

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

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Backgrounds and Motivation

- A world-wide boom in the consolidation of the banking industry over the past two decade
- Enhance the efficiency of surviving banks ?
- Contribute to the stabilization of the banking sector ?
- Or just increase their market power in setting prices ?
- Berger, Demsetz and Strahan (1999) → reviewing the US and European cases
 - (1) Improvement in profit efficiency and diversification of risks but little or no cost efficiency improvement on average
 - (2) Increase in market power especially in the case of “in-market mergers”.

The consolidation of Japanese banking industry

- The number of financial institutions (Yamori(2005)):
 - (1) City banks: 13 in 1980 → 7 in 2005
 - (2) Regional banks: 63 in 1980 → 64 in 2005
 - (3) Second-tier regional banks: 71 in 1980 → 48 in 2005
 - (4) Shinkin banks: 462 in 1980 → 301 in 2005
 - (5) Credit cooperatives: 483 in 1980 → 179 in 2005
- Okada(2005) studied 10 mega-mergers among city banks during 1989-2000 → no improvement in X-efficiency but increase in cumulative excess return to stocks and decrease in default probability
- Inoue (2003) uses the observations of 33 mergers by Shinkin banks over the period 1989-98 → the cost efficiency of the acquirer is lower than the average of all shinkin banks and took 6 years to catch up with it.
- Yamori and Harimaya (2005) used the Shinkin bank data during 1998 – 2003 and analyzed the cost efficiency as of 2002 → The cost efficiency of those banks that had merged two years or more before was higher than those of peers (but not significant).

Hosono, Sakai and Tsuru (2006) on the consolidation of Japanese Shinkin banks

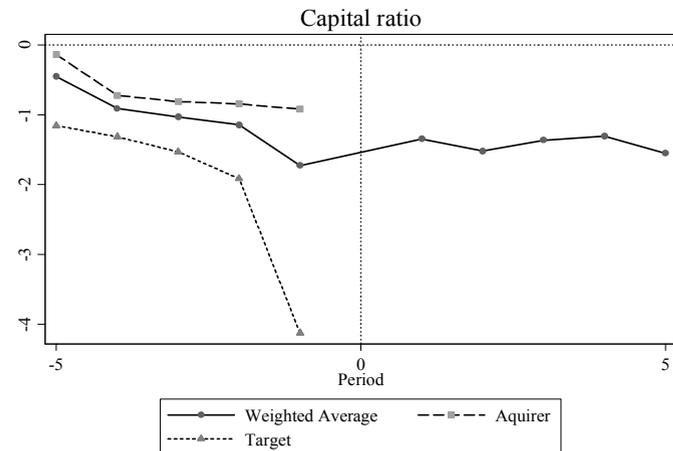
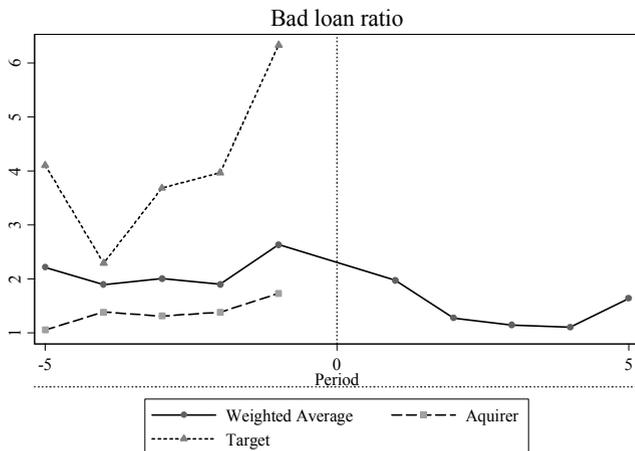
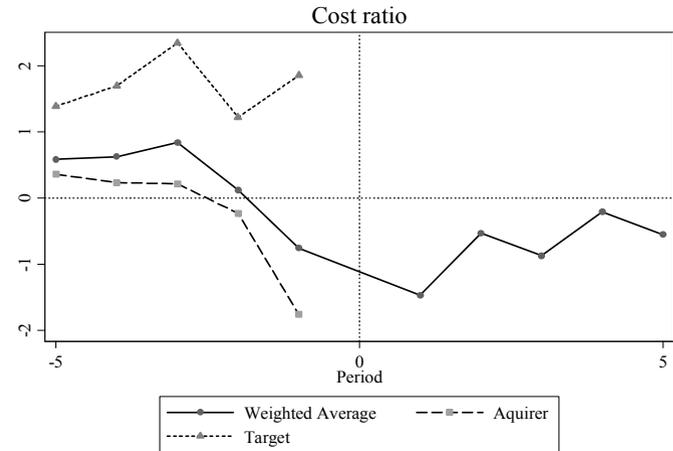
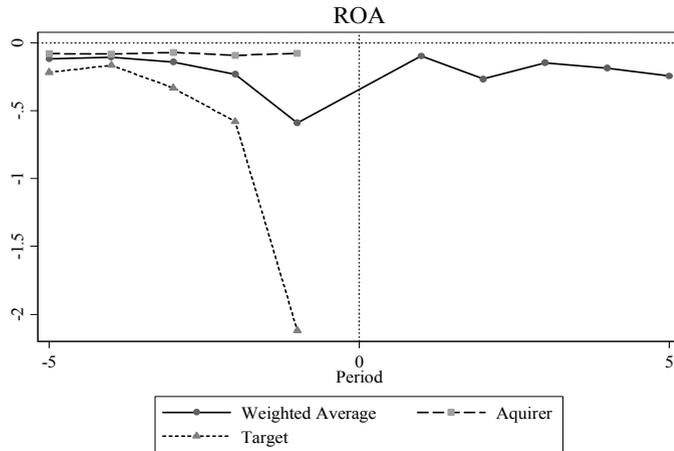
- Shinkin banks = deposit-taking cooperatives of small business whose objectives are to accept deposits from and make loans to member small firms
- Motives of Shinkin mergers → What type of a shinkin bank was more likely to be a target or an acquirer? (using a multinomial logit model)
- The effects of mergers on the profitability and healthiness as well as cost efficiency
- Comprehensive observations → use Shinkin data over the period 1984-2002 (109 M&As by Shinkin banks → 65 M&A data available)

