Merger Activities and Stock Market Valuation in China

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(Preliminary Version)

Abstract

Merger activities have been growing significantly in China's stock markets in recent years. Adopting the event-study method and accounting method (financial indicators method), we examine 752 merger and acquisition events involving 587 companies traded on Shanghai and Shenzhen stock exchanges in 2005.

Our analysis indicates that within the event period (-50 days, 40 days), M&A companies' values were increased. The CAR (Cumulative Abnormal Return) of all M&A firms within the event period was 1.74%; for acquiring firms and target firms, the CAR were respectively 1.68% and 2.03%. We also examine whether M&A types, M&A companies' industries, ownership structures (the types of controlling shareholders) and the stock market's aggregate performance can have impacts on the returns of M&A evens.

Analyzing accounting indicators within a longer observation period (four years), we find that the financial conditions of M&A companies showed a certain degree of decline in the first year of M&A, but an obvious improvement in the following year. However, the short-term and long-term ability to repay debt declined without a clear sign of improvement after the merger.

Keywords: Mergers and Acquisitions, Cumulative Abnormal Returns, Event study, Accounting Indicators

1. Introduction

The stock markets of China have been developed quickly and in a very different way from other country's stock markets. Since establishment of the markets, China has adopted a dual-track equity system (or called "parallel market") with nontradable and tradable shares. The nontradable shares are owned by the government agencies of various levels, who are frequently the controlling shareholders of many listed companies. A major feature of the dual-track equity system might be the privatization of these state-owned companies over the least ten years in the stock market. By 2002, it was estimated that 11% of listed companies were privately owned. And to the end of 2005, private individuals controlled about 26% of listed companies. The changes are brought forth by thousands of transactions, including management buy-outs and negotiated transfers of control rights.

The purpose of this paper is to examine the nature of merger and acquisition (M&A) activity and analyze how it affects company's value in China's stock markets. The study of China's M&A markets can help us to understand better how the stock markets function with the special institutional arrangement of the dual-track equity system. We focus on the most recent period since merger and acquisition activities have been growing rapidly in the last few years. In addition, China's stock markets also experienced drastic changes in 2005. The reform of the dual-track equity system was first implemented in mid 2005. And on June 6th, 2005, Shanghai composite stock index dropped to below the 1,000-point level, returning to the level of eight years ago. During the whole year of 2005, the average daily transaction volume shrank considerably to less than tens of billions RMB. With such a market condition in 2005, it will be interesting to assess whether mergers and acquisitions can bring value for listed companies.

In the first part of the paper we adopt the event-study method (see Brown and Warner (1985), and Bruner (2002)) to assess the effects of M&As in China. We use estimates of abnormal returns, the difference between actual and expected stock returns, to measure of the economic effects of M&As. The expected returns are based on the Capital Asset Pricing Model (CAPM) with the market index served as the benchmark to summarize the influence of market-wide events on the returns of individual stocks. After reviewing thirteen studies of US market data, Jensen and Ruback (1983) found that targets of successful mergers earn significantly positive returns around twenty to thirty percent, but returns to bidding firm shareholders are zero. Their conclusions are also confirmed by more recent works, as summarized by Bruner (2002).

It will be interesting to study whether such a pattern of returns also emerges in China's M&A market. In 2005 we find 752 M&A events involving 587 companies listed on Shanghai and Shenzhen stock exchanges. Loaded with heavy computation of the CAPM models for these individual stocks, the current version only concentrates on the M&A activities in 2005. We will examine the Cumulative Abnormal Returns (CAR) of acquiring firms and target firms. Since privatization is an important feature in China's stock market, we will also study how the ownership structure may affect the CAR of M&A events.

The validity of event-study method relies much on the stock market being efficient such that CAPM can be used to capture the market influence on individual stocks. There exist doubts about the efficiency of China's stock markets as they are in a flux of institutional transformation. The alternative avenue of investigation is to use the accounting method. Using the Returns on Assets (ROA), Meeks (1977) found that merger activities brought ROA down for bidding firms. Mueller (1980) found that profitability of acquiring firms declines and economic gains from mergers appear to be small. Other related

works include Healy, Palepu and Ruback (1992), and Clark and Ofek (1994), who adopt various accounting indicators to study M&A events.

In the second part of the paper we use accounting indicators as a complementary way to understand the effects of M&As in China. We obtain financial indicators for four years and study whether the financial conditions of M&A companies demonstrated a deteriorating or improving trend after the M&A event. We examine how earning per share (EPS), return on asset (ROA), return on equity (ROE), operating cash flows.(OCF), free cash flows (FCF) and other indicators change during and after M&A . We also obtain from financial statements the current ratio, quick ratio, equity multiplier and liability to equity ratio to study their ability to repay debt before and after merger..

In the next section we describe merger and acquisition activities in China's stock markets. The economic effects of M&A as analyzed by the event-study method are discussed in Section 3. The results from using accounting methods are examined in Section 4. In Section 5 we provide concluding remarks about our findings and discuss directions for future research.

