The Effect of Takeover Defenses on the Japanese Firms' Value

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Abstract

This study, by investigating Japanese firms' adoption of anti-takeover measures, supports the management entrenchment hypothesis. It is likely that the potential benefits associated with the takeover defenses may be offset by the amplified agency costs resulting from the insulation from the market discipline. The empirical results also suggest that the managerial shareholding plays an important role in the incentive of the adopting firm's management. For firms with lower managerial shareholding, the adoption of takeover defenses mainly serves as a signal of the expected takeover premiums, with no significant change in the post-adoption operating performance. For firms with high managerial shareholding, the defenses may serve not only as a signal of the expected premiums, but also of the management's amplified agency problems after the adoption.

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In recent years, Japanese firms have been adopting takeover defenses. One reason is the occurrence of a hostile takeover attempt by *Livedoor* targeted at *TBS* in 2005, both of which are Japanese firms. This hostile takeover was quite a landmark, and received huge attention. According to *RECOF*, an M&A consulting firm, the net number of firms adopting takeover defenses amounts to 572 in 2009. With a sudden increase in the adoption of takeover defenses, it is imperative to investigate the motives and the effects on firm value.

  Some hypotheses have been advanced to explain the motives of takeover defenses. Managerial entrenchment hypothesis states that the management adopts takeover defenses in order to keep their control at the expense of the firm value and shareholder wealth (Malatesta & Walking, 1988; Ryngart 1988; Sundaramurthy & Mahoney 1997).

  On the other hand, the shareholder interest hypothesis states that firms adopting takeover defenses could protect their important human assets and physical assets from potential takeovers, which maintains or enhances the firm value and shareholder wealth (Stein, 1988; Puph Page & Jaherd, 1992).

  Another hypothesis is signaling hypothesis, which states that firms adopting takeover defenses signal their private information regarding the possible future takeover (Comment Schment, 1995; Datta & Iskandar-Datta, 1996). This hypothesis predicts a rise in stock price since the target firm's shareholders can expect a takeover premium. In fact, if the target firms adopt takeover defenses in order to retrieve a better condition from the raiders, higher takeover premiums can be expected. However, if firms adopt takeover defenses in order to deter takeovers, the likelihood of premiums lowers and results in a fall in stock price.

  Event study method is commonly used in the previous empirical studies regarding takeover defenses. Cumulative abnormal return (CAR) is calculated based on the stock prices for a certain length of period around the announcement of the adoption of takeover defenses. CAR thus is used too measure the change in stock price. Assuming maximization of shareholder wealth as the ultimate goal for corporations, CAR can be

used to assess the change in the firm value and shareholder wealth.

However, CAR reflects the expected, not the actual, changes in the management behaviors after the adoption of defenses measures. It is also necessary to examine the actual changes in the operating performance, which reflect the possible changes in the management's commitment and efforts as a consequence of the defenses measures.

This study aims to provide new empirical evidence on the motives of the adoption of takeover defenses, by investigating the change in stock prices and operating performance of Japanese companies adopting takeover defenses. A small wave of takeover defenses occurred a few years ago in Japan, but the studies on Japanese firms are still limited (Arikawa & Mitsusada, 2007; Hirose, Fujita, Yanagida, 2007; Okada, 2008; Shigemoto 2008). Most of these studies are only focusing on CAR, and many of them fail to account for the factors explaining the variation of CAR. This study attempts to fill the void by investigating these factors based on the hypotheses to be described in the following section.

1. Hypotheses

1.1. Managerial entrenchment hypothesis vs. shareholder interest hypothesis

The managerial entrenchment hypothesis states that the management adopts takeover defenses in order to keep their control at the expense of the firm value and shareholder wealth. This is more pronounced in corporate Japan where the traditional monitoring by main banks had weakened since the late 1990s due to bad loan problems and financial liberalization (Yeh, 2007). For example, managers are more likely to engage in unprofitable projects that may enhance their private interest at the expense of firm value. Therefore, the hypothesis H1a is constructed as follows.

H1a: Adoption of takeover defenses reduces the firm value and the shareholder wealth.

