but did not happen to consolidate. The probability of being an acquirer or a target is derived from the estimation result of Table 3 for the full sample period. We have 2976 observations constructing newly weighted averaged peers, where we have 5118 observations for constructing previously weighted averaged peers. See the details for constructing new peers in Appendix 3.

Table 8 shows the results for weighted average of acquires and targets. ROA significantly improves one to two years after M&As, as in the baseline

results. The improvement of the cost ratio, however, is not significant. The capital ratio significantly deteriorates, again as in the baseline results. The loan ratio tends to increase, unlike the baseline results, suggesting that the consolidated bank portfolio became riskier.

In sum, the effects of consolidation on the profitability and bank health are robust, while the result for the effect on the cost efficiency is somewhat weaker than the baseline result.

6. Ex ante conditions and the gains from consolidation

A. Hypotheses

The previous sections show that, on average, the cost efficiency and profitability improved but bank health deteriorated by M&As. However, the consequences of bank consolidation may depend on various ex ante characteristics of acquires and targets as well as market conditions.

The relative performance hypothesis

If a relatively efficient bank acquires a relatively inefficient bank and applies its superior managerial skills to the consolidated bank, then the efficiency gains would be greater. Akhavein, Berger and Humphrey (1997) call this the relative efficiency hypothesis. Using the U.S. megamergers data, they found evidence supporting the relative efficiency hypothesis.

We test whether the differences of the ROA and the capital ratio between pre-merger acquirers and targets, denoted by relative performance and relative healthiness, respectively, have impacts on the changes in the post-merger performances. Both of the relative performance and relative healthiness variables are weighted by the proportion of their combined pre-merger total assets accounted for by the target.

The low efficiency hypothesis

Profit efficiency may tend to improve if the either the acquirer or the target or both are poor performers. Akhavein et al., (1997) points out that the merger may “wake up” management and be used as an “excuse” to implement restructuring that would be difficult to implement without the merger. If either or both of merging banks are inefficient prior to the merger, there is a large room to improve. Akhavein, Berger and Humphrey (1997) obtain evidences

from the U.S. mergers consistent with this hypothesis.

We test whether the ROA and the capital ratio of each of the acquirer and target have impacts on the changes in the post-merger performances.

The relative size hypotheses

The size of the target relative to the size of the acquirer may have impacts on the performance of the merger. Akhavein et al., (1997) asserts that in the case of "mergers of equals," there may be greater cost savings from the elimination of parallel management structures, though their evidence does not support this hypothesis.

Milgrom and Roberts (1992), on the other hand, asset that the costs of mergers, including conflicts of corporate cultures and political battles leading to influence costs, tend to arise when similar-sized organizations are brought together.

To test these conflicting hypotheses, we test whether the size of the target relative to the size of the acquirer have impacts on the changes in the post-merger performances.

B. Baseline results

We estimate the following equation using all the pre-merger and post-merger bank data.

$$\Delta Y = \beta_0 + \beta_1 \mathrm{Re}\,lative\,Performance + \beta_2 \mathrm{Re}\,lative\,Health + \beta_3 \mathrm{Re}\,lative\,Size + \beta_4 Herfindahl\ Index + \beta_5 Market\ Share + \beta_6 \mathrm{Pr}\,efectural\,GDP + \beta_7 Size + \varepsilon \quad (2)$$

, where the dependent variable ΔY is the difference of bank characteristics variables between the time average of weighted average of acquirers and targets over up to 5 years before M&As and the time average of consolidated banks over up to 5 years after M&As. The dependent variables are all the pre-merger time average values over up to 5 years. In addition to the relative performance, relative healthiness and relative size, we add two pre-merger sum of acquirers and targets: the market share of deposits, and the logarithm of total assets. Furthermore, we add two prefectural indexes: the Herfindahl Index of deposit market within a prefecture and the growth rate of GDP. When we test the low efficiency hypothesis instead of the relative efficiency hypothesis, we replace the relative performance with the acquirer's and the target's pre-merger performance variables and the relative health with the acquirer's and the target's pre-merger health variables. In this subsection, we

use as peers all the banks that are not involved with mergers.

Table 9 shows the estimation results for the full sample period. The relative performance and the relative healthiness have a significantly positive impact on the change in ROA (Panel A) and the capital ratio (Panel E) and a significantly negative impact on the change in the bad loan ratio (Panel F). These results are consistent with the relative performance hypothesis. In addition, the relative performance and the relative healthiness have a significantly positive impact on the loan growth rate.

Dividing the relative performance into the acquirer's and the target's performance and the relative healthiness into the acquirer's and the target's healthiness, we see that better pre-merger performance and healthiness tend to improve the cost efficiency and healthiness, while the target's worse pre-merger performance and healthiness tend to improve the cost efficiency and healthiness. These results support the relative performance hypothesis. The results for the target's pre-merger performance and healthiness are also consistent with the low efficiency hypothesis. The worse pre-merger target performance and healthiness result in a higher loan growth rate, suggesting that the loan growth rate tends to recover from a low level at the target.

The relative size has a significantly negative impact on the capital ratio (Panel E), suggesting that the consolidated banks tend to increase the capital ratio more as the size of the target is smaller relative to the acquirer, which is consistent with the conflict of corporate culture hypothesis (Milgrom and Roberts, 1992).

The size has a significantly negative impact on the deposit interest rate (Panel C), suggesting that depositors feel safer if larger banks merge.

Dividing the sample period into the two sub-periods, 1991-1995 and 1996-2002, we see that the full sample estimation results largely resemble the results for the latter half of the 1990s, though the results are not shown to save space. (The results are available from the authors upon request.)

C. Robustness check

To avoid the sample selection bias mentioned in the previous section, we use peers defined in Section 5. B. The results (Table 10) do not virtually change from the baseline results. Especially, the relative performance and the relative healthiness have a significantly positive impact on the change in ROA and the capital ratio and a significantly negative impact on the change in the bad loan

ratio.

7. Conclusion

The recent waves of mergers and acquisitions in the banking industries across the world raise important questions of whether mergers enhance the efficiency of surviving banks and contribute to the stabilization of the banking sector. We investigate the motives and consequences of the consolidation of cooperative banks (*Shinkin*) in Japan during the period 1984-2002. Our major findings are as follows.

First, acquiring banks and target banks were less profitable and less efficient than peers, i.e., those banks that did not merge or were not merged with another bank, though acquiring banks were more profitable, efficient and larger than target banks. These results are consistent both with the acquirer's value-maximizing motive and the regulators' too-big-to-fail or bailout policy.

Second, acquiring banks improved cost efficiency after the consolidation. M&A also raised the loan interest rate and improved profitability particularly since the latter half of the 1990s. The improvement in profitability seems to have been brought about both by more efficient operation and stronger market power since the latter half of the 1990s. The latter result may be problematic from the viewpoint of competition policy. Nonetheless, the improvement of ROA after the merger was not sufficient to fill in the initial gap of the capital ratio between merging banks (i.e., acquirers and targets) and peers, resulting in the deterioration of the capital ratio of consolidated banks relative to peers. The M&As did not contribute to sufficiently stabilize the local banking system.

Finally, the consolidation tended to improve the profitability of merging banks when the difference in profitability and healthiness between acquiring banks and target banks were large, which is consistent with the relative efficiency hypothesis (e.g., Akhavein, Berger, and Humphrey, 1997).

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Table 1. Number of *Shinkin* Banks

Year	All banks	Merger	Transfer of business	Dissoluton	Switch over of business
1984	456	0	0	0	0
1985	456	0	0	0	0
1986	455	1	0	0	0
1987	455	0	0	0	0
1988	455	0	0	0	0
1989	454	1	0	0	0
1990	451	3	0	0	0
1991	440	7	0	0	2
1992	435	4	0	0	1
1993	428	5	0	1	0
1994	421	8	0	0	0
1995	416	4	0	0	0
1996	410	5	1	0	0
1997	401	8	0	0	0
1998	396	3	0	0	0
1999	386	5	1	0	0
2000	371	7	8	0	0
2001	343	11	6	0	0
2002	327	15	6	0	0
Total	7,956	87	22	1	3

Table 2. Summary Statistics

	Mean Std. Dev.
ROA (%)	0.41
	(0.90)
Cost ratio (%)	39.94
	(14.24)
Interest rate of deposit (%	2.27
	(1.56)
Interest rate of loan (%)	5.24
	(1.72)
Capital ratio (%)	5.28
	(9.55)
Bad loan ratio (%)	6.00
	(4.42)
New bad loan ratio (%)	0.20
	(0.40)
Loan ratio (%)	58.14
	(9.59)
Loan growth (%)	3.15
	(30.36)
ln(Asset)	18.68
	(1.00)
Asset growth (%)	3.20
	(25.16)
Market share (%)	11.27
	(12.10)
Herfindahl index	0.16
	(0.11)
ln(Prefectual GDP)	16.20
	(1.04)
Number of observations	7,956