2. Merges Activities in China's Stock Market

As it stands now, China's stock market has a capitalization of 2,358 billion US dollars, with an upward trend in transaction volume and relative importance in the global financial market. About 900 of the 1,300-plus list companies have their controlling parties from government agencies of various levels. Many of the merger activities involve decisions by government agencies, which is a special feature of China's M&A market. The dollar amounts of mergers activities occurred in the stock market have been growing in recent years (Table 1). The total values of M&A in the last two years are about one percent of China's Gross National Product (Table 2).

Table 1 : The Size of Merger Activities,2002－2005

Year	Events	Total Amount (billion RMB)
2002	951	77.78
2003	934	92.31
2004	1541	211.69
2005	1219	132.32

Table 2 : Relative Importance of Merger Activities

(billion RMB)

	2004	2005	Growth Rate
Total Amount	211.69	132.32	-37.5%
GDP	13651.5	18232.1	9.9%
Total Amount/GDP(%)	1.55	0.73	-52.9%

We collect all announcements related to M&A activities and obtain 752 events in 2005. In total there are 587 firms involved in these merger activities (Table 3).

Table 3 : Sample of Merger Activities in 2005

	Shanghai Stock Exchange	Shenzhen Stock exchange	Total
Firms	361	226	587
Events	468	284	752

For these 752 events, we can further break down them into 229 acquiring firms and 288 target firms. There were also 235 events involving mixed reorganization (Table 4).

Table 4 : Acquiring and Target Firms

	Acquiring firm	Target firm	Mixed case	Total
Shanghai	140	169	159	468
Shenzhen	89	119	76	284
Total	229	288	235	752

As for the ownership structure, there were 503 events with state holding companies as the controlling shareholders and 211 events with privately-owned enterprises as the controlling shareholder (Table 5).

Table 5: Types of Controlling Shareholders

Type	State Holding Company	Privately Owned enterprise	Foreign Owned Company	Others	Total
Shanghai	312	127	4	25	468
Shenzhen	191	84	0	9	284
Total	503	211	4	34	752

In year 2005, the reform of the dual-trade equity system was first implemented in May. The stock market also turned around in June of 2005 (Figure1A & Figure1B).

Figure 1A: Shanghai Composite Index, 2000-2007



Figure 1B: Shenzhen Component Index, 2000-2007



During the first half of 2005 before June 3, 300 events of merges and acquisitions occurred together with a downward market. For the second half of 2005, there were 452 events of mergers and acquisitions in the market with an upward trend (Table 6).

Table 6: Merger Activities in Upward and Downward Markets

	Period of Downward Index (2005.1.1-2005.6.3)	Period of Upward Index (2005.6.6-2005.12.31)	Total
Shanghai	178	290	468
Shenzhen	122	162	284
Total	300	452	752

In the next section, we will use the factors of ownership structures (Table 5) and aggregate market performance (Table 6) to divide our sample and examine whether M&A events may depend on these factors.

3. Stock Market Valuation of M&A Events

We divide the event period (t_0, t_2) into the pre-announcement subperiod $(t_0, t_1 - 1)$, and post-announcement subperiod (t_1, t_2), with t_1 as the date of announcement.

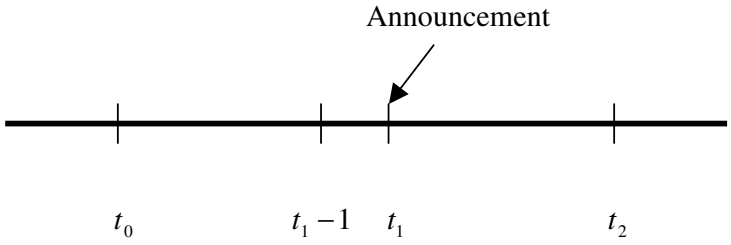


Figure 2: Time line of the event

In order to use the event-study method, we need to estimate the expected returns from holding the stocks of M&A companies if the M&A event did not occur, which are then used as the benchmark for computing the abnormal returns. The period $(t_0, t_1 - 1)$ before announcing of M&A at $t = t_1$ is used as the basis to estimate the daily expected returns in the CAPM framework

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad \text{for} \quad t = t_0 \quad \text{to} \quad t = t_1 - 1, \quad i = 1,...N, \tag{1}$$

where R_{mt} is the returns on market index in period t. We define

$r_{it} = \dfrac{(P_{it} - P_{it-1})}{P_{it-1}}$ and adopt the continuously compounded rate of return

$R_{it} = \ln(1 + r_{it})$ and $R_{mt} = \ln(1 + r_{mt})$. Then daily abnormal returns (AR) before and after the announcement, i.e. $t = t_0$ to $t = t_1 - 1$ and $t = t_1$ to

$t = t_2$, can be computed as

$$AR_{it} = R_{it} - E(R_{it}), \tag{2}$$

with

$$E(R_{it}) = \alpha_i + \beta_i R_{mt}, \text{ for } t = t_0 \text{ to } t = t_2. \tag{3}$$

Then we can aggregate across securities to obtain average abnormal return (AAR). The associated average Cumulative Abnormal Returns (CAR) is

$$CAR_t = \sum_{t=t_0}^{t} AAR_t, \tag{4}$$

with

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \tag{5}$$

In our study the pre-announcement period $(-50,-1)$ corresponds to $(t_0, t_1 - 1)$ and the post-announcement period $(0,39)$ corresponds to (t_1, t_2) in the above formulation.