On the other hand, the shareholder interest hypothesis states that takeover defenses can deter speculative takeovers aiming at short term reselling gains, thus protecting the firm's important human assets and physical assets. Managers are more able to make decisions in a long term perspective, which can also contribute to a higher productivity and the formation of firm-specific assets such as employee skills. Such long-term orientated strategies have been said to be the strengths of Japanese companies. Takeover

defenses can solve the tendency of decision making in pursuit of short term gains, especially in a market with takeover threat and costly information, where long term investment projects tend to be undervalued. Hypothesis H1b is constructed as follows.

H1b: Adoption of takeover defenses enhances the firm value and the shareholder wealth.

1.2. Managerial shareholding

Previous studies have pointed out role of managerial ownership in mitigating the agency problem (Jensen, 1976). Morck, Shleifer & Vishny (1988) found a positive relationship between managerial ownership and firm value for firms with extremely low and high managerial ownership, where the interest of managerial interest is more aligned with the shareholders, and an adverse relationship for firms with intermediate managerial ownership, where the deviation between the managerial owners' ownership and control is greater. Along this line of reasoning, the following arguments can be made. In the low to intermediate level of managerial ownership, as the interest alignment between the managers and the firm increases, the takeover defenses adopted by the managers are more likely to enhance the firm value. On the other hand, as the managerial ownership rises to a greater level, where the deviation of control and ownership is greater, the takeover defenses adopted by the managers are more likely to hurt the firm value.

H2: In the low to intermediate level of managerial ownership, there exists a positive relationship between CAR and the managerial shareholding. On the other hand, in the high level of managerial ownership, there exists an adverse relationship between CAR and the managerial shareholding.

1.3. Signaling

Signaling hypothesis predicts different market reactions depending how the management is expected to respond in case a raider appears. If the target firms adopt takeover defenses in order to retrieve a better condition from the raiders, higher takeover premiums can be expected. However, if firms adopt takeover defenses in order to deter takeovers, the likelihood of premiums lowers and results in a fall in stock price.

H3a: Announcement of takeover defenses is associated with a rise in the stock prices if the adoption is perceived as leverage for retrieving a better buyout deal.

H3b: Announcement of takeover defenses is associated with a fall in the stock prices if the adoption is perceived as deterrence of possible takeovers.

Since signaling hypothesis states that adoption of takeover defenses signals private information regarding the possible future takeover, the market reaction may also be related to the likelihood of takeovers. Previous studies have found that managerial ownership is a factor influencing the likelihood of a takeover being realized. For firms with near zero managerial ownership, the likelihood of a successful takeover is larger, therefore the realization of expected premiums also higher. On the other hand, for firms with higher managerial ownership, the likelihood of a successful takeover as well as the realization of expected premiums is lower.

H4: There exists an adverse relationship between the managerial shareholding and the announcement-associated CAR.

1.4. Stable Shareholders

In general Japanese firms have a relatively low level of managerial shareholding. For example, Tokyo Stock Exchange (first section) listed firms have an average managerial shareholding percentage of only 3.7% as of 2008. In fact, the Japanese firms' shares are held by their transacting financial institutions, suppliers, clients, or group firms (*keiretsu*), a practice known as cross-shareholding. In Japan these firms are unofficially called "stable" shareholders or "silent" shareholders. These stable shareholders are characterized as non-interventionist, giving a carte blanche to the management. These stables are relied up to support the incumbent management in the case of a raider appears. This is exemplified in a recent unsuccessful takeover bid attempted by a Japanese paper-maker *Oji-seishi* against a minor maker *Hokuetsu-seishi*, which defeated the bid by the support of its stable shareholders.

However, the shareholders of stable shareholders have been in decline. Ito (2009) survey shows that the shares held by all Japanese listed firms held a long term have fallen from 36.9% in 1991 to 14.4% in 2008, on a volume basis. The survey also reports that the shares reciprocally held by all Japanese listed firms, on a volume basis, have fallen from 23.6% in 1991 to 6.8% in 2008, on a volume basis. With the decline of stable shareholders, a hostile takeover is more likely to occur in Japan as a whole.

In all, firms with high stable shareholding has a lower probability of takeover, the adoption of takeover defense further eliminate the likelihood of a takeover, and hen the premiums. The relationship between the stable shareholders and the announcement associated CAR can be summarized as follows.