The Motives of bank consolidation (Berger et al. (1999))

- Value-maximization (an acquirer's view):
 - (1) Increase in efficiency by improving cost efficiency or changing product mix (given the market power)
 - (2) Increase in market power in setting prices
- Non-value maximization:
 - (1) Empire-building to gain financial and non-financial gains from consolidated institutions
 - (2) Take advantage of the government's too-big-to-fail policy through M&A activities
- Social welfare maximization (government's view):
 - (1) Restore the stability of banking system by promoting bank consolidation

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

As compared with “peer banks” = not an acquirer nor a target throughout the sample periods



Empirical results on the motives for consolidation (Table 3)

- Shinkin 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 etc.
- Shinkin 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.
- A larger bank is more likely to be an acquirer and a smaller one a target.

Empirical results on the consequences of consolidation

- Table 4: the differences of bank characteristics variables between pre-merger acquirers and post-merger consolidated banks as compared with “peers”
- Table 5: the differences of bank characteristics variables between pre-merger weighted averages and post-merger consolidated banks as compared with “peers”
- Table 4 and 5 :
The cost ratio and the capital ratio significantly decreased after M&As but most of other variables do not change significantly. An improvement in profitability (ROA) was limited.
→ The cost efficiency increased with M&As but the capital ratio continued to deteriorate.
- Table 6(1991-1995), Table 7(1996-2002) :
The improvement in the cost ratio and ROA is evident in the latter half of the 1990s but not in the first half of the 1990s.
The loan interest rate rose after the merger in the second half of the 1990s.
→ The improvement in profitability seems to have been brought about both by more efficient operation and strong market power after M&As in the second half of the 1990s.

