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Change in Bank Equity Stakes before Merger Completion

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Abstract

This study investigates the relationship between the changes in the shareholdings of the institutional financial/investment professionals and the firm-specific characteristics of the acquiring companies prior to merger completion. The present study thus serves to identifying the factors dominating investment behaviors of acquiring firms. Both total and average changes in their ownership are considered to test the popular agency and signaling hypotheses. Evidence shows that commercial banks are more likely to increase their equity holdings of those businesses with increasing current liability and decreasing profitability. The former supports the signaling hypothesis but the latter suggests the agency cost hypothesis is correct. Investment banks, on the other hand, prefer those with increasing assets and a stable financial status. A competitive relation of these financial experts is also presented in terms of the pursuit of greater controlling power over the board against each other before the merger completion date.

Keywords: Bank holding; Financial expertise; Agency theory; Signaling theory; Corporate governance

Introduction

Financial institutions play an important role in the financial markets by not only serving as a key funding source for new enterprises but also, through the exchange process, monitoring a firm's operations and diagnosing a firm's financial condition. Within the realm of financial institutions, commercial banks and investment banks have a particularly strong effect on the firm's performance. Petersen and Rajan [1] pointed out that as firms and commercial banks build and maintain long-term relationships, both lenders and borrowers can reduce agency conflict and the information asymmetry problem [2-5]. Investment banks can provide professional advice to firms on investment projects including mergers and acquisitions (M&As) activities [6]. In particular, investment banks can gain access to the firm's inside information and thus more accurately estimate the true value in the underwriting process, reducing the possibility of credit risk [7,8]. In addition, an investment bank holding firm's stock can reduce underwriting fees because the firm can reduce the cost of equity financing [9].

It is a well-known fact that M&As come in waves. Jensen and Meckling [10] apply agency theory to the modern corporation and model the agency costs of outside equity. The corporate finance literature comes up with different answers to this question. Shleifer and Vishny [11] argue that ownership concentration enhances corporate control by improving the monitoring of management. With diffused ownership, shareholders have few incentives for monitoring. With concentrated ownership, the cost of shirking will be mostly borne by large shareholders who therefore have a strong incentive to monitor the firm's management.

Commercial bank holding firm's stock in order to reduce the agency problem between shareholders and creditors, when the smaller size of the firm, the higher the ratio of intangible assets, greater volatility, and lower profitability, so that firms have more serious information asymmetry and agency conflicts [2,3,12,13]. The bank holding to get control of the firms through effective supervision and control of the firm's plans for the choice, reduce the conversion of assets, over- or under-investment problems, bank holding can use earning of investment plan to make up for some of the diluted value of the bank loan to the firm. This can often lead to increased bank holdings of probability.

The past research only considered a single type of a bank holding firm's stock or treated the supervisor of the companies' directors as the research object. Under general conditions, a variety of financial institutions will hold the stock at the same time. The present research simultaneously considers the commercial bank and the investment bank holding firm's stock as the research object. In addition, the previous studies are mostly for a specific time to explore the external financial institutions to enter the directors of the Companies Board of Supervisors and the companies characteristics related to research [14-16]. However, each firm may have different, time-dependent shocks. In addition, at the point in time before the study, the financial institutions may have had early access to the firm's board of directors and the holding firm's shares. Because the use of a specific point in time may be difficult to illustrate, the of financial institutions into directors of the Companies Board of Supervisors or holding shares of the firm's motives. This study does not explore the motive of ownership of financial institutions at a particular point in time. The quarterly holding changes between the first six quarters for the merger completion date to determine whether to increase its holding and to research the change in the connection between shareholding of financial institutions and financial characteristics.

The organization of the remainder of this paper is as follows. Section 2 describes our model, while Section 3 discusses the date and reports the main estimation results. Finally, Section 4 offers some concluding thoughts and discusses some implications of our findings.

Model Implementation

This section briefly introduces the Logistic model used to investigate the bank's holdings increases and each bank's average holdings increase

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on the relationship between characteristics of the bidding firms. The commercial banks and investment banks were measured using the same method described as follows:

$\Delta Y1a_{i=}$ the commercial bank's holdings change by firm i (1)

$\Delta Y1b_{i=}$ the each commercial bank's average holdings change by firm i (2)

$\Delta Y2a_i$=the investment bank's holdings change by firm i (3)

$\Delta Y2b_i$=the each investment bank's average holdings change by firm i (4)

$$\text{each banks average holdings it} = \frac{\text{the bank holdings by firm i in quarter t}}{\text{the bank number by firm i in quarter t}}$$

where Y_i is equal to 1 if the bank's holdings increase for the period between the M&A announcement date to the completion date, and 0 otherwise.

The model

This paper analyses the relationship between the bank's holdings change and characteristics of the bidding firms. Following the methodology proposed by Kroszner and Strahan [14] and controlling for firm operating performance variables such as changes in financial position ($\Delta ZSCORE_i$); value of firms (Tobin's q_{it-6}); fame of firms ($FAME_i$) and change in investment quality ($\Delta EROIC_i$). First, based on agency theory and signaling effects, we examine the relationship between the commercial bank's holdings increase probability and changes in the bidding firm's characteristics. The basic regression model takes the following form:

$$\Delta Y_i = \alpha_0 + \sum_{j=1}^{3} \beta_j IND_j + \beta_4 CONTROL_{it+} \beta_5 TOBINQ_{it-6+} \beta_6 \Delta ZSCORE_i + \beta_{10} \Delta LnTA_i + \beta_7 \Delta VOL_{i+} \beta_8 \Delta VOL^2_{i+} \beta_9 \Delta PROFIT_{i+} \beta_{11} \Delta TANRATIO_i + \beta_{12} \Delta DEBTRATIO_{i+} \beta_{13} \Delta CDRATIO_{i+} \beta_{14} \Delta EROIC_i + FAME_i + \varepsilon_{it} \quad (5)$$

Second, this paper examines the relationship between the investment bank's holdings change and characteristics of the bidding firms. The basic regression model takes the following form:

$$\Delta Y_i = \alpha_0 + \sum_{i=1}^{3} \beta_i IND_i + \beta_4 CONTROL_{it+} \beta_5 TOBINQ_{it+} \beta_6 \Delta ZSCORE_{it+} \beta_7 \Delta LnTA_i + \beta_8 \Delta INVRATIO_{i+} \beta_9 \Delta EQRATIO_i + \beta_{10} \Delta FAME_{i+} \varepsilon_{it} \quad (6)$$

The coefficient α_0 is the intercept, β_j is the regression coefficient, and ε_{it} is an error term assumed to be normally distributed with a mean of zero, iis firm i, t is the six quarters before the M&A completion date, Δ is the change invariables in the six quarters before the M&A announcement date and the completion date. Because this study aims to examine changes in firm characteristics which affect a bank's holdings change, changes in the amount of use were also included as other independent variables (in addition to control variables, some of the powers, and Tobin's Q using the quarter in six quarters before M&A completion date).