H5: There exists an adverse relationship between the stable shareholders' shareholding and the announcement-associated CAR.

2. Methodology

To test the hypotheses in the above section, I investigated the change in the stock price and the operating performance of Japanese firms which had announced to adopt takeover defenses measures.

Samples of defenses adopting firms during the period of 2005 to 2007 were collected from *Nikkei* newspaper and its affiliates. In accordance with this study's objective, the samples are confined to the cases whose adoption decision made in the capacity of the firm's board of directors. Corporate and financial information was gathered from *Nikkei*'s database NEEDS, stock price data from *Toyo Keizai*'s database. In total, 130 cases remained as effective sample, with 11, 53, and 66 cases announced in the year 2005, 2006, and 2007, respectively. Table 1 reports the characteristics of the sample firms.

I use CAR (cumulative abnormal return), a standard indicator in event studies, to measure the change in stock price associated with the announcement of takeover defense measures. Under the market efficiency assumption, when the information regarding the defenses adoption is revealed, the market quickly gauges the potential effects on the future cash flows of the adopting firm, resulting in a change in the firm's stock price. Since the stock price can be considered as the present value of the future cash flows discounted by a risk-adjusted rate of return, stock price change can indicate the market perception of the potential effects of the defenses measure on the firm's future operating performance. Inspection of the announcement-associated stock price change can conduce to the testing of hypotheses regarding the effects of defenses measures. I adopted the estimation method of CAR stipulated by Campbell, Lo & Mackinlay (1996).

In theory, CAR reflects the expected, not the actual, change in the managerial

behaviors after the adoption of defenses measures. I also use the operating performance measures as a proxy to evaluate how the defense measures affect the management's commitment and efforts. Specifically, I calculate the adopting firm's operating profit margin, ROA, ROE, sales growth rate, ratio of R&D expenditure to sale, ratio of capital investment expenditures to sales, and debt ratio, before and after the adoption year.

To account for possible noises, for each financial ratio, I also calculate each sample firm's industry average as a control variable. The industry classification follows NEEDS's 5-digit classification. Then for each financial ratio, each firm's industry-adjusted ratio is calculated by subtracting the industry average from its original ratio. Such industry-adjusted ratio is meant to adjust for the possible biases associated with the economic or industrial factors.

3. Empirical Results

3.1. CAR and changes in operating performance

Table 2 reports the CAR around the initial press report of takeover defenses adoption. As can be seen, CAR was not statistically significant 2 days prior to the report date (t=-2), but turned out be a significant -0.46% one day before the press report date (t=-1). On the press report date and the subsequent date, CAR was -0.03% and -0.13%, respectively, both of which are statistically insignificant.

Insert Table 2 Here

Given the possibility that the adoption information may be already around the market just before it was reported in the press, the significant negative CAR at t=-1 can be interpreted as a response by the market. In fact, the other dates around the announcement did not show significant CAR, even though the subsequent two days after date t=-1 report negative but insignificant CAR. On the other hand, the 3-day CAR (t=-1 to 1) is averaged at -0.63%, statistically significant. The results imply that the adoption of takeover defenses is associated with negative market reaction, reducing the shareholders' wealth.

Table 3 reports the changes in the industry-adjusted operating performance before and after the adoption (panel B).

It can be seen that prior to the adoption, the sample firms underperformed their industry average in profit measures, all showing a negative sign. The underperformance in profitability further deteriorated, in general, in the year(s) after the adoption. For example, the change in the industry-adjusted ROE was statistically significant between one year before and after the adoption. The change in the industry-adjusted operating profit margin was also statistically significant between one year before and two years after the adoption. Nonparametric tests show similar patterns.

Regarding industry-adjusted sales growth rate and R&D ratio, it is inconclusive as to the pre-adoption performance, since sample firms outperformed their industry peers in terms of average value, but underperformed in terms of median. Also the changes in these two ratios are not statistically significant.

In terms of leverage ratio, there is also no significant change in the industry-adjusted debt ratio of the sample firms. It can be seen that, however, these sample firms are less indebted relative to their industry peers in the pre-adoption and post-adoption year(s).

