The Impact of Capital Structure and Financial Media on Mergers & Acquisitions

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The Impact of Capital Structure and Financial Media on Mergers & Acquisitions

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Abstract

This thesis explores the impact of capital structure and financial media on Mergers and Acquisitions. The empirical evidence on this thesis demonstrates that firm's capital structure and financial media are both significantly related to the M&A success and M&A performances. Chapter 3 empirically investigates the interaction between a bidder's capital structure and the probability of M&A success. It suggests that bidders with great leverage deficit are less likely to be successful in M&A. The potential explanation is that overleveraged bidders are unable to provide attractive takeover offers with high premiums and thus reducing the probability of success. Chapter 4 further studies the implications of capital structure theory for M&A. The empirical evidence shows that bidder's leverage deficit is negatively related to the probability of using pure cash payment. This implies that firms may actively rebalance their financial leverage to optimal level through M&A. Overleveraged bidders are less likely to use cash payment since they are willing to reduce their deficit level by acquiring targets with equity. By contrast, underleveraged bidders have more incentive to use cash payment because they tend to increase their debt level. Chapter 4 also shows that bidder's capital structure has large impact on the merging firms' stock performances in both short term and long term. Therefore bidder's capital structure is considered as an important determinant for M&A performance. In addition, Chapter 5 further examines the relation between M&A performance and financial media. It reports that bidders with positive media attitude in pre-merger period are significantly outperformance than those with negative media attitude. It concludes that the pre-merger news released by influential financial media has large impact on market reactions to M&A announcements. Furthermore, the empirical evidence suggests that financial media is able to partially predict merging firm's long term stock performance. Overall, our research in this thesis contributes to the literature with conclusive evidence that the considerations of capital structure and financial media provide further understandings with M&A performances.

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Statement of Copyright

Chapter 1

1. Introduction

Mergers and acquisitions (M&A) are considered the most important aspect of corporate finance. They play a crucial role in financial markets. The beginnings and endings of merger waves are considered a reliable indicator of economic conditions. Historical data show that there have been six merger waves. The first merger wave can be traced back to the beginning of the 20th century. The sixth merger wave, the most recent, started in 2003 and ended with the financial crisis in 2008. During the emergence of each of these six merger waves, M&A activities continued to experience dramatic growth in either trading values or trading volumes. Therefore, research on M&A also developed rapidly. Most aspects of M&A activity are well explored in the literature. However, several unfathomed questions remain, since M&As have been undergoing innovations in the corporate control market. The major purpose of this thesis is to explore unexplained aspects of M&As and to fill gaps in the literature. This research covers mainly two aspects of M&As: their probability of success and the performance of takeover deals. Based on previous studies, this thesis seeks to identify new factors that affect the probability of successful M&A completions and the M&A performances.

The M&A literature mainly focus on the following aspects of M&As: their motivation, their process, their stakeholders, their performance, and merger waves. Chapter 2 systematically reviews the most well-known and seminal papers in M&A research. This literature review reveals that the current general understanding of M&As in regards to the development of M&A research is impressive.

Several developments in M&A research have taken place in recent years. For instance, the connection between a firm's capital structure and M&A deals has attracted great attention, especially during the sixth merger wave. Increasing numbers of papers are

focusing on this relation, examining the motivation of M&A activity with traditional capital structure constructs such as tax shielding, financial slack, and wealth transfer. A few studies associate firm capital structure with takeover success. Morellec and Zhdanov (2008) developed a dynamic model relating a bidder's capital structure to takeover success. Their theoretical model predicts that bidders with a low leverage ratio can have substantial advantages in takeover contests. However, to our best knowledge, no study empirically examines the potential interaction between the bidder's leverage ratio and the takeover outcome. To fill this gap, the Chapter 3 of this thesis sheds light on this relation. The main research question of this chapter is that whether bidder's capital structure has potential effect on the takeover success. It is expected that bidder's different capital structures may have diversified impacts on the takeover success in the future. It is essential to explore how the under-leveraged capital structure generates advantages for bidding firm. Based on this consideration, firm managers may have incentive to actively manage their leverage ratios and obtain these advantages. Furthermore, it is important to investigate the potential explanation for this relation. We suppose that under-leveraged bidders have strong ability to propose high bid premiums for target shareholders. Therefore target shareholders and managers are more likely to accept the offer from these bidders.

To answer these questions, Chapter 3 of this thesis empirically investigates the interaction between a bidder's capital structure and the probability of success of M&As by using a large sample of 19,203 US takeover deals during the period 1980–2009. To more accurately proxy for a firm's capital structure status, we use the concept of leverage deficit, which is based on the target capital structure theory. In line with typical capital structure research, we adopt a Tobit regression model to estimate each bidder's target leverage ratio. Then the leverage deficit is calculated as the difference between the firm's actual financial leverage and the target level. The Tobit regression results suggest that a firm's target capital structure relies on numerous factors. Both firm size and asset tangibility increase with the firm's target leverage ratio. In contrast, firm profitability,

research and development (R&D) expenses, selling expenses, the market-to-book ratio, and cash reserves all have a significantly negative impact on the target leverage ratio. These findings are mainly consistent with the framework of dynamic trade-off theory. In the following, the results from a logistic regression model strongly suggest that a bidder's leverage deficit has a significant and negative impact on the probability of M&A success. This implies that bidders with higher levels of pre-merger debt are less likely to be successful in a takeover. More specifically, we use three dummy variables to indicate the level of bidder leverage deficit. The empirical evidence shows that overleveraged bidders have the lowest rate of success, while target-leveraged bidders have the highest.

We also categorize the full sample into three subsamples according to the medium of payment. As expected, the interaction between leverage deficit and M&A success differs dramatically between these subsamples. For deals with pure cash payments, this relation is statistically insignificant. However, in deals with pure stock or mixed payments, the relation becomes much stronger. The estimates for other control variables are also significantly different in these regressions. Moreover, Chapter 3 explores potential explanations for the effect of leverage deficit by analysing the relation between a bidder's leverage ratio and bid premiums. Consistent with our prediction, the bidder's leverage deficit has a strongly negative impact on the premiums offered. Overleveraged bidders are unable to provide attractive takeover offers with high premiums and are thus more likely to fail in takeover contests. By contrast, target-leveraged bidders are able to provide more attractive offers which ensure their successes in M&As. The findings on bid premiums could be potentially explain the effect of bidder leverage deficit on M&As.

Following the studies in Chapter 3, it is believed that the M&A activities could be considered as an important and effective way for capital structure rebalancing. Consistent with previous argument, we predict that a large proportion of M&A deals are motivated by the consideration of firm's capital structure. In Chapter 4, we plan to find more evidence to prove this argument that capital structure adjustment is an essential

motivation for M&A activity. Moreover, it is also necessary to identify and examine how the stock markets react to these deals. Therefore, based on these motivations and research questions, Chapter 4 further investigates the implications of target capital structure theory for M&As. The research sample contains 537 large M&A deals with a value of more than 20% of the bidder's firm size. Chapter 4 empirically explores how the bidder's capital structure affects payment choices in M&A deals. We apply a logistic regression model to investigate the interaction between bidder leverage deficit and the probability of a pure cash payment. The results indicate that overleveraged bidders are less likely to use cash payments because they are not willing to issue more new debt. In contrast, underleveraged bidders are more likely to use debt financing and pure cash payments. These findings are consistent with our prediction that M&A deals are considered as an important approach for capital structure adjustment. The empirical evidence suggests that the choice of the M&A payment depends on the status of bidder's capital structure and the motivation of making takeover deals. These results provide further support for the target capital structure theory. It also strongly confirms the argument that firms may actively rebalance their capital structure to target levels through M&A activity (Harford, Klasa, and Walcott, 2009).

Furthermore, to examine how the financial market reacts to such leverage-motivated deals, Chapter 4 investigate the short-run stock performance of deals around the announcement period. In univariate analysis, the full sample is categorized by both the bidder's and the target's leverage deficits. The empirical evidence suggests that bidder's leverage deficit has significantly large impacts on market reactions to a takeover announcement, while the target firm's leverage deficit has none. More specifically, the stock market responds more favourably to deals made by overleveraged bidders than to those made by target-leveraged bidders. The results from cross-sectional multivariate regressions consistently lead to the same conclusions as with univariate analysis. The potential explanation is that in the deals made by target-leveraged bidders, the stock market may worry about the results that bidder's leverage ratio will deviate from the

optimal level, which has negative impact on the long term performance. Therefore, the market reactions to these deals are highly negative. By contrast, investors believe that deals made by over-leveraged bidders help to reduce the debt ratio and consequently the firm's financial distress. Thus we argue that the bidder's capital structure strongly affects short-term announcement returns.

To conclude, Chapter 4 strongly supports the argument that capital structure rebalancing is an important motivation for M&A activities. Firms present a strong incentive to adjust their financial leverage towards optimal levels by acquiring other appropriate targets. However, financial markets provide differential reactions to these takeover attempts. Either in the short term or in the long term, deal performance is influenced by bidder and target capital structures. Therefore, firm managers should carefully consider decisions involving capital structure and M&As.

After controlling for several well-known factors, Chapter 4 proves that bidder leverage deficit can affect M&A performance. However, studies on stock returns continue to proliferate. In recent years, several studies have focused on the influence of financial media on stock prices. A series of papers – for example, those of Tetlock (2007, 2010) and Tetlock, Saar-Tsechansky, and Macskassy (2008) – prove that financial news content can predict the future movements of the financial market. This finding could partially resolve the problem of information asymmetry between different groups of investors. On the other hand, Fang and Peress (2009) find a significantly negative relation between a firm's stock returns and media coverage. Following such media research, this thesis starts to pay attention to the interaction between the news released by the financial media and M&A activities. The basic motivation of this research is to investigate whether financial media can affect and predict M&A performance, in either short run or long run. In line with previous studies, it is believed that financial media is able to magnify or weaken the financial market reactions to the takeover announcements. Therefore, it is necessary to examine the bidder's announcement returns and the news released in pre-merger period.

Moreover, since financial media may contain firm's unreleased fundamental information, it is reasonable to believe that the news relating to M&A deals is able to predict the future prospect of new merging firms. To answer these questions, we provide a comprehensive research for the interaction between financial media and M&A deals in Chapter 5

To conduct this research, we construct a large media data set that contains 478,830 financial news items relating to 288 M&A deals. The empirical evidence from both univariate and multivariate analyses suggests that the pre-merger media attitude has a strong impact on the bidder's stock returns in the announcement period. The market's reactions to deals announced by bidders with positive media attitude are significantly better than those to deals announced by bidders with negative media attitude. After controlling for several determinant variables, the impact of pre-merger media remains strong. However, pre-merger media coverage does not have a significant influence on bidder announcement returns.

For long-term stock performance, merging a firm's 12-month BHARs is also significantly associated with the content of financial news. In our analysis, media attitude has strong explanatory power on a firm's long-term performance. This finding implies that financial media can partially predict a firm's post-merger performance. In addition, Chapter 5 explores the potential relations between bid premiums and the pre-merger financial media. The results suggest that the premiums paid by bidding firms to target shareholders are also affected by both attitude and pre-merger media coverage. We argue that the positive media reports received before an M&A can help bidders avoid the overpaying. Thus these deals are significantly outperformed in both the short and long run.

In general, the major contributions of this thesis are as follows: First, this thesis provides a robust and comprehensive analysis of the interaction between bidder capital structure and takeover success. Our study's large M&A sample and carefully constructed methodology could effectively avoid both the selection bias and endogeneity problems.

This research helps us significantly improve our understanding of the relation between capital structure theory and M&As. Second, the analysis of firm capital structure and deal performance provides strong support for the concept of target capital structure. In line with previous literature, we find supplementary evidence from M&A deals to support the notions of trade-off theory. It also helps to increase the explanatory power of firm capital structure for bidder announcement returns. Besides other well-known factors, our research demonstrates that variable leverage deficit should also be considered an important determinant of M&A performance. Third, the study on financial media and M&As establishes a general framework to explain how media news affects merging firms' stock performance in both the short and long run. This framework is an important supplement to financial media research, which has recently been experiencing rapid growth. The financial media should be identified as a potential determinant or predictor of M&A performance.

The remainder of the thesis is organized as follows: Chapter 2 provides a general review of the M&A literature. Chapter 3 empirically examines the interaction between bidder capital structure and M&A success. Chapter 4 mainly explores the impact of firm capital structure on M&A performance, while Chapter 5 focuses on the interaction between financial media and M&A activities. Chapter 6 concludes the thesis by summarizing its main findings and discusses potential implications of this research. It also briefly proposes avenues of future investigation. Each chapter includes a literature review of the most critical pertinent papers. The figures and tables are at the end of each chapter.

Chapter 2

2. Literature Review

2.1 M&A motivations

2.1.1 Synergies

Prior research indicates that the value and performance of the new combined firm after a merger will be greater than the sum of the separate individual parts of the acquirer and target firms, a phenomenon called synergy. Therefore, synergy is considered a general motive for M&A activity.

Bradley, et al. (1983) points out that the synergy hypothesis is more consistent with previous evidence than the information hypothesis to explain gains from M&As. To further support their argument, Bradley, et al. (1988) evaluates the performances of 236 takeover deals during 1963–1984 and suggest a 7.4% increase in new combined firms' market equity value, on average. Houston, et al. (2001) analyses the synergistic gains of large bank mergers over a period of 12 years. They estimate that the average increase in the market value of combined firms is 13%. Their study further suggests that merger gains in synergy are attributed to management cost savings rather than revenue enhancement.

The more recent studies of Devos, et al. (2009) and Hoberg and Phillips (2010) both concern the economic efficiency of synergy. Devos, et al. (2009) examines three potential sources of synergies from M&A activities: productive efficiency, tax payment reduction, and market power increase. Relying on Value Line forecasts, they find an average value enhancement in combined equity value of 10.03%. Further analysis shows that operating synergies account for the main portion of the additional value, 8.38%, while financial

synergies comprise the remainder. As Houston, et al. (2001), the authors also conclude that operating synergies are primarily generated by investment expenditures. This finding suggests that M&A activities create value by advancing resource allocation rather than tax savings or improving market power. Hoberg and Phillips (2010) provide further evidence of product market synergies, using a new text-based method. This method is based on a textual analysis of the content of a firm's 10-K report, mainly the product descriptions, and interestingly reveals levels of product similarity and differentiation between acquiring firms and their rivals. The results show that M&A deals are more likely between firms with high product similarity. Such deals will have better long-term performance, which the authors called the asset complementarily effect. Moreover, this competitive effect shows that a high level of product differentiation between a target firm and its acquirer's rivals improves the combined firm's future performance. Finally the authors argue that these two effects help merging firms exploit product synergies.

2.1.2 Good bidders acquire bad targets

Besides synergies, differences in the performance of managers between the acquirer and target are also an important source of M&A gains. Lang, et al. (1989) examines the relation between Tobin's Q and the abnormal returns of firms involved in M&A activities. Tobin's Q ratio is a measure of managerial performance. A well-managed firm will have a high Tobin's Q ratio and will be rewarded by financial markets. If a well-managed firm takes over a poorly managed firm, it will create value through relocation and better usage of poorly managed resources. The authors generally conclude that the shareholders of both high-Tobin Q bidders and low-Tobin Q targets gain significantly more than others. Servaes (1991) re-examines the relation between a firm's Tobin's Q and takeover gains by using a longer period and larger M&A sample. The author's results are consistent with those of Lang, et al. (1989) and show that high-Q ratio bidders and low-Q ratio targets outperform other firms. The main differences between the two studies are as follows: (1) the sample of Lang, et al. (1989) consists only of deals with tender offers, whereas

Servaes (1991) examines both mergers and tender offers. (2) The multivariate analysis of Servaes (1991) includes more control variables, such as the hostility and payment of deals and the relative sizes of the bidder and target. (3) While Lang, et al. (1989) use a specific cut-off point to classify high- and low-Q ratio categories, Servaes (1991) chooses the industry average Q ratio and provides additional evidence of the validity of the relation between Q ratio and takeover gains.

Choosing a different measure of managerial performance, Martin and McConnell (1991) investigate the disciplinary role of M&A activities. They classify a takeover as disciplinary by the turnover rate of the target firm's top managers. In the first part of a series of empirical tests, they examine the market- and industry-adjusted abnormal returns of target firms in samples of disciplinary and non-disciplinary takeovers. Consistent with previous studies, the cumulative abnormal returns (CARs) for both bidders and targets are positive and significantly greater than zero, which indicates that takeovers generate gains for shareholders. In the second part of the authors' tests, comparison studies show that both the market- and industry-adjusted returns of disciplinary takeover targets are significantly lower than those of non-disciplinary takeover targets. These results suggest that the targets of disciplinary takeovers underperformed in the pre-takeover period. In announcement period, however, the CARs of both bidders and targets are not significantly different between the disciplinary and non-disciplinary samples. Finally, Martin and McConnell (1991) conclude that takeovers play a crucial role in disciplining top firm managers for non–value-maximizing decisions.

Previous studies argue that one of the M&A motivations is to improve poorly managed firms. Agrawal and Jaffe (2003) examine this argument with empirical works on a large scale. They determine the following three major findings: (1) most previous studies focus on examining short-term stock returns around takeover announcements and pay much less attention to long-term stock performance for. (2) The development of current popular methodologies for evaluating long-term stock performance appears later than previous

studies. Thus Agrawal and Jaffe (2003) believe that earlier empirical evidence of long-term stock returns is suspect. (3) The measures of firm operating performance are questionable, leading to ambiguous empirical evidence. Therefore, it is necessary to conduct a comprehensive investigation of firm-inefficient management. To reclaim previous studies, Agrawal and Jaffe (2003) examine a large sample of target firm stocks and operating performances prior to takeover announcements during 1926–1996. They control for industry, firm size, and previous performance when measuring operating performance. The authors use a calendar time portfolio approach to measure long-term stock returns after controlling for firm size, the book-to-market ratio, and previous stock returns. Surprisingly, the results indicate no significant difference between target firms and others in terms of either operating or stock return performance. Thus the empirical evidence does not support the disciplinary effect of takeovers on poorly managed firms.

2.1.3 Agency costs

As stated in the literature, M&As can create additional value for both acquirer and target shareholders. However, value-destroying M&A deals abound. It is hard to find potential motivations for these bad deals. Since the agency costs problem was noted by Jensen and Meckling (1976), corporate finance papers have often used it to study the relation between corporate management and shareholders. In M&A research, there are two major views of how agency problems lead to systematic overpayments. One view is that firm managers tend to pursue personal objectives rather than maximizing shareholder values. Another view is that the hubris of managers of bidders will cause them to overpay for their targets. Such managers falsely believe that target firms are poorly managed and overestimate their own ability to improve them.

Morck, et al. (1990) firstly relates agency problems with the rationale of value-destroying acquisitions. They argue that though M&As may fulfil both personal objectives and shareholder interests, personal benefits are still the managers' primary consideration. A

takeover deal that provides substantial managerial benefits can bias the valuation of target firms. Bidder's managers present incentive to engage in M&A activities which may sacrifice shareholder's interests. After an examination of 326 US takeover deals between 1975 and 1987, Morck, et al. (1990) identify three kinds of value-destroying deals caused by agency problems. The first such deal is the diversification takeover. To ensure the safety of their jobs and reduce the risk of bankruptcy, managers have a strong incentive to enter new industries to increase diversification. The second is the deal with a high-growth target. In this case the growth of sales is an important factor in the structure of management compensation. Thus firms in a mature industry are willing to acquire growing firms to increase personal incomes. Such acquisitions will also provide more top positions, reducing the risk of competition from young managers. The last deal type involves bidders with poor past performance. Bad managers have a higher probability of involvement in value-destroying takeovers. For the survival of the firm and their jobs, poor managers show a high inclination toward M&A activities. Morck, et al. (1990) finds empirical evidence that these three types of takeover deals present the highest possibility of making a bad acquisition. Similar to Lang, et al. (1989), they use Tobin's Q to evaluate a firm's quality of management. They prove that deals made by low-Tobin Q bidders have significantly lower stock returns. In contrast, deals with low-Tobin Q targets have higher announcement returns.

Conflicts of interest exist not only in bidding firms, but also between target shareholders and managers. Hartzell, et al. (2004) provides evidence that target chief executive officers (CEOs) pursue personal benefits through M&As. Since only 3% of M&A deals are unsolicited, target CEOs are expected to have sufficient bargaining power to require personal benefits in M&A negotiations. These benefits are considered compensation for their job positions, salaries, and so on. However, shareholder interests may be compromised. To address these issues, Hartzell, et al. (2004) investigate the relation between M&A features and personal benefits received by target CEOs, asking two major research questions: (1) What degree of compensation can induce target managers to

relinquish their control power? (2) How much shareholder interest can target manager sacrifice in return for personal benefits? Both golden parachutes and special cash bonuses proxy for compensations paid to target managers. The regression results show that the probability of target managers remaining in new combined firms is inversely correlated to the amount of their negotiated payments, accepting an average of $5 million in excess payments to abandon their positions. If target CEOs enjoy excess incomes prior to acquisitions, they will certainly negotiate for higher payments. Similarly, the regression results suggest that target managers accept lower bid premiums in pursuit of their own extraordinary interests. Target CEOs tend to seek managerial positions and directorships on the boards of the acquiring firms or simply additional cash payments.

Following previous studies, Mitchell and Lehn (1990) predict that firms with substantial free cash flow are more likely to be involved in value-destroying deals and these bad bidders are easy targets for future takeovers. Thus, the conflicts of interest between shareholders and managers relate not only to poor operating performance, but also to value-reducing acquisitions. Consistent with predictions, the authors' empirical results suggest that firms previously involved in value-reducing acquisitions are more likely to become targets of takeovers, especially hostile ones. Conversely, a good bidder is less likely to receive a takeover offers in the following years. These findings are consistent with Jensen's (1986) argument that M&A activities can discipline firm managers who participate in value-destroying takeovers and damage shareholder interests.

Unlike previous studies, which focus on examining free cash flows, Harford (1999) sheds light on the conflicts of interest in cash-rich firms. The author confirms that cash-rich firms are likely to make value-destroying acquisitions. Using actual cash reserves to classify bidding firms into different groups, Harford (1999) briefly introduces how cash-rich firms are identified from a sample of US corporations covering a long period (1950–1994). The author develops a baseline model to predict each firm's normal cash reserve level. Firms with cash reserves greater than predicted are considered cash rich.

The rest of the paper examines how manager's decisions are affected by different cash positions. The author's major findings are consistent with the predictions of free cash flow hypothesis. Cash-rich firms are more likely to become a bidder, if one controls for other factors. Further, acquisitions made by cash-rich firms receive significantly negative market responses. This finding displays a converse correlation between announcement abnormal returns and bidders' excess cash holdings. Examinations based on deal characteristics show that cash-rich firms make more diversification acquisitions and attract fewer competing bidders. Cash-rich firms have a strong incentive to overpay to prohibit potential competing bids. Since a negative market response is predicted, the operating performance of cash-rich firms drops significantly after a takeover.

As Mitchell and Lehn (1990) prove, the corporate control market is an effective external mechanism to discipline firm managers who participated in value-reducing takeovers. Lehn and Zhao (2006) focus on the disciplinary role of corporate governance and ask several questions: (1) how often is acquirer CEOs replaced after takeovers? What are the frequencies of replacement according to internal or external mechanisms? (2) Is there an inverse relation between value created by an acquisition and the probability of CEO replacement? (3) What role do corporate governance and ownership structure play in the disciplinary process?

To answer these questions, Lehn and Zhao (2006) collect a large sample of 714 bidding firms during the entire period of the 1990s. They examine the relation between the announcement abnormal returns of takeovers and subsequent CEO replacements for each bidding firm. The results show that 57% of firm CEOs are replaced for disciplinary reasons, 31.5% by internal governance, 20% by the corporate control market, and 5.5% through bankruptcy. Logistic analysis of Lehn and Zhao (2006) reiterates that firm managers are less likely to be replaced if they cancel value-destroying takeovers. Furthermore, the empirical evidence from both the logistic and hazard models reveals significant differences in announcement returns between firms that subsequently replace

their CEOs and those that do not. The CEO-replacing acquirers' announcement returns are highly negative and significantly lower than for non–CEO-replacing acquirers. These findings suggest that firm managers who made value-reducing acquisitions should pay the price. They also indicate that both internal corporate governance and the external takeover market are effective mechanisms to solve agency problems.

2.1.4 The hubris hypothesis

Roll (1986) introduced a new motivation for M&A activities, especially value-reducing deals, arguing that, rather than being in pursuit of personal benefits, managers are sometimes overconfident and overestimate the gains from takeovers. The author calls such managers hubris managers. In the process of takeover valuation, hubris managers believe in potential synergies or gains from a takeover that do not exist. This belief boosts their valuations of the target and leads them to acquire bad targets or pay higher premiums. The hubris hypothesis is necessary to explain why firm managers engage in value-reducing acquisitions. It predicts that, around takeover announcements, the stock prices of bidders will decrease and target price should increase. His empirical evidence is consistent with above predictions.

Contrary to the hubris hypothesis, several studies conclude that M&As create additional value for shareholders in short-run abnormal returns. Rau and Vermaelen (1998) examine two important issues: whether acquirers underperform in the long run and the major determinants of this underperformance. The authors choose a reliable model, adjusting for both firm size and book-to-market variables to estimate long-term acquirer performance. They also use a bootstrapping approach (Ikenberry, et al., 1995) to test the statistical significance of the results. As Kothari and Warner (1997) show, the bootstrapping procedure can effectively adjust for systematic biases in assessing statistical significance. Their sample includes 3169 mergers and 348 tender offers during 1980–1991. Controlling for firm size and the book-to-market ratio, the authors determine that the long-term

performance of acquirers in mergers is significantly worse than the benchmarks. On the other hand, acquirers in tender offers gain an average of 9% in positive abnormal returns.