Ex ante conditions and their effects on the gains from consolidation: Hypotheses

- **“The relative performance hypothesis”** (Akhavein, Berger and Humphrey (1997)):
 - If a relatively efficient bank acquires a relatively inefficient bank and applies its superior management skills to the consolidated bank, then the efficiency gains would be greater.
- **“The low efficiency hypothesis”** (Akhavein et al. (1997)):
 - If either or both of merging banks are inefficient prior to the merger, there is a large room to improve.
- **“The relative size hypothesis”**
 - In the case of “mergers of equals”, there may be greater cost savings from the elimination of parallel management structures (Akhavein et al. (1997)).
 - The costs of mergers including conflicts of corporate culture and political battles leading to influence costs, tend to arise when similar-sized organizations are brought together (Milgrom and Roberts (1992)).

Ex ante conditions and their effects on the gains from consolidation: Empirical results

$$\Delta Y = \beta_0 + \beta_1 \text{RelativePerformance} + \beta_2 \text{RelativeHealth} + \beta_3 \text{RelativeSize} + \beta_4 \text{HerfindahlIndex} + \beta_5 \text{MarketShare} + \beta_6 \text{PrefecturalGDP} + \beta_7 \text{Size} + \varepsilon$$

- Relative Performance = relative T's size × (A's ROA – T's ROA)
- Relative Health = relative T's size × (A's CAP ratio – T's CAP ratio)
- Relative size = T's assets / (A's assets and T's assets)
- The relative performance and the relative healthiness have a significantly positive impact on the change in ROA (Table 9-A) and the capital ratio (Table 9-E) and a significantly negative impact on the change in the bad loan ratio (Table 9-F). → consistent with “the relative performance hypothesis”
- The relative size has a significantly negative impact on the capital ratio (Table 9-E). → The consolidated banks tend to worsen their healthiness more as the size of the target is larger relative to the acquirer. → consistent with “the conflict of corporate culture hypothesis” (Milgrom and Roberts (1992))

Conclusion

- Acquiring banks and target banks were less profitable and less efficient than “peers”, though acquiring banks are more profitable and efficient and larger than target banks. → value-maximizing motive, taking advantage of the too-big-to-fail policy, the bail-out policy to stabilize the (local) banking system
- Acquiring banks improved cost efficiency after the consolidation.
- 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 (“the relative performance hypothesis”, Akhavein et al. (1997))
- The M&As have raised the loan interest rate and improved profitability particularly since the second half of the 1990s. → problematic from the view point of competition policy
- The M&As did not contribute to sufficiently stabilize the local banking system, with the continuing deterioration of the capital ratio of consolidated banks relative to “peers”.