Variables

Industry variables (IND_i): This paper uses codings in accordance with SIC CODE (Standard Industrial Classification Code) before the two-digit codes. Figure 1 shows the characteristics of the sample according to industry, which can be divided into four main categories (energy category, manufacturing sector, retail trade, and services sector). These exclude the regulatory constraints of industry such as financial sector (SIC CODE=60~69) and public utilities (SIC CODE=49) (Figure 1).

IND_j is a dummy variable of industry in which j=1 is equal to 1 if the manufacturing sector (SIC CODE=20~48); j=2 is equal to 1 if the retail trade (SIC CODE=50 ~ 59); j=3 is equal to 1 if the services sector (SIC CODE=70~87).

Controlling power variables ($CONTROL_i$): This study suggests that holding a larger percentage of shares have greater controlling power before the M&A completion date. In other words, the commercial bank's holdings more than investment banks holdings in the bidding firms that commercial banks have greater controlling power, and vice versa. $CONTROL_i$ is a dummy variable of controlling power for bidding firms, which is equal to 1 if the commercial bank's holdings are more than the investment bank's holdings in the bidding firms and 0 otherwise.

In samples of commercial bank holdings changes, if the coefficient of controlling power was significantly positive, that commercial bank will continue to increase its holdings to maintain controlling power; if the coefficient is significantly negative, this indicates the investment bank of lower holding will increase its stake to gain controlling power. In samples of investment bank holdings changes, if the coefficient is significantly positive, this indicates the investment bank of lower holding will increase its stake to gain controlling power; if the coefficient is significantly negative, that commercial bank of higher holding has controlling power and will not continue to increase its holdings to maintain its controlling power.

Growth opportunities ($TOBINQ_{it-6}$): Firms with high levels of growth opportunities will have more demand for investment spending, and prior studies [17,18] empirically document such a relation. $TOBINQ_{it-6}$ [1]is the proxy for growth opportunity. If Tobin's Q is higher, that Investors believe the companies governance and higher evaluation of asset quality, thus reducing the firm's proxy conflicts. According to the agency cost hypothesis, when Tobin's Q is greater that bank will reduce holdings. According to the signaling hypothesis, when Tobin's Q greater firms with high levels of growth opportunities [19,20]. Bank holdings may be earning higher profits for earning of the investment plan. Therefore it will increase holdings.

Changes in financial position ($\Delta ZSCORE_i$): Following Altman [21], we measured criteria by the Z-score model. In general, Z-scores are the proxies for the probability of financial distress. Firms that are not financially distressed show lower credit risks and are therefore easier to finance in the market. As a result, the conflicts between the shareholders and the creditor agency are usually small. According to the agency cost hypothesis, when bank holding for loan firms in order to reduce the agency conflicts, so bank holding will reduce for non-financial distress firms. According to the signaling hypothesis, firms that are not financially distressed have lower credit risks and their liquidity is higher. If bank holdings for loan firms in order to earn profits for earning of the investment plan, banks will increase holdings for firms of lower credit risk and more debt can be secure

1 $TOBINQ_{i,t-6} = (V_{i,t-6} + MVD_{i,t-6}) \div TA_{i,t-6}$, where $V_{i,t-6}$ is the market value of the shares of firm *i*, $MVD_{i,t}$ is the market value of debt;however, we use the book value of debt instead, and $TA_{i,t-6}$ is the book value of asset.

	two-digit SIC code	Industry name	Numbers	sub total	% of samples	sub total
Panel A	13	Petroleum and Natural Gas	9		3.46	
	15	Operative Builders	1		0.38	
	17	Construction	1		0.38	
				11		4.23
Panel B	20	Food Products	6		2.31	
	23	Apparel	1		0.38	
	26	Business Supplies	2		0.77	
	27	Printing and Publishing	6		2.31	
	28	Chemicals	23		8.85	
	29	Petroetroleum Refining	2		0.77	
	30	Rubber and Plastic Products	2		0.77	
	33	Steel Works Etc	1		0.38	
	34	Fabricated Products	3		1.15	
	35	Machinery	23		8.85	
	36	Electrical Equipment	38		14.62	
	37	Automobiles and Trucks	2		0.77	
	38	Measuring and Control Equipment	21		8.08	
	39	Recreation	2		0.77	
	44	Transportation	1		0.38	
	45	Airtransport	2		0.77	
	47	Arrange Trans-Freight and Cargo	1		0.38	
	48	Communication	7		2.69	
				143		55.00
Panel C	50	Computers and Software	2		0.77	
	51	Wholesale	5		1.92	
	53	Retail	2		0.77	
	54	Foodstores	1		0.38	
	56	Clothing Stores	5		1.92	
	57	Furniture	4		1.54	
	58	Restaraunts, Hotels, Motels	3		1.15	
	59	Other Retails	5		1.92	
				27		10.38
Panel D	70	Hotel	1		0.38	
	73	Business Services	60		23.08	
	79	Entertainment	2		0.77	
	80	Healthcare	6		2.31	
	82	Educational Services	3		1.15	
	87	Other Services	7		2.69	
				106		40.77
	Total		260			100

Figure 1: Industry distribution of sample firms.

Note: In this study, the first two under the SIC-code code, the sample is divided into four parts, as follows: Panel A gold mine for the energy category (SIC CODE = 13 ~ 17) has 11 firms; Panel B for the manufacturing sector (SIC CODE = 20 ~ 48) has 143 firms; Panel C for the retail trade (SIC CODE = 50 ~ 59) has 27 firms; Panel D for the services sector (SIC CODE = 70 ~ 87) has 106 firms. However, all samples have 260 firms.

compensation. $\Delta ZSCORE_i$[2]is a dummy variable of financial position changes, which is equal to 1 if $Z\text{-score}_t$=1 and $Z\text{-score}_{t-6=}0$ or $Z\text{-score}_t$=1 and $Z\text{-score}_{t-6=}1$, and 0 otherwise.

Changes in asset size ($\Delta lnTA_i$) and changes in tangible assets ($\Delta TANRATIO_i$): When the firm has more assets or tangible assets to provide a higher guarantee for a loan, the creditor may conduct an auction of the collateral to back debt even if the firm is unable to repay the debt. Therefore, firms can increase the ratio of the assets or tangible assets to reduce agency conflicts between creditors and shareholders. According to the agency cost hypothesis, a bank maintaining a creditor will not increase its holdings. According to the signaling hypothesis, the loan firms increase the ratio of assets or tangible assets to reduce the internal private information and increase transparency of information [22,23]. Therefore, banks holdings are negatively correlated to increase the proportion of assets or tangible assets. $\Delta lnTA_i$[3]is the change in asset size and $\Delta TANRATIO_i$[4]is the change in tangible assets,

Volatility of firm (ΔVOL_i): According to the agency cost hypothesis, the greater volatility of loan firms that have higher the risk of firm and agency conflict. It is more difficult to provide the firm with equity financing so the firm will rely more on bank lending. When the bank holding increases the stock of loan firm, indicating can reduce the

[2]Following Altman (1983) measured criteriabyZ-score model. $Z=1.2X_1+1.4X_2+3.3X_3+0.6X_4+0.999X_5$, where X_1 is *Operating capital/Total asset*, X_2 is *Retained earnings/Total asset*, X_3 is *Earnings before interest and tax/Total asset*, X_4 is *Equity market/Total debt*, X_5 is *Sales revenue/Total asset*. $Z\text{-score}_t$ is dummy variable of non-financial crisis firms which$Z\text{-score}_t$is equal to 1 if $Z\text{-score}_t$ more than 2.675, and 0 otherwise.