To explain these findings, Rau and Vermaelen (1998) propose a performance extrapolation hypothesis. This hypothesis suggests that both the financial market and managers over extrapolate past acquirer performance, especially for firms with low book-to-market ratios (glamour bidders). Consistent with the hubris hypothesis, decision makers are more likely to be overconfident about their abilities to pursue M&As. Thus firms with overconfident managers have a higher possibility of making value-destroying acquisitions. The performance extrapolation hypothesis also explains the difference between acquirers' short- and long-run returns. It assumes that the financial market reassesses acquirer performance gradually. Hence, the financial market responds better to deals announced by glamour bidders in the short run. As the quality of takeovers is realized, acquirer long-term performance is reversed.

The empirical evidence in this paper is more consistent with the performance extrapolation hypothesis than with the means of payment hypothesis or the earnings per share myopia hypothesis. The long-run performance of glamour bidders is highly negative and statistically significant. Conversely, value bidders present positive and significant abnormal returns. The comparison tests show that the differences between the two groups of bidders are remarkable and robust. Moreover, the results also partially support the mean of payment hypothesis. The negative performance of acquirers in mergers can be attributed to the frequent usage of stock payments. Due to cash payments, acquirers in tender offers present much better performance.

Malmendier and Tate (2005) also use managerial overconfidence to explain corporate investment distortions. The traditional literature proposes two hypotheses – the agency problem hypothesis and the asymmetric information hypothesis – to explain the issue of investment distortions. Malmendier and Tate (2005) indicate an alternative hypothesis to

investigate the relation between a manager's personal characteristics and suboptimal investment decisions. The authors argue that overconfident managers overestimate their firms' future returns and ongoing investments. If firms have substantial free cash flow, overconfident managers tend to use internal funds for investment financing. On the other hand, when facing internal financial constraints, they prefer to curb investments rather than choose external financing.

To find empirical evidence supporting their hypothesis, Malmendier and Tate (2005) construct overconfidence measures relating to the options hold by CEOs. They identify a benchmark for the exercise of managerial options. If CEOs keep holding options and exercise them later than the benchmark, these CEOs are identified as overconfident. Another measure for overconfidence is CEO stock holdings. The authors obtain a sample of 477 US firms during 1980–1994. The results show that firms with overconfident managers have significantly higher investment-free cash flow sensitivity ratios. As the new hypothesis predicts, overconfident managers will adopt distorted investment behaviours when they have sufficient internal funds.

In addition to overconfidence, this study examines other personal characteristics. CEO education and employment background are important factors in decision making. Comparison tests show that managers with an engineering background have higher investment-free cash flow sensitivity than financial managers. Moreover, managers born in the 1930s or who have multiple job positions display greater sensitivity than others. These findings all support the argument that research on managers' personal characteristics can provide better insight into decision making processes. Another crucial issue is the endogeneity problem. Personal characteristics can also be selection criteria for managers. To partially alleviate endogeneity concerns, we add more control variables to our tests. The additional tests show that the major conclusions are not affected by endogeneity.

2.1.5 Managerial timing

As the hubris hypothesis indicates, the financial markets are assumed to be completely efficient but with irrational firm managers. It is hard, however, to explain certain historical evidence. To address this issue, Shleifer and Vishny (2003) developed a new theory of market-driven acquisitions. The theory's basic assumption is that the financial markets are not efficient. Thus there is firm mispricing. However, firm managers are assumed to be completely rational: They know the true value of their firms and perceive the inefficiencies of financial markets. Furthermore, managers have the incentive and ability to take advantage of misvaluations through M&A activities. This new theory contributes to a better interpretation of several M&A issues, such as the choice of target, the medium of payment, target valuation, and merger waves. The theory's key measure is relative valuations between acquirers and targets. The theory generates several predictions: (1) Bidding firms tend to use stock payments when market valuations are high and cash payments when they are low. When valuations across firms are widely dispersed, the financial market uses more stock payments. (2) Bidders using stock payments in acquisitions display significant signs of overvaluation. Thus they have negative long-term performance. Generally, market-driven acquisition theory argues that overvalued firms have a strong incentive to take over undervalued or relatively less overvalued firms by using stocks.

Following this theoretical work, Dong et al. (2006) empirically examine the relation between the market valuation of firms and takeover motivations. Two alternative hypotheses are indicated to explain the empirical findings: the misvaluation hypothesis and Tobin's Q hypothesis. As argued by Shleifer and Vishny (2003), misvaluation by inefficient financial markets is the major motivation for M&A activities. Firm managers have a strong incentive to take over undervalued or less overvalued targets by using overvalued stocks. Therefore financial markets should negatively react to such takeover announcements. On the other hand, Tobin's Q hypothesis suggests that high market

valuation is an indicator of great growth opportunities. Thus takeovers are an approach to improving economic efficiency, with good bidders buying bad targets, and financial markets will respond more favourably. Dong et al. use market-to-fundamental ratios to proxy for stock misvaluations and growth opportunities, specifically, the ratios of the market price to the book value of equity (P/B) and of the market price to the residual income value (P/V), respectively. Deal characteristics, such as the medium of payment, bid premiums, probability of success, and announcement returns, are supposedly affected by market valuation measures.

To provide comprehensive coverage, Dong et al. (2006) collects a large sample of deals covering the period 1978–2000. Their univariate tests divide the entire sample into quintiles ranked separately by bidder and target valuation measures. It is easy to observe trends in deal characteristics among the different quintiles. The multivariate analyses use both logistic and ordinary least squares regressions to investigate the interaction between takeovers and market valuations. Due to the long sample period, we research the two subperiods 1978–1989 and 1990–2000 separately. Consistent with predictions, the bidding firms have significantly higher P/B and P/V ratios than the targets. High-valuation targets are more likely to receive stock offers than cash offers. High-valuation bidders are more likely to use stock payments than cash payments. They also tend to pay higher bid premiums and to have significantly lower announcement returns. Overall, both the misvaluation and Q hypotheses are supported by empirical evidence. The evidence from the subperiod 1978–1989 is more consistent with the Q hypothesis and the evidence from the 1990s is stronger for the misvaluation hypothesis.

Massa and Zhang (2009) investigate the impact of style investing on M&As. Rather than using market valuation to classify different groups of bidders and targets, the authors use firm popularity as the benchmark. Their main argument is that highly popular firms are more likely to be targets and buying a more popular target can increase bidder value. The measure of popularity is innovative and not directly related to firm stock price. Massa and

Zhang (2009) use mutual fund stock holding data as the measure of popularity for each firm. They show that the differences in popularity between targets and bidders are unrelated to takeover synergies. Bidding firm managers are more likely to choose highly popular targets. A potential reason is that investor demands and market reactions to M&A announcements are both better for the acquisition of highly popular firms. If the difference in popularity rises by one standard deviation, bidder market value increases by about 10%. Furthermore, the empirical results show that the boost in bidder asset value is focused on the short and medium term rather than the long term. The main contribution of Massa and Zhang (2009)'s paper is that it sheds new light on the motivation of M&A activities. It indicates that bidders' managers increase firm asset value by buying more popular targets. These transactions can improve the bidding firm's popularity and investor demand for their stocks, called the halo effect by the authors. Importantly, the halo effect is unrelated to either synergy or misvaluation.

2.2 The M&A process

2.2.1 Target choice

This section reviews the literature relating to the M&A process. Choosing a target is the starting point. The choice of target firms will affect many aspects of the takeover, including the form of acquisition, the medium of payment, market reactions, and the probability of deal success. Previous studies are generally separated into two groups. One group attempts to use a statistical model to predict takeover targets. These predictive models are generally constructed from firm financial information. As Dietrich and Sorensen (1984) report, predictions made by statistical models are extraordinary accurate, ranging from 60% to 90%. On other hand, the other research group investigates whether financial markets can predict takeover targets. Asquith (1983) and Jensen and Ruback (1983) indicate that it is very difficult to predict future takeover targets by using firms' pre-announcement stock price movements. According to the above, inconsistent

arguments, Palepu (1986) re-examines the predictive power of previous models and indicates that their accuracy may be unreliable, since the methodology used has principal flaws. The non-random and equal-share samples used by previous studies would particularly bias the estimations for takeover probabilities. Palepu (1986) carefully constructs the statistical model and selection criteria for his sample to avoid these problems. The empirical results show significant differences from earlier studies. Although the variables in the predictive model are statistically significant, the model's explanatory power is too low. The validating tests show that, while the model successfully distinguishes most future targets, a large number of non-target firms are falsely identified as takeover targets. Thus the prediction of all the models is questionable and impossible to implement in realistic applications. Palepu (1986) further notes that the methodological problems mentioned in the study are also relevant to any other research that involves binary condition models.

Extending Palepu's work, Ambrose and Megginson (1992) investigate the issue of target prediction by incorporating ownership structure and capital structure variables. They believe that a firm's ownership structure, especially involving insider and institutional shareholdings, affects a firm's probability of becoming a takeover target. As Stulz, et al. (1990) show, a target firm's insider ownership level is significantly lower than that of non-target firms. Similarly, the authors discuss the effects of institutional shareholdings. In addition to ownership variables, they investigate the impact of capital structure on predicting future targets, including the market-to-book ratio, growth opportunities, and asset tangibility variables. They also examine whether takeover defences can protect firms from becoming takeover targets.

The sample used in Ambrose and Megginson's paper contains 475 random selected listed firms, which is more general than the sample used by Palepu (1986). In univariate tests, three variables differ significantly between targets and non-targets: firm size, asset tangibility, and changes in institutional shareholdings. Multivariate examinations

consistently find evidence that firm asset tangibility affects the probability of becoming a takeover target. Firms with higher fractions of fixed assets are more likely to receive a takeover bid. The correlation between takeover probability and net percentage changes in institutional ownerships is significantly negative. Moreover, tests of takeover defence policy show that only blank check preferred stock authorizations can effectively prevent a takeover. Contrarily, even a voting rights defence is positively related to receiving takeover bids and a poison pill defence has no impact on deterring takeover bids.

2.2.2 Deal payments

Financing decisions for deal payments is a very popular M&A research area. The previous literature does not strictly distinguish between the medium of payment and sources of takeover financing. Recent papers focus on examining bidder financing decisions and one of the most representative works is that of Martynova and Renneboog (2009). Theirs is the first study to empirically examine sources of financing along with payment media. The most limiting part of this study is the lack of reliable data for bidder financing decisions. Martynova and Renneboog (2009) use a unique hand-collected data set of European M&As from 1993 to 2001. Their findings indicate that bidder choice between cash, debt, and equity financing generally follows pecking order theory. After controlling for the payment method, the bidder's financing decision is mainly influenced by concerns about the cost of capital. Cash-rich bidders tend to use internal funds, the cheapest source of financing. Bidders with insufficient internal funds must finance takeovers by issuing equity or debt. Debt financing is more favourable for bidders with a high debt capacity and outstanding creditor protection. Similarly, firms with strong growth opportunity and shareholder protection are more likely to choose equity financing. There is evidence that the medium of payment affects bidder financing decisions. In contrast, there is no evidence that conflicts of interest between managers, shareholders, and creditors have any impact on bidder financing decisions. Furthermore, Martynova and Renneboog (2009) show that a deal's payment method depends on the attitudes of the

bidder's shareholders, especially large shareholders. Comparison analysis shows that the main determinants of financing choice and medium of payment are significantly different, which is the primary motivation for this research.

Moreover, market reaction analysis by Martynova and Renneboog (2009) shows that not only the deal's payment method, but also the choice of the bidder's financing sources affects investor responses to takeover announcements. As for pure stock payments, bidding firms choosing external equity financing receive non-favourable responses from the financial market. Their abnormal stock returns around takeover announcements are significantly negative because the financial market believes this to be a signal of bidder stock overvaluation. On the other hand, market responses to debt-financing takeovers are highly positive, even outperforming internal financing bidders. Financial markets consider debt financing a favourable choice with various benefits for bidding firms.

Similarly, Harford, et al. (2009) examines bidder financing decisions from the view of capital structure. They study whether bidding firms have target capital structures and how financial deviations affect acquisition financing choices, where a financial deviation is the difference between the actual and target leverage ratios. Previous literature presents conflicting findings about the existence of target capital structure. Thus Harford, et al. (2009) use new evidence from M&As to further support the concept of target leverage. To construct the sample, they collect 1188 large US takeover deals from 1981 to 2000. A large deal is defined as a deal in which the relative size of the target to the bidder's market value is more than 20%. The empirical evidence generally indicates that bidding firms do have their target capital structure. Bidding firm managers are concerned about target capital structures when they make financing decisions for takeovers. The results show that a bidding firm's financial deviation is negatively correlated to the percentage of cash payment in M&As. Overleveraged bidders are less likely to finance a takeover by issuing new debt and more likely to choose equity financing.

Harford, et al. (2009) further shows that bidder's financing decisions also consider the target capital structure of new combined firms. If the target leverage ratio of the merging firm increases, bidders are more likely to use debt financing. To further support target capital structure theory, Harford, et al. (2009) also investigates how combining firms adjust their leverage ratio following takeovers. In debt-financing deals, most combining firms become overleveraged, but in next five years they stably reduce their debt ratio towards target levels. In sum, the authors' findings suggest that acquirers have a target leverage ratio and M&As are a way to move a firm's actual leverage forwards to target levels. Based on this argument, the empirical evidence further suggests that a bidder's financial deviation before acquisition is a major determinant in the choice of payment and financing methods.

2.2.3 Advisor selection

Financial advisors play an important role in M&As. Both bidder and target hire investment banks to be their takeover advisors. M&A advising is one of the most important businesses for investment banks. Rau (2000) examines which factors affect investment bank market shares in M&As and proposes two opposite hypotheses: The superior deal hypothesis predicts that the acquirer's performance in M&As is the main determinant of the advisor's market share. Thus deals advised by top-rated investment banks will receive much more favourable market reactions. On the contrary, the deal completion hypothesis argues that financial advisors only care about whether deals are successfully completed. There is no significant relation between the acquirer's performance and the advisor's market share.

Rau (2000) ranks all investment banks into three groups, depending on their average market shares from 1980 to 1994. The univariate results show that an investment bank's market shares have a significant impact on its advisory fee structure. The contingent fee of top-rated advisors constitutes a much higher fraction of their total fees, from 55% to

73%. Rau uses multivariate tests to examine the main determinants of market share. The results indicate that the percentage of completed deals advised by investment banks in previous years is positively related to their market shares in following years. Comparison analysis further shows that top-ranked investment banks complete a significantly higher fraction of deals than the other two ranks of banks. This finding strongly supports the deal completion hypothesis. However, there is no consistent relation between the acquirer's post-merger performance and the advisor's market share. In mergers, bidders advised by top-rated banks significantly underperform other bidders. In tender offers, such bidders gain higher announcement abnormal returns. The empirical evidence is inconsistent with the superior deal hypothesis. To explain the findings, Rau (2000) further studies the role of bid premiums. Consistent with the author's prediction, the premiums paid by acquirers advised by top-rated investment banks are significantly higher than for acquirers advised by low-ranking advisors. This result implies that top-rated advisors may encourage bidders to make higher bids to improve the probability of deal completion. The higher the premium bidders pay, the worse market reactions they receive. To summarize, Rau's paper provides a comprehensive examination of the financial advisor's role in M&As.

Motivated by conflicting findings on financial advisors, Golubov, et al. (2012) provide new evidence on the role of financial advisors in M&As. Using a comprehensive sample of US takeovers during the period 1996–2009, they examine the correlation between investment bank reputation and the cost and quality of advisory services. The authors argue that top-tier investment banks have great incentive to be in line with their clients' best interests to keep their reputational capital. Financial advisors play a more important role in public acquisitions than in other types of deals.

The empirical evidence of Golubov, et al. (2012) shows that deals advising by top-tier investment banks are related to significantly higher announcement returns, especially in public acquisitions. Acquirers obtain an average increase of 1.01% in announcement abnormal returns. Assorting with the better performance, top-tier investment banks also

charge more fees, on average. However, in the takeover of unlisted targets, there is no significant relation between a financial advisor's reputation and bidder announcement abnormal returns. Golubov, et al. (2012) further investigate the main sources of top-tier investment banks' advantages. They show that top-tier banks have greater ability to identify synergistic targets. Such banks can find the most valuable and suitable targets for their clients. Importantly, top-tier advisors also help bidding firms secure synergy gains and take less time for completion. However, if a target firm's financial advisor is also a top-tier bank, such advantages will be limited. In a robustness check, they use a Heckman (1979) two-stage procedure to control for the endogeneity problem of bidder–advisor matching. All findings continue to hold.

Using fixed effects analysis, Bao and Edmans (2011) obtain a similar conclusion that investment banks care about M&A performance in the deals they advise. Unlike previous studies (Rau, 2000; Golubov, et al., 2012) using market share or reputation to measure advisory quality, the authors employ a fixed effects approach to better exhibit differential performances. Examining all investment banks during 1980–2007 and controlling for time effects, the authors find empirical evidence to support the fixed effects to three-day CARs around deal announcements. The difference between the 25th and 75th percentiles is 1.26% and statistically significant. Their study shares two major challenges: The first is the attribution of performance, whether the CAR is the responsibility of the advisor or the bidder. Thus both the component of abnormal returns that could be explained by acquirer characteristics and their fixed effects should be controlled for. After these effects are controlled for, the interquartile difference is still statistically significant. The second challenge concerns the effect of the investment bank's size. The limited capacity hypothesis suggests that large investment banks will also consider accepting small but positive deals, which can lower average performance. However, the authors' results reject this hypothesis that advisors' performances are most frequently in the middle of the distribution rather than towards the bottom. The authors investigate whether the time effects of different performances can be predicted based on historic performance. Their

empirical results show that investment bank performance is persistent. This implies that the previous performance of advisors is an effective instrument in predicting future returns for bidding firms. This approach should be better than using market shares or reputation measures.

Besides advisory services, investment banks have many other divisions. Haushalter and Lowry (2011) investigate the activities of investment bank analysts and asset management divisions when the bank is employed as a bidder's financial advisor in a deal. The authors focus on the interactions between analyst recommendations and the stockholdings of the asset management division around merger announcements. Owing to conflicts of interest between different divisions, divisional activities may not be synchronous. The results from 1197 mergers show no significant relation between changes in analyst recommendations and changes in stockholdings prior to takeover announcements. However, following takeover announcements, changes in the advising bank's stockholdings correspond highly with analyst recommendations. Additional tests on division information flow indicate that the stronger relation between analyst recommendations and stockholdings is primarily induced by the improvement of information flow between the different divisions. The recommendations made by an advising bank's high-quality analysts will have a more significant impact on stockholding adjustments. Such analysts are expected to give more reliable information about the mergers. Haushalter and Lowry (2011)'s detailed study of the recommendations shows that the asset management divisions of advising banks do not respond to analysts' upgrade recommendations. In contrast, investment banks have strong responses when their analysts downgrade acquirer ratings. These findings support the hypothesis that information is shared across different divisions of advising banks. The extent of information dissemination is affected by conflicts of interest among divisions.

2.2.4 Takeover defence

Takeover defence, that is, an effective approach for firms to deter potential takeover bids, is an important component of M&As. Since 1980, there have been great developments in corporate anti-takeover approaches. The appearance of poison pills induced a dramatically fall in takeover activities since the late 1980s. Comment and Schwert (1995) examine whether anti-takeover methods can effectively prevent firms from being acquired. They find no evidence that either control share law or business combination law can deter takeover bids. The empirical evidence of a poison pill's deterrence effect is also weak. It is more likely that managers adopt poison pills when takeover bids are imminent. The examinations of stock returns also find poison pill adoption to have an insignificant deterrence effect. Market reactions to poison pill announcements are significant and negative. However, there is a positive relation between takeover premiums and the strength of protection of state laws or poison pills. This finding suggests that the adoption of anti-takeover methods improves the relative bargaining power of target firms. Thus Comment and Schwert (1995) argue that financial markets can misestimate the eventual effect of takeover protection; the costs of deterrence are overestimated and the benefits are underestimated. Moreover, it is generally believed that the widespread adoption of modern anti-takeover methods is the major explanation for the collapse of the corporate control market at the end of the 1980s. Comment and Schwert (1995) determine that 87% of public firms are covered by at least one form of takeover protection since 1980, partially supporting this explanation, but they find no direct evidence to support the deterrence effect of anti-takeover methods. Thus they conclude that the downturns of M&A activities are mainly caused by the recession of the macro economy and credit markets rather than the introduction of takeover protection.

Similarly, Heron and Lie (2006) examine the determinants and effects of two major takeover protections: poison pills and defensive payouts. To mitigate the endogeneity problem pointed out by Comment and Schwert (1995), the authors carefully construct a

sample of 526 unsolicited takeover bids, including both successful and failed bids. Their analysis considers all factors that could affect the takeover defence decision: for instance, capital structure, ownership structure, corporate governance, and deal characteristics. The authors investigate the determinants and effects of the choice to adopt a defensive approach in response to takeover bids. The empirical evidence shows that the probability of poison pill adoption is inversely related to the degree of insider ownership. This finding suggests that managers tend to increase their bargaining power through an anti-takeover mechanism in the sense that their ownerships are too low. As for Comment and Schwert (1995), Heron and Lie (2006) shows that the adoption of a poison pill does not reduce the probability of receiving takeover bids but it benefits target shareholders. That is because poison pills promote higher bid premiums and shareholder gains. Target managers can obtain greater bargaining power to protect shareholder interest. On the other hand, they also find that firms are more likely to undertake a defensive repurchase when they have a high level of insider ownership. The mechanism of defensive repurchases is found to effectively deter takeover success, yet defensive payouts do not harm target shareholder gains.

However, Jiraporn (2005) explores the relation between corporate takeover protection and earnings management. The author's investigation of whether takeover defences mitigate or exacerbate earnings management could contribute to ascertaining the correlation between takeover defences and the shareholder wealth effect. The presence of a takeover defence promoting firms to manage earnings is detrimental to shareholder interest. Jiraporn (2005) examines four specific anti-takeover approaches: blank check preferred stock, poison pills, classified boards, and dual class stock. The empirical evidence suggests that relations between takeover protection and earnings management vary by type. The presence of poison pills and classified boards can effectively mitigate earnings management, which is favourable for shareholder wealth. In contrast, firms with dual class stock present more earnings management. The impact of blank check preferred stock on earnings management is insignificant. For firms with multiple takeover defences,

the collective influence of earnings management is insignificant. The potential reason is that different types of takeover protection affect earnings management differently, cancelling each other out.

2.3 M&A stakeholders

2.3.1 Managers

Previous research shows a significant misalignment between manager compensation and takeover performance. CEOs who engage in takeovers receive higher compensations than others. However, their shareholders do not gain from these deals. To gain further insight into this issue, Grinstein and Hribar (2004) investigate the determinants of compensation relating to M&As. Their sample is composed of 327 large US deals during 1993–1999. The authors find that 39% of bidding firms reward their CEOs when the deal is successfully completed. Variations in the M&A bonus can be partially explained by managerial skill and effort in deal completion. The M&A bonus is positively related to deal size, duration until completion, and the number of board meetings during the M&A. Similarly, managerial power is also considered to contribute to a better understanding of the M&A bonus. CEOs with greater control power receive significantly more bonuses in takeovers. In contrast, the authors argue that the measures of takeover performance do not explain the deviations in M&A bonus. The empirical results even suggest that performance measures, such as announcement abnormal returns or bid premiums, are negatively related to the bonuses CEOs receive. Moreover, to support these findings, Grinstein and Hribar (2004) study compensation committee reports in detail, but these reports do not interpret the particular reason for rewarding bonuses. Only 125 acquirers mention the completion of takeover and 64 of them provide more detailed information. More than half of these acquirers indicate that the increase in firm size is the reason for the M&A bonus. The second most frequent explanation for the bonus is CEO effort and

skills. Therefore, the findings from compensation committee reports further support the authors' arguments.

While Grinstein and Hribar (2004) examine the relation between CEO compensation structure and M&As, Harford and Li (2007) explore how compensation policy affects managerial M&A incentives. It is generally believed that managers with higher ownership or more equity-based bonuses are less likely to make value-destroying acquisitions. However, this study shows that this incentive effect can be weakened by the presence of a dynamic compensation structure. The authors focus on examining whether a manager's compensation policy becomes more or less sensitive to firm performance after an M&A. Harford and Li (2007) find that managers of bidding firms receive substantial bonuses with stocks and options, the reward for deal completion and growth in firm size or sales. Furthermore, manager compensation structure becomes completely insensitive to poor stock performance following mergers. But a manager's personal wealth is still related to good stock performance. These findings question that whether the effectiveness of equity-based incentives is still sufficient. The empirical evidence also suggests that acquirers with strong boards could preserve the relativity of manager compensation and post-merger performance.

Compared with other large capital expenditure decisions, M&A activities have the largest impact on manager compensation structures. This finding indicates that the firm board and managers treat takeover decisions differently from other internal investment decisions. An M&A is considered a natural point of restructuring compensation policies for managers. The short-run superior performance around takeovers also strengthens bargaining powers for managers. To ensure the robustness of previous findings, Harford and Li (2007) carefully construct the control samples matched on firm size, industry, and previous performance. Their results are also robust after controlling for various deal characteristics, such as the method of payment, merger diversification, and announcement abnormal returns.