We first analyze the CAR of all merger activities (752 events, see Table 7) and find that AAR and CAR are significantly positive (Table 8).

Table 7 Descriptive Statistics of all Merger Activities

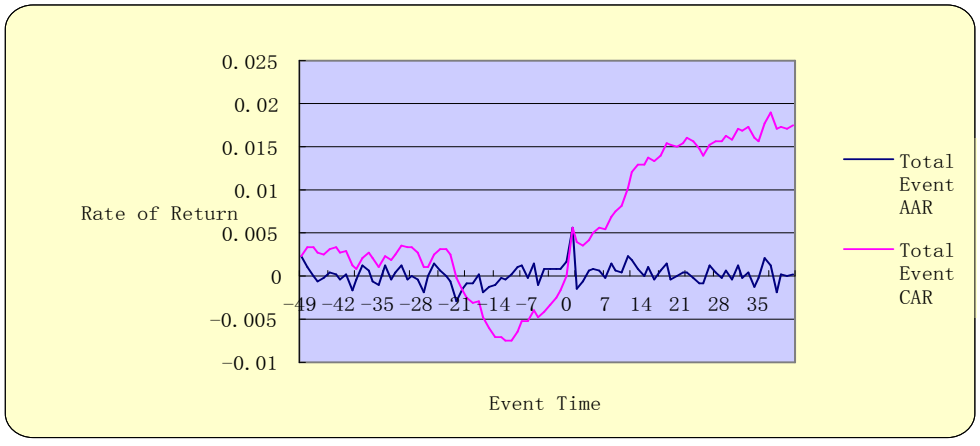
	Minimum	Maximum	Mean	Std. Deviation
AAR	-0.002816	0.0055395	0.0001699	0.0011215
CAR	-0.007585	0.0189335	0.0057595	0.0078968

Table 8 Significance Test of all Merger Activities

	Test Value = 0					
	t	df	Sig.(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
AAR	1.429	88	0.157	0.0001699	-6.64E-05	0.0004061
CAR	6.881	88	0	0.0057595	0.0040961	0.007423

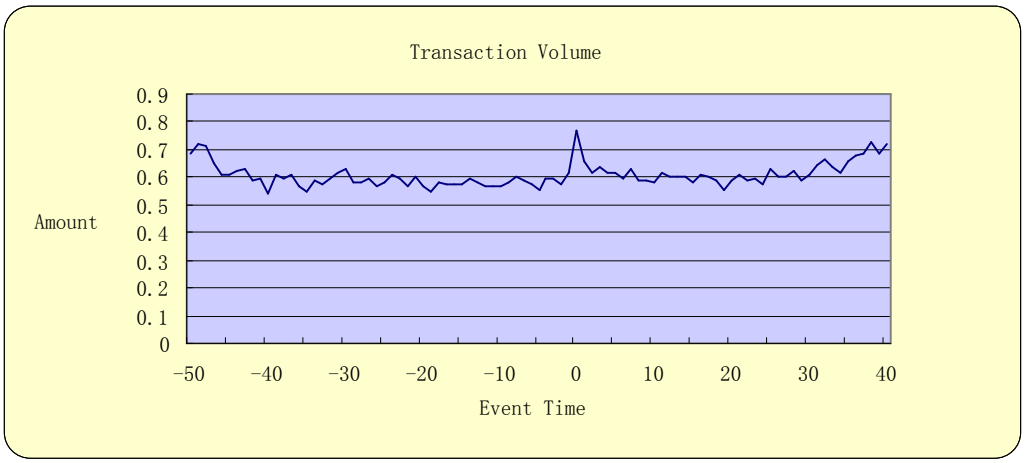
In order to better understand how average abnormal returns (AAR) and Cumulative abnormal returns (CAR) evolve over time, we plot them for the whole event period (Figure 3). We find that average CAR is about 0.57% and CAR is 1.74% at $t = 40$ for all merger activities combined together.

Figure 3: CAR of all Merger Activities (Average CAR=0.572%)



In addition, we find that transaction volume of the stocks involved in M&A jump at the date of announcement $(t = 0)$ and stay quite stable on other days.