Table 3. Multinominal Logistic Regression Results

	1984-2002		1991-1995		1996-2002	
	Coef.	Mrg. Ef.	Coef.	Mrg. Ef.	Coef.	Mrg. Ef.
Target						
ROA	-0.678 a	-0.005 a	-0.247	-0.002	-0.119	-0.001
	(0.100)	(0.001)	(0.158)	(0.001)	(0.144)	(0.001)
Cost ratio	0.033 a	0.000 a	-0.039	0.000	0.009	0.000
	(0.007)	(0.000)	(0.028)	(0.000)	(0.015)	(0.000)
Capital ratio	-0.009 a	0.000 b	-0.377 a	-0.003 a	-0.442 a	-0.003 a
	(0.004)	(0.000)	(0.136)	(0.001)	(0.092)	(0.001)
Size	-0.713 a	-0.005 a	-0.914 a	-0.006 a	-1.034 a	-0.008 a
	(0.108)	(0.001)	(0.249)	(0.002)	(0.168)	(0.002)
Size growth	-0.011 c	0.000 c	-0.090 b	-0.001 c	-0.149 a	-0.001 a
	(0.006)	(0.000)	(0.045)	(0.000)	(0.037)	(0.000)
Prefectural GDP	0.729 a	0.005 a	0.288	0.002	0.696 a	0.005 a
	(0.131)	(0.001)	(0.278)	(0.002)	(0.192)	(0.002)
Herfindahl index	3.168 a	0.023 a	0.621	0.004	1.965	0.015
	(1.010)	(0.007)	(2.500)	(0.017)	(1.329)	(0.011)
Cons	-4.870 c		11.133 b		5.306	
	(2.656)		(5.651)		(4.044)	
Aquirer						
ROA	-0.308 b	-0.004 c	0.151	0.002	-0.281	-0.006
	(0.154)	(0.002)	(0.816)	(0.009)	(0.194)	(0.005)
Cost ratio	0.025 a	0.000 a	0.018	0.000	0.005	0.000
	(0.007)	(0.000)	(0.028)	(0.000)	(0.015)	(0.000)
Capital ratio	-0.006	0.000	-0.273	-0.003	-0.022	0.000
	(0.011)	(0.000)	(0.174)	(0.002)	(0.068)	(0.002)
Size	0.545 a	0.006 a	0.383	0.004 c	0.601 a	0.014 a
	(0.112)	(0.001)	(0.234)	(0.002)	(0.162)	(0.003)
Size growth	0.001	0.000	-0.019	0.000	0.003	0.000
	(0.003)	(0.000)	(0.038)	(0.000)	(0.009)	(0.000)
Prefectural GDP	-0.002	0.000	-0.373	-0.004	0.046	0.001
	(0.144)	(0.002)	(0.320)	(0.003)	(0.202)	(0.005)
Herfindahl index	0.047	0.000	-2.092	-0.023	0.451	0.010
	(1.140)	(0.013)	(2.803)	(0.031)	(1.356)	(0.031)
Cons	-15.411 a		-4.363		-16.128 a	
	(2.297)		(5.157)		(3.774)	
Obs	7761		2127		2599	
Pseudo R-sq	0.129		0.070		0.198	
Log likelihood	-1025.9		-268.8		-532.2	

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

Table 4. Changes in Bank Characteristics after M&As: Acquirers

	t=1	t=2	t=3	t=4	t=5	Average
ROA						
Pre-merger	-0.09	-0.13	-0.10	-0.08	-0.09	-0.09
Post-merger (t years after	-0.10	-0.29	-0.16	-0.21	-0.29	-0.21
Diff	-0.01	-0.16	-0.06	-0.13	-0.20	-0.12
t-Statistics	-0.15	-0.60	-0.69	-1.14	-0.80	-1.03
z-Statistics	0.64	2.09 b	0.07	-0.43	0.55	0.47
Cost ratio						
Pre-merger	-0.27	0.13	0.48	0.66	0.75	-0.27
Post-merger (t years after	-1.74	-0.67	-1.07	-0.15	-0.59	-1.89
Diff	-1.47	-0.81	-1.55	-0.81	-1.35	-1.61
t-Statistics	-2.17 b	-0.98	-1.70 c	-0.97	-1.13	-2.29 b
z-Statistics	-1.52	-1.20	-2.05 b	-0.65	-0.75	-2.18 b
Interest rates of deposits						
Pre-merger	0.00	0.00	-0.01	-0.02	-0.02	0.00
Post-merger (t years after	0.03	0.03	0.03	0.03	0.03	0.02
Diff	0.03	0.03	0.04	0.05	0.05	0.02
t-Statistics	1.51	1.30	1.53	1.48	1.28	1.22
z-Statistics	1.27	1.06	1.51	1.37	1.08	1.05
Interest rates of loans						
Pre-merger	-0.02	-0.02	-0.04	-0.02	-0.01	-0.02
Post-merger (t years after	0.00	-0.02	-0.01	-0.01	0.00	0.01
Diff	0.02	0.00	0.02	0.01	0.00	0.02
t-Statistics	0.73	0.00	0.55	0.24	0.07	0.84
z-Statistics	0.94	-0.03	0.73	0.19	0.40	0.74
Capital ratio						
Pre-merger	-0.71	-0.70	-0.49	-0.44	-0.40	-0.71
Post-merger (t years after	-1.38	-1.60	-1.46	-1.44	-1.70	-1.60
Diff	-0.68	-0.90	-0.97	-1.00	-1.30	-0.89
t-Statistics	-5.68 a	-2.87 a	-4.65 a	-3.84 a	-3.32 a	-5.13 a
z-Statistics	-4.86 a	-3.93 a	-3.92 a	-3.22 a	-3.10 a	-5.01 a
Bad loan ratio						
Pre-merger	0.76	0.81	0.33	-0.03	-0.03	0.76
Post-merger (t years after	1.70	1.49	1.43	1.50	0.97	1.32
Diff	0.94	0.67	1.11	1.53	0.99	0.56
t-Statistics	1.48	0.83	1.31	2.66	1.42	0.97
z-Statistics	1.27	0.78	1.27	1.60	1.07	0.85
New bad loan ratio						
Pre-merger	0.30	-0.50	0.67			0.30
Post-merger (t years after	-0.12	-0.64	-1.03			-0.48
Diff	-0.42	-0.14	-1.70			-0.78
t-Statistics	-0.47	-0.12	-0.98			-0.93
z-Statistics	-0.52	-0.71	-1.07			-0.98
Loan ratio						
Pre-merger	3.79	3.89	4.00	3.18	2.75	3.79
Post-merger (t years after	3.32	3.81	4.17	3.31	3.45	3.71
Diff	-0.47	-0.08	0.17	0.13	0.70	-0.08
t-Statistics	-1.01	-0.15	0.26	0.17	0.74	-0.18
z-Statistics	-1.05	-0.53	0.08	0.28	0.73	-0.19
Loan growth						
Pre-merger	0.23	0.53	-0.14	0.21	0.23	0.23
Post-merger (t years after	-0.84	-0.62	-1.94	-1.84	-0.24	-0.73
Diff	-1.08	-1.15	-1.80	-2.06	-0.47	-0.96
t-Statistics	-1.38	-1.55	-3.22 a	-2.71 b	-0.27	-1.46
z-Statistics	-1.33	-1.27	-2.89 a	-2.64 a	-1.86 c	-1.66 c

Notes:
a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

Table 5. Changes in Bank Characteristics after M&As: Weighted Average

	t=1	t=2	t=3	t=4	t=5	Average
ROA						
Pre-merger	-0.23	-0.26	-0.14	-0.12	-0.13	-0.23
Post-merger (t years after	-0.10	-0.29	-0.16	-0.21	-0.29	-0.22
Diff	0.13	-0.03	-0.02	-0.09	-0.16	0.02
t-Statistics	1.60	-0.12	-0.21	-0.80	-0.64	0.12
z-Statistics	1.97 b	2.47 b	0.29	0.04	1.04	1.58
Cost ratio						
Pre-merger	0.09	0.41	0.68	0.58	0.66	0.09
Post-merger (t years after	-1.53	-0.39	-1.07	-0.15	-0.59	-1.69
Diff	-1.62	-0.80	-1.75	-0.74	-1.25	-1.78
t-Statistics	-2.16 b	-0.87	-1.71 c	-0.88	-1.02	-2.30 b
z-Statistics	-1.28	-0.73	-1.63	-0.47	-0.63	-1.91 c
Interest rates of deposits						
Pre-merger	0.01	0.01	0.00	0.00	0.00	0.01
Post-merger (t years after	0.03	0.03	0.03	0.03	0.03	0.02
Diff	0.02	0.02	0.03	0.03	0.03	0.02
t-Statistics	1.27	0.98	1.16	1.00	0.79	0.96
z-Statistics	0.57	0.59	1.16	1.03	0.55	0.70
Interest rates of loans						
Pre-merger	-0.02	-0.04	-0.07	-0.05	-0.05	-0.02
Post-merger (t years after	0.01	-0.01	-0.01	-0.01	0.00	0.02
Diff	0.04	0.03	0.05	0.05	0.04	0.04
t-Statistics	1.13	0.81	1.06	0.83	0.72	1.32
z-Statistics	1.28	0.64	1.23	0.47	0.67	1.20
Capital ratio						
Pre-merger	-0.98	-0.92	-0.63	-0.55	-0.52	-0.98
Post-merger (t years after	-1.37	-1.59	-1.46	-1.44	-1.70	-1.59
Diff	-0.39	-0.68	-0.83	-0.89	-1.18	-0.61
t-Statistics	-2.83 a	-1.97 c	-4.19 a	-3.58 a	-3.12 a	-3.04 a
z-Statistics	-3.28 a	-2.75 a	-3.41 a	-2.84 a	-2.66 a	-3.29 a
Bad loan ratio						
Pre-merger	1.89	2.02	0.82	0.47	0.47	1.89
Post-merger (t years after	1.59	1.35	0.95	1.50	0.97	1.23
Diff	-0.30	-0.67	0.13	1.03	0.50	-0.65
t-Statistics	-0.42	-0.63	0.17	1.75	0.49	-0.98
z-Statistics	-0.18	-0.20	0.28	1.60	0.59	-0.76
New bad loan ratio						
Pre-merger	0.77	-0.66	0.12			0.77
Post-merger (t years after	-0.11	-0.73	-0.38			-0.51
Diff	-0.88	-0.07	-0.49			-1.27
t-Statistics	-0.74	-0.05	-0.49			-1.17
z-Statistics	-0.77	-0.51	-0.45			-1.25
Loan ratio						
Pre-merger	3.15	2.97	2.97	2.07	1.58	3.15
Post-merger (t years after	3.20	3.65	4.17	3.31	3.45	3.59
Diff	0.05	0.67	1.20	1.24	1.87	0.44
t-Statistics	0.11	1.12	1.83 c	1.69	1.90 c	0.84
z-Statistics	-0.03	0.63	1.49	1.72 c	1.68 c	0.70
Loan growth						
Pre-merger	-0.96	-0.86	-1.06	-0.71	-0.74	-0.96
Post-merger (t years after	-0.86	-0.69	-1.94	-1.84	-0.24	-0.76
Diff	0.10	0.17	-0.87	-1.14	0.50	0.20
t-Statistics	0.15	0.26	-1.56	-1.49	0.27	0.35
z-Statistics	0.09	0.36	-1.40	-1.61	-0.98	0.14