Table 3. Multinomial Logistic Regression Results

	1984-2002		1991-1995		1996-2002	
	Coef.	Mrg. Ef.	Coef.	Mrg. Ef.	Coef.	Mrg. Ef.
Target						
ROA	-0.678 a (0.100)	-0.005 a (0.001)	-0.247 (0.158)	-0.002 (0.001)	-0.119 (0.144)	-0.001 (0.001)
Cost ratio	0.033 a (0.007)	0.000 a (0.000)	-0.039 (0.028)	0.000 (0.000)	0.009 (0.015)	0.000 (0.000)
Capital ratio	-0.009 a (0.004)	0.000 b (0.000)	-0.377 a (0.136)	-0.003 a (0.001)	-0.442 a (0.092)	-0.003 a (0.001)
Size	-0.713 a (0.108)	-0.005 a (0.001)	-0.914 a (0.249)	-0.006 a (0.002)	-1.034 a (0.168)	-0.008 a (0.002)
Size growth	-0.011 c (0.006)	0.000 c (0.000)	-0.090 b (0.045)	-0.001 c (0.000)	-0.149 a (0.037)	-0.001 a (0.000)
Prefectural GDP	0.729 a (0.131)	0.005 a (0.001)	0.288 (0.278)	0.002 (0.002)	0.696 a (0.192)	0.005 a (0.002)
Herfindahl index	3.168 a (1.010)	0.023 a (0.007)	0.621 (2.500)	0.004 (0.017)	1.965 (1.329)	0.015 (0.011)
Cons	-4.870 c (2.656)		11.133 b (5.651)		5.306 (4.044)	
Aquirer						
ROA	-0.308 b (0.154)	-0.004 c (0.002)	0.151 (0.816)	0.002 (0.009)	-0.281 (0.194)	-0.006 (0.005)
Cost ratio	0.025 a (0.007)	0.000 a (0.000)	0.018 (0.028)	0.000 (0.000)	0.005 (0.015)	0.000 (0.000)
Capital ratio	-0.006 (0.011)	0.000 (0.000)	-0.273 (0.174)	-0.003 (0.002)	-0.022 (0.068)	0.000 (0.002)
Size	0.545 a (0.112)	0.006 a (0.001)	0.383 (0.234)	0.004 c (0.002)	0.601 a (0.162)	0.014 a (0.003)
Size growth	0.001 (0.003)	0.000 (0.000)	-0.019 (0.038)	0.000 (0.000)	0.003 (0.009)	0.000 (0.000)
Prefectural GDP	-0.002 (0.144)	0.000 (0.002)	-0.373 (0.320)	-0.004 (0.003)	0.046 (0.202)	0.001 (0.005)
Herfindahl index	0.047 (1.140)	0.000 (0.013)	-2.092 (2.803)	-0.023 (0.031)	0.451 (1.356)	0.010 (0.031)
Cons	-15.411 a (2.297)		-4.363 (5.157)		-16.128 a (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 (3.285)	1.299 b (0.505)	1.369 a (0.304)					
Relative health	0.746 (0.570)	0.144 (0.269)		0.645 a (0.174)				
Relative size	-0.890 (1.112)	-1.189 (1.006)			0.450 (1.088)			
Acquirer's performance	-1.212 (1.378)					-0.906 (0.846)	-0.622 (0.659)	
Target's performance	-0.356 (3.160)					-1.518 a (0.549)	-1.346 a (0.296)	
Acquirer's health	-0.121 (0.276)					0.115 (0.189)		-0.024 (0.160)
Target's health	0.625 (0.537)					0.083 (0.277)		-0.522 a (0.162)
Herfindahl index	0.693 (1.919)	1.210 (1.718)	0.964 (1.703)	0.912 (1.779)	0.334 (1.976)	0.884 (1.944)	0.316 (1.760)	-0.220 (2.028)
Market share	-0.001 (0.015)	-0.006 (0.015)	0.001 (0.014)	0.000 (0.015)	0.010 (0.017)	0.003 (0.015)	0.004 (0.014)	0.005 (0.016)
Prefectural GDP	-0.240 (0.194)	-0.197 (0.169)	-0.118 (0.153)	-0.064 (0.159)	0.006 (0.189)	-0.129 (0.175)	-0.179 (0.158)	-0.150 (0.186)
Size	0.006 (0.014)	0.000 (0.014)	-0.008 (0.012)	-0.011 (0.012)	-0.019 (0.015)	-0.006 (0.013)	-0.008 (0.012)	-0.019 (0.013)
Cons	3.751 (3.350)	3.205 (2.886)	1.803 (2.579)	1.004 (2.682)	0.163 (3.238)	1.918 (2.988)	2.846 (2.658)	2.672 (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 (20.409)	0.433 (3.171)	-1.493 (1.947)					
Relative health	0.816 (3.542)	-2.146 (1.686)		-1.479 (1.053)				
Relative size	10.620 (6.911)	10.049 (6.311)			7.245 (5.969)			
Acquirer's performance	-5.536 (8.562)					-10.716 b (5.189)	-9.089 b (4.131)	
Target's performance	-15.697 (19.629)					-3.307 (3.367)	0.884 (1.855)	