Figure 4: Transaction Volume



In order to understand better how the stock market evaluates merger activities, we separate the sample into acquiring firms and target firms. The average CARs of both types are less than one percent. (Table 9 and Table 10)

Table 9 CAR of Acquiring Firms

	Test Value = 0					
	t	df	Sig.(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
AAR	0.958	88	0.341	0.0001666	-0.000179	0.0005124
CAR	8.948	88	0	0.0064602	0.0050255	0.0078949

Table 10 CAR of Target Firms

	Test Value = 0					
	t	df	Sig.(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
AAR	1.185	88	0.239	0.000227	-0.000154	0.0006076
CAR	4.946	88	0	0.0051033	0.0030527	0.0071539

In contrast to the findings with US date, the bidders is China obtain a

positive return (CAR at $t = 40$ is 1.68%), albeit very small. Also in contrast to the US market, the target firms' return (CAR at $t = 40$ is 2.03%) is much smaller than its counterpart in US where the target firms can earn up to twinty to thirty percent. (Figure 5 and Figure 6)

Figure 5: CAR of Acquiring Firms (Average CAR=0.641%)

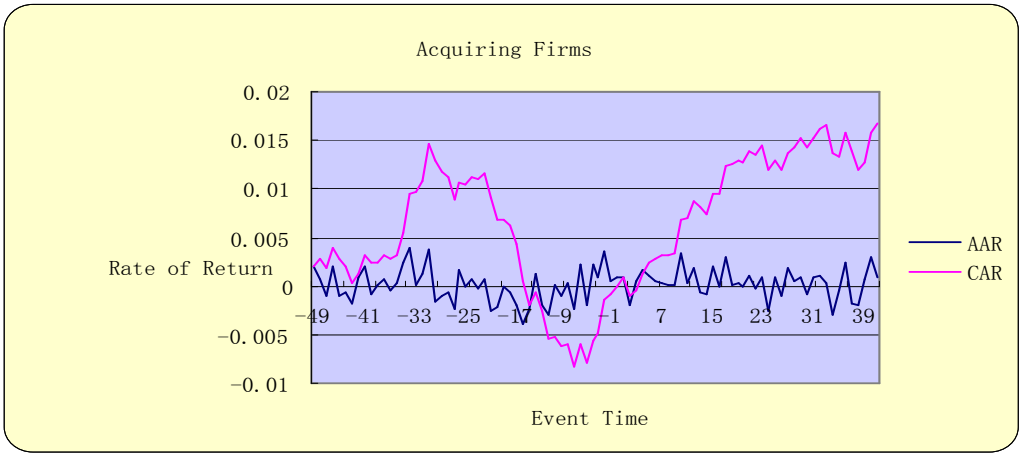
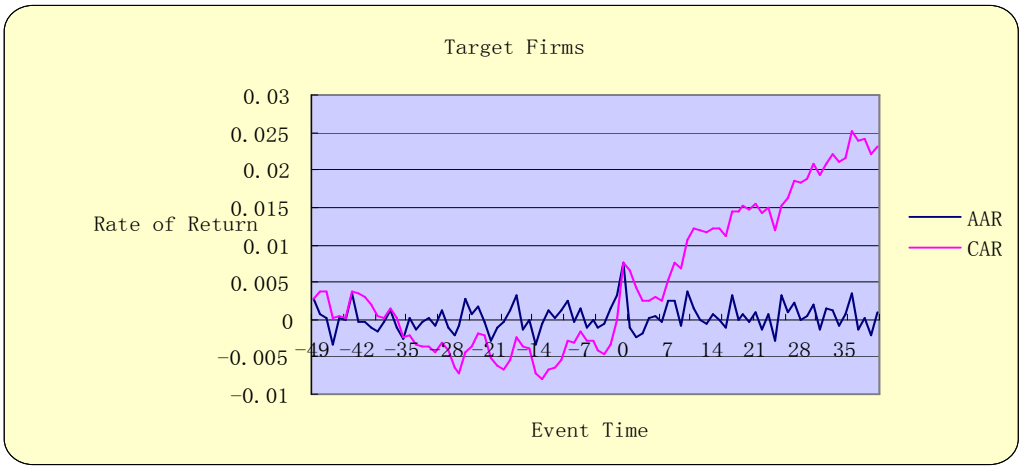


Figure 6: CAR of Target Firms (Average CAR=0.508%)



Next, we examine whether ownership structures may have influence on the value created through M&A. We find that those M&A activities with state as

the controlling party produce a relatively higher return (CAR at $t = 40$ is 1.83%) as compared with the private enterprises as the controlling party (CAR at $t = 40$ is 1.11%). One possible reason is that once the stock market is predominantly controlled by various government agencies, some better deals may have been negotiated directly among state holding companies.

Figure 7: State Holding Company as the controlling party (Average CAR=0.625%)