Notes:

a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

Table 6. Changes in Bank Characteristics after M&As: Weighted Average, 1991-1995

	t=1	t=2	t=3	t=4	t=5	Average
ROA						
Pre-merger	-0.10	-0.10	-0.10	-0.10	-0.11	-0.10
Post-merger (t years after	-0.15	-0.14	-0.06	-0.19	-0.39	-0.19
Diff	-0.05	-0.04	0.04	-0.09	-0.28	-0.09
t-Statistics	-1.10	-0.58	0.46	-0.57	-0.78	-0.70
z-Statistics	-1.22	-0.67	-0.05	0.24	0.50	-0.18
Cost ratio						
Pre-merger	0.93	0.93	0.93	0.93	0.83	0.93
Post-merger (t years after	0.83	0.72	1.32	0.91	0.65	0.88
Diff	-0.10	-0.21	0.40	-0.01	-0.18	-0.05
t-Statistics	-0.09	-0.16	0.33	-0.01	-0.13	-0.04
z-Statistics	1.22	0.37	0.18	0.44	0.23	0.41
Interest rates of deposits						
Pre-merger	-0.01	-0.01	-0.01	-0.01	0.00	-0.01
Post-merger (t years after	-0.01	0.00	0.00	0.01	0.00	0.00
Diff	0.00	0.00	0.01	0.01	0.00	0.01
t-Statistics	-0.02	0.11	0.18	0.30	-0.08	0.22
z-Statistics	-0.37	-0.18	0.05	0.18	-0.02	0.08
Interest rates of loans						
Pre-merger	0.00	0.00	0.00	0.00	0.00	0.00
Post-merger (t years after	-0.02	-0.04	-0.02	-0.01	0.01	-0.01
Diff	-0.02	-0.04	-0.02	-0.01	0.01	-0.01
t-Statistics	-0.33	-0.58	-0.31	-0.11	0.14	-0.25
z-Statistics	-0.21	-0.63	-0.11	-0.44	0.19	-0.31
Capital ratio						
Pre-merger	-0.40	-0.40	-0.40	-0.40	-0.39	-0.40
Post-merger (t years after	-0.76	-0.88	-1.23	-1.31	-1.71	-1.17
Diff	-0.36	-0.48	-0.83	-0.91	-1.32	-0.77
t-Statistics	-2.56 b	-2.56 b	-2.76 b	-2.92 a	-2.55 b	-3.21 a
z-Statistics	-2.13 b	-2.16 b	-2.06 b	-2.13 b	-1.89 c	-2.45 b
Bad loan ratio						
Pre-merger						
Post-merger (t years after)						
Diff						
t-Statistics						
z-Statistics						
New bad loan ratio						
Pre-merger						
Post-merger (t years after)						
Diff						
t-Statistics						
z-Statistics						
Loan ratio						
Pre-merger	0.83	0.83	0.83	0.83	0.48	0.83
Post-merger (t years after	1.53	1.85	2.09	1.44	1.68	1.76
Diff	0.70	1.02	1.26	0.61	1.19	0.93
t-Statistics	0.81	1.19	1.39	0.70	1.04	1.12
z-Statistics	0.80	0.96	1.06	0.63	0.85	0.86
Loan growth						
Pre-merger	-0.46	-0.46	-0.46	-0.46	-0.58	-0.46
Post-merger (t years after	-0.07	-0.59	-2.46	-1.70	-2.15	-1.39
Diff	0.39	-0.13	-2.00	-1.24	-1.57	-0.93
t-Statistics	0.34	-0.13	-2.51 b	-1.34	-1.73 c	-1.28
z-Statistics	0.11	-0.34	-2.32 b	-1.22	-1.55	-1.02

Notes:
a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

Table 7. Changes in Bank Characteristics after M&As: Weighted Average, 1996-2002

	t=1	t=2	t=3	t=4	t=5	Average
ROA						
Pre-merger	-0.32	-0.41	-0.21	-0.16	-0.19	-0.32
Post-merger (t years after	-0.07	-0.45	-0.33	-0.31	-0.02	-0.24
Diff	0.25	-0.04	-0.12	-0.15	0.17	0.07
t-Statistics	1.90 c	-0.07	-0.53	-0.72	1.57	0.35
z-Statistics	2.71 a	3.24 a	-0.09	-0.51	1.15	1.76 c
Cost ratio						
Pre-merger	-0.44	-0.08	0.26	-0.61	-0.01	-0.44
Post-merger (t years after	-2.90	-1.32	-5.18	-4.16	-5.75	-3.29
Diff	-2.46	-1.25	-5.44	-3.56	-5.74	-2.85
t-Statistics	-2.33 b	-0.86	-3.04 a	-2.41 c	-1.65	-2.60 b
z-Statistics	-1.94 c	-0.90	-2.61 a	-2.03 b	-1.36	-2.32 b
Interest rates of deposits						
Pre-merger	0.02	0.03	0.02	0.03	0.03	0.02
Post-merger (t years after	0.05	0.06	0.09	0.12	0.07	0.03
Diff	0.03	0.03	0.06	0.09	0.04	0.01
t-Statistics	1.45	1.21	2.36 b	2.95 b	0.92	0.91
z-Statistics	1.10	0.93	2.17 b	1.86 c	0.73	0.73
Interest rates of loans						
Pre-merger	-0.03	-0.06	-0.14	-0.15	-0.13	-0.03
Post-merger (t years after	0.05	0.06	0.09	0.11	0.08	0.06
Diff	0.07	0.12	0.24	0.26	0.20	0.08
t-Statistics	1.90 c	2.23 b	3.10 a	1.96 c	1.15	2.30 b
z-Statistics	1.86 c	2.30 b	2.92 a	2.03 b	0.94	2.40 b
Capital ratio						
Pre-merger	-1.38	-1.49	-1.14	-1.29	-1.27	-1.38
Post-merger (t years after	-1.78	-2.36	-2.07	-2.28	-2.27	-1.91
Diff	-0.39	-0.87	-0.92	-0.99	-1.00	-0.52
t-Statistics	-1.85 c	-1.29	-3.22 a	-1.69	-1.73	-1.75 c
z-Statistics	-2.18 b	-1.57	-2.61 a	-1.86 c	-1.78 c	-2.05 b
Bad loan ratio						
Pre-merger	1.89	2.02	0.82	0.47	0.47	1.89
Post-merger (t years after	1.59	1.35	0.95	1.50	0.97	1.23
Diff	-0.30	-0.67	0.13	1.03	0.50	-0.65
t-Statistics	-0.42	-0.63	0.17	1.75	0.49	-0.98
z-Statistics	-0.18	-0.20	0.28	1.60	0.54	-0.76
New bad loan ratio						
Pre-merger	0.77	-0.66	0.12			0.77
Post-merger (t years after	-0.11	-0.73	-0.38			-0.51
Diff	-0.88	-0.07	-0.49			-1.27
t-Statistics	-0.74	-0.05	-0.49			-1.17
z-Statistics	-0.77	-0.51	-0.45			-1.25
Loan ratio						
Pre-merger	4.40	4.75	6.15	5.18	4.28	4.40
Post-merger (t years after	4.18	5.34	7.44	9.27	10.17	4.66
Diff	-0.22	0.58	1.29	4.10	5.89	0.26
t-Statistics	-0.32	0.62	1.10	2.94 b	3.00 b	0.36
z-Statistics	-0.47	0.28	0.97	2.03 b	1.99 b	0.35
Loan growth						
Pre-merger	-1.44	-1.49	-2.60	-2.52	-2.53	-1.44
Post-merger (t years after	-1.04	-0.47	-1.41	-2.02	6.84	-0.28
Diff	0.41	1.02	1.18	0.50	9.36	1.16
t-Statistics	0.49	1.15	1.79 c	0.31	1.15	1.49
z-Statistics	0.22	1.38	1.54	0.00	1.15	1.47