Following previous papers, Minnick, et al. (2011) investigates the relation between managerial incentive structure and M&As. Unlike Harford and Li (2007), the authors limit themselves to the banking industry owing to both the importance and advantage of compensation research in the banking industry. It is now easier to find cross-sectional relations in the banking industry since it went through rapid consolidation in the 1990s. The banking industry business is homogeneous, which can avoid some of the challenges in multi-industry research. Since banks are crucial to economic development and growth, a corporate governance study is also very important. The authors' sample contains 159 M&As between public banks during 1991–2005. To proxy for managerial incentives, the authors calculate the CEOs' pay-for-performance sensitivity (PPS) ratios. The univariate tests show a positive correlation between the bidding bank's announcement returns and its CEO's PPS ratio. Banks with higher PPS outperform their counterparts by 1.43% in three-day cumulative announcement returns. Furthermore, logistic analysis shows that bank CEOs with higher PPS ratios are less likely to make value-destroying acquisitions and more likely to engage in value-enhancing acquisitions. This finding indicates that incentive-based compensation structure effectively aligns the interests of CEOs with those of shareholders. Taking into account the size effect, this approach shows that the motivating effect of PPS is much stronger for CEOs of small banks than for those of large banks. Since the compensation policies of large banks relate more to size growth, the effect of takeover performance is insignificant.

Fich, et al. (2011) also pay attention to target CEO's incentives. The historical evidence suggests that a large fraction of target CEOs receive unscheduled stock options during private deal negotiations. To investigate the questions related to the objectives and effects of unscheduled options, Fich, et al. use a sample of 920 deals from 1999 to 2007. They find an inverse relation between unscheduled rewards and golden parachute payments. This finding supports the hypothesis that unscheduled stock options are a substitute for golden parachutes. It also suggests that unscheduled options are considered compensation

for the target CEO's future loss. Logistic analysis shows that unscheduled stock options induce target CEOs to accept takeover bids, since target CEOs receiving unscheduled grants are more likely to sell their firms. Moreover, the bid premiums paid to target shareholders are 4.4% lower, on average, if their CEOs receive unscheduled options during the merger negotiation. These findings indicate that unscheduled stock options benefit only CEOs but harm target shareholder interests. Interestingly, bidder returns are positively related to whether target CEOs receive unscheduled stock options. This implies that unscheduled grants received by target CEOs will lead to wealth transfer from target shareholders to bidding firm shareholders.

On the other hand, researchers also assume that experienced managers are able to learn from the market reactions to M&A announcements and make further decisions on merger outcomes according to the market's initial reactions. Good responses from the financial market give bidder managers incentive to go through a deal. On the contrary, bidder managers can cancel takeover deals if the market has bad reactions. Jennings and Mazzeo (1991) examine the relation between bidder stock performances around M&A announcements and the final outcome of deals but find no significant empirical evidence to support the argument that bidder managers learn from financial markets during the M&A process. Luo (2005) re-examines this issue by using a larger sample and tighter testing specifications. The author finds empirical evidence to suggest that the initial reactions of the financial market to M&A announcements can predict a deal's final outcome. When managers of bidding firms make further decisions on M&A activities, they take into account the information learned from previous market reactions.

The basic incentive of learning is based on cost–benefit analysis. Bidding firms decide to learn only if the expected gains exceed the costs. They are more likely to decide to learn from the financial market when more information is expected from the market or it is easy to cancel announced takeover bids. The relative informational advantage of the market over the bidder increases the probability of learning by managers. Researchers

believe that market reactions are helpful since investors have more access to important information about target valuations. Unlike Jennings and Mazzeo (1991), Luo (2005) develops a new approach for the investigation. To obtain robust empirical evidence, the authors further control for two important effects that can influence the relation between market responses to M&A announcements and the final deal status. First, when the acquisition is announced, market responses will be affected by investor expectations of the completion probability. Second, cross-sectional differences in deal quality must be considered. A value-enhancing deal is more likely to receive greater market response and to be consummated by the bidding firm. Thus there appears to be a natural link between market announcement returns and completion probability of deals rather than a learning process. After controlling for these two effects, the results are still consistent with the learning argument.

2.3.2 Creditors

The M&A research literature focuses on examining the wealth effects of acquirer and target shareholders, with limited evidence on bondholders. To fill this gap, Billett, et al. (2004) investigates the effects of M&As on the value of relative bonds. First, they explore the potential reasons that research fails to find significant evidence of the bondholder's wealth effect. The main reason is the difficulty of obtaining bond price data. The quality of the bond data is also very poor. Therefore previous papers' samples are too small to have sufficient statistical power. To solve this problem, Billett, et (2004) al. constructs a large sample for the period 1979–1997 that includes 940 M&A deals and 3901 bonds. The empirical evidence suggests that target bondholders gain significantly positive abnormal returns around takeover announcements. The risk of target bonds also has a large impact on announcement returns. Target bonds above investment grade present with -0.8% announcement returns, while bonds below investment grade achieve 4.3% abnormal returns. However, the announcement abnormal returns for acquirer bonds are only -0.17%.

To further investigate the determinants of bond performance, the entire sample is divided into several groups. The results show that target bonds present significantly positive abnormal returns if target's credit ratings are lower than acquirer's. In contrast, target bondholders earn significantly negative returns if target's credit ratings are over the acquirer's. Similarly, target bonds will achieve better performance if the leverage ratio of new merged firms is lower than that of target firms. Moreover, consistent with maturity predictions, the empirical results suggest that target bonds that have a shorter maturity than the acquirer's bonds significantly outperform those with longer maturities. Relative size also has an impact on bond returns. When the target is relatively smaller than the acquirer, target bondholders achieve much higher abnormal returns. The performance of acquirer bonds is remarkably differed from that of target bonds. There are no significant differences between the abnormal returns of the subsamples determined by credit rating, relative maturity, or relative leverage ratio. However, acquirer bonds present significantly negative returns when the relative target size is large or the deal is a hostile takeover. The empirical evidence also indicates that the sample period has a large impact on bond performance. Around the 1980s, the average performance of acquirer and target bonds was distinctly worse than in the 1990s. The results from multivariate regression strongly support the arguments from the univariate grouping analysis. They also suggest that bondholder interests are positively correlated with shareholder interests.

Following previous studies, Mehrotra et al. (2011) analyse the role of creditors in M&As in Japan. Unlike typical M&A findings, takeovers in Japan do not create additional value for merging firms. Both bidder and target shareholders gain insignificant abnormal returns around the announcement period. To explore potential explanations, Mehrotra et al. (2011) thoroughly investigate the effects of creditors, especially the main bank, on the takeover process with a sample of 91 public firm mergers during 1982–2003. In a large fraction of these Japanese mergers, the bidder and target firms have a common main bank. The target firms are more likely to be in financial distress, while the bidding firms'

financial status is relatively healthy. Consistent with the 'bank power hypothesis', this finding implies that these common main banks are primarily motivated to protect their interests as creditors. Thus these rescue mergers do not create value for either bidder or target shareholders. Since the sample covers a long period, it is divided into three subperiods according to macroeconomic conditions. The subperiod analysis shows that, unlike the procyclical US merger waves, mergers in Japan are more likely to be countercyclical. The merger wave in Japan is inversely related to the general economy and stock market valuations, a phenomenon induced by the dominant role of creditors in the Japanese corporate control market.

2.3.3 Suppliers

Previous research shows that horizontal M&As can create additional wealth. Improvement in productive efficiency is considered the primary source of these gains. Anticompetitive collusion and increased buying power are also potential explanations. Fee and Thomas (2004) investigate the major sources of gains in horizontal takeovers. Their sample includes bidders and targets in horizontal mergers, as well as their important suppliers, customers, and rivals. It is the first study to explore a horizontal merger's impact on related customers and suppliers. The empirical evidence suggests that rival firms present positive abnormal returns when a takeover is announced. It also shows that both market responses to takeover announcements and post-merger performance are insignificant for customer firms. These two findings indicate that anticompetitive collusion is not the major source of gains in horizontal mergers.

In contrast, suppliers' cash flow margins decrease significantly after merger completion, which indicates that increased buying power induced by horizontal mergers is a crucial source of gains. To explore the underlying rationale of the increasing buying power, Fee and Thomas (2004) analyse suppliers differentiated by type. Interestingly, they find that the effects of a horizontal merger on a supplier depend on the supplier's ability to

maintain a relationship with the new merged firm. If relations are terminated after a merger, the supplier will experience significant and negative announcement returns. Suppliers who retain their positions present ascending market shares and insignificant announcement returns. This finding implies that merging firms may filter their existing suppliers through price competitions. Thus both merging firms and retained suppliers could gain from horizontal mergers. The results of multivariate regressions further support this argument. They also show that the buying power effects are more significant when the horizontal mergers occur in relatively concentrated industries.

Following Fee and Thomas (2004), Shahrur (2005) further tests the efficiency, collusion, and buying power theories using a large sample of 463 horizontal mergers during 1987–1999. The author focuses on examining the wealth effects of merger announcements on suppliers, customers, and rivals. Consistent with previous findings, both bidders and targets earn positive and significant abnormal returns during the announcement period. The wealth effects for their rivals and corporate customers are also significantly positive, while suppliers suffer negative abnormal returns. To further support previous theories, the entire sample is divided into two subsamples according to the combined wealth effect on the bidder and target. The results from the positive subsample show that rivals, suppliers, and customers all earn positive abnormal returns. This evidence strongly supports the efficiency theory but is inconsistent with the collusion and buying power theories. On the other hand, the analysis based on the negative subsample shows that rivals, suppliers, and customers all present negative wealth effects. This finding implies that value-destroying mergers also have negative impacts on suppliers and customers. Moreover, Shahrur (2005) conducts cross-sectional multivariate regressions to investigate the main determinants of firm's stock performance. These show that increased industry concentration, induced by horizontal mergers, has negative effects on the stock performance of merging firms and their competitors but no impact on supplier or customer abnormal returns.

Similarly, Bhattacharyya and Nain (2011) examine the effects of horizontal mergers on suppliers. They mainly compare changes in average product prices and profits in the supplier's industry following the completion of horizontal mergers. Consistent with the work of Fee and Thomas (2004), horizontal mergers have significant and negative impacts on supplier industries' cash flow margins. The average profits of supplier industries decline after horizontal mergers. Research on product price shows similar results. The Producer Price Index is a measure of the average selling prices for specific industries. That of supplier industries displays a pronounced declining trend in the three years after horizontal mergers. The results from alternative regression and robustness tests further support the argument that descending supplier product prices are mainly due to downstream consolidations. The findings for supplier product prices and profits are highly consistent with the predictions of the buying power hypothesis. To further determine support for the buying power hypothesis, Bhattacharyya and Nain (2011) regress the changes in supplier product prices on the industry competition measures. The results show that the price declines after horizontal mergers are inversely related to the supplier industry's Herfindahl index or four-firm concentration ratio. This implies that a supplier industry with a high concentration level will suffer much greater price declines following downstream consolidations. As buying the power hypothesis predicts, one of the basic motivations for horizontal mergers is to countervail upstream market powers.

2.3.4 Competitors

In addition, M&A activities have an impact on the competitors of both acquirers and targets. Eckbo (1983, 1985) and Mitchell and Mulherin (1996) all find that the competitors of target firms present positive and significant abnormal returns around M&A announcements. However, there is no reliable theory to explain the target rivals' gains. To resolve this issue, Song and Walkling (2000) develop an acquisition probability hypothesis. This hypothesis assumes that a target rival's positive announcement returns can be attributed to the increased probability of being acquired. Specifically, takeover

bids lead to a reassessment of the probability of acquisition attempts for the targets' competitors in same industry. The acquisition probability hypothesis has several advantages over the previous collusion hypothesis: The acquisition does not have to be horizontal or successful. The theory also leads to an understanding of cross-sectional variations in the performances of target competitors. Shocks on the perceived probability of being acquired vary systematically with the individual firm characteristics of rivals.

To provide empirical evidence of the acquisition probability hypothesis, Song and Walkling (2000) construct a sample of 141 takeover deals and 2459 target competitors during 1982–1991. Consistent with the predictions of the acquisition probability hypothesis, target competitors present positive and significant announcement returns. The form (horizontal or non-horizontal) and outcome (successful or failed) of the acquisition do not affect competitors' positive abnormal returns. Moreover, a competitor's stock performance tends to be positively related to the degree of surprise about the acquisitions. The cross-sectional differences in competitor performance can be explained by their individual characteristics, which can affect the probability of acquisitions. Most importantly, the empirical results suggest a significant and positive relation between rivals' abnormal returns and their reassessed probabilities of being acquired.

2.3.5 Arbitrageurs

The literature finds positive and significant arbitrage returns around M&As. Risk arbitrageurs are defined as financial institutions that increase target stockholdings following takeover announcements. Dukes, et al. (1992) find consistent empirical evidence from a sample of pure cash tender offers to support the argument that risk arbitrageurs gain from acquisitions. Baker and Savasoglu (2002) construct a larger and more comprehensive sample and use a new method to investigate the abnormal returns from risk arbitrages. Their sample includes 1901 M&A deals with both cash and stock payments during 1981–1996. They show that abnormal arbitrage returns are positively

related to completion risk and the selling pressure of target stocks. When the probability of success decreases and approaches 50% and the gap in gains between success and failure grows, arbitrageurs obtain substantial positive gains. They use regressions of estimations of merger outcome to predict the probability of deal completion and the selling pressure of target shares is measured by target firm size. The bid premium is the proxy for the difference between the payoffs of success and failure. However, arbitrage returns appear to be inversely related to the general size of risk arbitrage capital, as limited arbitrage theory predicts.

Evidence of the role of arbitrageurs in takeovers is still contradictory. Larcker and Lys (1987) argue that arbitrageurs play a passive role and attribute positive abnormal returns to the superior ability of arbitrageurs to predict the outcome of takeover bids. However, more recent papers (Cornelli and Li, 2002) suggest that arbitrageurs have an active impact on M&As. Changes in arbitrageurs' stockholdings affect deal characteristics and final bid outcomes. To address this issue, Hsieh and Walkling (2005) conduct a comprehensive empirical study for the role of arbitrageurs in M&As. They obtain empirical evidence from 608 takeover bids to suggest an endogenous relation between arbitrage holdings, arbitrage returns, takeover outcomes, and bid premiums. Importantly, the authors show that changes in arbitrage stockholdings are positively related to the probability of bid success. Growth in arbitrage holdings predicts the future success of takeover bids. The authors also indicate that changes in arbitrage stockholdings are positively correlated to bid premiums and arbitrage returns. These findings suggest that arbitrageurs play both active and passive roles in the takeover process. Moreover, after controlling for deal characteristics, Hsieh and Walkling (2005) show that arbitrageurs prefer small targets and buy significantly fewer stocks in large deals. Another important finding is that large changes in arbitrage holdings also predict bid revisions or the appearance of competing bids. This finding is consistent with the predictions of active effect theories.

2.4 Factors affecting M&A performance

2.4.1 Method of payment

Several factors are considered to affect post-merger performance. Travlos (1987) firstly explores the impact of payment methods on M&A performance. Although several studies indicate the importance of methods of payment in takeovers, there is no study links it with stock returns during the announcement period. He examines the role of different methods of payment in bidder's announcement returns, like the stock exchange offers and the pure cash offers. The empirical results indicate that the market responses to deals with different methods of payment are significantly differed. The bidding firms using pure stock exchange suffer large losses when the deals are announced. However, the announcement returns for pure cash deals are dramatically better. These findings do not varied among different types of M&A. In addition, Loughran and Vijh (1997) examine the major determinants of the long-term performance of merging firms using a sample of 947 takeover deals during 1970–1989. The majority of previous M&A studies adopt a calendar time approach with equally weighted, monthly rebalanced portfolios to calculate abnormal returns. However, this methodology can cause several statistical problems. Therefore Loughran and Vijh (1997) choose a buy-and-hold approach and matching samples that control for firm size and book-to-market ratios to obtain more accurate empirical results. The entire sample is grouped by form of acquisition (mergers or tender offers) and method of payment (cash or stock).

The merger deals show significantly more negative abnormal returns than matching firms, while tender offers earn significantly positive abnormal returns. Similarly, deals using stock payments present -24.2% negative abnormal returns compared to the matching sample. In contrast, cash deals earn 18.5% positive abnormal returns. Combining two group benchmarks, Loughran and Vijh (1997) find that stock mergers have highly negative abnormal returns and tender offers with cash payments show 61.7% higher

excess returns than the matching sample. Moreover, the abnormal returns of stock tender offers and cash mergers are both insignificant for matching firms. The investigation on market efficiency suggests that market efficiency theory is not supported by acquirers' significant post-merger abnormal returns. It appears that financial markets systematically misvaluate takeover gains. Specifically, the financial markets underreact to deal payment information.

Loughran and Vijh (1997) further compare the differences of long-term performance between stock mergers and stock issues. They show that the performance of stock mergers is worse than that of either firm initial public offerings (IPOs) or seasoned equity offerings (SEOs), but the differences are insignificant. The comparison test between cash tender offers and stock repurchases indicates that acquisitions using cash perform much better in the long term.

Methods of payment affect not only a merging firm's long-term performance, but also its announcement returns. Chang (1998) finds empirical evidence to support this argument after examining the announcement returns of deals acquiring privately held targets. Different from previous studies, he argues that bidding firm's shareholders may experience a positive announcement returns when they use pure stock to acquire private targets. By contrast, there are significantly negative abnormal returns for deals acquiring public firms through stock exchanges. On the other side, for pure cash offers, there is no significant wealth effect for bidding firm's shareholders. Moeller, et al. (2007) further confirm this argument. They examine the influence of opinion diversity and information asymmetry on acquirer announcement returns. The typical proxy for opinion diversity is the standard deviation of analyst forecasts and the authors use firm idiosyncratic volatility to proxy for information asymmetry. The results show that, in deals buying public targets with pure stocks, bidders with a high standard deviation in analyst forecasts have significantly lower announcement returns. However, this underperformance does not exist with private takeover targets or pure cash payments. On the other hand, the measure of

information asymmetry presents extremely strong explanatory power for acquirer announcement returns. As is the case for diversity of opinion, a significantly negative relation exists between information asymmetry and abnormal returns in the equity acquisitions of public targets. On the contrary, empirical evidence also suggests that acquirer abnormal returns are positively related to measures of opinion diversity and information asymmetry in pure cash takeovers. In conclusion, the diversity of opinion model successfully explains the difference in announcement returns between pure cash and pure stock payments used in public target takeovers but it fails to explain the differences between the acquisitions of public and private targets. However, the information asymmetry model is much better at explaining differences in announcement returns in various types of acquisitions using various types of payments.

As historical records show, a great number of firm managers tend to be engaged in M&A activities. Firms that make five or more successful takeover deals within three years are normally defined as multiple bidders. It is assumed that good managers will get great experience from previous successful deals and consequently improve performance in subsequent deals. Based on this assumption, Fuller, et al. (2002) designs a study of the announcement returns of 3135 takeovers made by multiple bidders from 1990 to 2000. They show that acquiring public targets have significantly negative announcement returns, but positive abnormal returns when acquiring private or subsidiary targets. The entire sample is further grouped by different methods of payment. Consistent with the findings of Moeller, et al. (2007), multiple bidders buying public targets using pure stocks have significant and negative announcement returns. In addition, the wealth effects on pure cash or mixed payment deals are insignificant. However, in deals buying private or subsidiary firms, acquirer shareholders earn significantly positive gains, regardless of the method of payment.

Furthermore, Fuller, et al. (2002) examine other determinants of the announcement returns for multiple bidders. They find that in public acquisitions the dispersion between

pure cash and pure stock payments is positively related to the relative size ratio of the target and acquiring firms. This finding implies that when relative size increases, deals with cash payments realize more positive gains and more negative results for stock payment deals. In deals with private or subsidiary targets, relative size also has a positive impact on the acquirer's announcement returns. The empirical findings of Fuller, et al. (2002) clearly show that market reactions to acquiring public targets versus private or subsidiary targets are distinctly different. This paper suggests that this finding is attributable to the liquidity hypothesis. The liquidity of private and subsidiary firms is significantly less than for public firms. Thus these firms are priced at a discount. Experienced bidders are able to capture this effect to create additional value from buying these targets. The liquidity hypothesis can also explain the differences in the abnormal returns of deals with various relative size ratios, since large targets are less liquid. In sum, M&A performance varies with payment choice and type of target. Their additional analysis is constructed based on a sample of bidders acquiring two firms within 90 days. Interestingly, the results show that bidders tend to choose different methods of payment in clustered deals. Further results suggest that both target and bidder characteristics contribute to a better understanding of payment method choices. The public status and industry and firm size of the targets are all considered.

2.4.2 Transaction attitude

Since the performances of hostile and friendly takeovers are significantly differentiated, researchers argue that hostile takeovers should be distinguished from non-hostile takeovers when examining M&A gains. The potential source of gains from hostile takeovers is the replacement of incumbent target managers, while strategic synergies are the main source of friendly takeovers. Schwert (2000) examines whether the characteristics of hostile takeovers are identifiably different from those of friendly takeovers, using the data on 2346 takeover contests for listed target firms during 1975–1996. The author uses the four most common indicators to identify hostile

takeovers: (1) The hostile takeover is noted by *The Wall Street Journal* or Dow Jones News/Retrieval, (2) the hostile takeover is recorded by the Securities Data Company, (3) unsolicited tender offers, and (4) pre-bid takeover speculation. The analysis shows that the correlations among these four indicators of hostility are significantly positive but not extremely high. Therefore Schwert argues that the choice of different indicators should be carefully considered in hostile takeover research. His studies based on a takeover sample of 22 years show that the frequency of hostile takeovers presents secular variations with time. These changes are mainly attributed to innovations in takeover technology and the development of anti-takeover approaches.

Two major theories explain the use of hostile takeovers: The management entrenchment hypothesis says that target managers resist takeover bids to avoid being acquired. The bargaining power hypothesis states the main purpose of target managers is to improve the terms of takeover bids. In the probit regression for the choice of hostile takeover, variables indicating management entrenchment have little impact on hostility. On the other hand, variables that represent the target's bargaining powers are highly significant and contribute the most explanatory power. Furthermore, hostile takeovers are shown to have significantly higher bid premiums than friendly takeovers. Both results are consistent with the predictions of the bargaining power hypothesis. The empirical evidence also suggests that hostile takeovers are more likely to attract competing bidders, which further supports the bargaining power hypothesis.

2.4.3 Type of target and acquirer

In M&As, the choice of target type has a significant impact on stock performance, especially the public status of the target firm. It is generally believed that acquiring public or private firms incurs different market reactions. Since the competition in acquiring a private target is limited, the limited competition hypothesis predicts that bidding firms will obtain significant positive abnormal returns with a high probability of underpayment.

Furthermore, deals buying private targets with stock payments are more likely to generate new outside blockholders. These new blockholders are considered effective monitors to improve the managerial performance of merging firms. Therefore bidders obtain substantial gains from acquiring private targets. Similarly, investors believe that deals acquiring public firms with stock payments are a signal of overvaluation. Thus, the financial market will have a negative response to the takeover announcement. However, this problem may be mitigated when buying private targets.

To find empirical evidence, Chang (1998) examines bidder's announcement returns, using a sample of 281 M&A deals with privately held targets during 1981–1992. The author's comparison analysis of deal characteristics shows that both the average deal value and relative size of private targets are significantly less than those of public targets. On the other hand, the probability of creating new blockholders and their stock ownerships in private target deals is significantly higher than in other types. This finding is consistent with the prediction of the monitoring hypothesis. Furthermore, Chang (1998)'s results from univariate tests suggest that abnormal returns of cash offers are statistically insignificant, regardless of the target's public status. This finding is inconsistent with the limited competition hypothesis. In stock offers, however, market reactions to announcements of acquiring private targets are highly positive and statistically significant, while reactions to announcements of acquiring public targets are profoundly negative. This result strongly supports the monitoring hypothesis, which argues that the generation of new blockholders increases firm value through a more efficient monitoring mechanism.

Seeking further support for the monitoring hypothesis, Chang (1998) divides the sample into groups according to whether a new blockholder is created in the takeover. Not surprisingly, deals creating new blockholders have significantly higher announcement returns, whether the target is public or private. Cross-sectional regressions yield results that are consistent with previous analysis. The estimation for exchanged share

percentages is significant and positive. Similarly, the dummy variable for new blockholders presents significantly positive effects on bidder announcement abnormal returns. Finally, the author concludes that the acquisition of private targets using stocks earns substantial positive returns, while using cash yields insignificant abnormal returns. The evidence of new blockholder creation mainly from targets supports the monitoring hypothesis.

Officer (2007) investigates the gains of acquiring unlisted targets, including subsidiaries, from another point of view. The author argues that the main source of positive gains is attributed to the selling discount of unlisted targets compared to public targets rather than improvements in managerial performance. The biggest limitation of that research is in measuring the fair prices of unlisted firms and subsidiaries due to the poor availability of information on these firms. Officer (2007) conquers this obstacle by adopting a comparison analysis approach. The acquisition multiples for unlisted targets are compared with industry- and size-matched deals acquiring public targets. The results show that bidders acquire unlisted targets at a discount of 15– 30%, on average, compared to the control sample of bidders buying public targets. The analysis also shows that public parent firms with serious liquidity constraints are more likely to sell their unlisted subsidiaries at a discount. Compared with the control sample firms, these parent firms have much lower cash flow, cash balances, net working capital, Z-scores, and bond ratings. They also have significantly higher debt ratios and negative former stock performance. All these differences indicate that the main consideration in selling subsidiaries is to mitigate the parent firm's liquidity constraints. The deal value of selling subsidiaries only possesses 4% of the parent firm's total assets, on average. But it is relatively large when comparing with parent firm's cash balance (105% on average). Thus the sale of unlisted subsidiaries significantly improves the financial status of parent firms. Moreover, the results suggest that the sales discounts mainly depend on the parent firm's former stock performance and the availability of alternate financing sources.

In addition to the target, different types of acquirers also affect takeover performance. As Myers and Majluf (1984) and Jensen (1986) argue, firms with great (little) financial slack may have overinvestment (underinvestment) problems. Smith and Kim (1994) believe that M&As are an effective way to reallocate resources by merging slack-rich firms with slack-poor firms. This process increases the value of combined firms. The authors' analysis is based on a sample of 827 tender offers from 1980 to 1986. First, they find that takeover deals between slack-rich and slack-poor firms present better stock performance than other firms. Bidder announcement abnormal returns are positive and statistically significant. Further analysis shows that the market reaction is more positive when a slack-poor bidder announces a takeover bid for a cash-rich target than when a cash-rich bidder acquires a slack-poor target. This finding is consistent with the prediction of free cash flow hypothesis, which suggests that bidders with much free cash flow are more likely to overpay for targets. Moreover, if these cash-rich bidders increase leverage ratios through acquisitions, their shareholders obtain significantly positive gains. On the other hand, slack-poor bidders show significantly positive abnormal returns when the takeover deals decrease their leverage ratios.