Several observations can be made from the investigation of the sample firms' operating performance. First, they were less indebted and less profitable before the adoption of takeover defenses. Second, their profitability deteriorated in the two years after the adoption, while there is no significant change in the leverage and R&D expenditures.

3.2. Univariate analysis

In this section, uni-variate tests are implemented to examine whether and how the variation of the announcement-associated CAR and the change in the operating performance can be explained by the ownership structure of the defenses adopting firms. 3-day CAR ($t=-1$ to 1) is used in the following tests.

In the study of Morck, Shleifer & Vishny (1988), the two critical levels of managerial shareholding in association with the firm value are estimated to be of about 5% and 20%. Table 4 reports the CAR for the sample firms divided into subgroups according to these two critical levels of managerial shareholding percentages.

Insert Table 4 Here

As can be seen, the subgroup with managerial shareholding below 5% reports an average of CAR at -0.41%, while the subgroup above 5% reports -1.58%. The difference is statistically significant. Firms with higher managerial shareholding level show a greater negative market reaction.

By further dividing firms with cutoff points at 1%, 5% and 20%, it is shown that firms with managerial shareholding below 1%, between 1% and 5%, between 5% and 20%, above 20%, has an average of CAR at -0.95%, 2.28%, -1.46%, and -1.75%, respectively, all of which are statistically significant. Previously it was reported that firms with managerial shareholding below 5% are associated with a CAR of -0.41%. However among the below-5%-firms, those with relatively higher managerial shareholding level earn a positive CAR (2.28%). For the two subgroups with managerial shareholding higher than 5%, the CAR is significantly negative. In all, a positive relationship between CAR and managerial shareholding can be observed for firms with low managerial shareholding, while an adverse relationship for firms with high managerial shareholding.

Table 4 also reports the CAR for the sample firms divided into subgroups according to the stable shareholders' shareholding percentages. Stable shareholders are approximated by the corporate and financial shareholders. The sample firms have a median of 48% shares held by their stable shareholders. Firms with stable shareholders' shareholding below the median are associated with a CAR of -0.59%, while those above the median -0.62%. The market reaction is negative to the adoption of takeover defenses, regardless of the level of the firms' stable shareholders.

Table 5 reports the change in the operating performance. For subgroups of firms with managerial shareholding below 1%, and between 1% and 5%, most of the examined financial ratios only show slightly and insignificant decline after the adoption. On the other hand, subgroups of firms with managerial shareholding above 5% report a significant deterioration in post-adoption sales growth and operating profitability. Previously in Table 3, the whole sample firms report a trend of deterioration in the profitability after the adoption. It can be inferred the main cause of the deterioration

comes from those firms with managerial shareholding above 5%.

3.3. Regression analysis

In this section, regressions are run to examine whether and how the variation of the announcement-associated CAR can be explained by the ownership structure of the defenses adopting firms. Again, 3-day CAR (t=-1 to 1) is used as the dependent variable. Independent variables include the ownership structure variables used in the univarate analysis. Firm size is also included as a control variable. Table 6 reports the results of regression tests.

In equation (1), the 3-day CAR is regressed on the adopting firm's size and the managerial shareholding variable. Firm size variable shows a negative coefficient, which is statistically significant. This result is consistent with the prediction that bigger firms are associated with lower CAR, since the cost of takeover is higher and the probability is lower of realizing takeover premiums for the shareholders. This result is also observed in the other estimation equations. On the other hand, the managerial shareholding variable shows a negative coefficient, which is statistically significant. This result is also consistent with the one obtained in the univariate analysis.

In equation (2), included in the independent variables are the firm size variable, the managerial shareholding percentage variable, as well as its square. The square of the managerial shareholding percentage is meant to account for the possibility that the relationship between CAR and the managerial shareholding may depend on the managerial shareholding level. A positive coefficient for this variable implies that the negative relationship between CAR and the managerial shareholding is more (less) pronounced for firms with lower (higher) managerial shareholding. However equation (2) shows an insignificant negative coefficient for the square variable, suggesting the negative relationship between CAR and the managerial shareholding does not depend on the managerial shareholding. This result is not supportive of the observation made in the univariate analysis.

In equation (3), included in the independent variables are the firm size variable, and the stable shareholding variable. The stable shareholding variable shows a positive but insignificant coefficient. This result is also consistent with the finding in the univariate analysis.