Notes:

a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

Table 8. Changes in Bank Characteristics after M&As: Weighted Average, Robustness Check

	t=1	t=2	t=3	t=4	t=5	Average
ROA						
Pre-merger	-0.24	-0.27	-0.15	-0.13	-0.14	-0.24
Post-merger (t years after	-0.15	-0.32	-0.18	-0.24	-0.33	-0.27
Diff	0.10	-0.06	-0.03	-0.11	-0.19	-0.02
t-Statistics	1.25	-0.20	-0.34	-0.92	-0.76	-0.17
z-Statistics	1.69 c	2.37 b	0.28	-0.22	0.73	1.10
Cost ratio						
Pre-merger	0.93	1.10	1.28	1.17	1.25	0.93
Post-merger (t years after	0.03	1.05	0.30	1.26	1.11	0.16
Diff	-0.90	-0.05	-0.99	0.09	-0.13	-0.77
t-Statistics	-1.23	-0.05	-1.02	0.11	-0.11	-1.02
z-Statistics	-0.35	0.23	-0.91	0.69	0.22	-0.29
Interest rates of deposits						
Pre-merger	0.01	0.01	0.01	0.01	0.01	0.01
Post-merger (t years after	0.03	0.03	0.02	0.02	0.02	0.02
Diff	0.02	0.02	0.02	0.02	0.01	0.01
t-Statistics	1.13	0.69	0.69	0.56	0.40	0.67
z-Statistics	0.42	0.38	0.75	0.75	0.24	0.53
Interest rates of loans						
Pre-merger	0.06	0.04	0.02	0.03	0.04	0.06
Post-merger (t years after	0.10	0.08	0.07	0.07	0.07	0.10
Diff	0.04	0.03	0.05	0.04	0.04	0.04
t-Statistics	1.26	0.86	1.01	0.80	0.64	1.35
z-Statistics	1.31	0.56	1.10	0.37	0.55	1.12
Capital ratio						
Pre-merger	-1.00	-0.95	-0.68	-0.61	-0.59	-1.00
Post-merger (t years after	-1.46	-1.65	-1.49	-1.46	-1.76	-1.69
Diff	-0.45	-0.70	-0.81	-0.85	-1.17	-0.69
t-Statistics	-3.44 a	-2.05 b	-4.04 a	-3.38 a	-3.10 a	-3.54 a
z-Statistics	-3.76 a	-2.90 a	-3.27 a	-2.54 b	-2.52 b	-3.85 a
Bad loan ratio						
Pre-merger	2.00	2.13	0.98	0.64	0.64	2.00
Post-merger (t years after	1.86	1.59	1.19	1.84	1.32	1.53
Diff	-0.14	-0.54	0.21	1.20	0.68	-0.47
t-Statistics	-0.19	-0.51	0.28	2.04	0.68	-0.71
z-Statistics	0.06	-0.20	0.28	1.60	1.07	-0.45
New bad loan ratio						
Pre-merger	0.74	-0.67	0.10			0.74
Post-merger (t years after	0.02	-0.53	-0.32			-0.38
Diff	-0.71	0.13	-0.43			-1.11
t-Statistics	-0.61	0.08	-0.43			-1.02
z-Statistics	-0.64	-0.34	-0.45			-1.17
Loan ratio						
Pre-merger	2.34	2.01	1.85	0.78	0.29	2.34
Post-merger (t years after	3.05	3.46	3.94	3.09	3.26	3.57
Diff	0.71	1.45	2.10	2.31	2.97	1.23
t-Statistics	1.37	2.37 b	3.19 a	3.17 a	2.98 a	2.33 b
z-Statistics	1.29	1.79 c	2.47 b	2.66 a	2.54 b	2.17 b
Loan growth						
Pre-merger	-0.92	-0.89	-1.17	-0.89	-0.93	-0.92
Post-merger (t years after	-0.70	-0.50	-1.70	-1.67	-0.04	-0.59
Diff	0.22	0.39	-0.54	-0.78	0.88	0.33
t-Statistics	0.32	0.61	-0.98	-1.02	0.49	0.60
z-Statistics	0.31	0.58	-0.87	-1.18	-0.57	0.45

Notes:

a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

Table 9. OLS Regression Results for the Change in Bank Characteristics after M&As

Panel A. Change in ROA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	1.132	1.299 b	1.369 a					
	(3.285)	(0.505)	(0.304)					
Relative health	0.746	0.144		0.645 a				
	(0.570)	(0.269)		(0.174)				
Relative size	-0.890	-1.189			0.450			
	(1.112)	(1.006)			(1.088)			
Acquirer's performance	-1.212					-0.906	-0.622	
	(1.378)					(0.846)	(0.659)	
Target's performance	-0.356					-1.518 a	-1.346 a	
	(3.160)					(0.549)	(0.296)	
Acquirer's health	-0.121					0.115		-0.024
	(0.276)					(0.189)		(0.160)
Target's health	0.625					0.083		-0.522 a
	(0.537)					(0.277)		(0.162)
Herfindahl index	0.693	1.210	0.964	0.912	0.334	0.884	0.316	-0.220
	(1.919)	(1.718)	(1.703)	(1.779)	(1.976)	(1.944)	(1.760)	(2.028)
Market share	-0.001	-0.006	0.001	0.000	0.010	0.003	0.004	0.005
	(0.015)	(0.015)	(0.014)	(0.015)	(0.017)	(0.015)	(0.014)	(0.016)
Prefectural GDP	-0.240	-0.197	-0.118	-0.064	0.006	-0.129	-0.179	-0.150
	(0.194)	(0.169)	(0.153)	(0.159)	(0.189)	(0.175)	(0.158)	(0.186)
Size	0.006	0.000	-0.008	-0.011	-0.019	-0.006	-0.008	-0.019
	(0.014)	(0.014)	(0.012)	(0.012)	(0.015)	(0.013)	(0.012)	(0.013)
Cons	3.751	3.205	1.803	1.004	0.163	1.918	2.846	2.672
	(3.350)	(2.886)	(2.579)	(2.682)	(3.238)	(2.988)	(2.658)	(3.171)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.249	0.232	0.236	0.167	-0.028	0.224	0.244	0.119

Panel B. Change in cost ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	-13.297	0.433	-1.493					
	(20.409)	(3.171)	(1.947)					
Relative health	0.816	-2.146		-1.479				
	(3.542)	(1.686)		(1.053)				
Relative size	10.620	10.049			7.245			
	(6.911)	(6.311)			(5.969)			
Acquirer's performance	-5.536					-10.716 b	-9.089 b	
	(8.562)					(5.189)	(4.131)	
Target's performance	-15.697					-3.307	0.884	
	(19.629)					(3.367)	(1.855)	
Acquirer's health	0.427					0.846		-0.647
	(1.716)					(1.158)		(0.950)
Target's health	3.552					2.353		1.284
	(3.334)					(1.702)		(0.964)
Herfindahl index	-9.721	-12.339	-10.073	-10.640	-10.419	-9.397	-16.332	-11.927
	(11.924)	(10.783)	(10.918)	(10.795)	(10.836)	(11.930)	(11.028)	(12.068)
Market share	-0.002	-0.008	-0.067	-0.058	-0.042	-0.046	-0.033	-0.056
	(0.096)	(0.095)	(0.092)	(0.091)	(0.094)	(0.090)	(0.091)	(0.093)
Prefectural GDP	-0.269	-0.362	-1.001	-1.008	-0.650	-1.047	-1.566	-1.185
	(1.207)	(1.063)	(0.980)	(0.962)	(1.034)	(1.072)	(0.987)	(1.105)
Size	-0.129	-0.178 b	-0.110	-0.113	-0.146	-0.060	-0.104	-0.102
	(0.087)	(0.086)	(0.076)	(0.074)	(0.083)	(0.077)	(0.073)	(0.075)
Cons	4.650	7.781	18.995	19.488	11.752	18.668	28.513 c	22.286
	(20.815)	(18.115)	(16.532)	(16.273)	(17.757)	(18.340)	(16.653)	(18.873)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.092	0.053	0.017	0.039	0.031	0.084	0.070	0.023

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

(Table 9. Continued from previous page)

Panel C. Change in interest rates of deposits

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	0.210	-0.106	-0.065 c					
	(0.418)	(0.066)	(0.039)					
Relative health	0.086	0.031		-0.016				
	(0.073)	(0.035)		(0.022)				
Relative size	0.063	-0.041			-0.109			
	(0.142)	(0.130)			(0.123)			
Acquirer's performance	0.152					0.201 c	0.130	
	(0.175)					(0.106)	(0.083)	
Target's performance	0.323					0.110	0.075 b	
	(0.402)					(0.068)	(0.037)	
Acquirer's health	-0.055					-0.028		0.000
	(0.035)					(0.024)		(0.020)
Target's health	0.058					-0.016		0.024
	(0.068)					(0.035)		(0.020)
Herfindahl index	-0.159	-0.083	-0.097	-0.082	-0.055	-0.127	0.005	-0.045
	(0.244)	(0.223)	(0.219)	(0.224)	(0.223)	(0.243)	(0.222)	(0.248)
Market share	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Prefectural GDP	0.061 b	0.060 a	0.062 a	0.058 a	0.051 b	0.060 a	0.072 a	0.063 a
	(0.025)	(0.022)	(0.020)	(0.020)	(0.021)	(0.022)	(0.020)	(0.023)
Size	-0.004 b	-0.003 c	-0.003 b	-0.003 b	-0.002	-0.004 b	-0.004 b	-0.003 c
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Cons	-0.882 b	-0.874 b	-0.904 a	-0.859 b	-0.724 c	-0.850 b	-1.069 a	-0.935 b
	(0.427)	(0.374)	(0.332)	(0.337)	(0.366)	(0.373)	(0.336)	(0.388)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.207	0.158	0.174	0.142	0.145	0.212	0.214	0.142