[3]$\Delta lnTA_i = lnTA_t - lnTA_{t-6}$

[4]Followingthe definition of Guner et al. (2005) andJagannathan (2004), $\Delta TANRATIO_i=(PPE_{i,t}-PPE_{i,t-6})/Average\ TA$, $PPE_{i,t}$where net property plant and equipment, $Average\ TA=(TA_{i,t}-TA_{i,t-6})/2$.

agency problems from the identity of the creditor banks transferred to shareholders. As a result, a bank's holdings increase is positively correlated with firm volatility. On the other hand, according to the signaling hypothesis, if bank holdings by the loan firm in order to earn profits for earning of the investment plan, then bank's holding will reduce for higher volatility of firm. Kroszner and Strahan [14] show the lower volatility of firm that bank holdings will increase. ΔVOL_i is the volatility of the standard deviation of daily stock returns before the M&A completion date. ΔVOL^2_i is the volatility of daily stock returns variance before the M&A completion date.

Profitability performance ($\Delta PROFIT_i$): According to the agency cost hypothesis, a firm's improved profitability can make the shareholders or creditors earn greater profits which works to reduce agency conflict. Therefore, the bank holdings are negatively correlated with the profitability performance of the firm. According to the signaling hypothesis, the bank holdings will increase for higher profitability firms in order to earn profits for earning of the investment plan. Then the bank holdings will be positively correlated with the profitability performance of firm. E $\Delta PROFIT_i$ is the profitability performance such as the return of asset (ROA).

Changes in debt ratio ($\Delta DBRATIO_i$): In general, the proportion of debt increase that the total assets of firm to use debt to buy assets in the proportion of improved while the financial risk of firm is increased, therefore, improve agency problem between shareholders and creditors. According to the agency cost hypothesis, the bank holding increases the stock of the loan firm, indicating can reduce the interest conflict problems between shareholders and the creditor. The bank's holdings increase is positively correlated with the debt ratio of firms. On the other hand, according to the signaling hypothesis, the bank holdings will increases for the loan firm in order to earn profits for earning of the investment plan. Bank holdings will then be reduced to increase the proportion of firm liabilities. Therefore, the bank holdings are negative correlated with the debt ratio of firms. $\Delta DBRATIO_i$ is a change in debt ratio.

Changes in short-term liabilities ratio ($\Delta CDRATIO_i$): According to Kroszner and Strahan [14] and Stearns and Mizruchi [24], short-term liabilities ratios are the proxies for the relationship between banks and are also the borrowing source of the loan firm. Fama [2] indicates that when firms have higher agency conflicts and asymmetric information, those firms cannot collect funds by equity financing. Rather, they must collect funds through financial institutions. According to the agency cost hypothesis, the bank holdings increase for the increased short-term liabilities of the firm in order to reduce the conflict of interest between stockholders and creditors. If the firm increases the proportion of short-term liabilities, then the information transparency will decrease. According to signaling hypothesis, the bank holdings will increase in order to control the internal information of firm. $\Delta CDRATIO_i$ is the change in short-term liabilities ratio.

Change in investment quality ($\Delta EROIC_i$): The firm increases the rate of investment to rapidly expand and thus create a higher return. When the firm has a high-quality investment project, it can work to reduce agency conflict between shareholders and creditors. According to the agency cost hypothesis, the bank holdings for the loan firm serve to reduce the conflict of interest between shareholders and creditors. As a result, the bank holdings decrease for firms that have high-quality investment projects. According to signaling hypothesis, the bank holdings for loan firms serve to earn profits for earning of the investment plan. Accordingly, bank holdings will reduce for i firms which have high-quality investment projects [25]. However, the firm invest lower-quality project that cannot use signaling theory to explain the direction of bank holdings rate. In general, return on investment is used as the proxy variable of the investment quality. $\Delta EROIC_i$[5] is the change in investment quality.

Changes in investment ratio ($\Delta INVRATIO_i$): Capital expenditures are increased to show increased investment opportunities, so firm need investment banks to increase invest. Therefore, changes in the investment bank holding rate are positively correlated with the investment spending of firm. Capital expenditures are the proxies for investment opportunities. $\Delta INVRATIO_i$[6] is the change in investment ratio.

Changes in equity financing ratio ($\Delta EQRATIO_i$): When the firm issues equity financing, firms need investment banking to support securities underwriting. Investment banks may increase holdings to obtain the opportunity for securities underwriting. Therefore, expected changes in the equity financing ratio and changes in investment bank holdings are positively correlated. $\Delta EQRATIO_i$[7] is the change in equity financing ratio.

Data

This study examines the connection between the holding changes in the commercial banks (investment banks) and the financial characteristics of the bidding firms for the six quarters between the M&A announcement date and the completion date. First, we select the date for all firms of M&A announced between 2000 and 2005 using the SDC database (1,025 firms). The top fifty holdings in firms, the quarterly holding date of the professional financial institutions from the Thomson One Banker in the board database, the daily stock returns date from CRSP database, the quarterly accounting date from Compustat database, press News from LexisNexis database. Of the original 1,025 firms, 260 were retained in the final analysis: 444 firms were deleted because the transactions do not provide the firm's complete stock data, 91 were deleted because they did not provide the status of the outside directors of companies holding, 146 firms were deleted because they were firms which the financial industry (SIC CODE=60~69) and public utilities (SIC CODE=49), and finally 84 additional firms were deleted from the analysis because there were not six quarters between the M&A announcement date and the completion date (Figures 2 and 3).

As the study shows, while commercial banks and investment banks simultaneously holding the bidding firms shares. Figures 2 and 3 show nine cases from a change set of all banks shares hold proportion. Each bank's average shares hold proportion changes set in the six quarters between the M&A announcement date and the completion date. For example, there were nine cases in which the commercial bank holdings increased (decrease and no change) and the investment holdings increased (decrease and no change). Figure 2 shows the 86 commercial and investment bank firms for which holdings all increased (33.08% of the total sample). Figure 3 shows the 95 commercial and investment bank firms for which the average holdings all increased (36.54% of the total sample). However, commercial banks and investment banks simultaneously holding the bidding firms shares before the M&A completion date.