The acquirer's firm size also affects takeover performance. An interesting finding noted by Moeller, et al. (2004) is that although the equally weighted average announcement return for bidding firms is 1.1%, great losses to shareholder wealth are incurred. This result is based on a comprehensive sample of 12,023 acquisitions during 1980–2001. A potential explanation is that acquisitions made by small firms are more profitable than deals made by large firms. Thus they have more positive returns but small wealth effects due to the limitation in the acquirer's firm size. On the other hand, large bidding firms make large acquisitions that result in large losses of wealth. To capture this effect, the authors' empirical analysis shows that the value-weighted average announcement return for the whole sample is -1.18%. They further investigate possible explanations for the bidder size effect.

Their descriptive analysis indicates that small deals are more likely in the acquisition of private targets than public targets. As both Chang (1998) and Fuller, et al. (2002) suggest, the abnormal announcement returns are significantly higher for deals buying private or subsidiary firms than for deals buying public firms. Therefore, the high portion of private targets in small deals probably explains this size effect. A second potential explanation is that small deals are more likely to be paid in cash than in stock. Takeovers using cash present significantly positive abnormal returns, whereas stock deals earn significantly negative abnormal returns (Loughran and Vijh, 1997). Finally, the different characteristics of large and small bidders may also have an impact on announcement returns.

Moeller, et al. (2004) examine whether these hypotheses lead to a better understanding of the size effect of bidding firms. They find that the bid premiums are positively related to the size of bidding firms after controlling for other variables. This finding implies that large firm managers tend to overpay for M&As. Consequently, large bidders are more likely to successfully complete deals. Furthermore, the size effect still holds when authors use the book value of firm assets as the size measure. This evidence does not support the overvaluation hypothesis. The overvaluation hypothesis attributes the negative performance of large firms to their overvalued equities. This negative performance should disappear when firm size is measured by book value instead of market value. There is also little evidence to support the free cash flow hypothesis. In conclusion, Moeller, et al. (2004) finds that the size effect is robust and does not reverse over time. The empirical evidence main supports the managerial hubris hypothesis.

2.5 Merger waves

Research extensively indicates that M&As occur in waves. Since M&A activities are a combination of financing and investment decisions, Rau and Stouraitis (2011) consider analysing merger waves together with other corporate events. Stock repurchases, SEOs, and IPOs are all forms of firm financing decisions. The authors collect a large and

comprehensive data set over 25 years (1980–2004), with more than 150,000 corporate transactions. They show that there are significantly positive correlations between different forms of stock issuance activities at the industry level and a negative correlation between stock issuance activities and stock repurchases. Furthermore, the results of a vector autoregressive model show that there is distinct evidence from lagged corporate events to support their arguments. Lagged SEO volume can predict future IPO volume and both SEO and IPO volumes are able to predict future stock-financed M&A waves. Similarly, a bootstrap simulation approach suggests that, although different corporate event waves overlap, each wave has a time pattern. Consistent with vector autoregressive analysis, stock issue waves come first, with SEOs preceding IPOs. Waves of M&As with stock financing subsequently occur and, finally, stock repurchase waves.

Two major hypotheses explain M&A waves: the efficiency hypothesis and the market misvaluation hypothesis. The neoclassical efficiency hypothesis argues that M&A activity is motivated by considerations of economic efficiency. Firm managers are expected to take advantage of growth opportunities or make investments with positive net present value. Good investment opportunities follow business cycles or industry productivity shocks. Thus M&A activities occur in waves. Alternatively, the market misvaluation hypothesis supposes that firm equities can be misvalued by the market and that rational managers will propose stock-financed takeovers to exploit such an advantage. Therefore stock-financed M&A waves should occur in the high market valuation period. Rau and Stouraitis (2011) argue that the historical evidence is consistent with both theories. In explanatory power regressions, they use five sets of variables to proxy for economic efficiency and market misvaluation factors, respectively. All variables are statistically significant in explaining equity issuance waves, which indicates these waves are motivated by either economic efficiency or market misvaluation. The relative importance of each theory varies with different time periods, leading to differing conclusions in previous studies.

2.5.1 Economic efficiency

Mitchell and Mulherin (1996) argue that M&A activities are driven by economic shocks after examining the fourth takeover wave in the 1980s. The authors first investigate industry-level patterns in M&A activity during 1982–1989. The evidence suggests that the density and time series of these activities are differentiated by industry and that the activities cluster in a few particular industries. Furthermore, most of these industries experienced great fundamental shocks during the sample period, which are considered the cause of M&A waves. These findings imply that both macroeconomic and industry-level factors must be included jointly in research design. They also help explain bidder announcement returns from an industry point of view.

Similarly, Jovanovic and Rousseau (2002) argue that most of the historical merger waves can be explained by Q theory. Tobin's Q is the ratio of the market value of a firm's assets to their replacement cost and it is generally a proxy for firm growth opportunity. Because of their high fixed costs and low marginal adjustment costs, M&A activities are more likely to be in response to acquirers' Q ratios than to other considerations. As economic efficiency theory indicates, bidder managers would take advantage of high Q ratios through buying low-Q firms. To validate this explanation, Jovanovic and Rousseau (2002) develop a theoretical model to study historical M&A data. Both their model and empirical results indicate that a firm's Q ratio has strong explanatory power for M&A waves of the 1900s, 1920s, 1980s, and 1990s, but not the 1960s.

The empirical results presented by Harford (2005) also support the neoclassical explanation that merger waves are driven by specific industry shocks. However, this author also argues that that industry shocks cannot fully explain the occurrence of merger waves. The consideration of asset liquidity is also indispensable. As we know, a merger wave is normally a process of asset reallocation that also requires sufficient capital liquidity. As previous theory shows, increasing asset liquidity reduces a firm's financing

constraints and transaction costs and improves the valuation of assets. The occurrence of merger waves requires two major conditions: the economic motivation for M&A activity and relatively low transaction costs to create a considerable trading volume. Therefore Harford (2005) argues that the correlation between high market valuation and merger waves is actually attributable to an increase in capital liquidity rather than to behavioural misvaluation. The author studies a sample of industry-level merger waves covering the period of both the 1980s and 1990s to validate this argument. The results show that large abnormal changes in most economic characteristics are normally followed by industry-level merger waves. The results from logistic analysis confirm that economic variables have strong predictive power for the start of industry merger waves. Furthermore, they show a strong time-series interaction between the industries involved in firm-level mergers and partial-firm acquisitions. These findings strongly support the neoclassical explanation of economic efficiency, while inconsistent with the explanation of behavioural misvaluation. Finally, Harford concludes that merger waves are not caused by managerial timing in market misvaluation. But they are driven by economic shocks and sufficient capital liquidity.

Furthermore, Garfinkel and Hankins (2011) attribute the appearance of merger waves to considerations of economic efficiency. They improve the understanding of M&A waves by studying the role of risk management in M&A activities from 1981 to 2006. Their results, based on analysing a large and comprehensive data set, suggest that risk management is a crucial component of M&A activities. First, the authors find a positive relation between the clustering level of vertical takeovers and the appearance of merger waves. A vertical takeover is more likely to occur during a period of merger waves. As traditional theory argues, vertical takeovers can be treated as a response to increased uncertainty duo to risk management. Vertical takeovers provide substantial benefits from operational hedging. Therefore the evidence shows that increases in the firm-level uncertainty of cash flow are able to predict the start of merger waves. Risk management is important not only at the firm level, but also in industry level analysis. These results

indicate that the causality relation between cash flow uncertainty and vertical takeovers is significant and robust. Furthermore, the empirical evidence shows that cash flow uncertainty declines significantly after vertical takeovers. Generally, these findings suggest that the consideration of risk management significantly influences M&A activities. Merger waves are partially driven by firm managers' willingness to reduce cash flow volatility.

2.5.2 Market misvaluation

Market misvaluation theory is also a common explanation for merger waves. As Rhodes-Kropf and Viswanathan (2004) argue, consideration of economic efficiency fails to tell the whole story of merger waves, especially the different choices of payment in merger waves. The authors develop a rational framework to show that misvaluation is an important determinant of merger waves. Market misvaluation is able to cause merger waves on its own and without economic shocks. Rhodes-Kropf and Viswanathan (2004)'s theoretical model suggests that market misvaluation has a significant impact on merger waves. The probability of a bidder making a takeover offer and a target accepting one is positively related to the level of market overvaluation. Therefore merger waves are more likely to occur when the financial market is significantly overvalued.

On the other hand, market undervaluation is also a potential explanation for why merger waves end. Market misvaluation theory can also explain the choices of payment in merger waves. As Shleifer and Vishny (2003) indicate, overvalued bidders have strong incentive to be engaged in stock mergers acquiring undervalued or relatively less overvalued targets. The evidence shows that stock mergers are more popular in merger waves caused by an overvalued market. On the contrary, in a period of market undervaluation, cash deals are more likely to successfully complete. In conclusion, the authors argue that, besides considerations of economic efficiency, merger waves can also be driven by market misvaluation, in periods of either overvaluation or undervaluation.

As a supplement to above-mentioned study, Rhodes-Kropf, et al. (2005) empirically tests market misvaluation theory for merger waves. They decompose the market-to-book ratio into three parts to represent the level of misvaluation: firm-specific error, time-series sector error, and long-run value to book. They obtain strong evidence to support the argument that merger waves are driven by market misvaluation. First, they show that acquirers are significantly more overvalued than targets and that acquirers' average market-to-book ratio is higher than the targets'. Further analysis shows that about 60% of the acquirers' market-to-book ratios are attributable to firm-specific error. In contrast, almost none of the targets' market-to-book ratios could be attributed to firm-specific error. Consistent with the predictions of Rhodes-Kropf and Viswanathan (2004), the targets in cash offers are relatively undervalued, on average, since they have negative firm-specific error, while targets in stock offers are slightly overvalued. From an acquirer's viewpoint, acquirers using stock are relatively more overvalued than acquirers using cash. Moreover, the increasing firm-specific error is positively related to the probability of firms making stock takeovers. Similarly, industry-level M&A activities increase with time-series sector error. Second, the authors' analysis based on a firm's long-run value suggests that, generally, low value-to-book firms acquire high value-to-book firms. This implies that the 'high buys low' effect is mainly caused by a firm's short-run pricing dynamics, but it will reverse direction in the long run. Rhodes-Kropf, et al. (2005) further determines that the short-run misvaluation is due to changes in market sentiment or asymmetric information. Finally, after controlling for several neoclassical factors, the misvaluation variable explains more than 15% of takeover activities at the industry level. The regression results indicate that misvaluation is an important factor for explaining the occurrence of merger waves, as well as neoclassical economic factors.

Chapter 3

3. Does Bidder Leverage Affect M&A Success?

3.1 Introduction

This chapter examines the relation between bidders' capital structure and their probability of success in M&A activities. The previous chapter, the literature review, shows that M&As are well researched in different aspects, such as merger motivations, merger performance, and merger waves. A large proportion of these studies focuses on examining firm's stock returns. However, much less research has been conducted on the determinants of bid success, especially with respect to the bidding firm's characteristics.

Factors reported to affect the success rate of bids include toehold strategies (Bulow, et al., 1999), the medium of payment (Cornu and Isakov, 2000), managerial resistance (Walkling, 1985), bidder size (Moeller, et al., 2004), and the use of poison pills (Comment and Schwert, 1995). They all have credible evidence to indicate their significant impact on the probability of success in takeovers. On the other hand, other papers associate capital structure with the motivations of M&As, based on the theories of wealth transfer (Roll, 1986), tax shielding (Renneboog, et al., 2007), and financial slack (Kiymaz and Baker, 2008). These studies greatly improve our understanding of why M&As occur.

However, only a few studies connect capital structure theory to takeover outcome. Stulz (1988) and Harris and Raviv (1988) empirically examine the relation between target firm financial leverage and bid success, finding that they are negatively associated, but the authors ignore the influence of bidder capital structure. Recently, Morellec and Zhdanov (2008) developed a dynamic model relating bidder capital structure with takeover success. They predict that the bidding firm with the lowest leverage ratio has the highest

probability of winning a takeover contest. In general, to the best of our knowledge, no study empirically examines the underlying relation between a bidder's financial leverage and takeover success. To fill this gap, this chapter sheds light on this issue by using a comprehensive data set and well-constructed methodologies. It is essential to explore how the under-leveraged capital structure generates advantages for bidding firm while the high leverage ratio may bring more disadvantages. Based on these considerations, bidder's managers have incentive to actively manage their leverage ratios in order to obtain these advantages and avoid potential disadvantages. Therefore, the main research question of this chapter is that whether bidder's capital structure has potential effect on the takeover success. Consistent with the prediction of theoretical model, it is expected that bidder's different capital structure s have diversified impacts on the takeover success in the future. Furthermore, it is important to investigate the potential explanation for the relation between firm's capital structure and takeover success since it may help us improve the understandings for the process and outcome of M&A deals. We suppose that under-leveraged bidders have strong ability to propose high bid premiums for target shareholders regarding less to different methods of payment. Therefore target shareholders and managers are more likely to accept these offers from under-leveraged bidders.

Using a large sample of 19,203 US M&A deals during 1980–2009, we empirically investigate the relation between a bidder's financial leverage ratio and the probability of M&A success. In contrast to the previous literature, which focuses only on successful M&A deals, this study includes both successful and failed deals. To obtain more reliable results, a firm's financial leverage is represented by four different measures. The primary measure is the firm's leverage deficit level, with three dummy variables further specifying the status of the firm's capital structure: an underleveraged dummy, a target-leveraged dummy, and an overleveraged dummy.

We adopt both the Tobit and logistic models in our empirical studies. First, the firm's target leverage ratio is estimated by a Tobit regression model. Then the financial leverage deficit is calculated by the difference between the firm's actual and target leverage ratios. Our logistic regression model's results strongly suggest that a bidder's deviation from the target leverage ratio has a negative impact on the probability of success in M&As, since the estimate for the leverage deficit variable is negative and statistically significant. This finding implies that firms with a higher debt level are less likely to successfully complete their takeover offers. Furthermore, analysis based on the status of leverage deficit shows that overleveraged firms present a lower probability of success while target-leveraged firms have a significantly higher probability of success. The dummy variable for an underleveraged firm has an insignificant impact on takeover success. The interaction analysis between the financial leverage measures and the competing deal dummy indicates that the effect of capital structure on takeover success is consistent but not enhanced or weakened by competing deals.

To further explore the impact of bidder capital structure on takeover success, we analyse the relation using three subsamples with different payment media. We find that in deals with pure cash payments, the effect of the leverage deficit is negative but statistically insignificant. However, when the leverage deficit is specified by three dummy variables, the effects are significantly different. For overleveraged firms, they have no impact on takeover success. But the probability of success of target-leveraged bidders is significantly higher, while that of underleveraged bidders is significantly lower. In contrast, for pure stock deals we find that a bidder's leverage deficit is negatively related to takeover success. The probability of success is insignificantly different between overleveraged and target-leveraged bidders. Interestingly, the underleveraged dummy variable is positively related to the probability of success and statistically significant. Moreover, in the analysis for deals using mixed payments, the effects of leverage deficit on takeover success are significantly negative. For the leverage status dummies, the

probability of success of overleveraged bidders is significantly lowered, while that of target-leveraged bidders is significantly increased.

To explore potential explanations for the effects of leverage deficit, we further analyse the determinants of bid premiums. Chowdhry and Nanda (1993) show that in cash deals bidders commonly tend to issue additional debt as a form of external financing. High credit ratings allow firms with high debt capacity to use additional debt issue with greater convenience and at significantly less issuing cost than firms with lower debt capacity. The subsequent advantage in takeover financing has a positive impact on the merger valuation, thus prompting bidding firms to make considerably higher offers to beat their rivals or deter potential competing bidders.

A low debt ratio is an advantage in not only cash takeover deals but also stock mergers. As indicated in the literature, overvalued stock prices can also lead to low leverage ratios. Shleifer and Vishny (2003) propose that firms with overvalued equity have great incentive to engage in M&A markets using stocks, an argument supported by Rhodes-Kropf and Viswanathan (2004) and Rhodes-Kropf et al. (2005). Based on the information asymmetry hypothesis, the management of overvalued firms shows a strong tendency to use highly valued stock as the medium of payment. Therefore, in bidding competitions, acquirers with a low leverage ratio, which can be attributed to overvalued stock, would want to tender a stock offer with a high premium to acquire a target and dilute the level of overvalued equity. Therefore, we predict an inverse relation between the bidder's leverage deficit and the premiums it offers.

In general analysis, the estimates for leverage deficit on bid premiums are negative but statistically insignificant, though the P-value is marginal. When the leverage deficit is measured by status dummies, the results are very different and clear. The premiums of overleveraged bidders are significant lower, while those of target-leveraged bidders are much higher. This finding is much in line with the results on the probability of success in

takeovers. It implies that firms with higher levels of debt levels are in an unfavourable position because it is harder for them to offer a high premium to compete for a particular target, since they face difficulties receiving further leverage to finance a deal. We argue that the differences in bid premiums partially explain the high probability of success of target-leveraged firms in M&As.

Our study makes several contributions to the literature. This is the first study to empirically examine the relation between bidder financial leverage and success in takeovers and to obtain sufficient evidence to support our argument. Our sample includes both successful and failed deals, producing a more comprehensive study and powerful results. Second, we examine the interactions of bidder leverage deficit with bid success across different payment media. This aspect of our study shows the effect of financial leverage more clearly for various statuses of takeover deals. The distinct results between pure cash, pure stock, and mixed payment deals remarkably improve our understanding of the effect of acquirer capital structure on M&A activities. Furthermore, we use dummy variables to differentiate between leverage deficit level statuses. These measures provide a more specific approach to investigate the relation between leverage deficit and M&A activity.

Our work is related to that of Harris and Raviv (1988), Stulz (1988), Ghosh and Jain (2000), Clayton and Ravid (2002), and Morellec and Zhdanov (2008). While Harris and Raviv (1988) and Stulz (1988) examine the relation between target leverage and bid success, we examine the relation between bidder leverage and success in M&As. Morellec and Zhdanov (2008) develop a theoretical model for bidder leverage and bid success, which we empirically investigate. Clayton and Ravid (2002) investigate how capital structure affects bidders in typical auctions. This chapter extends their research area to M&As. Finally, Ghosh and Jain (2000) show that successful bidders have relatively lower debt ratios. This chapter further investigates how the level of debt yields advantages and affects bid success.

This chapter is organized as follows. Section 3.2 reviews the previous related literature. Section 3.3 introduces the sample methodologies used in our study. Section 3.4 presents the empirical results. Finally, Section 3.5 concludes the chapter.

3.2 Literature review

3.2.1 Capital structure and M&A

Previous papers examine the relation between capital structure and M&A in different contexts. As Lewellen (1971) first indicated, M&A activities are probably driven by increases in the bidding firm's debt capacity. The shareholders of merging firms obtain benefits from the increased financial leverage following mergers. To demonstrate this reasoning, Bruner (1988) explores the hypothesis that changes in capital structure provide a motive for M&As. Besides the traditional debt ratio, the author uses a new measure, the 'net debt ratio', which adjusts for cash reserves to better represent the bidding firm's financial slack. Examining the financial leverage of both bidder and target firms of takeover deals, Bruner finds that bidder financial slack is significantly higher than in a general control sample of firms before mergers. The leverage ratio of target firm is significantly higher than for the control sample and for bidding firms. Unlike the previous study, Bruner's investigates the correlation between changes in capital structure and the shareholder wealth effect. The author also shows that bidder leverage changes over the next two years have a significant impact on the bidder's stock performance.

Consistent with Bruner's (1988) argument, Ghosh and Jain (2000) indicate that bidding firms have relatively lower debt ratios. They further investigate the leverage movements of combined firms after the successful completion of deals. By testing 239 successfully completed merger deals, they obtain evidence that suggests the financial leverage of merging firm significantly rises following mergers. There are two potential explanations

for this increase: the increasing debt capacity hypothesis and the unused debt capacity hypothesis. The results of cross-sectional regression reveal a statistically and economically significant relation between the announcement returns of acquiring firms and changes in the financial leverage ratio. This finding strongly supports the argument that increases in financial leverage results from the rising debt capacity of combined firms.

Harford, et al. (2009) studies the issue of whether firm target capital structure is based on evidence from acquisitions. Using a sample of 1188 large acquisitions during 1981–2000, they investigate whether leverage deficit, defined as the deviation from a firm's target capital structure, affects the bidding firm's financing choices. In general, the evidence suggests that bidders consider target capital structure when they anticipate future acquisitions. A bidder's pre-announcement leverage deficit is negatively related to the percentage of cash in the M&A payment. Since most cash payments in large deals are financed by new debt issues, the leverage deficit will also affect bidder financing decisions. Overleveraged bidders tend to choose equity financing over debt financing. Therefore the authors conclude that considerations of target capital structure are a crucial determinant of both the method of payment and financing decisions of acquisitions.

Using a two-step estimation approach, Uysal (2011) also researches the correlation between a firm's target capital structure and M&A activities, especially the probability of the firm making an acquisition, as well as its choices of payment method and bid premiums. The empirical evidence suggests that overleveraged firms are less likely to make an acquisition. The deals made by overleveraged bidders present significantly smaller average values and premiums; they are also less likely to use cash payments. These results support the argument that the leverage deficit of firms constrains their ability to make acquisitions. Moreover, the impact of leverage deficit on M&A activity indicates that firm managers may attempt to mitigate this impact. Uysal (2011) also analyses the connection between managerial decisions on capital structure and potential

acquisitions and finds that overleveraged firms reduce leverage deficit to move towards their target capital structure. This finding implies that managers actively adjust their firm's capital structure when they forecast a high probability of making acquisitions.

On the other hand, a bidder's capital structure also plays a strategic role in takeover contests, since debt is an important source of financing. Chowdhry and Nanda (1993) show that the strategic use of debt financing can provide substantial advantages to initial bidders over potential competitors. By constructing a five-date model with two potential bidders, the authors provide the testable empirical implication that the probability of the initial bidder facing no competition is positively related to the bidder's current debt ratio. Consequently, the initial bidder has a higher probability of successfully completing the ongoing deal.

Similarly, Clayton and Ravid (2002) explore the effect of capital structure on firm bidding behaviour in typical auctions. Unlike previous M&A studies, they focus on two common types of Federal Communication Commission spectrum auctions: the English auction and the first-price sealed-bid auction. First, the authors present a theoretical model to explain how the financial leverage ratio could affect bidding behaviour in auctions. The model predicts that both the leverage ratio of the bidding firm and the debt–equity ratio of the competition are crucial determinants in the auctions. A firm's debt level is inversely related to the highest bid it is able to give. Empirical evidence from the FCC auction data proves that a firm's financial leverage has a significant impact on its bidding behaviour. Clayton and Ravid show that bidding firms with higher leverage levels are less likely to win the auctions.

3.2.2 Factors affecting takeover success

3.2.2.1 Toeholds

Numerous factors affect the probability of takeover success, especially in the presence of competing bids for a same target. Burkart (1995) studies how a bidder's initial shareholdings, referred to as toeholds, influence the process of bidding competitions. The author argues that in a bidding competition, which is normally modelled as a typical English auction or second-price sealed-bid auction, the existence of toeholds can lead to inefficient results. In a takeover contest, rational bidders with toeholds can also overbid for their targets, falling victim to the winner's curse. To demonstrate this reasoning, Burkart (1995) examines the effect of initial shareholdings from both theoretical and empirical points of view. The author shows that the existence of toeholds leads to overbidding problems for bidders. Bidders with toeholds have a higher probability of success in takeover contests.

Evidence from Bulow, et al. (1999) further confirms the positive impact of a bidder's toehold on takeover success. The authors argue that bidders with toeholds can become more aggressive in bidding competitions. Bidders with no toehold become more conservative because they are more concerned about the rising winner's curse. The existence of toeholds can also effectively deter competing bids and reduce the probability of managerial resistance. Consistent with Burkart (1995), the model of Bulow, et al. provides a reliable explanation for the overbidding problem without appealing to the hubris hypothesis or agency cost theory.

Ettinger (2009) also examines this issue in a more recent study. Similar to previous studies, the author constructs a framework with two potential bidders: one with a toehold and one without. The takeover contests are modelled as typical ascending auctions with private and independent valuations. Ettinger investigates the effect of toeholds on both

bidder participation decisions and bidding strategy. The author shows that even with relatively low participating costs, the existence of toeholds is able to effectively deter competing bids made by non-toehold bidders. A bidder's more aggressive bidding strategy reduces the expected profit of other potential bidders. Since the expected profit is less than the participating costs, potential bidders decide to give up this investment opportunity. On the other hand, a toehold also increases the probability of takeover bids by firms with toeholds. Furthermore, Ettinger's theoretical framework takes into account the minimum premium. The condition of a minimum premium in this model significantly reduces the toehold deterrence phenomenon.

3.2.2.2 Managerial resistance

Ebeid (1975) uses discriminant analysis to compare the operating, market, and deal characteristics of target firms in successful and failed cash tender offers. The comparison analysis shows that only a few variables among the 28 selected are statistically significant. The most significant and dominant variable is the indicator for target management's reaction. This finding suggests that managerial resistance has a large impact on the outcome of cash tender offers. Hoffmeister and Dyl (1981) also investigate factors that may affect the outcome of cash tender offers, using discriminant analysis. Their data set is constructed from 267 cash tender offers during 1976–1977. Consistent with Ebeid, the authors find that managerial resistance is decisive in determining final outcomes. The estimates for managerial resistance are statistically and economically significant in all models. In addition, target firm size and price-to-earnings ratio also have insignificant impact on the success of tender offers.