Acquirer's health	0.427 (1.716)					0.846 (1.158)		-0.647 (0.950)
Target's health	3.552 (3.334)					2.353 (1.702)		1.284 (0.964)
Herfindahl index	-9.721 (11.924)	-12.339 (10.783)	-10.073 (10.918)	-10.640 (10.795)	-10.419 (10.836)	-9.397 (11.930)	-16.332 (11.028)	-11.927 (12.068)
Market share	-0.002 (0.096)	-0.008 (0.095)	-0.067 (0.092)	-0.058 (0.091)	-0.042 (0.094)	-0.046 (0.090)	-0.033 (0.091)	-0.056 (0.093)
Prefectural GDP	-0.269 (1.207)	-0.362 (1.063)	-1.001 (0.980)	-1.008 (0.962)	-0.650 (1.034)	-1.047 (1.072)	-1.566 (0.987)	-1.185 (1.105)
Size	-0.129 (0.087)	-0.178 b (0.086)	-0.110 (0.076)	-0.113 (0.074)	-0.146 (0.083)	-0.060 (0.077)	-0.104 (0.073)	-0.102 (0.075)
Cons	4.650 (20.815)	7.781 (18.115)	18.995 (16.532)	19.488 (16.273)	11.752 (17.757)	18.668 (18.340)	28.513 c (16.653)	22.286 (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 (0.418)	-0.106 (0.066)	-0.065 c (0.039)					
Relative health	0.086 (0.073)	0.031 (0.035)		-0.016 (0.022)				
Relative size	0.063 (0.142)	-0.041 (0.130)			-0.109 (0.123)			
Acquirer's performance	0.152 (0.175)					0.201 c (0.106)	0.130 (0.083)	
Target's performance	0.323 (0.402)					0.110 (0.068)	0.075 b (0.037)	
Acquirer's health	-0.055 (0.035)					-0.028 (0.024)		0.000 (0.020)
Target's health	0.058 (0.068)					-0.016 (0.035)		0.024 (0.020)
Herfindahl index	-0.159 (0.244)	-0.083 (0.223)	-0.097 (0.219)	-0.082 (0.224)	-0.055 (0.223)	-0.127 (0.243)	0.005 (0.222)	-0.045 (0.248)
Market share	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.000 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
Prefectural GDP	0.061 b (0.025)	0.060 a (0.022)	0.062 a (0.020)	0.058 a (0.020)	0.051 b (0.021)	0.060 a (0.022)	0.072 a (0.020)	0.063 a (0.023)
Size	-0.004 b (0.002)	-0.003 c (0.002)	-0.003 b (0.002)	-0.003 b (0.002)	-0.002 (0.002)	-0.004 b (0.002)	-0.004 b (0.001)	-0.003 c (0.002)
Cons	-0.882 b (0.427)	-0.874 b (0.374)	-0.904 a (0.332)	-0.859 b (0.337)	-0.724 c (0.366)	-0.850 b (0.373)	-1.069 a (0.336)	-0.935 b (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 (0.873)	0.049 (0.133)	0.077 (0.079)					
Relative health	0.117 (0.152)	0.004 (0.071)		0.034 (0.043)				
Relative size	0.158 (0.296)	0.199 (0.265)			0.257 (0.244)			
Acquirer's performance	0.049 (0.366)					-0.083 (0.216)	-0.222 (0.171)	
Target's performance	-0.266 (0.840)					0.017 (0.140)	-0.083 (0.077)	
Acquirer's health	-0.100 (0.073)					-0.057 (0.048)		-0.068 c (0.038)
Target's health	0.050 (0.143)					-0.050 (0.071)		-0.041 (0.038)
Herfindahl index	-0.928 c (0.510)	-0.467 (0.453)	-0.431 (0.444)	-0.436 (0.446)	-0.498 (0.444)	-0.898 c (0.498)	-0.602 (0.458)	-0.887 c (0.479)
Market share	0.004 (0.004)	0.003 (0.004)	0.002 (0.004)	0.002 (0.004)	0.003 (0.004)	0.003 (0.004)	0.003 (0.004)	0.003 (0.004)
Prefectural GDP	-0.078 (0.052)	-0.028 (0.045)	-0.042 (0.040)	-0.039 (0.040)	-0.020 (0.042)	-0.083 c (0.045)	-0.057 (0.041)	-0.084 c (0.044)
Size	-0.001 (0.004)	0.000 (0.004)	0.001 (0.003)	0.001 (0.003)	-0.001 (0.003)	0.000 (0.003)	0.001 (0.003)	0.000 (0.003)
Cons	1.379 (0.890)	0.508 (0.761)	0.761 (0.673)	0.715 (0.672)	0.398 (0.727)	1.497 c (0.765)	1.020 (0.691)	1.509 b (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.