[5] $\Delta EROIC_i = EROIC_{i,t} - EROIC_{i,t-6}$, where $EROIC_{i,t}$=*Net profit after tax/Capital investment spending*

[6] $\Delta INVRATIO_i = (INVRATIO_{i,t} - INVRATIO_{i,t-6})$/*Average TA*

[7] $\Delta EQRATIO_i = (EQRATIO_{i,t} - EQRATIO_{i,t-6})$/*Average TA*, where *EQRATIO=Total equity – Retained earnings.*

	(a)	(b)			(c)		
		C+	C−	C.	I +	I −	I .
C+I−	61	61	-	-	-	61	-
C+I.	6	6	-	-	-	-	6
C+I+	86	86	-	-	86	-	-
C−I−	59	-	59	-	-	59	-
C−I.	2	-	2	-	-	-	2
C−I+	44	-	44	-	44	-	-
C. I+	0	-	-	-	-	-	-
C. I−	2	-	-	2	-	2	-
C. I.	0	-	-	-	-	-	-
Total	260	153	105	2	130	122	8

Figure 2: Sample of all bank holdings and the process of selection.

Note: Difference of all commercial banks and investment banks shareholdings in the six quarters before the M&A announcement date and the completion date. For example, nine cases from change set of commercial banks holding and investment bank holding. *C* is commercial banks; *I* is investment banks; + is holdings increase; – is holding decrease;· is holding no change (a) shows firm numbers which nine cases from change set of commercial banks holding and investment bank holding; (b) only firms numbers of commercial banks holding change; (c) only firms numbers of investment banks holding change.

	(a)	(b)			(c)		
		C+	C−	C.	I+	I−	I.
C+I−	60	60	-	-	-	60	-
C+I.	5	5	-	-	-	-	5
C+I+	95	95	-	-	95	-	-
C−I−	45	-	45	-	-	45	-
C−I.	1	-	1	-	-	-	1
C−I+	50	-	50	-	50	-	-
C. I+	0	-	-	-	-	-	-
C. I−	4	-	-	4	-	4	-
C. I.	0	-	-	-	-	-	-
Total	260	160	96	4	145	109	6

Figure 3: Sample of all bank average holdings and the process of selection.

Note: Difference of all commercial banks and investment banks average shareholdings in the six quarters before the M&A announcement date and the completion date. For example, nine cases from change set of commercial banks holding and investment bank each unit share hold. *C* is commercial banks; *I* is investment banks; + is holding increase; – is holding decrease;· is holding no change (a) show firms numbers which nine cases from change set of commercial banks holding and investment bank holding; (b) only firms numbers of commercial banks holding change; (c) only firms numbers of investment banks holding change.

Empirical Results

We first report the results of our main test regarding changes in financial institution holdings for the quarters prior to the merger completion date. In Panel A of Table 1, the commercial banks quarters holding proportion in 3.41%~4.71% and average commercial banks quarters holding proportion in 0.63%~0.86%. This indicates a significant increasing trend for bank holdings from the second to fourth quarter before the M&A completion date. The investment banks quarters holding proportion is 3.63%~4.96% and average investment banks quarters holding proportion is 1.16%~1.63% in Panel B. The results show a significant decreasing trend for the investment bank's holding proportion between the fifth and sixth quarters before the M&A completion date, but a significant increasing trend between the third and fourth quarters before the M&A completion date. The average investment bank's holding proportion indicated a significant increasing trend from the second to the third quarter after the M&A completion quarter. Panel C shows the insurance companies quarters holding proportion in 1.19%~1.28% and average insurance companies quarters holding proportion in 0.79%~0.92%. The results show that the insurance company holdings proportions did not significantly change in the quarter before or after the M&A completion quarter (Table 1).

Because of commercial banks, investment banks and insurance companies quarters holding proportion not significant difference. We therefore used a difference test for comparing holdings proportion changes between the M&A completion quarter and each quarter. In Panel A of Table 2, the results show a significantly increasing trend for the commercial bank's holdings proportion in the two periods six quarters before the M&A completion quarter and from the fourth to the sixth quarter after the M&A completion quarter. The average commercial bank's holding proportion also revealed a significantly increasing trend from the third to the sixth quarter before M&A completion quarter and from the third to the sixth quarter after the M&A completion quarter. In Panel B, the results show a significantly increasing trend for the investment bank's holding proportion from the third to the fifth quarter before the M&A completion quarter and from the second to the sixth quarter after the M&A completion quarter. The average investment bank's holding proportion significantly increased from the third to sixth quarter before the M&A completion quarter and from the third to the sixth quarter after the M&A completion quarter. In Panel C, the results show that the insurance companies holding proportion did not significantly change between the M&A completion quarter and the other quarters (Table 2).