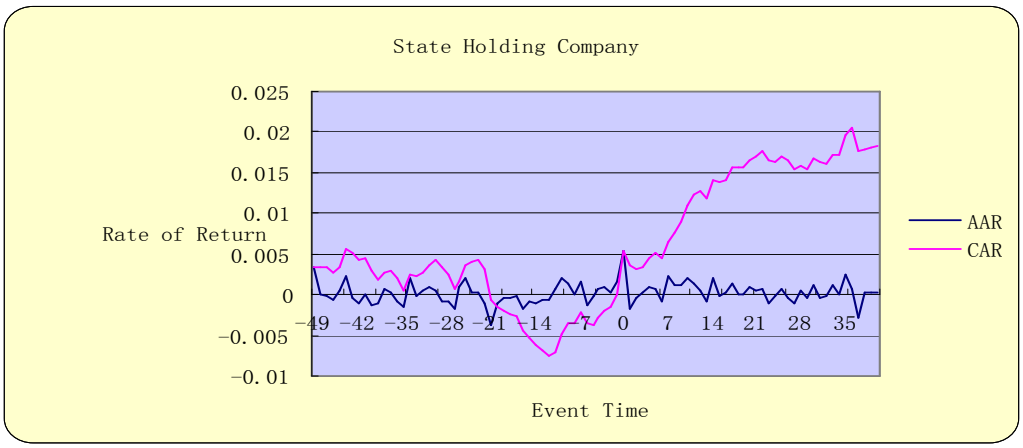
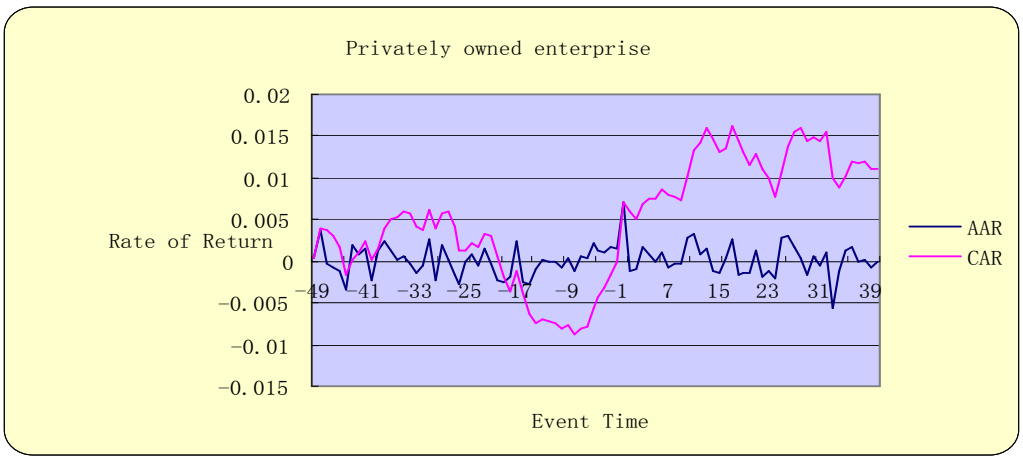


Figure 8: Privately Owned Enterprise as the controlling party (Average CAR=0.504%)



Finally, we separate our sample into a period with down ward index and

another with upward index. Year 2005 witnessed both a depressed market (before Jane 3) and an upbeat market afterwards. We find that merger activities increase company's value more in a depressed market (CAR at $t = 40$ is 3.19%) than in a upbeat market (CAR at $t = 40$ is 0.78%). Since we use CAPM as the benchmark to compute excess returns, this demonstrates that after correcting market conditions, M&A is a relatively more attractive channel of investment in a depressed market.

Figure 9: Period of Downward Index (Average CAR=0.963%)

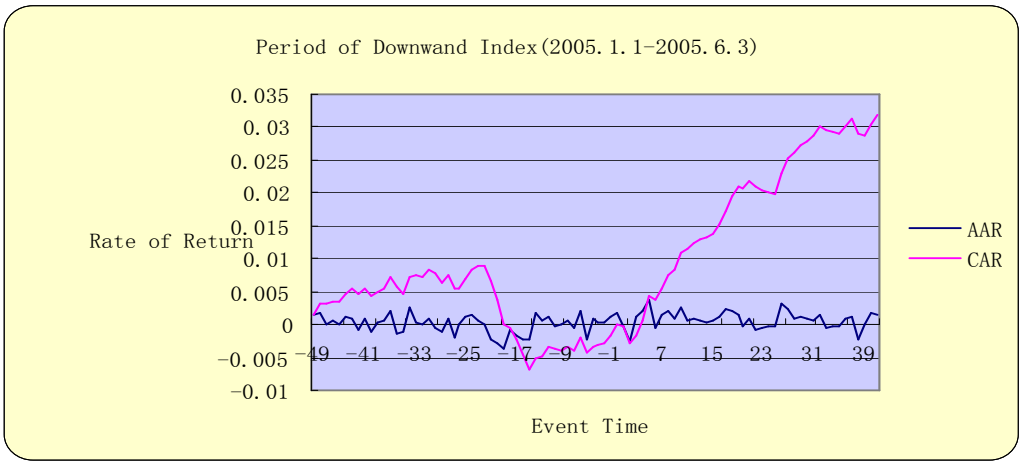
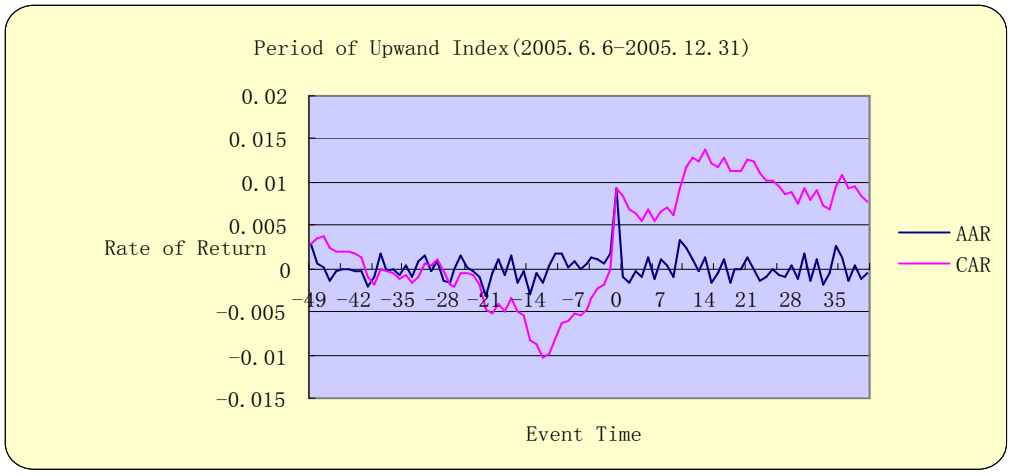