Equation (4) includes in the independent variables the firm size variable, the stable shareholding variable, the managerial shareholding percentage variable, as well as its square. The stable shareholding variable still shows an insignificant coefficient. The results regarding the managerial shareholding variable and its square are consistent with those in equation (2).

Insert Table 6 Here

4. Discussion

Our empirical results show that takeover defenses adopting Japanese firms were punished by the stock market, and were also experiencing a decline in the profitability in the years after the adoption. This supports hypothesis H1a. Hypothesis H1b is not supported, given the fact that the announcement of takeover adoption is associated with a negative CAR, and that the R&D expenditures and sales growth of the adopting firms did not manifest improvements. It may be argued that takeover defenses may deter hostile takeovers and enable long-term perspective management; however, such benefits may be offset by the amplified agency costs resulting from the insulation form the market discipline.

The negative announcement-associated CAR also supports hypothesis H3b, e.g., Japanese firms adopt takeover defenses mainly to deter possible takeovers. This is in line with hypothesis H1a's management entrenchment hypothesis. Takeover defenses can help managers maintain their control by lowering the possibility of takeovers, but, on the other hand, rid the shareholders of the expected takeover premiums. In fact, hostile takeovers are nearly non-existent in Japan after the WW2. It is likely that, in a general sense, Japanese managers adopt takeover defenses to protect from hostile takeover, rather than to use them as leverage for negotiation for a better deal as hypothesized in H3a.

Furthermore, the empirical results find that firms with managerial shareholding between 1% and 5% earned positive CAR, while all the others ended up with negative CAR. On the other hand, firms with managerial shareholding above 5% showed deteriorating operating performance, while all the others showed insignificant changes. This may partially support the hypothesis H2. Adopting firms with greater managerial

shareholding are more likely to be subject to managerial entrenchment, therefore associated with lower shareholding value. However, the hypothesis that adopting firms with managerial shareholding level in the interest alignment stage may enhance the firm value is only supported by the univariate analysis of CAR, but not by the univariate analysis of operating performance and the regression test results. Then how do we interpret the positive CAR manifested in the adopting firms with managerial shareholding between 1% and 5%? One alternative explanation is that these managers may be deemed to have an incentive to negotiate with a potential raider, instead of outright resistance of takeover proposals. I would further discuss this explanation as below.

Hypothesis H4 predicts a negative association of CAR with managerial shareholding, given the lower probability of takeover and expectation of premiums. The empirical results have supported this hypothesis. This can explain the finding that the adopting firms with managerial shareholding above 5% are associated negative CAR, and firms with managerial shareholding between 1% and 5% positive CAR. However, the empirical finding that firms with managerial shareholding below 1% associated with a negative CAR can not be explained by this line of reasoning. Instead, it may be explained by combining with the perspective of managerial incentive.

That is, firms with near zero managerial shareholding manifest a greater agency problem. These managers are more likely to adopt the takeover defenses in order to protect their position and control, instead of the intention to use them as a negotiation tool to enhance the shareholder interest. This may explain the result that these firms are associated with negative CAR.

On the other hand, firms with managerial shareholding between 1% and 5% have a greater interest alignment between managers and shareholders. Hence these managers are more likely to negotiate with the potential raider for a better deal, since they also benefit as shareholders.

In other words, the managerial shareholding level not only signals the possibility of a takeover and premiums, but also affects the managers' incentive as to how to respond to a potential takeover.

Finally, the empirical results do not support hypothesis H5. It was found that there exists no particular relationship between CAR and the firm's stable shareholders'

shareholding level.

5. Summary

This study investigated the market reaction to Japanese firms' adoption of anti-takeover measures, as well as the change in the operating performance after the adoption. In general, the results support the management entrenchment hypothesis. It is likely that the potential benefits associated with the anti-takeover measures may be offset by the amplified agency costs resulting from the insulation from the market discipline.

On the other hand, the empirical results also suggest that the managerial shareholding play an important role in the incentives of the adopting firm's management.