Panel A-I: Commercial banks holding (%)													
Quarter	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Mean	3.41	3.46	3.54	3.77	3.99	4.12	4.23	4.34	4.38	4.47	4.63	4.69	4.71
Mid	2.69	2.79	2.98	3.33	3.39	3.56	3.89	3.58	3.90	4.02	4.32	4.44	4.36
Std. Dev	3.24	3.19	3.15	3.55	3.66	3.66	3.71	4.17	4.07	4.11	4.12	3.66	3.59
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	15.63	15.53	17.72	26.42	25.26	21.05	21.83	34.79	36.11	35.67	35.22	20.05	18.03
Tests of difference with next quarter													
	(0.64)	(1.07)	(1.90)*	(1.99)**	(1.51)	(0.96)	(0.71)	(0.39)	(1.00)	(1.46)	(0.42)	(0.13)	
Panel A-II: Average commercial banks holding (%)													
Mean	0.60	0.62	0.65	0.70	0.73	0.75	0.76	0.84	0.82	0.86	0.87	0.86	0.86
Mid	0.51	0.51	0.57	0.61	0.67	0.67	0.71	0.70	0.74	0.80	0.84	0.83	0.85
Std. Dev	0.55	0.56	0.57	0.67	0.62	0.63	0.59	0.93	0.79	0.85	0.77	0.69	0.63
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	3.28	3.41	3.46	5.92	3.57	3.34	3.39	11.60	9.03	8.92	7.04	5.54	3.18
Tests of difference with next quarter													
	(0.81)	(1.56)	(1.73)*	(1.12)	(0.94)	(0.61)	(1.67)*	(-0.67)	(1.61)	(1.16)	(-0.10)	(-0.15)	
Panel B-I: Investment banks holding (%)													
Quarter	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Mean	4.31	3.63	3.73	3.89	4.06	4.09	4.12	4.19	4.38	4.67	4.76	4.72	4.96
Mid	3.19	3.11	3.16	3.34	3.65	3.53	3.66	3.86	4.03	3.25	4.21	4.50	4.62
Std. Dev	4.82	3.20	3.25	3.14	3.30	3.44	3.43	3.13	3.33	3.61	3.70	3.45	3.53
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	35.26	19.49	20.13	17.20	16.58	21.09	22.64	19.58	18.81	20.36	20.80	21.47	19.13
Tests of difference with next quarter													
	(-2.70)***	(1.49)	(1.79)*	(1.65)	(0.39)	(0.25)	(0.61)	(2.12)**	(3.30)**	(1.17)	(-0.44)	(2.31)**	
Panel B-II: Average investment banks holding (%)													
Mean	1.17	1.16	1.17	1.20	1.25	1.27	1.30	1.34	1.34	1.50	1.57	1.59	1.65
Mid	0.97	0.97	0.98	1.10	1.22	1.12	1.21	1.21	1.25	1.32	1.39	1.35	1.48
Std. Dev	0.99	0.99	0.91	0.92	0.92	0.96	1.02	0.98	1.07	1.40	1.30	1.29	1.21
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	6.59	5.50	5.03	5.28	4.77	5.17	6.04	6.86	9.55	14.12	7.63	8.41	6.34
Tests of difference with next quarter													
	(-0.32)	(0.20)	(0.11)	(1.19)	(0.70)	(0.80)	(0.88)	(0.08)	(3.54)**	(1.50)	(0.37)	(1.44)	
Panel C-I: Insurance companies holding (%)													
Quarter	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Mean	1.19	1.25	1.26	1.21	1.25	1.24	1.29	1.27	1.28	1.20	1.21	1.18	1.12
Mid	0.23	0.28	0.28	0.35	0.36	0.31	0.35	0.28	0.33	0.29	0.39	0.33	0.34
Std. Dev	2.36	2.45	2.49	2.20	2.14	2.16	2.10	2.16	2.25	2.25	2.23	2.28	2.23
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	20.18	21.11	17.88	15.60	14.55	17.59	16.72	16.98	16.52	18.00	17.64	19.45	19.31
Tests of difference with next quarter													
	(0.95)	(0.03)	(-0.70)	(0.63)	(0.14)	(0.79)	(-0.37)	(0.29)	(-1.32)	(-0.13)	(0.56)	(1.13)	
Panel C-II: Average insurance companies holding (%)													
Mean	0.80	0.83	0.82	0.79	0.82	0.86	0.93	0.91	0.89	0.85	0.86	0.86	0.81
Mid	0.21	0.25	0.22	0.28	0.26	0.24	0.28	0.21	0.26	0.22	0.31	0.31	0.29
Std. dev	1.81	1.83	1.63	1.51	1.33	1.60	1.64	1.73	1.68	1.71	1.49	1.64	1.54
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	20.18	21.11	16.83	15.60	9.17	17.59	16.72	16.98	16.52	18.00	10.34	11.79	10.06
Tests of difference with next quarter													
	(0.61)	(-0.21)	(-0.68)	(0.39)	(0.72)	(1.40)	(-0.50)	(-0.38)	(-0.82)	(0.15)	(0.07)	(-1.25)	

Note: Panel A –I (B-I and C-I) display the quarterly holdings changes in commercial banks (investment banks and insurance companies) which five top ten holdings in the firm. T-tests were used to compare quarterly holdings. Panel A-II (B-II and C-II) is the quarterly average holdings of commercial banks (investment banks and insurance companies) which five top ten holdings in the firm. T-tests were used to compare quarterly holdings. Positive t-values indicate an increasing trend; negative values indicate a decreasing trend. *:10%, **:5%, ***:1% significance level.

Table 1: Summary statistics of all banks and the difference analysis for each quarter (sample is 260 firms).

Panel A-I: Commercial banks holding (%)													
Quarter	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Mean	3.41***	3.46***	3.54***	3.77***	3.99*	4.12	4.23	4.34	4.38	4.47	4.63*	4.69**	4.71**
t-value	(4.67)	(4.42)	(4.15)	(2.81)	(1.69)	(0.96)		(0.71)	(0.83)	(1.22)	(1.85)	(2047)	(2.39)
Mid	2.69***	2.79***	2.98***	3.33***	3.39*	3.56	3.89	3.58	3.90	4.02	4.32*	4.44***	4.36***
z-value	(4.26)	(4.31)	(4.13)	(3.75)	(1.95)	(0.77)		(0.92)	(0.14)	(0.67)	(1.88)	(3.44)	(3.28)
Panel A-II: Average commercial banks holding (%)													
Mean	0.60***	0.62***	0.65***	0.70*	0.73	0.75	0.76	0.84*	0.82	0.86**	0.87**	0.86**	0.86***
t-value	(5.20)	(4.42)	(3.68)	(1.83)	(1.17)	(0.61)		(1.67)	(1.51)	(2.26)	(2.53)	(2.57)	(2.62)
mid	0.51***	0.51***	0.57***	0.61***	0.67	0.67	0.71	0.70	0.74	0.80*	0.84*	0.83***	0.85***
z-value	(5.00)	(4.55)	(3.99)	(3.20)	(1.37)	(0.14)		(1.36)	(1.02)	(1.85)	(1.89)	(3.07)	(3.29)
Panel B-I: Investment banks holding (%)													
Quarter	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Mean	4.31	3.63**	3.73*	3.89*	4.06	4.09	4.12	4.19	4.38***	4.67***	4.76***	4.72***	4.96***
t-value	(-0.60)	(2.38)	(1.89)	(1.26)	(0.42)	(0.25)		(0.61)	(2.26)	(3.56)	(3.99)	(3.56)	(4.36)
Mid	3.12	3.11**	3.16	3.34	3.65	3.53	3.66	3.86	4.03***	4.25***	4.21***	4.50***	4.62***
z-value	(0.67)	(2030)	(1.56)	(0.73)	(0.43)	(1.08)		(1.43)	(2.48)	(3.79)	(4.31)	(4.82)	(4.80)
Panel B-II: Average investment banks holding (%)													
Mean	1.17*	1.16**	1.17**	1.20*	1.25	1.27	1.30	1.34	1.34	1.50***	1.57***	1.59***	1.65***
t-value	(1.84)	(2.16)	(2.30)	(1.86)	(1.20)	(0.80)		(0.88)	(0.77)	(3.06)	(4.32)	(4.37)	(5.49)
Mid	0.97**	9.97**	0.98**	1.10**	1.22	1.12	1.21	1.21*	1.25	1.32***	1.39***	1.35***	1.48***
z-value	(2.07)	(2.53)	(2.26)	(2.08)	(0.78)	(1.22)		(1.88)	(1.04)	(3.08)	(4.45)	(4.40)	(5.59)
Panel C-I: Insurance companies holding (%)													
Quarter	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Mean	1.19	1.25	1.26	1.21	1.25	1.24	1.29	1.27	1.28	1.20	1.21	1.18	1.12
t-value	(0.81)	(0.27)	(0.25)	(0.73)	(0.44)	(0.79)		(0.37)	(0.03)	(0.90)	(0.71)	(0.86)	(1.27)
Mid	0.23	0.28	0.28	0.35	0.36	0.31	0.35	0.28	0.33	0.29	0.39	0.33	0.34
z-value	(1.39)	0.45)	(1.16)	(0.71)	(0.37)	(1.10)		(0.52)	(0.25)	(1.21)	(0.73)	(1.21)	(1.73)
Panel C-II: Average insurance companies holding (%)													
Mean	0.80	0.83	0.82	0.79	0.82	0.86	0.93	0.91	0.89	0.85	0.86	0.86	0.81
t-value	(1.44)	(1.10)	(1.36)	(1.81)	(1.45)	(1.40)		(0.50)	(0.69)	(1.14)	(0.81)	(0.65)	(1.15)
Mid	0.21	0.25	0.22	0.28	0.26	0.24	0.28	0.21	0.26	0.22	0.31	0.31	0.29
z-value	(1.86)	(1.06)	(1.46)	(1.46)	(1.70)	(1.25)		(0.91)	(0.85)	(1.10)	(0.45)	(1.36)	(1.46)