Panel D. Change in interest rates of loans

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	-0.315	0.049	0.077					
	(0.873)	(0.133)	(0.079)					
Relative health	0.117	0.004		0.034				
	(0.152)	(0.071)		(0.043)				
Relative size	0.158	0.199			0.257			
	(0.296)	(0.265)			(0.244)			
Acquirer's performance	0.049					-0.083	-0.222	
	(0.366)					(0.216)	(0.171)	
Target's performance	-0.266					0.017	-0.083	
	(0.840)					(0.140)	(0.077)	
Acquirer's health	-0.100					-0.057		-0.068 c
	(0.073)					(0.048)		(0.038)
Target's health	0.050					-0.050		-0.041
	(0.143)					(0.071)		(0.038)
Herfindahl index	-0.928 c	-0.467	-0.431	-0.436	-0.498	-0.898 c	-0.602	-0.887 c
	(0.510)	(0.453)	(0.444)	(0.446)	(0.444)	(0.498)	(0.458)	(0.479)
Market share	0.004	0.003	0.002	0.002	0.003	0.003	0.003	0.003
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Prefectural GDP	-0.078	-0.028	-0.042	-0.039	-0.020	-0.083 c	-0.057	-0.084 c
	(0.052)	(0.045)	(0.040)	(0.040)	(0.042)	(0.045)	(0.041)	(0.044)
Size	-0.001	0.000	0.001	0.001	-0.001	0.000	0.001	0.000
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Cons	1.379	0.508	0.761	0.715	0.398	1.497 c	1.020	1.509 b
	(0.890)	(0.761)	(0.673)	(0.672)	(0.727)	(0.765)	(0.691)	(0.750)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	-0.062	-0.068	-0.041	-0.047	-0.038	-0.018	-0.023	0.015

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

(Table 9. Continued from previous page)

Panel E. Change in capital ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	9.152 b	1.779 b	2.061 a					
	(4.400)	(0.675)	(0.422)					
Relative health	0.259	0.436		1.056 a				
	(0.764)	(0.359)		(0.237)				
Relative size	-2.015	-2.990 b			-0.380			
	(1.490)	(1.343)			(1.548)			
Acquirer's performance	-1.057					1.999 c	2.174 b	
	(1.846)					(1.191)	(0.925)	
Target's performance	7.024					-1.719 b	-1.843 a	
	(4.232)					(0.773)	(0.415)	
Acquirer's health	0.060					0.058		0.313
	(0.370)					(0.266)		(0.220)
Target's health	0.063					-0.083		-0.854 a
	(0.719)					(0.391)		(0.223)
Herfindahl index	2.572	2.110	1.478	1.468	0.670	2.807	2.721	1.601
	(2.571)	(2.295)	(2.367)	(2.427)	(2.811)	(2.739)	(2.470)	(2.797)
Market share	-0.003	-0.006	0.011	0.009	0.019	0.004	0.004	0.011
	(0.021)	(0.020)	(0.020)	(0.020)	(0.024)	(0.021)	(0.020)	(0.021)
Prefectural GDP	-0.419	-0.586 a	-0.390 c	-0.315	-0.269	-0.266	-0.280	-0.258
	(0.260)	(0.226)	(0.213)	(0.216)	(0.268)	(0.246)	(0.221)	(0.256)
Size	0.029	0.031 c	0.011	0.007	0.000	0.008	0.008	-0.003
	(0.019)	(0.018)	(0.016)	(0.017)	(0.021)	(0.018)	(0.016)	(0.017)
Cons	5.649	8.531 b	5.056	3.893	3.821	2.986	3.235	3.157
	(4.487)	(3.855)	(3.585)	(3.659)	(4.606)	(4.211)	(3.730)	(4.373)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.371	0.361	0.311	0.276	0.029	0.281	0.305	0.219

Panel F. Change in bad loan ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	-8.812	0.074	-3.890 a					
	(13.630)	(2.365)	(1.041)					
Relative health	-0.084	-3.024 b		-2.953 a				
	(2.704)	(1.460)		(0.633)				
Relative size	-2.471	0.488			-6.011			
	(5.723)	(4.859)			(5.254)			
Acquirer's performance	3.343					0.642	-5.158 b	
	(5.206)					(2.903)	(2.484)	
Target's performance	-7.809					0.530	3.531 a	
	(12.597)					(1.777)	(0.995)	
Acquirer's health	-2.794 b					-2.531 a		-2.424 a
	(1.307)					(0.902)		(0.660)
Target's health	1.963					2.334 b		2.553 a
	(2.169)					(1.054)		(0.481)
Herfindahl index	-15.051	1.022	1.870	0.930	3.014	-12.614	-2.686	-11.992
	(9.860)	(7.160)	(7.442)	(6.806)	(9.118)	(8.359)	(7.688)	(7.916)
Market share	-0.047	-0.095	-0.112 c	-0.096 c	-0.141 c	-0.038	-0.084	-0.039
	(0.061)	(0.058)	(0.060)	(0.056)	(0.073)	(0.056)	(0.060)	(0.054)
Prefectural GDP	-3.021 b	-1.100	-0.969	-1.126	-1.982 c	-2.423 b	-1.440 c	-2.421 a
	(1.303)	(0.847)	(0.787)	(0.708)	(0.975)	(0.871)	(0.834)	(0.835)
Size	0.006	0.005	0.013	0.007	0.086	0.002	0.020	0.010
	(0.051)	(0.053)	(0.048)	(0.044)	(0.060)	(0.044)	(0.047)	(0.039)
Cons	52.674 b	18.818	16.155	19.340	31.760 c	42.029 b	24.091 c	41.750 a
	(22.978)	(14.627)	(13.284)	(11.996)	(16.992)	(15.037)	(14.045)	(14.408)
Obs	31	31	31	31	31	31	31	31
Adjusted R-sq	0.488	0.428	0.369	0.474	0.065	0.545	0.405	0.579

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

(Table 9. Continued from previous page)

Panel G. Change in new bad loan ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	34.491	-0.459	-4.559					
	(46.567)	(6.425)	(4.186)					
Relative health	-7.104	-1.363		-1.074				
	(10.022)	(2.919)		(2.163)				
Relative size	-14.762	-11.102			-10.788			
	(13.523)	(9.973)			(7.394)			
Acquirer's performance	-18.200					-12.568	-9.027 c	
	(13.844)					(6.949)	(4.978)	
Target's performance	32.715					6.098	5.025	
	(40.538)					(4.811)	(3.626)	
Acquirer's health	1.942					1.406		-0.504
	(3.221)					(2.073)		(1.661)
Target's health	-6.278					-1.412		0.934
	(7.648)					(2.425)		(2.108)
Herfindahl index	-20.618	3.908	4.303	8.679	7.110	-12.695	-17.172	5.730
	(29.250)	(15.323)	(14.846)	(14.673)	(13.450)	(24.784)	(19.105)	(23.294)
Market share	-0.076	-0.262 c	-0.235	-0.269 c	-0.299 b	-0.066	-0.046	-0.248
	(0.232)	(0.141)	(0.133)	(0.135)	(0.117)	(0.185)	(0.169)	(0.172)
Prefectural GDP	-4.457	-4.167 b	-3.423 b	-3.523 b	-4.223 b	-2.836	-3.344 b	-3.562
	(3.032)	(1.680)	(1.496)	(1.545)	(1.511)	(2.169)	(1.421)	(2.125)
Size	0.108	0.144	0.086	0.117	0.156	0.061	0.047	0.111
	(0.148)	(0.124)	(0.109)	(0.107)	(0.102)	(0.122)	(0.105)	(0.119)
Cons	76.871	68.255 b	54.358 b	54.347 c	67.919 b	46.717	56.234 b	55.425
	(52.734)	(28.260)	(24.610)	(25.468)	(25.571)	(37.598)	(23.328)	(36.381)
Obs	19	19	19	19	19	19	19	19
Adjusted R-sq	0.120	0.201	0.247	0.193	0.294	0.251	0.333	0.127

Panel H. Change in loan ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	-13.337	-3.163	-1.489					
	(14.534)	(2.211)	(1.329)					
Relative health	2.837	1.374		-0.108				
	(2.522)	(1.176)		(0.735)				
Relative size	-3.220	-2.573			-3.933			
	(4.921)	(4.400)			(4.117)			
Acquirer's performance	7.182					2.638	0.709	
	(6.097)					(3.655)	(2.921)	
Target's performance	-8.128					4.316 c	1.513	
	(13.978)					(2.371)	(1.311)	
Acquirer's health	-1.935					-0.877		-0.475
	(1.222)					(0.815)		(0.660)
Target's health	0.420					-1.520		0.196
	(2.374)					(1.199)		(0.670)
Herfindahl index	-3.179	2.834	2.084	2.618	3.230	-2.937	2.799	0.202
	(8.491)	(7.518)	(7.454)	(7.535)	(7.475)	(8.402)	(7.797)	(8.387)
Market share	-0.073	-0.076	-0.058	-0.064	-0.083	-0.051	-0.062	-0.056
	(0.068)	(0.067)	(0.062)	(0.063)	(0.065)	(0.064)	(0.064)	(0.064)
Prefectural GDP	-1.698 c	-0.986	-0.851	-0.948	-1.203 c	-1.238	-0.778	-1.178
	(0.860)	(0.741)	(0.669)	(0.671)	(0.713)	(0.755)	(0.698)	(0.768)
Size	0.050	0.070	0.053	0.061	0.086	0.020	0.053	0.058
	(0.062)	(0.060)	(0.052)	(0.052)	(0.057)	(0.055)	(0.052)	(0.052)
Cons	28.183 c	15.482	13.170	14.330	18.974	20.565	11.948	18.407
	(14.822)	(12.629)	(11.286)	(11.358)	(12.249)	(12.917)	(11.774)	(13.117)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	-0.008	-0.008	-0.003	-0.024	-0.009	0.006	-0.017	-0.033

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

(Table 9. Continued from previous page)