In contrast, Walkling (1985) uses logistic analysis to explore the main determinants of tender offer success. The major motivation of this research is to find evidence on the surprising results for bid premiums. Both Ebeid (1975) and Hoffmeister and Dyl (1981)

indicate that the scale of bid premiums does not affect the success of cash tender offers. Consistent with Walkling's predictions, empirical evidence from the logistic model supports the importance of bid premiums in takeover success. The size of bid premiums is positively related to the probability of success in tender offers. The author further points out that the insignificant results are mainly attributed to incorrect specifications of bid premiums. Consistently, the managerial resistance of target firms appears to have a negative impact on takeover success. Both initial shareholdings and solicitation fees also have a significant impact.

3.2.2.3 Other factors

Other factors are also very important. For example, Cornu and Isakov (2000) examine the deterring role of the method of payment in takeover contests. They believe that the choice of payment method has a significant effect on takeover outcome, whether a success or a failure, and the shareholder wealth effect. Their main incentive is to specify the equilibrium bidding strategy for initial bidders that deters potential competing bids. Their model identifies three alternative methods of payment: cash, equity, and debt offers. Following the requirements of a perfect Bayesian equilibrium in signalling games, the theoretical model generates equilibrium solutions that depend on different target values. It further specifies the optimal method of payment for initial bidders launching hostile takeovers. The theoretical model suggests that the probability of a competing bid in hostile takeovers is lower after a cash offer than after an equity offer. To validate this prediction, the authors examine takeover deals in UK from 1995 to 1996. Consistent with theoretical suggestions, the empirical evidence shows that cash offers present more of a deterrent than equity and debt offers, because cash offers normally signal a high-valuation bidder.

Since the 1990s, the rapid development of takeover defences shows their increasing impact on the offer success of M&As. The most representative and popular takeover defence approach is the poison pill. As Ryngaert and Netter (1988) show, the adoption of a poison pill is an effective way to deter potential hostile takeovers. The historical records show that hostile takeovers are more likely to be defeated when acquiring firms use poison pills. Heron and Lie (2006) extend the understanding of the effect of poison pills in response to takeover bids. They carefully design the research methodology to mitigate potential endogeneity problems. Their sample has 526 unsolicited takeover offers, both successful and failed. To obtain more powerful and robust evidence, their regression models take into account financial, governance, and ownership characteristics that may affect the process and outcome of takeovers. The authors' study of the adoption of a defensive mechanism suggests that the probability of a target firm adopting a poison pill in response to a takeover attempt is negatively related to its degree of insider ownership. In contrast, the probability of defensive repurchases increases with the extent of insider ownership. Moreover, the evidence suggests that target shareholders benefit from poison pills, since the adoption of poison pills is associated with higher bid premiums and shareholder gains. The results for defensive repurchases indicate that poison pills do not harm shareholder wealth.

3.3 Data and methodology

3.3.1 Sample selection

Our sample includes all successful and unsuccessful M&As in the US corporate control market from January 1980 to December 2009. The source of the M&A data set is the Securities Data Company (SDC) Mergers & Acquisitions database. The selected period is driven by the availability of the SDC data. Table 3.1 shows the selection criteria used in this chapter and the number of deals remaining after filtering by each criterion. We collect all deals acquired by US public firms that were announced between 1 January

1980 and 31 December 2009, for a total of 132,412 deals. To exclude small and noise deals, we omit deals of less than US$1 million, which leaves 70,780 deals. Furthermore, based on our research design, the sample contains successful and withdraw deals. Deals of unknown status or still pending are excluded from the sample, which brings the sample size down to 52,266. Following traditional M&A research, we eliminate deals involving firms in the financial or utility industry. Deals identified by the SDC as types of privatization, acquisitions of remaining interest, spinoffs, recapitalizations, repurchases, and self-tenders are also excluded, leaving a sample with 33,319 deals. After matching with both the Compustat and Center for Research in Security Prices (CRSP) databases, our final sample contains 19,203 M&A deals.

3.3.2 Sample description

Table 3.2 presents the description of annual M&A characteristics for the entire sample from 1980 to 2009. As discussed in the literature review, M&A activities occur in waves. The first merger wave in our sample, the fourth wave on historical record, occurred between 1984 and 1989. The second merger wave started in 1992 and ended in 1999 before the Internet bubble crashed. The latest wave started in the middle of the 2000s, with the highest deal value in 2006. This wave was stopped by the financial crisis in 2008.

An interesting trend in Table 3.2 is the increasing number of foreign deals. A deal with both a US acquirer and a US target is defined as a domestic deal, while a deal with a non-US target is defined as a foreign deal. Both the total number and percentage of foreign deals exhibit a significant upward trend that is attributable to the rapid globalization. When we consider the medium of payment, historical evidence suggests that the popularity of either cash or stock payments varies with different merger waves. In the late-1980s merger wave, the major medium of payment was cash; about 30% of deals were paid for with pure cash. In contrast, the percentage of deals paid for with pure stock

is significantly lower. After 1990, more stock deals and fewer cash deals were announced in the 1990s merger waves. Following the break of the Internet bubble, the frequency of cash payment deals fell dramatically, from over 20% to less than 5%; however, the percentage of pure cash deals recovered significantly from the large decline during the 1990s. In the latest 2000s merger wave, over 40% of deals are paid for in cash, on average.

Table 3.3 further displays the summary statistics of M&A deals regarding the public status of target companies. This result shows that the percentage of public targets in the entire sample is only around 20%. The remaining ~80% of targets are either private companies or subsidiaries. This finding provides an additional incentive for us to include private and subsidiary targets in our research. This inclusion will yield much stronger and more robust empirical evidence to support our predictions.

3.3.3 Variable definitions and descriptive statistics

Tables 3.4 and 3.5 present descriptive statistics for acquirer and M&A deal characteristics, respectively. Since we are examining factors that affect the probability of success in M&A offers, our research summarizes the descriptive statistics for the whole sample, as well as two subsamples, namely, a successful bidder group (SBG) and a failed bidder group (FBG). The tables present not only the mean and median values for each accounting variable, but also the T-test results for differences in mean value between the two subsamples and the Wilcoxon test results for differences in median value.

Table 3.4 shows that the accounting characteristics of successful and failed bidders are distinctly different. Both the average market value and sales of successful bidders (US$8.11 trillion and US$3.34 trillion, respectively) are significantly larger than for failed bidders (US$4.93 trillion and US$2.57 trillion, respectively). The empirical results of both the T-test and Wilcoxon test confirm this large gap, which is statistically

significant at the 1% level. In this chapter, we use the natural logarithm of the market value and sales to represent firm size. Earlier literature notes that large firms' cash flows are less volatile because they are well diversified. Therefore, large firms should face less financial distress and, consequently, their target leverage ratio should be higher (Rajan and Zingales, 1995). Hence, we predict that firm size will have a positive influence on success in M&As. The difference in the mean log market values between the SBG and the FBG is positive and significant (0.4543). This implies that the average firm size of successful bidders is larger than that of failed bidders. A potential explanation is that the board of the target company has more incentive to accept a takeover offer from a larger firm (Moeller, et al., 2004).

The proxy for growth opportunity is the market-to-book ratio. As Myers (1977) and Goyal, et al. (2002) suggest, growth opportunity is an indispensable indicator of capital structure and the authors argue that growth opportunity and financial leverage ratio are inversely related. Due to their impact on financial leverage, differences in financial leverage ratios between the SBG and the FBG can induce these two groups of firms to have diverse market-to-book ratios. The SBG firms should exhibit a higher market-to-book ratio than FBG firms. The primary results in Table 3.4 provide evidence to support our hypothesis and the mean market-to-book ratios for the SBG and FBG are 2.9223 and 2.5869, respectively.

Following previous studies, we adopt the ratio of R&D expenses to total assets (R&D/Total Assets) as a proxy for a firm's product uniqueness (Titman and Wessels, 1988). A firm's financial distress will be exacerbated by its product uniqueness, so there will be a negative relation between a firm's target capital structure and product uniqueness. Table 3.4 shows that the average ratio of R&D expenses to total assets is 0.0386 for the SBG and 0.0322 for the FBG. Both the T-test and Wilcoxon test indicate that the difference between the two subsamples is statistically significant. Another proxy for product uniqueness is the ratio of selling expenses to total sales. Firms with higher

selling expenses ratios are expected to produce more specialized products. Consistent with the findings for R&D expenses, we expect to observe a negative relation between the selling expense and financial leverage ratios.

More profitable firms have more free cash flow (Uysal, 2011) and thus prefer to use internal financing rather than debt financing. Therefore, firm profitability and financial leverage are negatively related. In our research, profitability is represented by the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets (TA), or EBITDA/TA. On the other hand, in M&As a more profitable bidder also enjoys several potential advantages. These advantages are able to help bidders successfully acquire their targets at lower prices. Therefore, we expect bidders in the SBG to be more profitable than firms in the FBG. The descriptive results confirm our prediction that the difference in the mean (median) profitability ratio between the two subsamples is statistically significant (P-value 0.0002).

The tangibility of firm assets is another crucial variable for firm capital structure. It is believed that more liquid assets are related to lower bankruptcy costs, which results in a higher financial leverage ratio (Titman and Wessels, 1988). We measure tangibility with the ratio of tangible assets to the value of total assets (Tangible Assets/TA). Table 3.4 shows that the SBG and FBG firms differ markedly in the tangibility of their assets (0.2666 versus 0.3116, respectively).

The variable of interest, the coverage ratio, is used to measure how easily a firm can afford its interest payments to existing debt. The interest coverage ratio is calculated by dividing a firm's earnings before interest, taxes, depreciation, and amortization (EBITDA) by the firm's interest expenses. The interest coverage ratio is also considered an effective indicator of firm capital structure. The lower the ratio, the more seriously the firm is burdened by outstanding debt expenses. This implies that a firm's interest coverage ratio is positively correlated to its potential debt capacity. Not surprisingly, the average interest

coverage ratio for the SBG is 80.099, while that for the FBG is only 22.797. This significantly huge gap indicates that the financial status of successful bidders is much healthier than of failed bidders.

Table 3.4 also presents the average market leverage and the leverage deficit for bidders. We find that the average market leverage of firms in the SBG (0.2863) is significantly lower than that of the firms in the FBG (0.3517), which partially suggests that bidders with low debt levels have an advantage in M&A offers. Similarly, the firms in the SBG seem to have a negative leverage deficit, -0.003 on average, while the FBG firms have a positive leverage deficit of 0.0289. The definition of leverage deficit implies that, generally, successful bidders are underleveraged but failed bidders are overleveraged. Either a T-test or a Wilcoxon test can confirms the significance of the difference between market leverage and leverage deficit.

Table 3.5 presents deal characteristics. Deal value is presented in millions of dollars, while the relative size is the ratio of the market value of target firms to that of the bidding firms. Consistent with the argument of Cosh, et al. (2006), we believe that bidding firms can take advantage of larger firm size to convince target shareholders to accept M&A offers. Thus we expect a positive relation between bidder size and the possibility of success in M&As and a negative relation between relative size and bid success.

Previous M&A research considers the toehold size variable an important factor in bid success. As discussed in the literature review, Burkart (1995), Bulow, et al. (1999), and Ettinger (2009) show that initial shareholdings help bidding firms dominate in the takeover contest. Thus we predict that the probability of M&A offer success will increase with the bidder's toehold size. Omitting bidders without initial shareholdings, Table 3.5 shows that the average toehold size for successful bidders is 27.27%, while that for failed bidders is only 15.15%. The comparison analysis suggests that a successful bidder's mean (median) toehold size is distinctly higher than that of an unsuccessful bidder.

Not surprisingly, the percentage of hostile takeovers in the SBG is much less than in the FBG, consistent with Hoffmeister and Dyl's (1981) findings. The hostility of M&A offers is used as an indicator of managerial resistance. As Ebeid (1975) and Hoffmeister and Dyl (1981) show, managerial resistance is the most important factor in marring the success of M&A offers. There should be a negative relation between the hostility of bids and the success rate. On the other hand, bidders normally resort to a tender offer if they believe a friendly negotiation is not a viable option. Starting in the 1980s, tender offers have been frequently used in acquisitions, especially in hostile takeovers. The SDC's M&A database flags tender offer deals and we construct a dummy variable for it. According to Gaughan (2007), tender offer deals have a much higher possibility of failure compared to other forms of M&As. Consistent with this point of view, our preliminary results show that deals in the SBG are less likely to use tender offers than those in the FBG.

Furthermore, the medium of payment in M&A deals plays a crucial role. Cornu and Isakov (2000) believe that the medium of payment has strong explanatory power for the determinant effects of takeover outcome. Pure cash offers can effectively deter potential competing offers and promote the deal's successful completion. On the contrary, a stock exchange offer would have an adverse effect. The descriptive statistics show that successful bidders obviously put forth more pure cash offers and fewer pure stock exchange offers compared with unsuccessful bidders. The other three variables—one for unsolicited deals, one for poison pill adoption, and one for the appearance of competing offers—all have negative impacts on the completion of takeover proposals. Consistent with our predictions, the differences in all three variables between the two subsamples are highly negative and statistically significant.

3.3.4 Methodology

3.3.4.1 Capital structure measures

As discussed in detail below, we examine how the financial leverage of bidders affects the probability of success in M&As. Tests on the hypotheses require precise measurements of the bidding firm's capital structure. Therefore, the first step in our methodology is the construction of capital structure measures. This chapter uses the firm's leverage deficit level to measure a firm's capital structure. This variable is defined as the difference between a firm's actual and target leverage ratios. Capital structure theories suggest that the target level of financial leverage varies across firms. As Graham and Harvey (2001) report, 81% of firms have their own target debt levels. This finding is consistent with that of Fama and French (2002), who also show that firms justify their financial leverage ratio as moving towards their target level. To calculate a firm's target leverage ratio, we adopt the Tobit regression model, as in previous studies of target capital structure (Kayhan and Titman, 2007; Harford, et al., 2009). Following standard procedure, a firm's actual market leverage ratio is regressed on a group of determinants of capital structure using the Tobit model:

$$MarketLeverage = \beta_0 + \beta_1 Sale + \beta_2 EBITDA/TA + \beta_3 Tangible/TA + \beta_4 RD/TA + \beta_5 RDMiss + \beta_6 SE/Sale + \beta_7 MtB + \beta_8 Cash/TA + \beta_9 MML + \varepsilon \quad (3.1)$$

The predicted value of the regression is considered a firm's target capital structure, which is restricted to between zero and one.

So that we can obtain a more precise estimation of firm target capital structure, the group of determinant variables includes numerous firm-level characteristics, as well as industry- and market-level explanatory variables. To avoid the potential endogeneity problem, we

ensure that the causality runs from the independent variables to the market leverage ratios and the control variables are all lagged.

The firm-level explanatory variables include firm size, profitability, tangibility, growth opportunities, product uniqueness, and cash reserves. As described in the section on variable definitions, the proxy of firm size is the natural logarithm of sales in the prior year. The proxy of profitability is the ratio of EBITDA to total assets. The firm's asset tangibility is represented by the ratio of net property, plant, and equipment to total assets. We use the market-to-book assets ratio to proxy for a firm's growth opportunities. In addition, the ratio of R&D expenses to total assets is used as a proxy for product uniqueness. Since a large portion of firms do not record R&D expenses in the Compustat database, it is necessary to differentiate these observations. As in previous papers, we use a dummy variable to indicate if a firm has no R&D expenses. Another proxy for firm product uniqueness is the ratio of selling expenses to total sales. Lastly, we use the ratio of cash holdings to total assets as a proxy for the corporate status of cash reserves.

To capture the potential impacts of other determinants that are common in a particular industry, our estimation model also includes a group of industry dummies. These industry dummy variables correspond to the 48 classified industries of Fama and French (1997). Moreover, Baker and Wurgler (2002) show that firm managers have potential incentive to time the stock market. Therefore, to control for the market timing effect, our analysis includes the market's median leverage ratio in the same time period.

Since the predictive value of this regression is considered a firm's target leverage ratio, the firm's leverage deficit is calculated as its actual financial leverage minus its target leverage ratio in a given year:

$$LeverageDeficit_{it} = Market\_Leverage_{it} - TargetLeverage_{it} \quad (3.2)$$

Three more capital structure measures are the dummy variables for the status of the bidder's leverage deficit. The dummy variable Overleveraged is set to one if the bidder is overleveraged with a large positive value of leverage deficit and zero otherwise. On the contrary, the dummy variable Underleveraged is set to be one if the bidder is underleveraged with a substantial negative leverage deficit. The target-leveraged dummy is set to be one if the bidder's leverage deficit is not significantly different from zero, which suggests that the firm's financial leverage level depends on its target capital structure.

3.3.4.2 Logistic analysis

To explore the potential relation between a bidder's capital structure and probability of success in M&A offers, we introduce the logistic regression model. Deal outcome is regressed on the leverage measures estimated in the previous step and a group of determinant variables is regressed on the probability of success in takeovers Z_i :

$$P(Success=1) = \beta_0 + \beta_1 LeverageDeficit + \beta_2 MtB + \beta_3 LMV + \beta_4 EBITDA + \beta_5 RSize + \beta_6 MR + \beta_7 Toehold + \beta_8 PoisonPill + \beta_9 Tender + \beta_{10} Unsoli + \beta_{11} StockSwap + \beta_{12} Compete + \varepsilon \quad (3.3)$$

The dependent variable in this logistic model is a binary variable that takes the value of one if the deal is successfully completed and zero otherwise. Our main variable of interest is the financial leverage measure, determined in two different ways. The independent variable Z_i includes a group of explanatory variables that are considered to affect bid success: the bidding firm's market-to-book ratio, managerial resistance, toehold size, relative size, bidder size, appearance of poison pill, tender offer, unsolicited deal, stock exchange deal, and competing bids. The market-to-book variable is the ratio of the bidder's market value of assets to its book value. Managerial resistance is measured by

the hostility of the takeover offer. We construct a dummy variable to indicate whether a deal is hostile or not. The variable toehold size is the percentage of shares initially owned by the bidding firm before the takeover announcement. Relative size is the ratio of the target's market value to the bidder's market value. We use the natural logarithm of the bidding firm's market value to proxy for bidder firm size. Five dummy variables are added into the regression to indicate whether target managers execute poison pills, whether a bidding firm adopts tender offers, whether the offer is an unsolicited deal, whether the medium of payment is pure stock, and whether competing deals exist.

As in the previous step, all accounting variables in the logistic model are lagged to avoid potential endogeneity problems. Another important issue is that, since our research sample covers a long period, from 1980 to 2009, we incorporate a dummy variable for each single year in the empirical analysis to control for potential yearly effects.

3.4 Empirical results

3.4.1 Estimation of leverage deficit

This section examines the determinants of target capital structure and determines a firm's deviation from its target level. Table 3.6 presents the coefficient estimates of the target leverage ratio from Tobit model regressions. The results are highly consistent with the findings of capital structure previous research (Harford, et al. 2009). As we predicted, the estimate of log sales is positive (0.0181) and statistically significant (P-value at 0.0001). Similarly, the influence of asset tangibility on target leverage ratio is also positive (0.0759) and highly significant. Moreover, the coefficient of the market's median leverage is 0.3707 and statistically significant at the 1% level. This implies that a firm's target leverage ratio fluctuates with market conditions. In contrast, the estimate of a firm's profitability ratio is -0.3495, with a P-value of 0.0001. More profitable firms are more likely to reduce their outstanding debt levels. Consistent with our predictions, the

variables for the R&D expense ratio and selling expense ratio are both negative (-0.1819 and -0.0079, respectively), with a significant impact on target capital structure. The estimate of the missing R&D dummy is positive and significant, which further confirms the impact of R&D expenses. Furthermore, the empirical evidence suggests that a firm's market-to-book and cash reserve ratios are both negatively related to its target leverage ratio.

Following the methodology introduced previously, we obtain the leverage deficit of each firm in a given year. To further classify a firm as overleveraged, underleveraged, or not leveraged, the entire sample is divided into three sections denoting underleveraged firms (Q1), target-leveraged firms (Q2), and overleveraged firms (Q3). Table 3.7 presents the descriptive statistics of the firm and deal characteristics for each group and the comparison results between Q1 and Q3 firms. It clearly shows that the average leverage deficit of Q1 is -0.1501 and statistically significant and that of Q3 is 0.1626 and also statistically significant. On the contrary, the average leverage deficit of Q2 is only -0.0165 and insignificantly different from zero. This finding implies that the firms in Q1 are generally underleveraged, since their actual financial leverages are significantly under their target levels. On the other hand, the firms in Q3 are considered overleveraged, since their average leverage deficit is significantly larger than zero. However, this finding suggests that firms in Q2 are neither overleveraged nor underleveraged, since their leverage deficits are not significantly different from zero.

The variables for market value and total sales in Table 3.7 are a proxy for firm size. The table shows that the average size of Q2 firms is larger than that of the firms in the two other sections, but the differences are insignificant. The firm sizes of overleveraged and underleveraged firms do not differ from each other since the differences between Q1 and Q3 are mixed and insignificant. Moreover, the average market-to-book ratio of Q2 firms (3.3139) is significantly higher than for the other two sections, whose values are very close to each other (2.6974 and 2.7032). As for the market-to-book ratio, both the average

ratio of R&D expenses to total assets and the profitability ratio for Q2 firms are slightly higher than for other firms. On the other hand, the mean (median) asset tangibility of Q2 firms is lower than for both overleveraged and underleveraged firms. The results also indicate that Q2 firms hold more cash reserves. Another interesting finding is that the average interest coverage ratio of firms decreases dramatically with the order of the sections (from 135.31 to 17.539). Consistent with our predictions, underleveraged firms should have a higher interest coverage ratio and overleveraged firms will suffer more serious financial constraints from outstanding debt levels. To sum up, the accounting performance of Q2 firms is generally distinguishable from that of firms in the other two sections. However, the differences in variables between the underleveraged and overleveraged firms are mostly insignificant, except for the interest coverage ratio.

The deal characteristics in Table 3.7 show that the average value of deals made by Q2 firms is the largest of the three sections. The differences in deal value between the underleveraged and overleveraged bidders are statistically significant for the mean, but become insignificant for the median values. However, the average relative size ratio of Q2 firms is significantly lower than for the other firms. The toehold sizes of the firms in all sections are not remarkably differentiated and are around 25%, on average. Interestingly, the probabilities of making hostile, unsolicited offers and using a tender offer approach all generally increase with the order of the sections. The evidence suggests that underleveraged bidders are less likely to make hostile, unsolicited M&A offers with a tender offer approach. It also suggests that the payment media used by bidders in each section are not significantly different, whether pure cash or pure stock payments. Another important finding is that the occurrence of competing bids is much less likely for underleveraged initial bidders than for overleveraged bidders.

3.4.2 General logistic analysis

Table 3.8 reports the results of logistic analysis to investigate the determinants of a bidding firm's capital structure that affect the probability of success in M&As. We use the measure for leverage deficit and three dummy variables to represent the status of the bidder's capital structure. In the first column for model 1, we find that the estimate for leverage deficit is -1.1076 and the P-value is less than 0.01. This result is strongly consistent with our main prediction, which implies that the bidding firm's capital structure should have a great impact on the possibility of offer success. It also provides reliable evidence to support the major prediction of Morellec and Zhdanov's (2008) dynamic theoretical model. To further specify the effects of leverage deficit, the results for leverage deficit dummies are presented in the remaining columns of Table 3.8. The estimates for overleveraged and target-leveraged dummies are -0.3006 and 0.2462, respectively, both significant at the 1% confidence level. This suggests that overleveraged bidders present a significantly lower probability of takeover success on average, while target-leveraged bidders have much better outcomes. However, the estimate for the underleveraged dummy is 0.0922 and is statistically insignificant (P-value at 0.2306). This empirical finding shows that the inverse relation between leverage deficit and takeover success is mainly driven by overleveraged and target-leveraged bidders rather than by underleveraged bidders.

The estimates for the control variable market-to-book ratio are consistent across different estimation models. In model 1, the coefficient of the market-to-book ratio is positive (0.0633) and statistically significant (0.0021). Consistent with our prediction, firms with higher growth opportunity are more likely to successfully complete their takeover offers. In line with Ebeid (1975) and Hoffmeister and Dyl (1981), we find strong and robust evidence to indicate that managerial resistance has a negative effect on takeover success. In Table 3.8, the estimates for managerial resistance dummy are conformably negative (around -1.6) and statistically significant at the 1% confidence level. This result does not

vary for different regression models. Therefore, we argue that managerial resistance should be considered an important explanatory variable for M&A success.

The roles of the dummy variables for unsolicited and stock swap deals are similar to that of managerial resistance. The two explanatory variables have a negative influence on the probability of success in M&As. The estimates for the unsolicited deal dummy are consistently around -2.7, with a P-value less than 0.01 in all models. Normally, bidding firms propose unsolicited takeovers if their managers believe that negotiations cannot achieve their desired outcomes. Our empirical evidence suggests that this may not be a good choice, since it will arouse resistance from target managers and reduce the probability of deal completion. Similarly, as Cornu and Isakov (2000) suggest, M&A offers using stock swap payments are much more likely to be rejected by target shareholders, who have a greater tendency to accept cash offers rather than stock offers. Consistent with the authors' argument, the estimates for stock swap dummies are all approximately -1 and statistically significant at the 1% confidence level in Table 3.8. Moreover, our finding suggests that the existence of competing bids also has a strongly negative impact on the success of M&A offers. It shows that the coefficients of competing deal dummies are over -2.76 and statistically significant. Moreover, the existence of competing deals will naturally depress a bidder's probability of success. The estimates for the competing deal dummy are consistently negative and significant among the four regression models.