Note: The table shows quarterly holdings rate, number and average (median) holdings of commercial banks (investment banks and insurance companies) which five top ten holdings in the firm. We use T-tests (Wilcoxon rank-sum test) to test the mean (median) of M&A completion quarter holdings for a significant difference. *:10%, **:5%, ***:1% significance level.

Table 2: Difference analysis of all bank holdings for each quarter and the M&A completion quarter (sample is 260 firms).

In Panel A of Figure 4, the results show that 91.54% complete M&A since M&A announcement date to the completion date which need about three quarters. The results show 72.69% completed within the three months between the M&A announcement date and the completion date in Panel B. These results are similar to Wansley et al. [26]. Therefore, the M & A announcement date may be the second quarter before the M&A completion date and the financial institutional holdings show no significant change between the M&A announcement date and the completion date. This study was to explore the financial institutions holding behavior before M&A completion date (Figure 4).

According to the results obtained, the commercial (investment) banks have a higher holdings proportion and a significantly increasing trend before the M&A completion date. So the commercial banks and investment banks important than the insurance companies. The bidding firms acquire the M&A professional advice by investment banks holdings [27], and obtain debt expertise by commercial banks holding. Therefore, this study of commercial and investment bank holding changes before the M&A completion date is the main object of study, with the specific goal of testing the connection between the financial institutions holding proportion and the firm's financial characteristics.

In Panel A and B of Table 3 provides the descriptive statistics used to analyze the financial institutions of holding proportion increase that assets size increase level higher than financial institutions of holding proportion decrease from the sixth quarter before M&A completion date to the M&A completion date. The results show that firms increase the ratio of assets to reduce agency problems between shareholders and creditors. Furthermore, the financial institutions monitor profit more than costs, and the banks choose to increase holding proportion for the firms that increase higher ratio of asset size. Therefore, bank holdings were significantly positively correlated with increases in the proportion of assets. These results are inconsistent with both the agency cost hypothesis and signaling hypothesis. The results show that the profitability of firms improved to make the shareholders or creditors increase earned profits, thus reducing the agency conflict within the firms. Therefore, bank holdings were significantly negatively correlated with changes in the profitability performance of the firm. These results are consistent with the agency cost hypothesis in Panel A-I (-II).

In Panel A-II, the average commercial banks holdings by the loan firm in order to earn profits for earning of the investment plan, then banks holding will reduce for higher volatility of firm. The results show the average commercial bank's holdings are significantly negatively correlated with the volatility of the firm, consistent with the signaling hypothesis. Fama [2] found that when the firm had higher agency

Panel A : The quarters between M&A announced date and completed date										Total
Quarter	0	1	2	3	4	5-6	7-8	9-10	11-12	
Number of firms	99	107	32	10	6	2	2	1	1	260
% of samples	38.08	41.15	12.31	3.85	2.31	0.77	0.77	0.38	0.38	100
Panel B : The months between M&A announced date and completed date										**Total**
Months	0	1	2	3	4	5	6	7	8-13	15-37	
Number of firms	46	53	42	48	17	13	8	11	16	6	260
% of samples	17.69	20.38	16.15	18.46	6.54	5.00	3.08	4.23	6.15	2.31	100

Note: Panel A is the length difference by quarter; Panel B is the length difference by month (22 trading days).

Figure 4: Length of the average time from the M&A announcement date to the completion date.