Panel I. Change in loan growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	18.584	1.715	3.477 b					
	(14.793)	(2.231)	(1.390)					
Relative health	-0.880	1.885		2.228 a				
	(2.567)	(1.186)		(0.745)				
Relative size	-9.163 c	-8.205 c			-3.453			
	(5.009)	(4.439)			(4.496)			
Acquirer's performance	-4.032					2.762	3.603	
	(6.206)					(3.860)	(3.062)	
Target's performance	17.713					0.247	-3.050 b	
	(14.227)					(2.505)	(1.375)	
Acquirer's health	0.605					0.120		0.499
	(1.244)					(0.861)		(0.675)
Target's health	-3.106					-1.985		-1.961 a
	(2.417)					(1.266)		(0.686)
Herfindahl index	-10.598	-8.196	-10.073	-9.731	-11.060	-10.725	-8.039	-10.508
	(8.643)	(7.585)	(7.795)	(7.640)	(8.163)	(8.874)	(8.175)	(8.580)
Market share	0.015	0.008	0.056	0.049	0.059	0.050	0.046	0.054
	(0.069)	(0.067)	(0.065)	(0.064)	(0.071)	(0.067)	(0.067)	(0.066)
Prefectural GDP	-1.468 c	-1.404 c	-0.887	-0.790	-0.860	-0.826	-0.701	-0.795
	(0.875)	(0.748)	(0.700)	(0.681)	(0.779)	(0.797)	(0.732)	(0.786)
Size	0.058	0.080	0.025	0.022	0.025	-0.007	0.021	-0.001
	(0.063)	(0.060)	(0.054)	(0.053)	(0.062)	(0.058)	(0.054)	(0.053)
Cons	26.425 c	24.353 c	15.286	13.544	16.487	14.828	12.214	14.115
	(15.087)	(12.742)	(11.802)	(11.516)	(13.376)	(13.642)	(12.344)	(13.417)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.107	0.123	0.062	0.099	-0.029	0.052	0.044	0.076

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

Table 10. OLS Regression Results for the Change in Bank Characteristics after M&As, Robustness Checks

Panel A. Change in ROA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	0.815	1.253 b	1.319 a					
	(2.755)	(0.502)	(0.301)					
Relative health	0.771	0.139		0.621 a				
	(0.577)	(0.267)		(0.172)				
Relative size	-0.780	-1.161			0.421			
	(1.103)	(0.997)			(1.071)			
Acquirer's performance	-1.127					-0.968	-0.658	
	(1.321)					(0.864)	(0.658)	
Target's performance	-0.582					-1.514 a	-1.336 a	
	(2.622)					(0.529)	(0.297)	
Acquirer's health	-0.130					0.125		-0.048
	(0.300)					(0.201)		(0.166)
Target's health	0.650					0.089		-0.509 a
	(0.536)					(0.271)		(0.165)
Herfindahl index	0.619	1.081	0.843	0.785	0.217	0.822	0.209	-0.463
	(1.932)	(1.708)	(1.692)	(1.764)	(1.948)	(1.941)	(1.736)	(2.026)
Market share	-0.004	-0.007	-0.001	-0.001	0.008	0.000	0.002	0.005
	(0.015)	(0.015)	(0.014)	(0.015)	(0.017)	(0.014)	(0.014)	(0.015)
Prefectural GDP	-0.261	-0.212	-0.136	-0.084	-0.017	-0.166	-0.217	-0.176
	(0.196)	(0.167)	(0.151)	(0.156)	(0.185)	(0.174)	(0.156)	(0.186)
Size	0.004	-0.001	-0.009	-0.012	-0.019	-0.005	-0.007	-0.019
	(0.014)	(0.014)	(0.012)	(0.012)	(0.015)	(0.013)	(0.012)	(0.013)
Cons	4.051	3.432	2.086	1.308	0.544	2.520	3.469	3.102
	(3.377)	(2.850)	(2.550)	(2.647)	(3.174)	(2.979)	(2.624)	(3.168)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.239	0.221	0.226	0.159	-0.028	0.221	0.241	0.110

Panel B. Change in cost ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	-4.913	0.736	-1.032					
	(16.936)	(3.132)	(1.923)					
Relative health	0.434	-2.050		-1.245				
	(3.546)	(1.665)		(1.042)				
Relative size	12.155 c	10.187			7.864			
	(6.782)	(6.226)			(5.857)			
Acquirer's performance	-9.437					-11.848 b	-9.536 b	
	(8.121)					(5.281)	(4.099)	
Target's performance	-7.777					-3.172	0.534	
	(16.119)					(3.234)	(1.850)	
Acquirer's health	0.841					1.080		-0.737
	(1.846)					(1.229)		(0.988)
Target's health	3.213					2.102		1.127
	(3.295)					(1.653)		(0.979)
Herfindahl index	-8.518	-11.189	-8.933	-9.514	-9.513	-7.919	-15.330	-11.552
	(11.878)	(10.661)	(10.799)	(10.698)	(10.658)	(11.857)	(10.813)	(12.025)
Market share	0.011	0.006	-0.053	-0.044	-0.024	-0.039	-0.019	-0.040
	(0.093)	(0.093)	(0.090)	(0.089)	(0.092)	(0.088)	(0.088)	(0.091)
Prefectural GDP	-0.015	-0.163	-0.806	-0.797	-0.389	-0.865	-1.390	-1.050
	(1.205)	(1.045)	(0.965)	(0.949)	(1.012)	(1.064)	(0.971)	(1.101)
Size	-0.124	-0.170 b	-0.101	-0.105	-0.144 c	-0.054	-0.097	-0.099
	(0.085)	(0.085)	(0.075)	(0.074)	(0.081)	(0.076)	(0.072)	(0.074)
Cons	0.709	4.855	16.091	16.360	7.859	15.917	25.782	20.543
	(20.763)	(17.794)	(16.277)	(16.054)	(17.362)	(18.198)	(16.344)	(18.799)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.082	0.031	-0.007	0.013	0.019	0.072	0.061	0.000

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

(Table 10. Continued from previous page)

Panel C. Change in interest rates of deposits

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	0.054	-0.098	-0.059					
	(0.358)	(0.066)	(0.039)					
Relative health	0.087	0.031		-0.013				
	(0.075)	(0.035)		(0.022)				
Relative size	0.022	-0.037			-0.097			
	(0.144)	(0.131)			(0.123)			
Acquirer's performance	0.201					0.200 c	0.134	
	(0.172)					(0.110)	(0.085)	
Target's performance	0.169					0.100	0.070 c	
	(0.341)					(0.067)	(0.038)	
Acquirer's health	-0.056					-0.027		0.005
	(0.039)					(0.026)		(0.021)
Target's health	0.056					-0.014		0.021
	(0.070)					(0.034)		(0.020)
Herfindahl index	-0.143	-0.078	-0.091	-0.077	-0.053	-0.116	0.007	-0.018
	(0.251)	(0.224)	(0.220)	(0.224)	(0.223)	(0.247)	(0.223)	(0.250)
Market share	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Prefectural GDP	0.061 b	0.062 a	0.063 a	0.060 a	0.053 b	0.063 a	0.074 a	0.066 a
	(0.026)	(0.022)	(0.020)	(0.020)	(0.021)	(0.022)	(0.020)	(0.023)
Size	-0.004 c	-0.003	-0.003 b	-0.003 c	-0.002	-0.004 b	-0.003 b	-0.003 c
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Cons	-0.889 b	-0.911 b	-0.935 a	-0.894 a	-0.776 b	-0.920 b	-1.115 a	-1.005 b
	(0.439)	(0.374)	(0.332)	(0.336)	(0.364)	(0.380)	(0.337)	(0.391)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.176	0.144	0.161	0.134	0.138	0.191	0.200	0.133

Panel D. Change in interest rates of loans

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	-0.763	0.056	0.083					
	(0.713)	(0.131)	(0.078)					
Relative health	0.162	0.000		0.035				
	(0.149)	(0.069)		(0.043)				
Relative size	0.267	0.222			0.285			
	(0.286)	(0.260)			(0.240)			
Acquirer's performance	0.315					0.010	-0.185	
	(0.342)					(0.219)	(0.171)	
Target's performance	-0.680					0.014	-0.092	
	(0.679)					(0.134)	(0.077)	
Acquirer's health	-0.147 c					-0.079		-0.077 c
	(0.078)					(0.051)		(0.039)
Target's health	0.080					-0.052		-0.047
	(0.139)					(0.069)		(0.038)
Herfindahl index	-1.042 b	-0.492	-0.452	-0.459	-0.525	-0.969 c	-0.590	-0.958 b
	(0.500)	(0.445)	(0.437)	(0.439)	(0.436)	(0.492)	(0.451)	(0.472)
Market share	0.004	0.003	0.002	0.002	0.004	0.004	0.003	0.004
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Prefectural GDP	-0.096 c	-0.031	-0.047	-0.043	-0.023	-0.093 b	-0.061	-0.093 b
	(0.051)	(0.044)	(0.039)	(0.039)	(0.041)	(0.044)	(0.040)	(0.043)
Size	-0.001	0.000	0.001	0.001	-0.001	0.000	0.001	0.000
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Cons	1.706 c	0.570	0.846	0.796	0.452	1.680 b	1.089	1.674 b
	(0.875)	(0.742)	(0.659)	(0.659)	(0.710)	(0.755)	(0.681)	(0.738)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	-0.018	-0.054	-0.031	-0.039	-0.026	0.003	-0.020	0.038

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

(Table 10. Continued from previous page)