On the positive side, the estimates for the variable Log of Market Value are positive, around 0.1, and statistically significant. This result holds in all four models. This evidence is consistent with our prediction that a larger bidding firm has advantages in M&As. The managers and shareholders of target firms have more incentive to agree with an offer from a large bidder than from a small bidder. The potential explanation is that large firms usually have better reputation and longer history and are able to provide a much brighter and more reliable prospect for the new merging firm following the successful completion

of takeovers. Another two control variables that have a positive impact on takeover success are bidding firm profitability and a tender offer dummy. The coefficient of the profitability variable in the model 1 is 0.9013 and statistically significant at the 1% level (P-value 0.0001). In the other three models, though the coefficients are slightly lower, around 0.8, they are still statistically significant. These results indicate that profitable bidders are more likely to be successful. Moreover, the estimates for the tender offer dummy are all significant (nearly 0.7) and statistically significant in all regression models.

Certain control variables are insignificant in the estimation regressions. The estimates for the variables Toehold Size, Relative Size, and Poison Pill Dummy are statistically insignificant, although some of them are marginal. These findings imply that, to some extent, these three factors do not have a considerably large impact on M&A success.

The pseudo-R-squared values for all models are over 0.22 and indicate that our cross-sectional logistic analysis provides relatively credible evidence to explain takeover outcomes.

3.4.3 Interaction analysis

From the empirical evidence of the models in Table 3.8, we find that bidder financial leverage has a significant impact on the probability of takeover success. In Table 3.9, we further examine whether in takeover deals with more than one bidder, which we call competing deals, the effect of the bidder's capital structure is enhanced or weakened. Therefore, besides the measure for capital structure, the interaction variable of capital structure measures multiplied by the competing deal dummy is added to the regression model as an independent variable. The regression model is as following:

$$P(Success=1)=\beta_0+\beta_1 LeverageDeficit+\beta_2 LD*Compete+\beta_3 MtB+\beta_4 LMV+\beta_5 EBITDA+\beta_6 RSize$$
$$+\beta_7 MR+\beta_8 Toehold+\beta_9 PoisonPill+\beta_{10} Tender+\beta_{11} Unsoli+\beta_{12} StockSwap+\beta_{13} Compete+\varepsilon$$

(3.4)

Consistent with the empirical results in our general analysis section, the estimate for the bidder's leverage deficit measure is negative, which exceeds the -1 and is statistically significant at the 1% confidence level. For leverage deficit dummies, the estimates are identical to the results in Table 3.8. However, the estimates for the interaction term are statistically insignificant as an explanatory variable. This finding implies that the influence of the bidder's capital structure is not significantly different in competing deals from that in takeover deals with a single bidder.

Moreover, the estimates for the other control variables are similar to those in Table 3.8. The variables for the market-to-book ratio, firm size, bidding firm profitability, and the adoption of a tender offer strategy significantly increase the probability of offer success. On the contrary, the estimates for the managerial resistance dummy, the unsolicited deal dummy, and the stock swap dummy are consistently negative and significant at the 1% confidence level. Finally, the Toehold Size, Relative Size, and Poison Pill dummy variables are statistically insignificant, as before.

3.4.4 Payment analysis

This part of the analysis divides the entire sample into three categories according to different payment media, namely, pure cash payments, pure stock payments, and mixed payments. As Cornu and Isakov (2000) argue, the medium of payment strongly determines the outcome of takeover offers. To explore the distortion effect of the medium of payment on the relation between bidder capital structure and M&A offer success, the empirical results are presented in Table 3.10.

Panel A of Table 3.10 shows the logistic analysis results for M&A deals using only cash as the offer payment. It shows that though the estimate for the leverage deficit measure is negative (-0.4186), it is statistically insignificant in the first model (P-value 0.4443). This result suggests that in pure cash deals, the effect of the bidder's capital structure is weaker and even null. But the estimates for the deficit status dummies are significantly different. The overleveraged dummy's coefficient is 0.0232 and insignificant (P-value 0.8925). Consistently, the target-leveraged bidder presents a higher possibility of takeover success, even in pure cash deals, since its estimate is 0.3185 and significant at the 10% level. However, the estimate for the underleveraged dummy is negative (-0.3085) and statistically significant (P-value 0.0627). This finding is inconsistent with our statement that underleveraged bidders have advantages in pure cash takeovers. The evidence shows that the cash reserve of underleveraged bidders is the lowest, on average, compared to the other two groups. To contrast, target-leveraged bidders have much higher cash reserves. Another potential reason is that the profitability of target-leveraged bidders is much greater than that of underleveraged bidders, on average

The results for the other control variables are also slightly different. The estimates for the market-to-book ratio become insignificant in all models. Similarly, neither of the variables for the log of the market value or the profitability ratio is statistically significant as before. These changes are consistent in all four regressions. On the other hand, in Panel A of Table 3.10, we find that the estimates for relative size and toehold size are both negative and statistically significant. In line with our prediction, the relative size of the target to that of the bidder should have a negative impact on takeover success. Contrary to our expectations, the variable for toehold size, which is supposed to increase with the probability of offer success, presents persistently negative and significant explanatory power in the logistic analysis. In contrast, the role of the control variables Managerial Resistance dummy, Tender Offer dummy, Unsolicited Deal dummy, and Competing Deal dummy do not change from the previous analysis.

Panel B of Table 3.10 presents the analysis results for deals using pure stock payments. Unlike pure cash deals, the estimate for the bidding firms' leverage deficit is negative (-0.8919) and statistically significant (P-value 0.0549). Although the negative effects are slightly weaker compared to the whole-sample results, bidding firm financial leverage still plays a remarkably negative role in takeover success for pure stock payment deals. The estimates for the status dummies are insignificant for both overleveraged and target-leveraged bidders but positive (0.2789) and statistically significant (P-value 0.0804) for underleveraged bidders. This result shows that the effect of underleverage in pure stock deals is opposite to that in pure cash deals.

In general, the performance of the control variables is close to that in the whole-sample analysis. The variables that proxy for bidder firm size and growth opportunity are both positively related to the probability of takeover success. On the other hand, competing and unsolicited deals has strongly negative effects on final outcome. Our analysis also finds that the other control variables do not have significant explanatory power for the successful completion of pure stock deals.

Panel C of Table 3.10 shows the empirical findings for M&A offers using mixed payments. Similar to the results of the full sample, the coefficient of the bidder's leverage deficit is negative (-1.4467) and highly significant at the 1% confidence level. In particular, the effect of bidder financial leverage is the strongest in mixed payment deals rather than in deals using other payment media. Furthermore, the performance of leverage deficit dummies is also close to that in the full-sample results, but slightly stronger. Overleveraged bidders present a much lower probability of success, while target-leveraged bidders have a significantly higher probability of success. Two control variables, the profitability ratio and the tender offer dummy, become positive and significant estimates in the regressions, but the effect of the tender offer dummy is marginal (P-value 0.0854). On the contrary, the relative size variable, the managerial resistance dummy, the unsolicited deal dummy, and the competing deal dummy all have

strongly negative and statistically significant explanatory power for the dependent variables in the regression. The estimates for the remaining control variables in Panel C are insignificant in the regression results.

3.4.5 Bid premium analysis

Since we investigate the relation between a bidding firm's financial leverage and its possibility of success in a takeover through different model constructions and subsamples, we now explore a potential explanation for the inverse relation of financial leverage with the successful completion of M&A deals. In accordance with the theoretical model of Morellec and Zhdanov (2008), we generally believe that a bidding firm's financial leverage has a strong impact on the offer premium and consequently influences M&A offer success. Therefore, the regression models are constructed so that the bid premium is regressed on leverage measures and a group of control variables. To construct the bid premium variables, we divide the offer price to target shareholders by the target share price four weeks prior to the takeover announcement date. Following previous premium study, the bid premium variable is truncated between zero and 200% (Officer, 2003). Our control variables include both bidder and M&A deal characteristics. Similar to previous logistic analysis, the yearly effects on each regression model are controlled for by a group of yearly dummy variables. Following is the regression model:

$$4WPREMIUM = \beta_0 + \beta_1 LeverageDeficit + \beta_2 MtB + \beta_3 LMV + \beta_4 EBITDA + \beta_5 RSize + \beta_6 MR + \beta_7 Toehold + \beta_8 Tender + \beta_9 Unsoli + \beta_{10} Compete + \varepsilon \quad (3.5)$$

Table 3.11 reports the empirical results for the full sample. Due to the data availability of variable bid premiums, the number of observations is 2548, which is much lower than in the previous part of the analysis. The reason is that we are able to obtain bid premium

data only for deals acquiring public targets. Deals acquiring private or subsidiary targets failed to provide bid premium information in the SDC M&A database.

When bidder capital structure is measured by financial deficit, the estimate is negative (-8.8835) but marginally insignificant (P-value 0.1749). However, the effect of leverage deficit on bid premiums becomes clearer when it is measured by status dummies. Specifically, the estimate for the overleveraged bidder dummy is -4.5503 and statistically significant at the 1% confidence level. But the estimate for the underleveraged bidder dummy is statistically insignificant (P-value 0.8334). On the other hand, the estimate for target-leveraged bidders becomes positive (4.8214) and significant (P-value 0.0157). Consistent with our prediction, the empirical evidence implies that overleveraged bidders pay 4.55% lower bid premiums on average, which may induce them to fail in M&As, while target-leveraged bidders pay, on average, 4.82% higher premiums. These findings are in line with the negative influence of bidder capital structure on the probability of takeover success in the above discussions. Therefore, we conclude that the relation between bid premiums and bidder financial leverage is a reliable explanation for our main argument.

The bid premiums are also affected by several control variables. Regarding firm characteristics, as we predicted, the estimates for the variable market-to-book ratio are consistently positive and significant in all four models. This finding suggests that bidders with higher growth opportunities will pay higher premiums. In contrast, the estimates for firm size are all negative, over -2, and significant at the 1% confidence level. Large bidders will pay lower premiums, since they already have other advantages in M&As. The effects of bidder profitability and the relative size between the target and bidder are insignificant in our regressions. In relation to deal characteristics, although the coefficients of both managerial resistance and unsolicited deal dummies are positive, their explanatory powers are insignificant. The estimates for toehold size are negative and significant. The potential reason may be the same as for firm size: Bidders with large

initial shareholdings believe they already have sufficient advantages to complete the deal and therefore do not have an incentive to pay higher premiums. Consistent with our prediction, the evidence suggests that bid premiums increase remarkably for a tender offer strategy and competing bids. Their estimates are highly positive and statistically significant.

As the previous section shows, the relation between bidder financial leverage and takeover success varies with different payment media. Therefore, we further investigate the relation between bid premium and bidder capital structure for different payment media. Table 3.12 reports the results based on leverage deficit. In the analysis using the pure cash subsample, the result is significantly different from that for the full sample. The estimate of the leverage deficit is -4.2221 and statistically insignificant (P-value 0.6809), which indicates that the relation between bidder capital structure and bid premiums in pure cash deals is insignificant. This finding is in line with previous results, where bidder financial leverage has no impact on takeover success in pure cash deals. Moreover, the effects of the bidder's market-to-book ratio and firm size also turn out to be insignificant in pure cash deals. However, unlike the full-sample results, the estimate for the bidder's profitability ratio is highly positive (27.728) and statistically significant (P-value 0.0764). This change implies that profitable bidders have a strong incentive and ability to pay higher premiums to acquire their targets. The performance of the toehold size variable, the tender offer dummy, the unsolicited deal dummy, and the competing deal dummy are the same as in the full-sample results.

The empirical results of pure stock deals are distinctly different. The estimate for the leverage deficit is -27.723 and significant at the 5% confidence level, which suggests that bidder capital structure affects the premiums paid to target shareholders strongly. This finding could explain our finding that bidders with higher financial deficit are less likely to successfully complete their M&A deals. Most of the control variables yield insignificant estimations in this model, except for the bidder's market-to-book ratio and

firm size. Consistent with the whole-sample analysis, the bidder's market-to-book ratio generally increases with bid premiums, while firm size decreases.

For mixed payment deals, the bidder's leverage deficit variable displays very weak explanatory power in the regression model (P-value 0.9161). This finding is inconsistent with our prediction, since empirical evidence already proves that the bidder's leverage deficit is negatively related to the probability of success in deals using mixed payments. It is therefore necessary to further explore the potential explanation for this result.

In conclusion, the empirical evidence suggests a significant relation between bidder capital structure and bid premiums to target shareholders. The bidder's leverage deficit level has a significantly negative impact on its offer premiums. Especially in M&A deals with pure stock payments, overleveraged bidders pay remarkably lower bid premiums. In conjunction with our previous findings, we believe this could be a reliable explanation for the negative relation between bidder financial leverage and the probability of success in M&A offers.

3.5 Conclusion

This chapter analyses the relation between bidding firms capital structure and the outcome of takeover deals based on a sample of 19,203 US M&A offers during 1980–2009. Adopting a measure of the financial leverage (Leverage Deficit) and three leverage status dummies (Overleveraged Bidder Dummy, Target-leveraged Bidder Dummy and Underleveraged Bidder Dummy), we choose both a Tobit regression model and a logistic regression model for analysis. We find strong and consistent evidence that a bidder's financial leverage is negatively correlated with the probability of success in M&A offers. We also identify several determinant factors that also provide explanatory power for takeover success. This finding suggests that the probability of offer success significantly increases with a bidder's firm size, growth opportunity, profitability, and

adoption of a tender offer strategy. On the other hand, bidding firms are less likely to successfully complete their deals in the presence of managerial resistance and competing bids. If bidders choose to propose unsolicited M&A offers with pure stock swap payments, the possibilities of successful completion are also dramatically reduced. By including the interaction variable that is the leverage measure multiplied by the competing deal dummy in the analysis, we suggest that the negative impact of the bidding firm's capital structure is neither enhanced nor weakened in takeover deals in the presence of competing bidders.

We further explore the relation between bidder financial leverage and takeovers in three subsamples categorized by different payment media in M&A deals: pure cash payments, pure stock payments, and mixed payments. The empirical evidence suggests that the effects of bidder capital structure are distinctly different for each subsample. It shows that the negative impact from a bidder's financial leverage level still holds in deals with pure stock payments or mixed payments. However, it becomes statistically insignificant in deals with pure cash payments, since all three financial leverage measures yield insignificant estimates in the analysis.

To investigate the rationale behind this inverse relation, the offer premiums proposed by bidding firms are regressed on their financial leverage measures and a group of control variables. The empirical results show that leverage deficit has a negative impact on bid premiums, although its estimate is statistically insignificant. However, when bidding firms are classified by their leverage deficit levels, the results are more explicit. They show that the overleveraged bidder dummy presents strong and negative explanatory power for bid premiums, while the underleveraged bidder dummy has an insignificant estimate. Target-leveraged bidders significantly improve their premiums. These findings indicate that the negative relation between leverage deficit and bid premiums is mainly driven by overleveraged and target-leveraged bidders rather than by underleveraged bidders. Furthermore, the results also suggest that the bid premiums significantly decrease

with bidder firm size and toehold size. In contrast, bidders with good growth opportunities are willing to pay more premiums to target shareholders in M&A deals with tender offers. The existence of competing bids also encourages increases in bid premiums.

This chapter's main contribution is that it provides comprehensive empirical evidence for the relation between bidder capital structure and the probability of success in M&A offers. Our findings further strengthen the importance of capital structure in M&A research. This chapter also provides reliable explanations for the main argument, which is related to bid premiums. However, evidence about deals using mixed payments is still inconclusive and requires further study.

Table 3.1 Sample Selection

This table presents the sample selection process for research. The Merger & Acquisition data is from Securities Data Corporation (SDC) M&A Database. The accounting data is from COMPUSTAT Database. The stock price data is from CRSP database.

Selection Criteria		Size
Acquirer Nation	United States of America	268174
Date Announced	01/01/1980 to 12/31/2009	243694
Acquirer Public Status	Public	132412
Deal Value	Larger than $1 Million	70780
Deal Status	Completed or Withdraw	52266
Firm Industry	Exclude Finance and Utility Firms	37388
Deal Type	Exclude Other M&A	33319
Accounting and Share Price Data Availability	Exclude Unmatched Deals	19203

Table 3.2 Yearly M&A Deals

This table presents a sample of deals with US Bidders in each year from 1980 to 2009. The number of M&A deals includes both successful and fail deals, but excludes pending deals. As the sample includes both US target and Non-US target, this table presents the numbers of domestic deals and foreign deals separately. It also reports the sum, mean and median of deal value for all deals. If a deal is paid by 100% cash, it is considered to be pure cash deal, and same way for pure stock deal. The percent of pure cash is the percentage of pure cash deals divided by total number of deals in each year, same for percent of pure stock deal.

Deal Number	Success Deal	Fail Deal	Domestic Deal	Foreign Deal	Sum Deal Value	Mean Deal Value	Median Deal Value	Percent of Pure Cash	Percent of Pure
22	20	2	22	0	6909.48	314.07	169.77	13.64	4.55
125	107	18	125	0	45309.22	362.47	37.50	4.80	2.40
161	138	23	161	0	15660.78	97.27	15.50	0.00	0.00
213	194	19	213	0	12810.17	60.14	13.10	0.94	0.00
239	221	18	236	3	30253.77	126.58	15.00	4.18	0.42
100	92	8	95	5	24434.07	244.34	50.50	40.00	15.00
166	148	18	156	10	32728.07	197.16	46.09	27.71	15.06
138	124	14	124	14	27522.87	199.44	46.00	34.78	10.14
187	155	32	170	17	49773.05	266.17	50.00	35.29	8.02
350	313	37	294	56	70546.64	201.56	24.50	28.00	12.57
358	333	25	307	51	32864.10	91.80	13.00	23.74	14.81
404	368	36	346	58	22428.51	55.52	12.50	21.29	18.32
515	482	33	436	79	31123.77	60.43	11.50	20.00	18.45
628	587	41	558	70	53141.85	84.62	14.69	22.61	19.75
831	773	58	718	113	84282.45	101.42	15.09	24.07	17.21
962	894	68	814	148	125696.8	130.66	18.88	21.73	22.56

Table 3.2 – Continued from Previous Page

Deal Number	Success Deal	Fail Deal	Domestic Deal	Foreign Deal	Sum Deal Value	Mean Deal Value	Median Deal Value	Percent of Pure Cash	Percent of Pure
1144	1086	58	972	172	201272.4	175.94	23.13	20.54%	21.77%
1449	1373	76	1219	230	260104.2	179.51	20.64	21.05%	17.39%
1436	1378	58	1174	262	327613.9	228.14	24.00	22.49%	16.64%
1222	1171	51	991	231	315376.9	258.08	28.95	25.21%	17.10%
995	945	50	806	189	330284.6	331.94	36.00	25.53%	19.79%
884	844	40	719	165	230741.8	261.02	33.92	27.04%	16.74%
813	786	27	667	146	101255.3	124.55	30.00	36.53%	8.12%
797	769	28	657	140	103506.1	129.87	32.00	33.88%	8.03%
940	913	27	739	201	307591.9	327.23	39.02	38.94%	6.28%
933	915	18	730	203	357368.6	383.03	36.53	41.81%	5.04%
977	946	31	773	204	474877.8	486.06	44.00	43.91%	4.40%
941	915	26	740	201	348094.8	369.92	45.00	44.42%	2.66%
729	688	41	574	155	268138.9	367.82	42.00	42.11%	3.98%
544	526	18	410	134	322701.7	593.20	40.00	38.05%	6.62%

Table 3.3 Year Target Type

This table presents different types of target in each year, including the number of public target, private target and subsidiaries. We further present the percentage of each type over total number of deals.

Year	Deal Number	Public Target	Private Target	Subsidiary Target	Percent of Public	Percent of Private	Percent of Subsidiary
1980	22	7	11	4	31.82%	50.00%	18.18%
1981	125	42	61	22	33.60%	48.80%	17.60%
1982	161	44	78	38	27.33%	48.45%	23.60%
1983	213	36	109	67	16.90%	51.17%	31.46%
1984	239	52	99	88	21.76%	41.42%	36.82%
1985	100	48	17	35	48.00%	17.00%	35.00%
1986	166	53	52	61	31.93%	31.33%	36.75%
1987	138	60	28	50	43.48%	20.29%	36.23%
1988	187	83	40	61	44.39%	21.39%	32.62%
1989	350	99	105	143	28.29%	30.00%	40.86%
1990	358	75	129	150	20.95%	36.03%	41.90%
1991	404	80	165	154	19.80%	40.84%	38.12%
1992	515	81	230	198	15.73%	44.66%	38.45%
1993	628	100	270	254	15.92%	42.99%	40.45%
1994	831	158	370	291	19.01%	44.52%	35.02%
1995	962	218	451	286	22.66%	46.88%	29.73%
1996	1144	215	551	371	18.79%	48.16%	32.43%
1997	1449	248	749	438	17.12%	51.69%	30.23%
1998	1436	273	743	410	19.01%	51.74%	28.55%
1999	1222	255	593	366	20.87%	48.53%	29.95%
2000	995	207	480	296	20.81%	48.24%	29.75%
2001	884	195	362	314	22.06%	40.95%	35.52%
2002	813	117	380	309	14.39%	46.74%	38.01%
2003	797	131	367	290	16.44%	46.05%	36.39%
2004	940	130	509	297	13.83%	54.15%	31.59%
2005	933	134	478	309	14.36%	51.23%	33.12%
2006	977	153	506	311	15.66%	51.79%	31.83%
2007	941	127	514	296	13.50%	54.62%	31.46%
2008	729	124	371	225	17.01%	50.89%	30.86%
2009	544	107	247	184	19.67%	45.41%	33.82%

Table 3.4 Descriptive Statistics for Acquirers

This table presents firm characteristics for bidders from 1980 to 2009. It includes the results for the full sample and two subsamples which are classified by deal status, successful or failed. It reports the number of observation, mean and median value for each variable. The variable Market Value is the bidder's market value of total assets. The Sales is the total sales of given year. The Market-to-Book ratio is the market value divided by the book value of total assets. R&D/TA represents expenses in research and development (R&D) over total assets. EBITDA/TA is the ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) over total assets. Tangible Asset/TA is defined as the ratio of net property, plant, and equipment over total assets. Interest Coverage is the ratio of EBITDA over yearly interest expense. Cash/AT is the ratio of cash reserves over total assets. Market Leverage is the ratio of book debt to market value of assets. This table also presents the results of T-test and Wilcoxon test for the mean and median value of differences. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Descriptive Statistics for Firm Characteristics													
Variable	Full Sample			Successful Deal			Failed Deal			Difference (Success - Failed)			
	Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	Mean	Median	T-test	Wilcoxon Test
Market Value	19203	7943.5	691.26	18204	8108.7	699.79	999	4933.7	513.07	3175.1***	186.72***	0.0001	0.0038
Sales	19203	3299.3	325.50	18204	3339.2	328.28	999	2570.5	272.68	768.80***	55.600***	0.0057	0.0021
Market to Book Ratio	19203	2.9048	2.3624	18204	2.9223	2.3755	999	2.5869	2.1351	0.3353***	0.2404***	0.0001	0.0001
R&D/TA	19203	0.0383	0.0007	18204	0.0386	0.0012	999	0.0322	0.0000	0.0064**	0.0012***	0.0158	0.0010
EBITDA/TA	19203	0.1187	0.1340	18204	0.1199	0.1346	999	0.0948	0.1229	0.0251***	0.0117***	0.0002	0.0002
Tangible Asset/AT	19203	0.2689	0.1967	18204	0.2666	0.1942	999	0.3116	0.2485	-0.0450***	-0.0543***	0.0001	0.0001
Interest Coverage	16943	77.002	8.0597	16027	80.099	8.2311	916	22.797	5.9409	57.303***	2.2902***	0.0001	0.0001
Selling Expense/Sales	19203	0.3304	0.2176	18204	0.3283	0.2185	999	0.3692	0.1952	-0.0409	0.0233***	0.4076	0.0025
Cash/AT	19203	0.1154	0.0588	18204	0.1163	0.0597	999	0.1001	0.0469	0.0163***	0.0128***	0.0003	0.0001
Market Leverage	19203	0.2897	0.2581	18204	0.2863	0.2549	999	0.3517	0.3294	-0.0654***	-0.0745***	0.0001	0.0001
Leverage Deficit	19203	-0.0014	-0.0169	18204	-0.003	-0.0181	999	0.0289	0.0114	-0.0319***	-0.0295***	0.0001	0.0006

Table 3.5 Descriptive Statistics for Deal

This table presents deal characteristics from 1980 to 2009. It includes the results for the full sample and two subsamples which are classified by deal status, successful or failed. It reports the number of observation, mean and median value for each variable. The variable Deal value is the value recorded in SDC Database. Relative Size is the total value of target over acquirers. Toehold Size is the percentage of common shares held by the acquirers before takeover. Hostile Deal is the percentage of hostile takeovers in each sample. Tender Offer is the percentage of acquirers using tender offers. Pure Cash is the percentage of deals paid 100% by cash. Pure Stock is the percentage of deals paid 100% by stock. Unsolicited Deal is the percentage of deals where acquirers make the offer without prior negotiations. Poison Pill is the percentage of targets using poison pill defences. Competing Deal is the percentage of deals in which more than one bidder is involved in a target. This table also presents the results of T-test and Wilcoxon test for the mean and median value of differences. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Descriptive Statistics for Deal Characteristics

Variable	Full Sample			Successful Deal			Failed Deal			Difference (Success - Failed)			
	Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	Mean	Median	T-test	Wilcoxon Test
Deal Value	19203	240.29	27.000	18204	214.56	25.5	999	709.22	70.62	-494.66***	-45.12***	0.0001	0.0001
Relative Size	19203	0.1766	0.0471	18204	0.1583	0.0443	999	0.5098	0.1941	-0.3515***	-0.1498***	0.0001	0.0001
Toehold Size	630	25.70%	20.00%	548	27.27%	21.73%	82	15.15%	9.12%	12.12%***	12.61%***	0.0001	0.0001