Panel A-I: Commercial banks holding (%)										
	Full Sample Number of firms = 258			**Holding increase Number of firms = 158**			**Holding decrease Number of firms = 105**			Test of difference
	Mean	**Media**	**Std. Dev**	**Mean**	**Media**	**Std. Dev**	**Mean**	**Media**	**Std. Dev**	t-value
∆*LNTA*	0.506	0.358	0.703	0.588	0.439	0.769	0.388	0.302	0.578	-2.382**
∆*TANRTIO*	0.064	0.025	0.141	0.068	0.028	0.128	0.058	0.018	0.158	-0.540
∆*VOL*	1.064	0.954	0.513	1.025	0.937	0.436	1.116	1.037	0.598	1.261
∆*PROFIT*	0.011	0.008	0.056	0.004	0.005	0.045	0.022	0.011	0.067	2.258***
∆*CDRATIO*	0.030	0.000	0.192	0.033	0.000	0.196	0.025	0.000	0.185	0.357
∆*DEBTRATIO*	0.148	0.103	0.245	0.137	0.078	0.237	0.164	0.132	0.257	0.865
∆*EROIC*	0.004	-0.004	0.179	-0.005	-0.007	0.184	0.017	0.004	0.171	0.953
TOBIN Q_{-6}	3.810	1.817	8.450	4.280	1.814	10.359	3.134	1.820	4.417	-1.067
FAME	2.473	1.000	4.892	2.621	1.000	4.796	2.257	1.000	5.044	-0.586
Panel A-II: Average commercial banks holding (%)										
∆*LNTA*	0.508	0.358	0.705	0.561	0.431	0.745	0.419	0.314	0.626	-1.672*
∆*TANRTIO*	0.064	0.025	0.141	0.064	0.027	0.125	0.064	0.020	0.165	-0.017
∆*VOL*	1.064	0.008	0.055	1.018	0.949	0.437	1.138	1.023	0.616	1.672*
∆*PROFIT*	0.011	0.008	0.055	0.004	0.006	0.043	0.023	0.013	0.069	2.278**
∆*CDRATIO*	0.030	0.000	0.192	0.046	0.000	0.219	0.003	0.000	0.134	-1.946*
∆*DEBTRATIO*	0.148	0.103	0.246	0.139	0.085	0.229	0.163	0.130	0.271	0.782
∆*EROIC*	0.004	-0.004	0.180	-0.005	-0.006	0.180	0.018	0.004	0.178	0.989
TOBIN Q_{-6}	3.831	1.831	8.480	4.148	1.773	10.131	3.310	2.022	4.632	-0.821
FAME	2.477	1.000	4.911	2.669	1.000	5.510	2.156	1.000	3.709	-0.821
Panel B-I: Investment banks holding (%)										
	Full Sample Number of firms = 258			**Holding increase Number of firms = 158**			**Holding decrease Number of firms = 105**			Test of difference
	Mean	**Media**	**Std. Dev**	**Mean**	**Media**	**Std. Dev**	**Mean**	**Media**	**Std. Dev**	t-value
∆*LNTA*	0.519	0.391	0.707	0.660	0.467	0.758	0.370	0.296	0.618	-3.334***
∆*VOL*	1.081	0.969	0.519	1.065	0.969	0.440	1.098	0.955	0.591	0.454
∆*PROFIT*	0.011	0.009	0.056	0.006	0.006	0.052	0.018	0.012	0.060	1.523
∆*CDRATIO*	0.031	0.000	0.194	0.033	0.000	0.161	0.029	0.000	0.225	-0.129
∆*DEBTRATIO*	0.155	0.104	0.250	0.158	0.096	0.251	0.152	0.121	0.250	-0.190
∆*INVRATIO*	0.011	0.007	0.049	0.016	0.009	0.049	0.005	0.003	0.048	-1.722*
∆*EQRATIO*	0.344	0.145	0.630	0.424	0.176	0.606	0.259	0.091	0.645	-2.058**
TOBIN Q_{-6}	3.872	1.842	8.541	4.687	2.042	11.270	3.017	1.718	3.921	-1.579
FAME	2.278	1.000	3.967	1.977	1.000	2.595	2.598	1.000	5.027	1.221
Panel B-II: Average investment banks holding (%)										
∆*LNTA*	0.515	0.386	0.706	0.644	0.456	0.730	0.344	0.241	0.638	-3.409***
∆*VOL*	1.078	0.960	0.518	1.070	0.975	0.432	1.088	0.953	0.614	0.242
∆*PROFIT*	0.011	0.008	0.056	0.006	0.007	0.050	0.018	0.009	0.063	1.525
∆*CDRATIO*	0.030	0.000	0.193	0.039	0.000	0.200	0.019	0.000	0.185	-0.771
∆*DEBTRATIO*	0.153	0.104	0.250	0.152	0.104	0.229	0.156	0.098	0.275	0.139
∆*INVRATIO*	0.011	0.007	0.048	0.016	0.010	0.047	0.004	0.004	0.049	1.816*
∆*EQRATIO*	0.341	0.139	0.628	0.385	0.173	0.670	0.283	0.088	0.565	-1.258
TOBIN Q_{-6}	3.850	1.831	8.511	4.657	2.143	10.730	2.791	1.713	3.870	-1.922*
FAME	2.465	1.000	4.920	2.034	1.000	2.893	3.037	1.000	6.707	1.461

Note: *:10%, **:5%, ***:1% significance level.

Table 3: Descriptive statistics relating a financial institution's holdings proportion and the firm's financial characteristics.

conflicts and asymmetric information, the firm cannot collect funds by equity financing. Instead, such funds must be collected through financial institutions. The results show that the average commercial bank's holdings increase for the increased short-term liabilities of the firm in order to reduce the conflict of interest between stockholders and creditors. The results show that the average commercial bank's holdings were significantly positively correlated with changes in the short-term liabilities ratio, consistent with the agency cost hypothesis.

In Panel B-I of Table 3, capital expenditures increased to show that increase investment opportunities, so firm need investment banks to increase invest. Therefore, the results show that changes in an investment bank's holding rate are significant positively correlated with the investment spending of the firm, consistent with Panel B-II. When the firm issues equity financing, firms need investment banks to underwrite the securities. Investment banks may therefore increase holdings to obtain an opportunity for securities underwriting. Therefore, one may expect changes in the equity financing ratio and changes in the investment bank holdings to be significantly positively correlated. In Panel B-II, if Tobin's Q is greater that firms with high levels of growth opportunities [19,20]. The average investment bank's holdings may be earning higher profits for earning of the investment plan, and it will therefore increase holdings. The results show the average investment bank's holdings are significantly positively correlated with the firm's growth opportunities. These results are consistent with the signaling hypothesis (Table 3).

This paper used logistic regression analysis to examine the relationship between the changes in financial institutions holding proportion and the firm's characteristics. In order to avoid collinearity problems of the explanatory variables each other and to affect regression results between dependent variables and the stability of the explanatory variables. Therefore, this paper uses correlational analysis to examine the explanatory variables for the firm characteristics in Figure 5 (a Pearson correlation coefficient matrix). The results show the variables' correlation coefficients were lower than 0.3 or -0.3 which is a low degree of correlation except for debt ratio (or Tobin's q or equity financing ratio) and the size of the firm's assets that Pearson correlation is 0.472 (or 0.446 or 0.567) (Figure 5).

The commercial bank's holdings more than investment banks holdings in the bidding firms that commercial banks have greater controlling power in Table 4. In Panel A, the coefficient of controlling power is significantly negative, indicating that investment banks with lower holdings will increase their stake to gain controlling power. In Panel B, the coefficient is significantly positive, indicating that investment banks with lower holding will increase their stake to gain controlling power. In Table 4, the results show that firms increase the ratio of assets to reduce agency problems between shareholders and creditors. Furthermore, the financial institutions monitor profits more than costs, and the banks choose to increase the holding proportion for those firms that have a higher ratio of asset size. Therefore, bank holdings are significantly positively correlated with the proportion of assets. These results are inconsistent with the agency cost hypothesis and the signaling hypothesis. In Panel A, the results show the profitability of the firm improved to make the shareholders or creditors increase earned profits to reduce agency conflict. Therefore, the bank holdings were significant negatively correlated with changes in profitability performance of the firm, consistent with the agency cost hypothesis.

In (c) and (d) of Panel A, the greater volatility of the loan firms have a higher risk of firm and agency conflict. It is more difficult for the firm to get equity financing so the firm will necessarily rely more on bank lending. The average commercial bank holdings by the loan firm in order to earn profits for earning of the investment plan, then banks holding will reduce for higher volatility of firm. The results here show that the lower volatility of firm that average commercial bank holdings will increase, consistent with the signaling hypothesis. The empirical results reveal a quadratic relation between the volatility of the firm and the average commercial bank's holdings proportion in (d) of Panel A.

Firms that are not financially distressed show a lower credit risk and have higher liquidity. They are therefore easier to finance in the market. In these cases, shareholder and creditor agency conflict is usually small. The investment bank's holdings for loan firms in order to earn profits for earning of the investment plan. The investment banks will increase holdings for firms with a lower credit risk and more debt can be secure compensation. These results are consistent with the signaling hypothesis (Table 4).