Panel E. Change in capital ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	8.088 b	1.634 b	1.918 a					
	(3.655)	(0.665)	(0.417)					
Relative health	0.041	0.442		0.997 a				
	(0.765)	(0.353)		(0.232)				
Relative size	-3.132 b	-3.051 b			-0.589			
	(1.464)	(1.322)			(1.502)			
Acquirer's performance	-1.303					1.590	2.104 b	
	(1.753)					(1.211)	(0.921)	
Target's performance	5.994 c					-1.710 b	-1.748 a	
	(3.479)					(0.742)	(0.416)	
Acquirer's health	0.306					0.188		0.389 c
	(0.398)					(0.282)		(0.227)
Target's health	-0.103					-0.055		-0.806 a
	(0.711)					(0.379)		(0.225)
Herfindahl index	3.313	1.935	1.295	1.288	0.542	3.082	2.461	1.887
	(2.564)	(2.263)	(2.344)	(2.386)	(2.733)	(2.720)	(2.431)	(2.759)
Market share	-0.013	-0.013	0.004	0.002	0.011	-0.005	-0.003	0.003
	(0.020)	(0.020)	(0.019)	(0.020)	(0.023)	(0.020)	(0.020)	(0.021)
Prefectural GDP	-0.391	-0.634 a	-0.436 b	-0.366 c	-0.338	-0.287	-0.353	-0.255
	(0.260)	(0.222)	(0.210)	(0.212)	(0.259)	(0.244)	(0.218)	(0.253)
Size	0.027	0.028	0.007	0.003	-0.001	0.008	0.007	-0.003
	(0.018)	(0.018)	(0.016)	(0.016)	(0.021)	(0.018)	(0.016)	(0.017)
Cons	5.131	9.372 b	5.887	4.798	5.030	3.378	4.565	3.106
	(4.481)	(3.778)	(3.533)	(3.580)	(4.452)	(4.174)	(3.674)	(4.314)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.355	0.341	0.285	0.259	0.027	0.264	0.284	0.205

Panel F. Change in bad loan ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	-11.521	0.154	-3.775 a					
	(11.232)	(2.363)	(1.041)					
Relative health	-0.115	-3.012 b		-2.884 a				
	(2.616)	(1.458)		(0.633)				
Relative size	-1.437	0.645			-5.675			
	(5.348)	(4.859)			(5.212)			
Acquirer's performance	4.477					0.783	-4.949 c	
	(4.681)					(2.922)	(2.542)	
Target's performance	-10.274					0.392	3.446 a	
	(10.175)					(1.746)	(1.022)	
Acquirer's health	-2.896 b					-2.505 b		-2.371 a
	(1.257)					(0.901)		(0.666)
Target's health	1.795					2.405 b		2.549 a
	(2.118)					(1.050)		(0.499)
Herfindahl index	-15.872	1.018	1.808	0.901	2.989	-11.936	-2.237	-11.394
	(9.750)	(7.168)	(7.457)	(6.821)	(9.060)	(8.418)	(7.777)	(7.984)
Market share	-0.048	-0.093	-0.110 c	-0.094	-0.139 c	-0.037	-0.082	-0.038
	(0.060)	(0.058)	(0.060)	(0.055)	(0.073)	(0.056)	(0.061)	(0.054)
Prefectural GDP	-3.225 b	-1.125	-1.003	-1.156	-1.976 c	-2.330 b	-1.382	-2.327 b
	(1.276)	(0.845)	(0.785)	(0.706)	(0.966)	(0.883)	(0.845)	(0.846)
Size	0.010	0.007	0.016	0.010	0.086	0.002	0.017	0.008
	(0.050)	(0.053)	(0.048)	(0.044)	(0.059)	(0.045)	(0.048)	(0.040)
Cons	56.196 b	19.062	16.556	19.687	31.483 c	40.243 b	22.796	39.965 b
	(22.543)	(14.604)	(13.244)	(11.961)	(16.819)	(15.231)	(14.215)	(14.591)
Obs	31	31	31	31	31	31	31	31
Adjusted R-sq	0.491	0.419	0.358	0.465	0.064	0.529	0.381	0.565

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

(Table 10. Continued from previous page)

Panel G. Change in new bad loan ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	34.087	-0.024	-4.290					
	(43.535)	(6.531)	(4.260)					
Relative health	-7.235	-1.414		-0.996				
	(9.992)	(2.956)		(2.185)				
Relative size	-19.421	-11.488			-10.809			
	(15.299)	(10.120)			(7.472)			
Acquirer's performance	-17.880					-12.840 c	-9.186 c	
	(12.844)					(7.007)	(5.145)	
Target's performance	30.927					5.457	4.456	
	(36.587)					(4.863)	(3.777)	
Acquirer's health	1.690					1.473		-0.444
	(3.099)					(2.066)		(1.683)
Target's health	-6.158					-1.429		0.637
	(7.495)					(2.433)		(2.159)
Herfindahl index	-22.214	3.970	4.261	8.473	6.779	-12.098	-16.894	5.966
	(29.748)	(15.582)	(15.133)	(14.858)	(13.616)	(25.237)	(19.480)	(23.539)
Market share	-0.064	-0.261 c	-0.231	-0.264 c	-0.293 b	-0.064	-0.042	-0.250
	(0.234)	(0.143)	(0.135)	(0.136)	(0.118)	(0.189)	(0.173)	(0.172)
Prefectural GDP	-4.668	-4.152 b	-3.377 b	-3.474 b	-4.172 b	-2.748	-3.285 b	-3.578
	(3.037)	(1.702)	(1.517)	(1.559)	(1.524)	(2.216)	(1.459)	(2.195)
Size	0.090	0.143	0.082	0.112	0.150	0.054	0.039	0.106
	(0.151)	(0.125)	(0.110)	(0.108)	(0.103)	(0.126)	(0.109)	(0.120)
Cons	80.567	67.713 b	53.294 c	53.255 c	66.812 b	44.764	54.842 b	55.211
	(53.034)	(28.543)	(24.857)	(25.605)	(25.729)	(38.336)	(23.809)	(37.568)
Obs	19	19	19	19	19	19	19	19
Adjusted R-sq	0.103	0.177	0.222	0.174	0.277	0.221	0.302	0.101

Panel H. Change in loan ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	-10.473	-3.146	-1.479					
	(12.424)	(2.232)	(1.339)					
Relative health	2.511	1.340		-0.116				
	(2.601)	(1.186)		(0.741)				
Relative size	-2.123	-2.207			-3.602			
	(4.975)	(4.437)			(4.148)			
Acquirer's performance	6.865					2.929	0.844	
	(5.957)					(3.816)	(2.975)	
Target's performance	-5.145					4.301 c	1.522	
	(11.825)					(2.337)	(1.343)	
Acquirer's health	-1.983					-0.940		-0.420
	(1.354)					(0.888)		(0.701)
Target's health	0.073					-1.555		0.139
	(2.417)					(1.195)		(0.695)
Herfindahl index	-4.402	2.420	1.748	2.292	2.858	-3.487	2.526	0.181
	(8.714)	(7.597)	(7.521)	(7.600)	(7.548)	(8.570)	(7.849)	(8.535)
Market share	-0.067	-0.076	-0.059	-0.066	-0.083	-0.047	-0.063	-0.059
	(0.068)	(0.067)	(0.062)	(0.063)	(0.065)	(0.064)	(0.064)	(0.064)
Prefectural GDP	-1.822 b	-1.073	-0.965	-1.061	-1.293 c	-1.305 c	-0.865	-1.272
	(0.884)	(0.745)	(0.672)	(0.674)	(0.717)	(0.769)	(0.705)	(0.782)
Size	0.043	0.065	0.050	0.058	0.082	0.016	0.049	0.056
	(0.062)	(0.060)	(0.052)	(0.052)	(0.058)	(0.055)	(0.053)	(0.053)
Cons	31.236 b	17.665	15.857	16.989	21.190 c	22.408 c	14.169	20.690
	(15.232)	(12.680)	(11.335)	(11.405)	(12.296)	(13.152)	(11.863)	(13.343)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	-0.009	-0.005	0.003	-0.017	-0.005	0.011	-0.011	-0.029