Figure 10: Period of Upward Index (Average CAR=0.312%)



Besides using the event period $(-49,40)$, we also tried different windows

such as $(-24,20)$ and $(-12,10)$. The results are quite similar and we omit them in this version of the paper.

We can conclude this section by noting that the event-study method produces some rather interesting results for the valuation of merger activities in China. Although China's stock market may not have reached the level of efficiency as the US market, some preliminary investigation demonstrates that its efficiency has been improved in recent years, This paper also shows that stock market valuation of all merger activities in China is mildly positive, which may also help to enhance the allocative role of China's stock market.

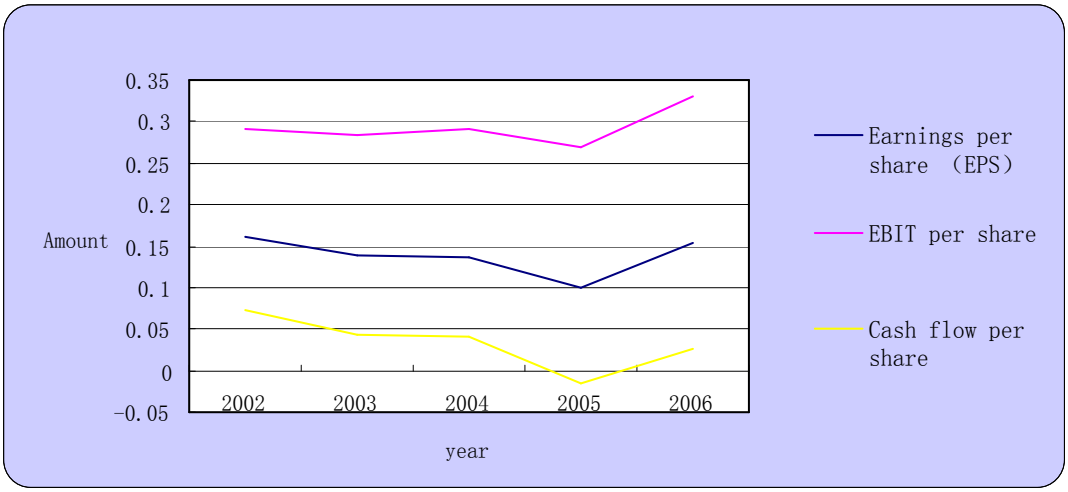
4. Accounting Indicators Before and After Mergers

In this section we study the financial conditions of merging firms. We collect accounting information from the financial statements of the 587 firms from 2002 to 2006. First, we obtain earning per share, EBIT per share and cash flow per share of all firms we studied in the last section. From Table 11 and Figure 11, we can see clearly that all three indicators decline in 2005, the year of merger, and improve in 2006, the year after the merger. The growth rates of the last two years are – 27% and 55% for EPS, -8% and 23% for EBIT per share, and -138% and 270% for cash flow per share. These three indicators demonstrate a consistent pattern before, during and after the merger.

Table 11 EPS, EBIT, Cash flow Per Share, 2002-2006

	2002	2003	2004	2005	2006
Earnings per share （EPS）	0.161864	0.13994	0.13541	0.09876	0.153206
EBIT per share	0.291789	0.284257	0.291105	0.267955	0.329258
Cash flow per share	0.073534	0.043986	0.040717	-0.01556	0.027136