For firms with near zero shareholding, even though the probability of takeovers and premiums is higher, the entrenched managers may choose to adopt the defenses in order to deter the potential takeovers. Hence such firms are associated with negative CAR. However, the operating performance did not particularly change in the post-adoption years. The adoption of anti-takeover measures by firms with near-zero managerial shareholding mainly serves as a signal of disappearance of the expected takeover premiums.

Firms with low to intermediate managerial shareholding levels have a higher degree of interest alignment between the management and firm value. Managers have an incentive to use the anti-takeover measures as leverage to negotiate with raiders for a better deal, since they also benefit as shareholders. Hence such firms are associated with positive CAR. Also, the operating performance did not particularly change in the post-adoption years. The adoption of anti-takeover measures by firms with low to intermediate managerial shareholding mainly serves as a signal of higher likelihood of the expected takeover premiums.

Firms with high managerial shareholding levels have a lower probability to be taken over. The adoption of takeover defenses further reduces the likelihood, hence associated a negative CAR. Moreover, the operating performance of such firms deteriorated in the profitability. The adoption may exacerbate the agency problems embedded in the firms with high managerial shareholding, resulting in the decline in the firm value after the adoption. The empirical results suggest that the adoption of anti-takeover defenses by firms with high managerial shareholding may serve not only as a signal of

disappearance of the expected takeover premiums, but also of the management's amplified agency problems after the adoption.

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Table 1: The Characteristics of takeover defense adopting firms

	N	mean	median
book valued asset (million yen)	130	668731	217641
market valued asset (million yen)	130	867591	246273
managerial shareholding %	128	3.71%	0.30%
financial institutional shareholding %	128	29.91%	31.30%
corporate shareholding %	128	17.07%	15.00%
foreign shareholding %	128	17.98%	17.10%
individual shareholding %	128	33.09%	27.80%
financial institutional + corporate shareholding %	128	46.81%	48.21%

Table 2: CAR associated with the announcement of takeover defenses

Date	N	mean		P-value	median		P-value
-2	130	0.00%		0.9815	0.06%		0.5987
-1	130	-0.46%	***	0.0068	-0.31%		0.1144
0	130	-0.03%		0.8721	-0.03%		0.5987
1	130	-0.13%		0.4421	-0.18%		0.2926
2	130	0.04%		0.8158	-0.17%		0.3805
3-day （-1〜1）	130	-0.63%	**	0.0321	-0.97%	***	0.0050

Table 3: Change in the operating performance of the firms after adopting takeover defense measures

		(1)	(2)	(2)-(1)	(3)	(3)-(1)	(4)	(5)	(5)-(4)	(6)	(6)-(4)
Panel A: original ratio	N	Year -1 mean	Year 1 mean	P-value	Year 2 mean	P-value	Year -1 median	Year 1 median	P-value*	Year 2 median	P-value*
operating income ratio	125	6.4%	6.3%	0.732	4.5%	0.000	5.8%	5.7%	0.002	4.9%	0.000
ROA	125	6.2%	6.1%	0.499	5.2%	0.003	5.6%	5.3%	0.023	4.5%	0.000
ROE	125	15.4%	14.2%	0.023	11.6%	0.005	12.4%	11.7%	0.000	9.7%	0.000
sales growth ratio	122	8.5%	8.8%	0.826	2.2%	0.001	4.0%	5.1%	0.582	1.3%	0.000
R&D expenditure ratio	94	3.8%	3.5%	0.286	4.2%	0.169	1.5%	1.4%	0.281	1.4%	0.215
capital investment ratio	122	5.2%	5.0%	0.328	5.7%	0.345	4.4%	4.6%	0.658	4.8%	0.355
debt ratio	125	50.4%	49.4%	0.028	50.0%	0.545	52.5%	50.0%	0.008	50.8%	0.108
Panel B: industry-adjusted ratio	N	Year -1 mean	Year 1 mean	P-value	Year 2 mean	P-value	Year -1 median	Year 1 median	P-value*	Year 2 median	P-value*
operating income ratio	125	-0.51%	-0.62%	0.713	-1.51%	0.050	-0.30%	-0.42%	0.007	-0.80%	0.090
ROA	125	-0.16%	-0.37%	0.341	-0.43%	0.444	-0.35%	-0.39%	0.039	-0.96%	0.469
ROE	125	-0.21%	-1.09%	0.099	-1.66%	0.299	-1.36%	-2.12%	0.019	-1.90%	0.405
sales growth ratio	122	2.11%	1.92%	0.878	-0.14%	0.214	-0.46%	-1.17%	0.819	-1.08%	0.354
R&D expenditure ratio	94	1.42%	1.07%	0.208	1.68%	0.349	-0.21%	-0.21%	0.492	-0.09%	0.391
debt ratio	125	-3.92%	-4.43%	0.281	-4.39%	0.492	-3.96%	-5.30%	0.824	-4.97%	0.235