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

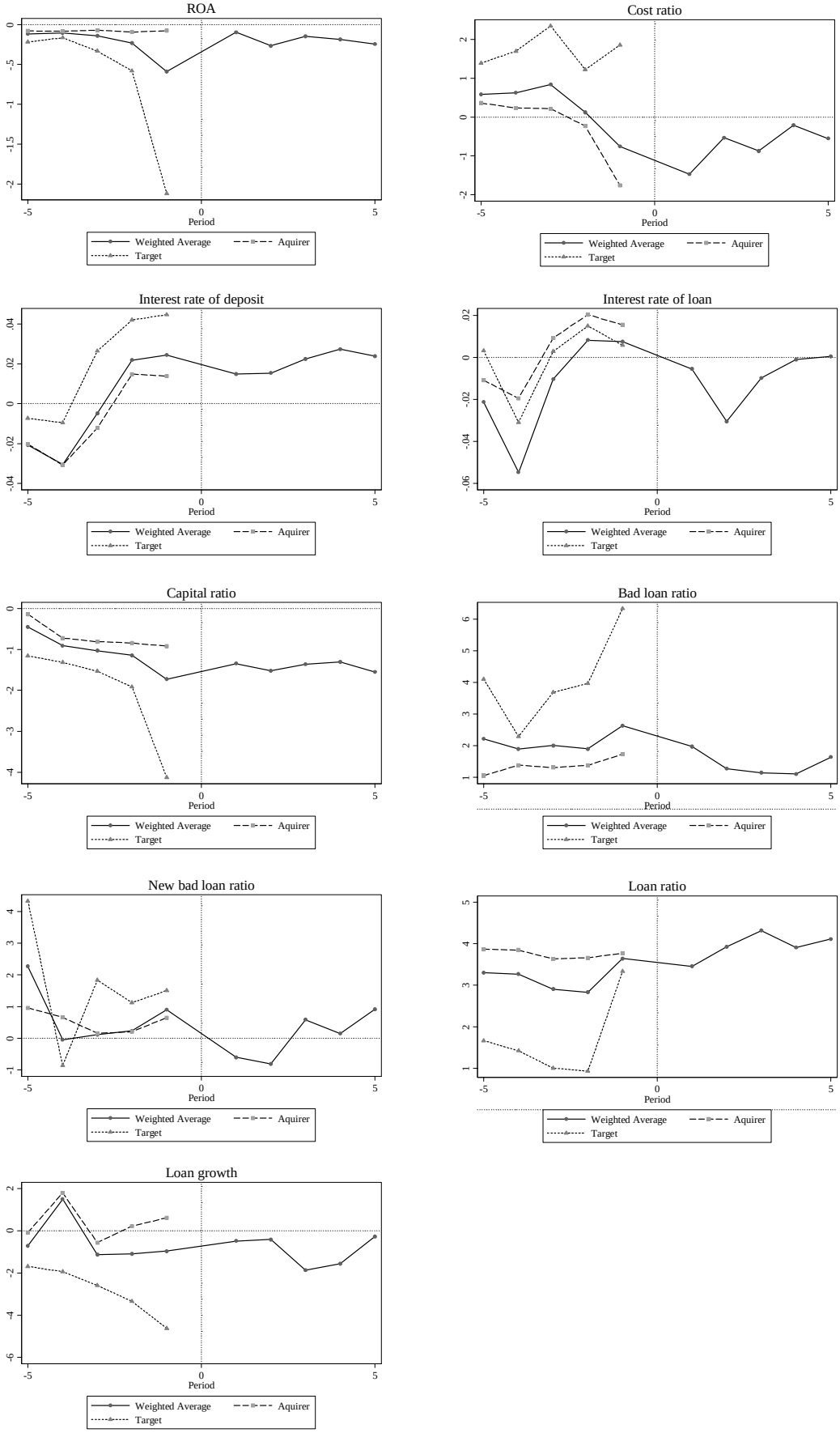
(Table 10. Continued from previous page)

Panel I. Change in loan growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relative performance	13.162	1.549	3.227 b					
	(12.260)	(2.180)	(1.362)					
Relative health	-0.712	1.838		2.104 a				
	(2.567)	(1.159)		(0.730)				
Relative size	-11.078 b	-8.321 c			-3.823			
	(4.909)	(4.335)			(4.370)			
Acquirer's performance	-2.345					2.850	3.500	
	(5.879)					(3.912)	(3.024)	
Target's performance	12.410					0.020	-2.937 b	
	(11.669)					(2.396)	(1.365)	
Acquirer's health	0.527					0.059		0.482
	(1.337)					(0.911)		(0.696)
Target's health	-2.939					-1.831		-1.903 a
	(2.385)					(1.225)		(0.690)
Herfindahl index	-10.761	-8.938	-10.814	-10.475	-11.712	-11.565	-8.882	-11.276
	(8.599)	(7.422)	(7.645)	(7.490)	(7.951)	(8.785)	(7.978)	(8.469)
Market share	0.010	0.004	0.052	0.045	0.053	0.049	0.041	0.052
	(0.067)	(0.065)	(0.063)	(0.062)	(0.068)	(0.066)	(0.065)	(0.064)
Prefectural GDP	-1.525 c	-1.496 b	-0.977	-0.887	-0.989	-0.928	-0.839	-0.881
	(0.872)	(0.728)	(0.683)	(0.665)	(0.755)	(0.789)	(0.716)	(0.776)
Size	0.056	0.076	0.020	0.018	0.024	-0.005	0.020	0.000
	(0.062)	(0.059)	(0.053)	(0.051)	(0.061)	(0.057)	(0.053)	(0.052)
Cons	27.658 c	26.371 b	17.307	15.665	19.127	17.018	15.118	16.026
	(15.031)	(12.389)	(11.522)	(11.240)	(12.953)	(13.483)	(12.058)	(13.239)
Obs	64	64	64	64	64	64	64	64
Adjusted R-sq	0.101	0.123	0.058	0.096	-0.020	0.049	0.045	0.074

Notes:
1) Standard errors are in parentheses.
2) a, b, and c represent significance at the 1% level, 5% level, and 10% level, respectively.

Figure 1. Characteristics of Acquirer, Target, and Weighted Average in the Pre and Post M&As



Appendix 1. Definition of Variables

- $ROA = \frac{Current\ profit}{Total\ assets} \times 100$
- $Cost\ ratio = \frac{Personnel\ expenditure + Nonpersonnel\ expenditure + Taxes}{Current\ profit} \times 100$
- $Interest\ rate\ on\ deposits = \frac{Interest\ on\ deposits}{Deposits\ outstanding} \times 100$
- $Interest\ rate\ on\ loans = \frac{Interest\ on\ loans}{Loans\ outstanding} \times 100$
- $Capital\ ratio = \frac{Total\ capital}{Total\ assets} \times 100$
- $Bad\ loan\ ratio = \frac{Non\ performing\ loans}{Loans\ outstanding} \times 100$
- $New\ bad\ loan\ ratio = \frac{Increase\ in\ non\ performing\ loans + Loans\ written-off}{Loans\ outstanding} \times 100$
- $Loan\ ratio = \frac{Loans\ outstanding}{Total\ assets} \times 100$
- $Loan\ growth = Growth\ rate\ of\ loans\ outstanding \times 100$
- $Size = ln(Total\ assets)$
- $Size\ growth = Growth\ rate\ of\ total\ assets \times 100$
- $Herfindahl\ index = Prefectual\ herfindahl\ index\ calculated\ by\ deposits\ outstanding\ of\ shinkin\ banks$
- $Market\ share = Each\ shinkin\ bank's\ deposits\ outstanding\ as\ a\ proportion\ to\ total\ deposits\ outstanding\ of\ the\ shinkin\ banks\ within\ the\ same\ prefecture \times 100$
- $Relative\ performance = \frac{Target's\ assets}{Acquirer's\ assets + Target's\ assets} \times (Acquirer's\ ROA - Target's\ ROA)$
- $Relative\ health = \frac{Target's\ assets}{Acquirer's\ assets + Target's\ assets} \times (Acquirer's\ capital\ ratio - Target's\ capital\ ratio)$
- $Relative\ size = \frac{Target's\ assets}{Acquirer's\ assets + Target's\ assets}$
- $Acquirer's\ performance = \frac{Acquirer's\ assets}{Acquirer's\ assets + Target's\ assets} \times Acquirer's\ ROA$
- $Target's\ performance = \frac{Target's\ assets}{Acquirer's\ assets + Target's\ assets} \times Target's\ ROA$
- $Acquirer's\ health = \frac{Acquirer's\ assets}{Acquirer's\ assets + Target's\ assets} \times Acquirer's\ capital\ ratio$
- $Target's\ health = \frac{Target's\ assets}{Acquirer's\ assets + Target's\ assets} \times Target's\ capital\ ratio$

Appendix 2. Changes in Major Components of the Capital Ratio after M&As

	t=1	t=2	t=3	t=4	t=5	Average
Invest in capital ratio						
Pre-merger	0.02	0.03	0.02	0.02	0.02	0.02
Post-merger (t years after)	0.08	0.11	0.17	0.14	0.14	0.13
Diff	0.06	0.08	0.15	0.12	0.12	0.10
t-Statistics	2.99 a	2.45 b	2.92 a	2.55 b	2.53 b	3.60 a
z-Statistics	2.10 b	2.45 b	2.85 a	2.15 b	1.99 b	2.84 a
Special reserve ratio						
Pre-merger	-0.77	-0.74	-0.56	-0.48	-0.57	-0.77
Post-merger (t years after)	-1.33	-1.45	-1.40	-1.32	-1.40	-1.40
Diff	-0.56	-0.71	-0.84	-0.84	-0.83	-0.63
t-Statistics	-4.17 a	-4.70 a	-4.14 a	-3.23 a	-2.57 b	-4.42 a
z-Statistics	-3.68 a	-3.86 a	-3.13 a	-2.45 b	-1.89 c	-3.61 a
Unappropiated profit ratio						
Pre-merger	-0.19	-0.20	-0.08	-0.07	-0.07	-0.19
Post-merger (t years after)	-0.04	-0.28	-0.18	-0.07	-0.18	-0.19
Diff	0.15	-0.08	-0.10	0.00	-0.11	0.00
t-Statistics	1.70 c	-0.26	-1.40	-0.05	-1.18	-0.02
z-Statistics	1.61	1.56	-1.17	0.17	-0.67	1.25

Appendix 3. Method of Constructing New Peers

First we classify definitely predicting acquirers and targets using the estimation results in Table 3. Let $\hat{p}_A$ be the estimated probability of each banks to become acquirer and $\hat{p}_T$ be those to become target. The standard errors of the difference in these two predictions are depicted by (See, e.g., Stata, 2005),

$$s.e = \sqrt{\frac{\hat{p}_A(1-\hat{p}_A)}{n_A} + \frac{\hat{p}_T(1-\hat{p}_T)}{n_T}}$$

We then calculate following z-value,

$$z = \frac{\hat{p}_A - \hat{p}_T}{s.e}$$

We consider the banks with $z > 1.96$ as definitely predicting acquirers, those with $z < 1.96$ as definitely predicting targets, and others as ambiguous. And we define control peer groups as those which suffice following two conditions: (1) those banks which classified as definitely predicting acquirers or targets, and (2) those banks which have not got involved in any merger or acquisition throughout all the sample period. Finally we obtain different two control peer groups for the acquirer and target respectively, and we can then take the weighted average of characteristics variable of control peer banks.