Figure 11: Accounting Information (per share) for All Merging Firms

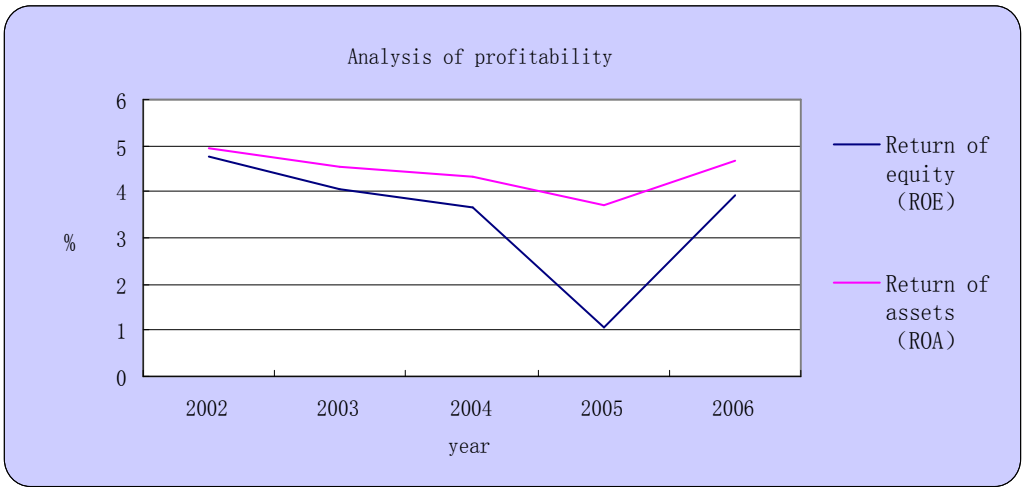


Next, we study the earning ability of these firms, which forms the basis of a firm's strong financial condition. From Table 12 and Figure 12, we can find that EBIT increases over the whole period but return on equity (ROE) and return on asset (ROA) both decrease in 2005 and then improve in 2006.The growth rates for the last two years are -71% and 273% for ROE and -14% and 25% for ROA. In contrast to the findings in the US market, our results show a clear pattern for the 587 firms combined together. In a later study, we will separate them into acquiring firms and target firms.

Table 12 Earning Ability, 2002-2006

	2002	2003	2004	2005	2006
EBIT(Billion RMB)	0.214956	O.253167	0.331346	0.368624	0.447996
Return of equity (ROE)	4.769542	4.070747	3.650489	1.049658	3.917524
Return of assets (ROA)	4.943371	4.563602	4.337534	3.726122	4.671156

Figure 12: Earning Ability of All Merging Firms, 2002-2006



The ability to service debt is another way to measure the firm's financial conditions. We first study the current ratio, which is current asset (cash, cash equivalent, accounts receivable and inventory) divided by current liability (short-term loans and accounts payable). Since inventory is not easy to convert into cash, the quick ratio, which does not include inventory in the numerator, is also computed for our data set. These two ratios measure the firm's ability to repay short-term debt.

The normal range of current ratio is within 0.5 to 2.0. For our 587 firms, their average is within the safe range, but it clearly declines over time. The quick ratio should have its ideal range around 1. We can see that the average of quick ratio fell below 1 after the merger in 2005. Both ratios of these merging firms clearly become worse after 2005. So the short-term ability of these merging firms to repay debt has declined after the merger (see Table 13).

We use the liability to equity ratio and the equity multiplier to represent the long-term ability to repay debt. As the liability to equity ratio increase, the ability to repay debt has declined, as shown in Figure13A, before and after the

merger. In the mean time, as the equity multiplier, which is defined to be the ratio of asset to equity, rises in Figure 13B the firm's reliance on debt has also increased.

Table 13 Ability To Repay Debt, 2002－2006

	2002	2003	2004	2005	2006
Liability to equity ratio	44.8117	47.34732	50.01123	52.28126	52.64088
Current Ratio	1.632192	1.525752	1.427801	1.333356	1.32292
Quick Ratio	1.240658	1.123622	1.021103	0.933706	0.889238
Equity multiplier	2.0863	2.151938	2.229744	2.466456	2.89927

Figure 13A: Liability Equity Ratios

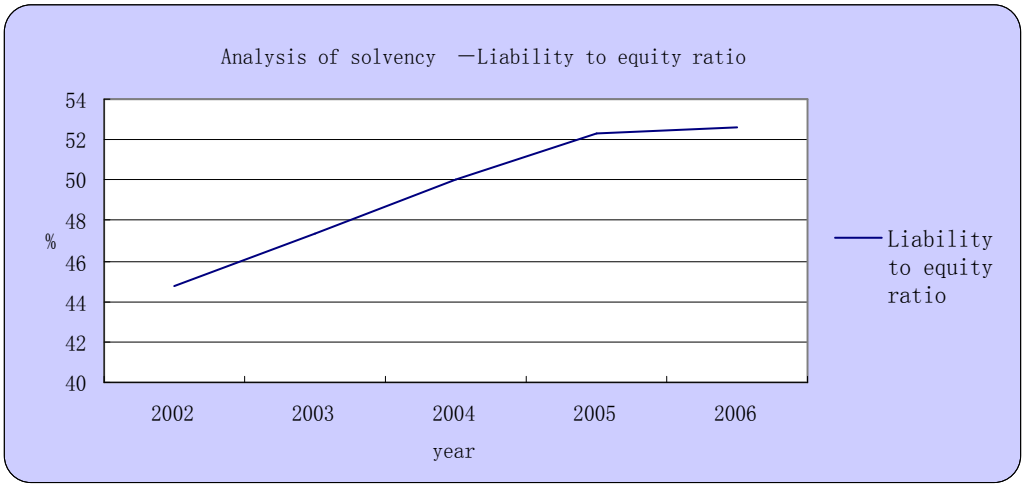
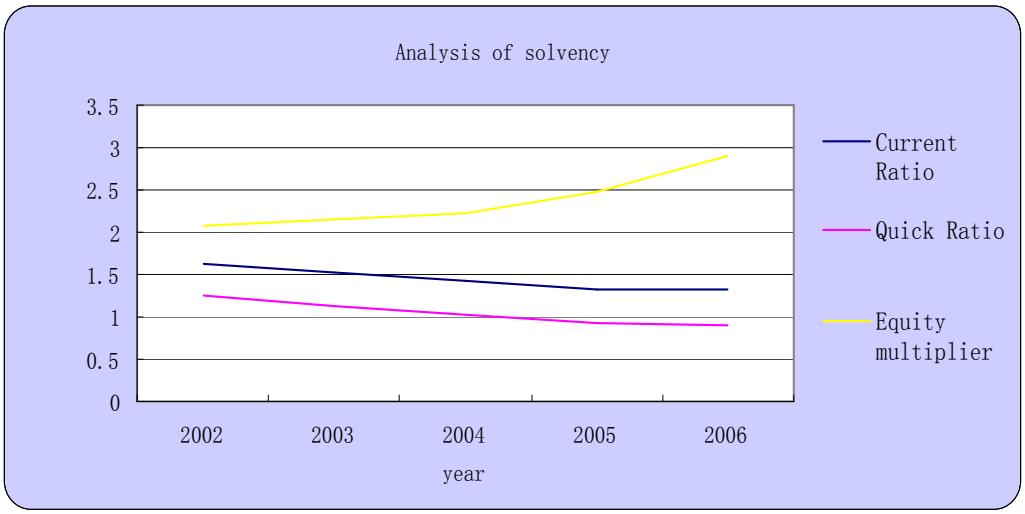