* Wilcoxon signed ranking test

Table 4: Ownership structure and announcement associated CAR

Firms with	N	mean	P-value
managerial shareholding			
below 5%	107	-0.41%	0.1668
above 5%	22	-1.58%	0.0000
managerial shareholding			
below 1%	89	-0.95%	0.0012
between 1% and 5%	18	2.28%	0.0000
between 5% and 20%	14	-1.47%	0.0000
above 20%	8	-1.76%	0.0000
stable shareholders' shareholding			
above 48%	65	-0.62%	0.0345
below 48%	64	-0.59%	0.0452

Table 5: Ownership structure and the change in the operating performances.

Firms with	N	(1) Year -1 mean	(2) Year 2 mean	(2)-(1) P-value *	(3) Year -1 median	(4) Year 2 median	(4)-(3) P-value *
managerial shareholding above 5%							
operating income ratio	22	-0.87%	-4.86%	0.0676	1.01%	-1.92%	0.0716
ROA	22	1.53%	0.66%	0.5301	2.20%	-2.01%	0.3065
ROE	22	0.93%	-0.24%	0.7071	1.28%	-1.36%	0.7578
sales growth ratio	20	18.89%	2.74%	0.0660	5.31%	3.57%	0.0442
R&D expenditure ratio	14	9.60%	11.60%	0.2761	-0.90%	-0.76%	0.4325
debt ratio	22	-9.43%	-9.48%	0.9869	-11.17%	-12.04%	0.5267
managerial shareholding between 1% and 5%							
operating income ratio	18	0.28%	-2.21%	0.2580	-0.71%	-0.43%	0.1556
ROA	18	-1.01%	-2.29%	0.3256	-1.35%	-1.47%	0.4265
ROE	18	-4.95%	-13.86%	0.3639	-6.79%	-7.08%	0.4955
sales growth ratio	18	3.45%	-2.33%	0.3087	0.06%	-1.04%	0.5321
R&D expenditure ratio	15	1.03%	0.69%	0.3779	0.10%	0.15%	0.6379
debt ratio	18	-12.95%	-12.86%	0.9615	-18.04%	-16.67%	0.6092
managerial shareholding below 1%							
operating income ratio	89	-0.48%	-0.54%	0.8514	-0.43%	-0.70%	0.4268
ROA	89	-0.36%	-0.36%	0.9941	-0.64%	-0.82%	0.8190
ROE	89	0.33%	-0.07%	0.6455	-1.42%	-1.52%	0.4092
sales growth ratio	89	-1.26%	-0.51%	0.5986	-1.38%	-1.53%	0.9867
R&D expenditure ratio	67	-0.19%	-0.18%	0.8923	-0.18%	-0.16%	0.2143
debt ratio	89	-1.55%	-2.28%	0.2441	-0.64%	-1.85%	0.3845

* Wilcoxon signed ranking test

Table 6: Regression test results with the 3-day announcement-associated CAR as independent variable.

	(1)		(2)		(3)		(4)	
N	129		129		129		129	
adjusted R square	0.042		0.0557		0.023		0.0520	
F value (P-value)	3.793	(0.025)	3.5179	(0.017)	2.512	0.085	2.7556	(0.031)
	coefficient	P-value	coefficient	P-value			coefficient	P-value
Constant	0.199	0.021	0.170	0.051	0.131	0.100	0.155	0.083
market valued asset (ln)	-0.008	0.019	-0.007	0.042	-0.006	0.049	-0.007	0.042
managerial shareholding	-0.135	0.033	0.123	0.458			0.170	0.340
managerial shareholding square			-0.741	0.094			-0.798	0.076
stable shareholders' shareholding					0.051	0.146	0.029	0.476