Conclusion

In this paper, we examined the effect that changes in a financial institution's holdings proportion for those quarters before the M&A completion date. The financial institution's holdings proportion for the bidding firms was the largest for investment banks, followed

	ΔLnTA	ΔVOL	ΔPROFIT	ΔTANRATIO	ΔCDRATIO	ΔDEBTRATIO	ΔINVRATIO	ΔEROIC	ΔEQRATIO	TOBINQ$_{-6}$	FAME
ΔLnTA	1.000										
ΔVOL	0.290 ***	1.000									
ΔPROFIT	0.245 ***	-0.042	1.000								
ΔTANRATIO	-0.104	0.119 *	-0.029	1.000							
ΔCDRATIO	0.102	0.121 *	-0.036	0.011	1.000						
ΔDEBTRATIO	0.472 ***	0.378 ***	0.186 ***	0.137 **	0.313 ***	1.000					
ΔINVRATIO	0.186 ***	0.269 ***	0.015	-0.024	-0.018	0.117 *	1.000				
ΔEROIC	0.231 ***	-0.007	0.007	0.209 ***	-0.083	-0.015	-0.023	1.000			
ΔEQRATIO	0.567 ***	0.015	0.105	-0.104	-0.110 *	-0.085	0.005	0.367 ***	1.000		
TOBIN Q$_{-6}$	0.446 ***	0.046	-0.060	0.058	-0.008	0.087	0.091	0.188 ***	0.320 ***	1.000	
FAME	-0.018	-0.042	0.028	-0.021	-0.019	-0.026	-0.041	0.000 ***	-0.015	-0.037	1.000

Note: *:10%, **:5%, ***:1% significance level.

Figure 5: Pearson Correlation coefficient matrix.

	Panel A: Commercial Bank				Panel B: Investment Bank	
	All Holding		Average Holding		All Holding	Average Holding
	(a)	(b)	(c)	(d)	(e)	(f)
Cons	0.594 (0.402)	-0.495 (0.180)	1.514 (2.324)	0.111 (0.008)	-2.189 (9.876)	-1.079 (3.470)
IND1	0.421 (0.260)	0.447 (0.287)	0.089 (0.011)	0.046 (0.003)	1.064* (2.716)	0.736 (1.656)
IND2	1.404 (2.309)	1.341 (2.067)	1.129 (1.396)	0.962 (0.997)	0.851 (1.305)	0.402 (0.347)
IND3	0.595 (0.508)	0.587 (0.483)	-0.204 (0.055)	-0.298 (0.114)	1.401** (4.293)	0.357 (0.349)
$CONTROL_{-6}$	-1.305*** (13.397)	-1.363*** (14.247)	-1.556*** (16.528)	-1.609*** (17.258)	1.433*** (21.121)	0.885** (6.198)
$TOBINQ_{-6}$	0.006 (0.035)	-0.006 (0.040)	0.020 (0.468)	-0.023 (0.610)	-0.006 (0.083)	0.026 (0.571)
FAME	0.010 (0.100)	0.005 (0.021)	0.053 (1.270)	0.046 (0.943)	-0.052 (1.393)	-0.047 (1.742)
$\Delta ZSORE$	0.030 (0.006)	0.041 (0.011)	0.369 (0.847)	0.419 (1.046)	0.574* (3.547)	0.737** (6.200)
$\Delta LNTA$	0.889* (3.236)	0.849* (2.866)	1.050* (3.356)	1.058* (3.173)	0.653** (5.015)	0.658** (4.819)
$\Delta TANRTIO$	0.149 (0.010)	0.175 (0.013)	0.842 (0.247)	-0.980 (0.318)	-	-
ΔVOL	-0.431 (1.722)	1.528 (1.385)	-0.828* (5.214)	1.848 (1.434)	-	-
ΔVOL^2	-	-0.664 (2.194)	-	-0.949* (2.824)	-	-
$\Delta PROFIT$	-8.130* (3.721)	-7.962* (3.545)	-11.365** (6.067)	-11.024** (5.681)	-	-
$\Delta DEBTRATIO$	-0.955 (0.761)	-1.100 (0.984)	-0.846 (0.480)	-1.069 (0.740)	-	-
$\Delta CDRATIO$	0.312 (0.118)	0.397 (0.194)	1.951 (2.605)	1.989 (2.732)	-	-
$\Delta EROIC$	0.490 (0.115)	0.295 (0.040)	0.772 (0.251)	0.379 (0.057)	-	-
$\Delta INVRATIO$	-	-	-	-	3.153 (1.015)	3.757 (1.523)
$\Delta EQRATIO_6$	-	-	-	-	0.172 (0.340)	-0.305 (0.904)
χ^2 for regression	33.761***	36.568***	48.696***	52.388***	41.445***	29.858***
-2 log likelihood	211.399	208.592	188.060	184.368	288.342	298.020
R^2	0.230	0.247	0.325	0.347	0.213	0.157
obs	180	180	178	178	238	240

Note: t-value in ( ).*:10%, **:5%, ***:1% significance level.

Table 4: Factors of financial institution's holdings proportion increase : Logistic model.

by commercial banks, and the smallest for insurance companies. Therefore, the investment and commercial banks significantly increase their holdings before the M&A completion date. The commercial banks and investment banks are therefore more important than insurance companies for the bidding firms.

This paper also uses descriptive statistics and logistic regression analysis to examine the relationship between the financial institutional quarters holdings proportion and the financial characteristics of the bidding firms. The results of the both analyses methods are consistent. The empirical results show that firms increase the ratio of assets to reduce agency problems between shareholders and creditors. Furthermore, the financial institutions monitor profit more than costs, and the banks choose to increase their holdings proportion for the firms which maintain a higher ratio of asset size. Therefore, banks holdings are significant positively correlated with proportion of assets. These results are inconsistent with the agency cost hypothesis and signaling hypothesis.

The results show that the profitability of the firm improved to make the shareholders or creditors increase earned profits in order to reduce agency conflict. Therefore, the commercial bank holdings are significantly negatively correlated with changes in the profitability performance of the firm, consistent with the agency cost hypothesis. The average commercial bank's holdings by the loan firm in order to earn profits for earning of the investment plan, then banks holding will reduce for higher volatility of firm. The results show that the lower volatility of the firm that average commercial bank holdings will increase. These results are consistent with the signaling hypothesis.

Our findings using logistic regression analysis reveal that the commercial banks holdings are more than investment banks holdings in the bidding firms that commercial banks have greater controlling power. The results indicate that the investment banks with lower holdings will increase their stake to gain controlling power. Firms that are not financially distress have lower credit risk and their liquidity is higher. The investment banks holdings for loan firms in order to earn profits for earning of the investment plan. The investment banks will increase holdings for those firms with a lower credit risk and more debt can be secure compensation.

Overall, the investment and commercial bank holdings significantly increased before the M&A completion date. We also found that the financial institutional quarters holdings proportion and the financial characteristics of the bidding firms have a significant relationship.

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