Figure 13B: Ability to Repay Debt



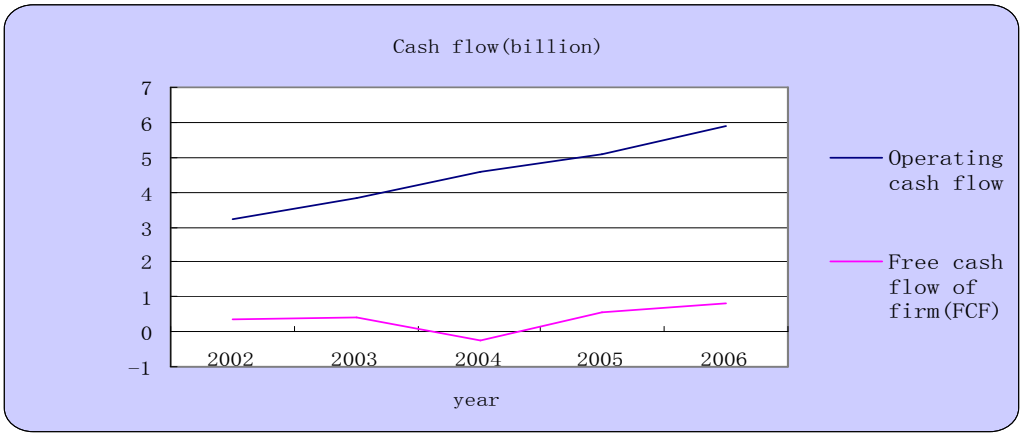
Before closing this section, we present the cash flows of these firms over the four year horizon. Both operating cash flows (OCF), which is EBIT plus depreciation minus taxes, and free cash flows (FCF), which is OCF minus any expenditures necessary to maintain the firm's operating assets, measure the firm's profitability before or after deducting investment expenditures. From Table 14 and Figure 14 we can see that the profitability of the merging firms has improved after the merger in 2005.

Table 14 Cash Flows, 2002－2006

(100 miillion RMB)

	2002	2003	2004	2005	2006
Operating cash flow	3.244178	3.807216	4.599242	5.102536	5.91053
Free cash flow of firm	0.373923	0.417455	-0.25308	0.549061	0.815731

Figure 14: Cash Flows, 2002-2006



By using the accounting method in this section, we can conclude that the financial conditions of the M&A firms showed a certain degree of decline in the first year of the M&A event, but improve in the next year. However, the short-term and long-term ability to repay debt declined without a clear sign of improvement after the merger.

5. Concluding Remarks

In this paper we examine 752 merger and acquisition events involving 587 companies traded on Shanghai and Shenzhen stock exchanges in 2005. Our event-study analysis indicates that within the event period (-50 days, 40 days), M&A companies' values were increased. Although not as large as in the US markets, this might still demonstrate that China's stock market can serve to assess the value created by merger and acquisition.

Analyzing accounting indicators within a longer observation period (four years), we also discover that the financial conditions of M&A companies showed a certain degree of decline in the first year of the M&A event, but an obvious improvement in the following year.

Our immediate directions of research include an expansion of scope to include the M&A events in 2004 and 2006. As for the accounting method we also plan to expand our study to analyze how the M&A types, M&A companies' industries, M&A companies' ownership structures and stock market's aggregate performance (as in Section 3 for event study) might have impacts on the financial conditions of M&A companies.

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