	Obs.	Mean	Obs.	Mean	Obs.	Mean	Mean	T-test
Hostile Deal	172	0.90%	67	0.37%	105	10.51%	-10.14%***	0.0001
Tender Offer	916	4.77%	802	4.41%	114	11.41%	-7.01%***	0.0001
Pure Cash	5492	28.60%	5258	28.88%	234	23.42%	5.46%***	0.0001
Pure Stock	2487	12.95%	2235	12.28%	252	25.23%	-12.95%***	0.0001
Unsolicited Deal	257	1.34%	93	0.51%	164	16.42%	-15.91%***	0.0001
Poison Pill	56	0.29%	22	0.12%	34	3.40%	-3.28%***	0.0001

Table 3.6 Tobit Model for Target Leverage Estimation

This table presents the Tobit estimates of target leverage ratio for each bidder. The dependent variable is the market leverage ratio of bidder. The independent variable Log of Sales is the natural logarithm of firm's total sales. The EBITDA/TA is EBITDA over total assets. Tangible Asset/TA is defined as the ratio of net property, plant, and equipment over total assets. R&D/TA is the ratio of R&D expense over total assets. R&D Miss Dummy is the dummy variable of firm which has no R&D expense in database. Selling Expense/Sales is the ratio of selling expense over total sales. Market to Book ratio is the ratio of market value over book value of total assets. Cash/TA is the ratio of cash reserves over total assets. Market Median Leverage is the median value of all firms' market leverage in market in a given year. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

$$MarketLeverage = \beta_0 + \beta_1 Sale + \beta_2 EBITDA/TA + \beta_3 Tangible/TA + \beta_4 RD/TA + \beta_5 RDMiss + \beta_6 SE/Sale + \beta_7 MtB + \beta_8 Cash/TA + \beta_9 MML + \varepsilon$$

	Market Leverage		
Variable	Coefficient	Standard Error	P-Value
Intercept	0.2317***	0.0227	0.0001
Log of Sales	0.0181***	0.0006	0.0001
EBITDA/TA	-0.3495***	0.0091	0.0001
Tangible Asset/TA	0.0759***	0.0071	0.0001
R&D/TA	-0.1819***	0.0197	0.0001
R&D Miss Dummy	0.0465***	0.0033	0.0001
Selling Expense/Sales	-0.0079***	0.0010	0.0001
Market to Book Ratio	-0.0326***	0.0006	0.0001
Cash/TA	-0.2473***	0.0090	0.0001
Market Median Leverage	0.3707***	0.0192	0.0001

Table 3.7 Descriptive Statistics for Leverage Deficit Trisections

This table shows the mean and median value of variables for each trisection of the full sample grouped by leverage deficit. The results of T-test and Wilcoxon test for the difference of mean and median value between Q1 and Q3 are also presented. The variable Leverage Deficit is the deviation of firm's actual leverage from its target leverage level. The variable Market Value is the bidder's market value of total assets. The Sales is the total sales of given year. The Market-to-Book ratio is the market value divided by the book value of total assets. R&D/TA represents expenses in research and development (R&D) over total assets. EBITDA/TA is the ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) over total assets. Tangible Asset/TA is defined as the ratio of net property, plant, and equipment over total assets. Interest Coverage is the ratio of EBITDA over yearly interest expense. Cash/AT is the ratio of cash reserves over total assets. Deal value is the value recorded in SDC Database. Relative Size is the total value of target over acquirers. Toehold Size is the percentage of common shares held by the acquirers before takeover. Hostile Deal is the percentage of hostile takeovers in each sample. Tender Offer is the percentage of acquirers using tender offers. Pure Cash is the percentage of deals paid 100% by cash. Pure Stock is the percentage of deals paid 100% by stock. Unsolicited Deal is the percentage of deals where acquirers make the offer without prior negotiations. Poison Pill is the percentage of targets using poison pill defences. Competing Deal is the percentage of deals in which more than one bidder is involved in a target. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Table 3.7 – Continued from Previous Page

Variable	Q1		Q2		Q3		Difference (Q1-Q3)			
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	T-test	Wilcoxon Test
Leverage Deficit	-0.1501	-0.1377	-0.0165	-0.0169	0.1626	0.1301	-0.3127***	-0.2678***	0.0001	0.0001
Market Value	8638.6	645.68	8490.6	910.94	6701.5	578.96	1937.1***	66.720**	0.0023	0.0174
Sales	3219.8	265.81	3502.7	383.11	3175.3	348.57	44.500	-82.760***	0.8535	0.0001
Market to Book Ratio	2.6974	2.4301	3.3139	2.7385	2.7032	1.9044	-0.0058	0.5257***	0.8571	0.0001
R&D/TA	0.0338	0.0000	0.0467	0.0147	0.0343	0.0000	-0.0005	0.0000	0.7016	0.1585
EBITDA/TA	0.1106	0.1436	0.1370	0.1499	0.1084	0.1158	0.0022	0.0278***	0.4195	0.0001
Tangible Asset/AT	0.2771	0.2011	0.2514	0.1854	0.2782	0.2067	-0.0011	-0.0056	0.8034	0.3265
Interest Coverage	135.31	14.604	85.956	9.9891	17.539	4.3784	117.77***	10.226***	0.0001	0.0001
Selling Expense/Sales	0.3441	0.2243	0.3272	0.2417	0.3201	0.1896	0.0240	0.0347***	0.2895	0.0001
Cash/AT	0.1031	0.0635	0.1405	0.0761	0.1027	0.0450	0.0004	0.0185***	0.8962	0.0001
Deal Value	244.44	26.000	280.16	29.7	196.28	25.530	48.16*	0.47	0.0747	0.6395
Relative Size	0.1705	0.0448	0.1342	0.0419	0.2251	0.0567	-0.0546*	-0.0119***	0.0957	0.0001
Toehold Size	26.19%	20.77%	23.89%	16.66%	26.59%	20.00%	-0.40%	0.77%	0.8351	0.6725

	Mean	Mean	Mean	Mean	T-test
Hostile Deal	0.58%	0.83%	1.28%	-0.70%***	0.0001
Tender Offer	4.17%	4.75%	5.39%	-1.22%***	0.0012
Pure Cash	29.11%	29.68%	27.01%	2.10%***	0.0083
Pure Stock	13.89%	13.75%	11.22%	2.67%***	0.0001
Unsolicited Deal	1.06%	1.078%	1.87%	-0.81%***	0.0001
Compete Deal	1.69%	1.67%	2.30%	-0.61%**	0.0137

Table 3.8 Logistic Model for Takeover Success

This table presents the impact of determinant variables on the probability of success in M&A through Logistic analysis. The dependent variable is the dummy of deal status. It is set to 1 if the deal successfully complete, otherwise 0. The independent variable Leverage Deficit is the firm's actual leverage minus its target leverage ratio. The Over-leveraged Dummy is the dummy variable for whether the bidder is over-leveraged. The Target-leveraged Dummy is the dummy variable for whether the bidder's leverage is in line with its target leverage level. The Under-leveraged Dummy is the dummy variable for whether the bidder is under-leveraged. The Market-to-Book ratio is the market value divided by the book value of total assets. The Log of Market Value is the natural logarithm of bidder's market value. The EBITDA/TA is EBITDA over total assets. Relative Size is the total value of target over acquirers. Managerial Resistance is the dummy variable whether the deal is hostile or not. Toehold Size is the percentage of common shares held by the acquirers before takeover. Poison Pill is the percentage of targets using poison pill defences. Tender Offer is the percentage of acquirers using tender offers. Unsolicited Deal is the percentage of deals where acquirers make the offer without prior negotiations. Stock Swap Dummy is the dummy variable that using pure stock payment. Competing Deal is the percentage of deals in which more than one bidder is involved in a target. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following are the models:

Model 1

$$P(Success=1)=\beta_0+\beta_1 LeverageDeficit+\beta_2 MtB+\beta_3 LMV+\beta_4 EBITDA+\beta_5 RSize+\beta_6 MR+\beta_7 Toehold+\beta_8 PoisonPill+\beta_9 Tender+\beta_{10} Unsoli+\beta_{11} StockSwap+\beta_{12} Compete+\varepsilon$$

Model 2

$$P(Success=1)=\beta_0+\beta_1 OverLeverage+\beta_2 MtB+\beta_3 LMV+\beta_4 EBITDA+\beta_5 RSize+\beta_6 MR+\beta_7 Toehold+\beta_8 PoisonPill+\beta_9 Tender+\beta_{10} Unsoli+\beta_{11} StockSwap+\beta_{12} Compete+\varepsilon$$

Model 3

$$P(Success=1)=\beta_0+\beta_1 TarLeverage+\beta_2 MtB+\beta_3 LMV+\beta_4 EBITDA+\beta_5 RSize+\beta_6 MR+\beta_7 Toehold+\beta_8 PoisonPill+\beta_9 Tender+\beta_{10} Unsoli+\beta_{11} StockSwap+\beta_{12} Compete+\varepsilon$$

Table 3.8 – Continued from Previous Page

Model 4

$$P(Success = 1) = \beta_0 + \beta_1 UnderLeverage + \beta_2 MtB + \beta_3 LMV + \beta_4 EBITDA + \beta_5 RSize + \beta_6 MR + \beta_7 Toehold + \beta_8 PoisonPill + \beta_9 Tender + \beta_{10} Unsoli + \beta_{11} StockSwap + \beta_{12} Compete + \varepsilon$$

	P (Success = 1)							
	Model 1		Model 2		Model 3		Model 4	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	3.0933***	0.0001	3.1537***	0.0001	2.9461***	0.0001	2.9593***	0.0001
Leverage Deficit	-1.1076***	0.0001						
Over-leveraged Bidder Dummy			-0.3006***	0.0001				
Target-leveraged Bidder Dummy					0.2462***	0.0028		
Under-leveraged Bidder Dummy							0.0922	0.2306
Market to Book Ratio	0.0633***	0.0021	0.0612***	0.0032	0.0615***	0.0037	0.0697***	0.0009
Log of Market Value	0.0953***	0.0001	0.0993***	0.0001	0.1030***	0.0001	0.1040***	0.0001
EBITDA/TA	0.9013***	0.0001	0.8163***	0.0001	0.7624***	0.0002	0.8310***	0.0001
Relative Size	-0.0129	0.2660	-0.0123	0.2871	-0.0127	0.2679	-0.0130	0.2611
Managerial Resistance	-1.6124***	0.0001	-1.6206***	0.0001	-1.6299***	0.0001	-1.6180***	0.0001
Toehold Size	-0.0092	0.1060	-0.0095*	0.0976	-0.0098*	0.0872	-0.0099*	0.0820
Poison Pill Dummy	-0.2383	0.5639	-0.2421	0.5571	-0.2377	0.5622	-0.2267	0.5798
Tender Offer Dummy	0.6908***	0.0001	0.6890***	0.0001	0.6661***	0.0002	0.6802***	0.0002
Unsolicited Deal Dummy	-2.7024***	0.0001	-2.6988***	0.0001	-2.7035***	0.0001	-2.7191***	0.0001
Stock Swap Dummy	-0.9862***	0.0001	-0.9851***	0.0001	-0.9714***	0.0001	-0.9682***	0.0001
Competing Deal Dummy	-2.7693***	0.0001	-2.7612***	0.0001	-2.7574***	0.0001	-2.7676***	0.0001
Observations	19203		19203		19203		19203	
Pseudo R-Square	0.2227		0.2216		0.2205		0.2194	

Table 3.9 Interaction Analysis

This table presents the impact of determinant variables on the probability of success in M&A through Logistic analysis. The added variable in these models is the interaction variable between financial leverage measures and competing deal dummy. The independent variable Leverage Deficit is the firm's actual leverage minus its target leverage ratio. The Over-leveraged Dummy is the dummy variable for whether the bidder is over-leveraged. The Target-leveraged Dummy is the dummy variable for whether the bidder's leverage is in line with its target leverage level. The Under-leveraged Dummy is the dummy variable for whether the bidder is under-leveraged. The Market-to-Book ratio is the market value divided by the book value of total assets. The Log of Market Value is the natural logarithm of bidder's market value. The EBITDA/TA is EBITDA over total assets. Relative Size is the total value of target over acquirers. Managerial Resistance is the dummy variable whether the deal is hostile or not. Toehold Size is the percentage of common shares held by the acquirers before takeover. Poison Pill is the percentage of targets using poison pill defences. Tender Offer is the percentage of acquirers using tender offers. Unsolicited Deal is the percentage of deals where acquirers make the offer without prior negotiations. Stock Swap Dummy is the dummy variable that using pure stock payment. Competing Deal is the percentage of deals in which more than one bidder is involved in a target. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following are the models:

Model 1

$$P(Success=1)=\beta_0+\beta_1 LeverageDeficit+\beta_2 LD*Compete+\beta_3 MtB+\beta_4 LMV+\beta_5 EBITDA+\beta_6 RSize+\beta_7 MR+\beta_8 Toehold+\beta_9 PoisonPill+\beta_{10} Tender+\beta_{11} Unsoli+\beta_{12} StockSwap+\beta_{13} Compete+\varepsilon$$

Model 2

$$P(Success=1)=\beta_0+\beta_1 OverLeverage+\beta_2 OL*Compete+\beta_3 MtB+\beta_4 LMV+\beta_5 EBITDA+\beta_6 RSize+\beta_7 MR+\beta_8 Toehold+\beta_9 PoisonPill+\beta_{10} Tender+\beta_{11} Unsoli+\beta_{12} StockSwap+\beta_{13} Compete+\varepsilon$$

Model 3

$$P(Success=1)=\beta_0+\beta_1 TarLeverage+\beta_2 TL*Compete+\beta_3 MtB+\beta_4 LMV+\beta_5 EBITDA+\beta_6 RSize+\beta_7 MR+\beta_8 Toehold+\beta_9 PoisonPill+\beta_{10} Tender+\beta_{11} Unsoli+\beta_{12} StockSwap+\beta_{13} Compete+\varepsilon$$

Model 4

$$P(Success=1)=\beta_0+\beta_1 UnderLeverage+\beta_2 UL*Compete+\beta_3 MtB+\beta_4 LMV+\beta_5 EBITDA+\beta_6 RSize+\beta_7 MR+\beta_8 Toehold+\beta_9 PoisonPill+\beta_{10} Tender+\beta_{11} Unsoli+\beta_{12} StockSwap+\beta_{13} Compete+\varepsilon$$

Table 3.9 Continued from Previous Page

	P (Success = 1)							
	Model 1		Model 2		Model 3		Model 4	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	3.0967***	0.0001	3.1555***	0.0001	2.9430***	0.0001	2.9539***	0.0001
Leverage Deficit	-1.1653***	0.0001						
Leverage Deficit * Compete Dummy	0.8678	0.3277						
Over-leveraged Bidder Dummy			-0.3028***	0.0001				
OLBD * Compete Dummy			0.0295	0.9149				
Target-leveraged Bidder Dummy					0.2377***	0.0055		
TLBD * Compete Dummy					0.1078	0.7214		
Under-leveraged Bidder Dummy							0.1019	0.2043
ULBD * Compete Dummy							-0.1231	0.6672
Market to Book Ratio	0.0630***	0.0022	0.0612***	0.0032	0.0616***	0.0036	0.0698***	0.0009
Log of Market Value	0.0953***	0.0001	0.0993***	0.0001	0.1030***	0.0001	0.1041***	0.0001
EBITDA/TA	0.9067***	0.0001	0.8166***	0.0001	0.7632***	0.0002	0.8330***	0.0001
Relative Size	-0.0129	0.2675	-0.0123	0.2874	-0.0127	0.2675	-0.0130	0.2618
Managerial Resistance	-1.6082***	0.0001	-1.6195***	0.0001	-1.6308***	0.0001	-1.6146***	0.0001
Toehold Size	-0.0093	0.1053	-0.0095*	0.0975	-0.0097*	0.0879	-0.0099*	0.0822
Poison Pill Dummy	-0.2493	0.5455	-0.2434	0.5551	-0.2363	0.5645	-0.2303	0.5734
Tender Offer Dummy	0.6905***	0.0001	0.6887***	0.0001	0.6643***	0.0002	0.6772***	0.0002
Unsolicited Deal Dummy	-2.7019***	0.0001	-2.6988***	0.0001	-2.7045***	0.0001	-2.7202***	0.0001
Stock Swap Dummy	-0.9886***	0.0001	-0.9853***	0.0001	-0.9716***	0.0001	-0.9691***	0.0001
Competing Deal Dummy	-2.7779***	0.0001	-2.7728***	0.0001	-2.7865***	0.0001	-2.7265***	0.0001
Observations	19203		19203		19203		19203	
Pseudo R-Square	0.2228		0.2216		0.2206		0.2195	

Table 3.10 Payment Analysis

This table presents the effects of determinant variables on takeover success based on different mediums of payment. Panel A shows the results of the Pure Cash sample, Panel B shows the Pure Stock sample, and Panel C shows the Mixed sample. The independent variable Leverage Deficit is the firm's actual leverage minus its target leverage ratio. The Over-leveraged Dummy is the dummy variable for whether the bidder is over-leveraged. The Target-leveraged Dummy is the dummy variable for whether the bidder's leverage is in line with its target leverage level. The Under-leveraged Dummy is the dummy variable for whether the bidder is under-leveraged. The Market-to-Book ratio is the market value divided by the book value of total assets. The Log of Market Value is the natural logarithm of bidder's market value. The EBITDA/TA is EBITDA over total assets. Relative Size is the total value of target over acquirers. Managerial Resistance is the dummy variable whether the deal is hostile or not. Toehold Size is the percentage of common shares held by the acquirers before takeover. Poison Pill is the percentage of targets using poison pill defences. Tender Offer is the percentage of acquirers using tender offers. Unsolicited Deal is the percentage of deals where acquirers make the offer without prior negotiations. Competing Deal is the percentage of deals in which more than one bidder is involved in a target. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following are the models:

Model 1

$$P(Success=1)=\beta_0+\beta_1 LeverageDeficit+\beta_2 MtB+\beta_3 LMV+\beta_4 EBITDA+\beta_5 RSize+\beta_6 MR+\beta_7 Toehold+\beta_8 PoisonPill+\beta_9 Tender+\beta_{10} Unsoli+\beta_{11} Compete+\varepsilon$$

Model 2

$$P(Success=1)=\beta_0+\beta_1 OverLeverage+\beta_2 MtB+\beta_3 LMV+\beta_4 EBITDA+\beta_5 RSize+\beta_6 MR+\beta_7 Toehold+\beta_8 PoisonPill+\beta_9 Tender+\beta_{10} Unsoli+\beta_{11} Compete+\varepsilon$$

Model 3

$$P(Success=1)=\beta_0+\beta_1 TarLeverage+\beta_2 MtB+\beta_3 LMV+\beta_4 EBITDA+\beta_5 RSize+\beta_6 MR+\beta_7 Toehold+\beta_8 PoisonPill+\beta_9 Tender+\beta_{10} Unsoli+\beta_{11} Compete+\varepsilon$$

Model 4

$$P(Success=1)=\beta_0+\beta_1 UnderLeverage+\beta_2 MtB+\beta_3 LMV+\beta_4 EBITDA+\beta_5 RSize+\beta_6 MR+\beta_7 Toehold+\beta_8 PoisonPill+\beta_9 Tender+\beta_{10} Unsoli+\beta_{11} Compete+\varepsilon$$

Table 3.10 Continued from Previous Page

Panel A Payment = Pure Cash								
	P (Success = 1)							
	Model 1		Model 2		Model 3		Model 4	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	3.5098***	0.0001	3.4781***	0.0001	3.4633***	0.0001	3.6309***	0.0001
Leverage Deficit	-0.4186	0.4443						
Over-leveraged Bidder Dummy			0.0232	0.8925				
Target-leveraged Bidder Dummy					0.3185*	0.0790		
Under-leveraged Bidder Dummy							-0.3085*	0.0627
Market to Book Ratio	0.0304	0.5454	0.0294	0.5617	0.0226	0.6553	0.0245	0.6323
Log of Market Value	0.0607	0.1802	0.0636	0.1604	0.0605	0.1813	0.0648	0.1533
EBITDA/TA	-0.9494	0.2938	-0.8434	0.3421	-0.9909	0.2664	-0.7904	0.3600
Relative Size	-0.2270***	0.0086	-0.2266***	0.0089	-0.2242***	0.0092	-0.2242***	0.0094
Managerial Resistance	-1.1615***	0.0075	-1.1578***	0.0076	-1.1729***	0.0066	-1.1644***	0.0071
Toehold Size	-0.0201**	0.0304	-0.0204**	0.0280	-0.0203**	0.0290	-0.0208**	0.0259
Poison Pill Dummy	-0.8930	0.1302	-0.8895	0.1307	-0.8951	0.1272	-0.8819	0.1323
Tender Offer Dummy	0.9369***	0.0016	0.9402***	0.0015	0.9030***	0.0022	0.9192***	0.0019
Unsolicited Deal Dummy	-2.8535***	0.0001	-2.8804***	0.0001	-2.8455***	0.0001	2.9094***	0.0001
Competing Deal Dummy	-3.0934***	0.0001	-3.0931***	0.0001	-3.0801***	0.0001	-3.0910***	0.0001
Observations	5492		5492		5492		5492	
Pseudo R-Square	0.3274		0.3271		0.3288		0.3290	

Table 3.10 Continued from Previous Page

Panel B Payment = Pure Stock								
	P (Success = 1)							
	Model 1		Model 2		Model 3		Model 4	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	1.5119*	0.0568	1.5081*	0.0574	1.3266*	0.0927	1.3240*	0.0935
Leverage Deficit	-0.8919*	0.0549						
Over-leveraged Bidder Dummy			-0.2424	0.1177				
Target-leveraged Bidder Dummy					-0.0372	0.8158		
Under-leveraged Bidder Dummy							0.2789*	0.0804
Market to Book Ratio	0.1863***	0.0001	0.1843***	0.0001	0.1903***	0.0001	0.1927***	0.0001
Log of Market Value	0.2262***	0.0001	0.2319***	0.0001	0.2398***	0.0001	0.2308***	0.0001
EBITDA/TA	0.4316	0.1869	0.3311	0.2951	0.2744	0.3854	0.3949	0.2210
Relative Size	0.0066	0.6501	0.0069	0.6311	0.0062	0.6678	0.0066	0.6473
Managerial Resistance	-1.5669	0.1031	-1.6010*	0.0966	-1.6389*	0.0879	-1.5887*	0.0964
Toehold Size	-0.0138	0.2095	-0.0137	0.2138	-0.0142	0.1971	-0.0145	0.1883
Poison Pill Dummy	0.0524	0.9872	0.1474	0.9632	0.1383	0.9636	0.0611	0.9846
Tender Offer Dummy	0.6819	0.1923	0.6824	0.1933	0.6273	0.2328	0.6557	0.2119
Unsolicited Deal Dummy	-3.7976***	0.0001	-3.7940***	0.0001	-3.8102***	0.0001	-3.8040***	0.0001
Competing Deal Dummy	-3.0166***	0.0001	-3.0058***	0.0001	-3.0178***	0.0001	-3.0368***	0.0001
Observations	2487		2487		2487		2487	
Pseudo R-Square	0.2002		0.1992		0.1974		0.1998	

Table 3.10 Continued from Previous Page

Panel C Payment = Mixed								
	P (Success = 1)							
	Model 1		Model 2		Model 3		Model 4	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	3.6813***	0.0001	3.7785***	0.0001	3.4807***	0.0001	3.4914***	0.0001
Leverage Deficit	-1.4467***	0.0001						
Over-leveraged Bidder Dummy			-0.4229***	0.0001				
Target-leveraged Bidder Dummy					0.3403***	0.0034		
Under-leveraged Bidder Dummy							0.1613	0.1365
Market to Book Ratio	0.0052	0.8544	0.0031	0.9130	0.0042	0.8856	0.010	0.6052
Log of Market Value	0.0183	0.4915	0.0219	0.4096	0.0260	0.3276	0.0286	0.2815
EBITDA/TA	1.2959***	0.0001	1.1988***	0.0001	1.1645***	0.0001	1.2357***	0.0001
Relative Size	-0.1590***	0.0012	-0.1550***	0.0017	-0.1524***	0.0021	-0.1545***	0.0016
Managerial Resistance	-2.0473***	0.0001	-2.0412***	0.0001	-2.0508***	0.0001	-2.0341***	0.0001
Toehold Size	0.0052	0.5990	0.0050	0.6118	0.0045	0.6480	0.0044	0.6510
Poison Pill Dummy	0.0110	0.9866	-0.0107	0.9869	-0.0092	0.9887	-0.0018	0.9978
Tender Offer Dummy	0.4551*	0.0854	0.4591*	0.0840	0.4098	0.1215	0.4139	0.1173
Unsolicited Deal Dummy	-2.8883***	0.0001	-2.8810***	0.0001	-2.8504***	0.0001	-2.8660***	0.0001
Competing Deal Dummy	-2.5723***	0.0001	-2.5679***	0.0001	-2.5700***	0.0001	-2.5700***	0.0001
Observations	11224		11224		11224		11224	
Pseudo R-Square	0.2035		0.2021		0.1999		0.1980	

Table 3.11 Bid Premium Analysis

This table presents the analysis of premium determinants. The dependent variable is the premium of the offer price to target stock price four weeks prior to the takeover announcement date. The independent variable Leverage Deficit is the firm's actual leverage minus its target leverage ratio. The Over-leveraged Dummy is the dummy variable for whether the bidder is over-leveraged. The Target-leveraged Dummy is the dummy variable for whether the bidder's leverage is in line with its target leverage level. The Under-leveraged Dummy is the dummy variable for whether the bidder is under-leveraged. The Market-to-Book ratio is the market value divided by the book value of total assets. The Log of Market Value is the natural logarithm of bidder's market value. The EBITDA/TA is EBITDA over total assets. Relative Size is the total value of target over acquirers. Managerial Resistance is the dummy variable whether the deal is hostile or not. Toehold Size is the percentage of common shares held by the acquirers before takeover. Tender Offer is the percentage of acquirers using tender offers. Unsolicited Deal is the percentage of deals where acquirers make the offer without prior negotiations. Competing Deal is the percentage of deals in which more than one bidder is involved in a target. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following are the models:

Model 1

$$4WPREMIUM = \beta_0 + \beta_1 LeverageDeficit + \beta_2 MtB + \beta_3 LMV + \beta_4 EBITDA + \beta_5 RSize + \beta_6 MR + \beta_7 Toehold + \beta_8 Tender + \beta_9 Unsoli + \beta_{10} Compete + \varepsilon$$

Model 2

$$4WPREMIUM = \beta_0 + \beta_1 OverLeverage + \beta_2 MtB + \beta_3 LMV + \beta_4 EBITDA + \beta_5 RSize + \beta_6 MR + \beta_7 Toehold + \beta_8 Tender + \beta_9 Unsoli + \beta_{10} Compete + \varepsilon$$

Model 3

$$4WPREMIUM = \beta_0 + \beta_1 TarLeverage + \beta_2 MtB + \beta_3 LMV + \beta_4 EBITDA + \beta_5 RSize + \beta_6 MR + \beta_7 Toehold + \beta_8 Tender + \beta_9 Unsoli + \beta_{10} Compete + \varepsilon$$

Model 4

$$4WPREMIUM = \beta_0 + \beta_1 UnderLeverage + \beta_2 MtB + \beta_3 LMV + \beta_4 EBITDA + \beta_5 RSize + \beta_6 MR + \beta_7 Toehold + \beta_8 Tender + \beta_9 Unsoli + \beta_{10} Compete + \varepsilon$$

Table 3.11 Continued from Previous Page

	Bid Premium							
	Model 1		Model 2		Model 3		Model 4	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	52.434***	0.0001	54.337***	0.0001	51.388***	0.0001	52.189***	0.0001
Leverage Deficit	-8.8835	0.1749						
Over-leveraged Bidder Dummy			-4.5503**	0.0249				
Target-leveraged Bidder Dummy					4.8214**	0.0157		
Under-leveraged Bidder Dummy							-0.4236	0.8334
Market to Book Ratio	1.6579***	0.0009	1.6456***	0.0010	1.4914***	0.0029	1.6013***	0.0014
Log of Market Value	-2.3259***	0.0001	-2.3598***	0.0001	-2.3194***	0.0001	-2.2402***	0.0001
EBITDA/TA	6.2127	0.3642	5.5749	0.4147	4.9286	0.4713	5.7229	0.4032
Relative Size	-0.6783	0.6108	-0.7245	0.5864	-0.6793	0.6096	-0.6360	0.6332
Managerial Resistance	1.4591	0.7808	1.4605	0.7803	1.0894	0.8351	1.2129	0.8170
Toehold Size	-0.3908***	0.0004	-0.3860***	0.0005	-0.3901***	0.0004	-0.3987***	0.0003
Tender Offer Dummy	13.205***	0.0001	13.202***	0.0001	13.080***	0.0001	13.136***	0.0001
Unsolicited Deal Dummy	4.7993	0.2400	5.0581	0.2156	4.9102	0.2287	4.5638	0.2637
Competing Deal Dummy	13.349***	0.0001	13.507***	0.0001	13.396***	0.0001	13.233***	0.0001
Observations	2548		2548		2548		2548	

Table 3.12 Bid Premium Analysis based on Different Mediums of Payment

This table presents the analysis of premium determinants based on different mediums of payment. The dependent variable is the premium of the offer price to target stock price four weeks prior to the takeover announcement date. The independent variable Leverage Deficit is the firm's actual leverage minus its target leverage ratio. The Market-to-Book ratio is the market value divided by the book value of total assets. The Log of Market Value is the natural logarithm of bidder's market value. The EBITDA/TA is EBITDA over total assets. Relative Size is the total value of target over acquirers. Managerial Resistance is the dummy variable whether the deal is hostile or not. Toehold Size is the percentage of common shares held by the acquirers before takeover. Tender Offer is the percentage of acquirers using tender offers. Unsolicited Deal is the percentage of deals where acquirers make the offer without prior negotiations. Competing Deal is the percentage of deals in which more than one bidder is involved in a target. The numbers followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following are the models:

Model:

$$4WPREMIUM = \beta_0 + \beta_1 LeverageDeficit + \beta_2 MtB + \beta_3 LMV + \beta_4 EBITDA + \beta_5 RSize + \beta_6 MR + \beta_7 Toehold + \beta_8 Tender + \beta_9 Unsoli + \beta_{10} Compete + \varepsilon$$

Table 3.12 Continued from Previous Page

	Bid Premium					
	Pure Cash		Pure Stock		Mixed	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	36.899***	0.0001	51.099***	0.0001	52.857***	0.0001
Leverage Deficit	-4.2221	0.6809	-27.723**	0.0477	1.1470	0.9161
Market to Book Ratio	0.8775	0.2959	2.2829**	0.0186	1.3292	0.1404
Log of Market Value	-1.0873	0.1630	-2.7580**	0.0171	-3.5211***	0.0001
EBITDA/TA	27.728*	0.0764	11.252	0.2925	-11.861	0.4385
Relative Size	0.2854	0.9162	-1.7503	0.6000	0.2456	0.8962
Managerial Resistance	1.4776	0.8225	21.506	0.2030	-7.2322	0.4045
Toehold Size	-0.6111***	0.0001	0.0654	0.8190	-0.1265	0.5729
Tender Offer Dummy	15.621***	0.0001	8.4349	0.3090	12.239***	0.0022
Unsolicited Deal Dummy	1.2388	0.8145	-6.8885	0.6329	12.339*	0.0594
Competing Deal Dummy	20.379***	0.0001	-0.4633	0.9557	11.263**	0.0427
Observations	950		713		885	

Chapter 4

4. Leverage-Motivated M&As and Their Stock Performance

4.1 Introduction

The previous chapter finds that the deviation from a firm's actual leverage ratio to its optimal level is a strong determinant of the successful completion of M&A deals. There is a significantly negative relation between the leverage deficit of the acquirer and the probability of success in takeovers. However, no study further examines the impact of leverage deficit on market reactions to takeover deals and their long-term performance in the post-merger period. The financial markets should have different understandings and expectations for the deals announced by bidders with different capital structure. Thus their reactions to these deals should be dramatically differed with bidder's capital structure. For target-leveraged bidders, the financial market worries about the issue that firm's leverage ratio may deviate from the optimal level, which has negative impact on firm's future prospect. According to this argument, the deals made by target-leveraged bidder should present significantly worse stock performance in both short-run and long-run. By contrast, deals made by over-leveraged bidders are more favoured from the financial market, since the completion of these deals may help them reduce the debt level and relief the financial distress. Therefore we predict that the market reactions to these deals are dramatically better. Based on this scenario, this chapter examines how the stock markets react to deals with different capital structure. Moreover, we plan to further test the implications of trade-off theory in M&A activities, since the takeover deals are considered as an important and effective approach for capital structure adjustment.

Trade-off theory in capital structure argues that every firm has its own target capital structure, which is determined by the trade-off between the benefits and costs of corporate debt. Traditional static trade-off theory suggests that a firm's financial leverage ratio is always optimal (Jensen and Meckling 1976). Empirical work by Bradley, Jarrell, and Kim (1984), Titman and Wessels (1988), and Rajan and Zingales (1995) confirms the existence of target capital structure and identifies a group of factors that may affect a firm's optimal leverage. Unlike traditional static trade-off theory, dynamic trade-off theory indicates that a firm's leverage ratio is not always at its optimal level but will revert to it over time. Fama and French (2002) and Kayhan and Titman (2007) both find empirical evidence to indicate that firm capital structure deviates from its target ratio, with firms apparently not immediately adjusting them. However, the evidence also shows that a firm's leverage ratio will eventually revert to its optimal level. Research by Leary and Roberts (2005) and Flannery and Rangan (2006) further support the arguments of dynamic trade-off theory. These authors examine the question of whether firms actively rebalance their capital structure towards target ratios. Consistent with the predictions of dynamic trade-off theory, their analysis shows that firm actively rebalance their capital structure towards their target levels, although these rebalancing activities are infrequent when adjustment conditions are costly.

More closely related to our research, Harford, et al. (2009) uses M&A data to examine the concept of target capital structure. They find that the deviation of an acquirer's actual leverage ratio from its target level has a significant impact on M&A deals, especially in the choices of financing decisions and methods of payment. Overleveraged acquirers are more likely to finance deals by issuing new equity rather than issuing debt. Moreover, Harford, et al. finds a positive relation between the changes in a merging firm's actual and target leverage ratios induced by M&A deals. Their research provides strong evidence to suggest that firms do have target capital structure and actively adjust their financial leverage towards target levels.

In conclusion from previous research, firms have a target capital structure and M&As are an effective approach to rebalancing their actual leverage towards optimal levels in the presence of adjustment costs. Therefore, capital structure rebalancing is an important motivation for making takeover deals. This chapter extends the research of M&As and capital structure by examining the market reactions to these capital structure rebalancing-motivated deals, as well as their long-term performance in the post-merger period.

Using a sample of 537 large M&A deals made during 1980–2009 whose deal value is more than 20% of the acquirer's firm size, this chapter empirically investigates both the short- and long-term performance of M&A deals that are potentially motivated by capital structure rebalancing. Following Harford et al. (2009)'s settings, deals with relative size less than 0.2 are eliminated from the sample since these deals appear to not have significantly large impacts on bidder's capital structure. Both the bidding and target firms' target leverage ratios are estimated by a Tobit regression model according to earlier well-known papers. The financial leverage deficit is calculated as the difference between a firm's actual leverage and its optimal level. To further specify the status of a firm's capital structure, we construct three dummy variables for the amount of leverage deficit: an overleveraged firm dummy, a target-leveraged firm dummy, and an overleveraged firm dummy. Using these leverage deficit and status dummies, both bidders and targets are categorized as an overleveraged bidder (OLB), a target-leveraged bidder (TLB), an underleveraged bidder (ULB), an overleveraged target (OLT), a target-leveraged target (TLT), or an underleveraged target (ULT).

Second, we examine the interaction between a firm's leverage deficit and payment choices in M&As. The results from a logistic regression model suggest that the probability of using a pure cash payment is negatively related to a bidder's leverage deficit level. Overleveraged bidders are less likely to use pure cash since they cannot issue more debt. However, underleveraged bidders are more likely to choose pure cash

payments because it is helpful in adjusting capital structure to target levels. These findings confirm the argument that bidders have strong incentive to rebalance their capital structure through M&A activities.

Moreover, empirical evidence from our analyses on bidder announcement CARs suggests that the short-term performance of M&A deals differs significantly according to different types of bidders, targets, and deals. Stock markets respond differently to deals announced by different types of bidders. Deals made by OLBs have the best short-term performance compared to the other deals, while deals made by TLBs are the lowest, on average. However, deals acquiring different types of targets are not dramatically different from each other. The results from multivariate cross-sectional regressions further support these arguments. These findings are consistent with our predictions that bidding firm's announcement returns are dramatically varied according to their financial leverage ratios. These different stock returns could be attributed to the impact of takeover deals on firm's capital structures. The deals made by TLBs will drive their leverage ratios away from the optimal level, which has negative shock on firm's M&A performance. By contrast, deals made by OLBs are more favoured by stock market since it is predicted that the takeover deals may help them to resolve the problem of overleverage and reduce the financial distress. Bidder's shareholders may get benefits from these deals.

Our target capital structure research further identifies six types of deals that are related to the active rebalancing of target capital structure. For these six types of deals, the bidder's financial leverage ratio presents a potential trend, moving towards its optimal level when takeovers are completed. Thus we consider that bidders actively adjust their capital structure close to their optimal levels through these deals. Stock market reactions to these deals vary dramatically. The short-term announcement CARs for deals with ULBs and OLTs are the lowest of all six types of deals, at -4.61%, and statistically significant. In contrast, deals with OLBs and ULTs have much better performance, on average. The comparison tests reveal a significant difference between these two typical types of deals.

Similarly, deals with OLBs and TLTs significantly outperform deals with ULBs and TLTs. The regression analysis provides the same conclusion as the results of the univariate analysis.

We further examine the 12-month BHARs for all merging firms. The results are slightly different from those of the CAR analysis. The BHAR analysis based on different types of bidders shows that deals with OLBs have the lowest long-term performance, on average, compared to the other two types of bidders, although the differences are not statistically significant. Similarly, deals with OLTs also have the lowest long-term performance. Furthermore, the empirical results suggest that different types of deals present different long-term post-merger stock performance. Deals with an OLB acquiring a TLT have the best long-term performance, significantly better than any other deals, on average.

This chapter makes a number of contributions to the literature. This is the first study to examine the performance of M&As based on the capital structure of bidders and targets. Extending the previous literature on the relation between capital structure and M&A, we investigate whether the financial leverage deficit of either the bidder or the target has an impact on M&A performance. This chapter finds substantial empirical evidence to support the argument that stock markets have different reactions to deals made by bidders with different leverage deficit statuses. Our findings provide further understanding in M&A performance research. Furthermore, we empirically investigate that how the stock market reacts to deals in which bidders adjust their capital structure towards optimal levels through M&As. The empirical results suggest that both the short- and long-term performance of merging firms vary for different types of deals. These findings provide further implications for managers who actively rebalance firm capital structure through M&A activities.

This chapter is organized as follows: Section 4.2 reviews work related to capital structure theory and the connection between capital structure and M&A research. Section 4.3

briefly introduces the sample and methodology used in our research. Section 4.4 presents our empirical results and discussions. Section 4.5 summarizes the chapter and points out the main conclusions.

4.2 Literature review

4.2.1 Capital structure theory

There are three preeminent theories in capital structure: trade-off theory, pecking order theory, and market timing theory. Trade-off theory argues that a firm's capital structure is mainly determined by the trade-off between the costs and benefits of corporate debt. In a traditional trade-off model, the benefits and costs of debt refer to the tax benefits of debt and the costs of bankruptcy, respectively. Thus this model determines a firm's capital structure by the weight of its tax benefits against bankruptcy costs. Several new studies extend the area of benefits and costs in other dimensions. Agency cost theory, developed by Jensen and Meckling (1976), suggests that the major benefits of debt are that corporate debt is able to discipline firm managers and mitigate the problem of agency cost. Agency cost is defined as the interest conflict between shareholders and firm managers. The existence of debt pressures managers to run firms well and prevents the misuse of free cash flow. However, though corporate debt can mitigate the conflicts between shareholders and executive managers, it also raises conflicts of interest between shareholders and debt holders. As Myers (1977) shows, a potential disadvantage of corporate debt is that firms with a high leverage ratio should have the opportunity costs for future valuable investment projects. Overleveraged firms may miss potential profitable investments since they are not able to afford them. Similarly, other perspectives consider that the costs of debt are mainly due to the disruption of corporate business operations rather than the direct costs of bankruptcy.

Unlike trade-off theory, pecking order theory (Myers, 1984) argues that the trade-off between the benefits and costs of debt is not the most important factor for a firm's capital structure. Myers (1984) further argues that a firm's financing decisions are mainly driven by the costs of the adverse selection of choices. The three major ways of raising capital are issuing equity, issuing debt, and retaining earnings separately. Pecking order theory shows that the costs of adverse selection are the most serious for issuing equity, less serious for issuing debt, and non-existent for retained earnings. Therefore, firms prefer internal financing first when they face a lack of capital. If firms have to use external financing when internal financing is insufficient, the choice of debt financing is more likely than equity financing.

Moreover, the basic idea in market timing theory is that firms timing the equity and debt issuance according to the valuation conditions of the stock and bond markets. This idea suggests that firm managers choose equity financing when stock market valuations are high and debt financing when the bond market is hot. If the market valuation is unusually high, managers will raise more capital, even if not needed. On the other hand, firms tend to use internal financing when both the stock and bond markets are cold and tend to repurchase their stocks when the stock market valuation is low. From the cost point of view, public firms tend to issue equity when the cost of equity is relatively low and to repurchase stocks when the cost of equity is relatively high.

To test these capital structure theories, Graham and Harvey (2001) conduct a comprehensive survey of 392 chief financial officers (CFOs) of large public companies. Generally, the evidence from the survey moderately supports trade-off theory. CFO choices show that the deduction of interest expenses, foreign tax treatment, and the maintenance of financial flexibility are all important. Similarly, evidence from the survey is also found to support pecking order theory. CFOs are more likely to choose debt financing than equity financing when internal funds are insufficient. However, the empirical evidence supports market timing theory the best, since almost two-thirds of

CFOs argue that the level of undervaluation or overvaluation is an extremely important consideration in issuing equity. The analysis of capital structure suggests that both the credit rating and financial flexibility are the most important factors affecting a firm's leverage policy. In equity issuance, the most influential factors are a firm's earning performance and stock returns. The degree of stock undervaluation also plays an important role in financing decisions.

Baker and Wurgler (2002) examine whether the timing of the stock market affects firm capital structure. Since some studies argue that the impact of market timing on capital structure is a short-term rather than a long-term effect, Baker and Wurgler further investigate whether this effect is persistent. To capture this effect, the authors collect data on all public firms involved in an IPO during 1968–1999. The final research sample includes 2839 firm observations. The firm's market valuation is measured by its market-to-book ratio. The empirical results suggest that low-leverage firms tend to raise capital when their market-to-book ratio is relatively high compared to historical data. The estimates from regressions indicate that a firm's financial leverage is negatively related to its past market valuations. When the leverage ratio is measured by either the book or market value and various control variables are included, the relation between a firm's capital structure and its historical market valuations is still statistically significant and robust. To determine whether this relation is persistent, we construct a three-step test. The evidence suggests that past market valuations have persistent influence on a firm's capital structure. A firm's capital structure in a given year even depends on market valuation 10 years earlier. These findings are inconsistent with either trade-off theory or pecking order theory. To explain them, Baker and Wurgler argue firm capital structure is simply the cumulative outcome of previous stock market timings. They conclude that market timing is an important consideration in firm financing decisions and thus persistently affect a firm's capital structure in the long term.

Welch (2004) also examines the relation between a firm's capital structure and its stock returns. The author investigates how stock price changes affect a firm's financial leverage ratio and whether this effect is persistent by decomposing capital structure changes into two main components: The first is caused by corporate financing decisions for issuing debt and equity; the other is caused by a firm's stock price changes. Welch's research sample includes 40,080 firm–year observations covering 1962–2000. The empirical evidence indicates that about 40% of changes in capital structure can be explained by stock price dynamics. It further implies that stock price changes have a large and long-term effect on firm capital structure. The remaining 60% of changes are mainly explained by financing issuance activities. The issuance of long-term debt explains a large portion of the leverage changes, but the empirical evidence does not provide explain the motivation for issuance activities. After stock price effects are controlled for, the changes in capital structure are hardly explained by existing well-accepted factors and therefore require further investigation.

4.2.2 Target capital structure theory

Static trade-off theory assumes that firms have their own target capital structure. They reach their target leverage levels through the trade-off process between the tax benefits of corporate debt and the costs of bankruptcy. However, pecking order theory states that firms do not have a target leverage ratio. Bradley, et al. (1984) develops a cross-sectional firm-specific model to examine optimal capital structure theory by using 851 firm observations during a 20-year period. Their empirical evidence strongly supports static trade-off theory, where firms have an optimal leverage level. The authors further specify that the expected costs of financial distress and non-debt tax shields are negatively related to a firm's optimal debt level. The variability of earnings also has a significant impact on a firm's target capital structure. The research of Titman and Wessels (1988) and Rajan and Zingales (1995) further demonstrate the existence of target capital structure and identify several new factors that can affect a firm's optimal leverage level.

More directly, Shyam-Sunder and Myers (1999) examine target capital structure theory by comparing the predictions of static trade-off theory and pecking order theory. Unlike the above-mentioned research on target capital structure, these authors view the two theories as contending hypotheses and thus propose an alternative hypothesis based on pecking order theory. Their results suggest that a firm's financing behaviour can be better explained by a pecking order model than by a static trade-off model. The authors show that pecking order theory, which states that external debt financing is driven by internal financial deficits, presents significantly greater explanatory power for time series data. There is no evidence to support the prediction that a firm's leverage ratio will gradually move towards its optimal level.

Similarly, Fama and French (2002) examine a group of predictions shared by two competing theories, namely, pecking order theory and trade-off theory. Extending previous studies, the authors jointly examine a firm's target leverage level, the mean reversion of the leverage ratio, and other related factors by using a significantly larger sample that includes more than 3000 firms covering the period 1965–1999. In general, the analysis provides strong evidence to support the common assumptions of pecking order theory and trade-off theory, but there are two major issues with the two competing theories. First, the empirical evidence shows that more profitable firms have less corporate debt, which is consistent with pecking order theory but contradicts trade-off theory. Second, the regression results suggest that a firm's leverage ratio gradually reverts to the mean value, which is consistent with trade-off theory. However, the evidence of mean reversion is not strong enough, since the speed of reversion is questionably slow.

Kayhan and Titman (2007) further prove that a firm's leverage ratio tends to move towards its target level over time. In line with the framework of previous research, the authors examine whether a firm's leverage ratio is mean reverting and identify the factors affecting a firm's target leverage ratio. Using a large sample of firm observations during

1960–2003, they find that firms do have a target leverage ratio, though certain realistic factors lead to significant deviations from firm target ratios. Consistent with Fama and French's (2002) findings, the reversion tests indicate that firm capital structure moves towards target levels but the adjustment speed is questionably slow. A possible reason is the considerable level of transaction costs for debt financing. In addition, the empirical evidence suggests that a firm's financial deficit is positively related to the financial leverage ratio. Past stock returns also have a significant impact on a firm's current capital structure. In conclusion, this paper provides strong evidence in support of the trade-off theory.

To further explain why a firm's financial leverage moves towards target levels at a slow rate, Leary and Roberts (2005) examine how firms rebalance their capital structure in the presence of adjustment costs. Since most of the previous capital structure research assumes no adjustment costs, firms are able to continuously rebalance their capital structure towards optimal levels. However, a firm's financing choices are affected by substantial adjustment costs. Firms may not immediately respond to capital structure shocks. As the authors argue, for fixed adjustment costs, the optimal financing choice for firms is to make a large adjustment upon reaching a boundary and then return the debt ratio to initial levels. For proportional adjustment costs, cost-minimizing firms will make very small adjustments upon reaching a recapitalization boundary. Therefore, such firms' leverage adjustments will be highly clustered in time. Moreover, for both fixed and weakly convex component adjustments, firms tend to adjust their leverage ratios to return to a point between the fixed-costs optimum and the closet boundary. Leary and Roberts show that capital structure shocks have a persistent impact if the leverage adjustments are costly. In addition, a significant relation exists between the adjustment costs and the speed and frequency of firms responding to capital structure shocks. Consistent with the authors' predictions, substantial adjustment costs lead to infrequent but clustered adjustments by firms. Most importantly, the authors find that the dynamic rebalancing of financial leverage is the major motivation of corporate financing decisions. Firms tend to issue

debt when their leverage has been relatively low or decreasing in a recent period. Similarly, they are more likely to issue equity when their leverage has been too high or increasing in a recent period. These findings imply that firms do have a specific target leverage ratio range and rebalance their debt levels around these targets.

Flannery and Rangan (2006) confirm the above finding that firms have long-term target capital structure and rebalance their financial leverage ratios towards this long-term target. Unlike previous studies, the authors indicate that some typical kinds of firms adjust their debt levels rapidly. Their research sample consists of 111,106 firm–year observations for 12,919 firms during 1965–2001. The partial adjustment model is adopted to explain the variation in firm capital structures. The empirical evidence based on the large sample strongly supports trade-off theory, where firms present their long-term target capital structure as either book leverage or market leverage. This target capital structure depends on a group of firm characteristic factors that are well accepted in previous research. When the leverage ratio is over or under the optimal level, the firm will adjust it quickly to offset the gap between the actual and optimal leverage ratios. Another interesting finding is that the speed of adjustment is relatively rapid compared to previous findings. The evidence shows that firms offset more than 30% of the leverage gap between the actual and optimal ratios each year. A potential explanation is that previous adjustment speed research imposes unnecessary assumptions in the empirical models and thus affects the estimation results.

Harford, et al. (2009) also investigates whether firms have leverage targets. Unlike previous studies that focus on corporate issuing activities, the authors find evidence from M&As. First, the logistic analysis of payment choice shows that the deal payments with cash versus with equity are negatively related to the acquiring firm's pre-merger deviation from the actual target leverage ratio. In most deals, the cash payment component is financed by issuing corporate debt. Thus overleveraged bidders are less likely to use cash payments and more likely to pay with equity. Their further analysis shows that acquiring

firms are more likely to make M&A deals that will increase their financial leverage after deal completion. The potential motive is that the merging firm's target leverage ratio also increases as a result of the takeover deal. The empirical results suggest that more than 65% of changes in the merging firm's new capital structure are already offset by the bidder's merger financing decisions.

To further support the concept of target capital structure and whether firms rebalance their debt level towards the target, Harford, et al. (2009) examines how merging firms adjust their capital structure in post-merger periods. The evidence shows that if merging firms become overleveraged after a merger since issuing new corporate debt, they will gradually reduce their financial leverage towards the target ratio in the following years. The results indicate that in the first five post-merger years, merging firms rebalance their capital structure to move towards their new targets. Therefore the deviation from a merging firm's actual financial leverage to its target ratio, induced by M&A activity, is further reduced by these costly adjustments. The research on motives for active rebalancing suggests that the capital structure adjustment is an important motivation for making takeover deals. The more the leverage ratio deviates from target levels, the more likely a bidder is to rebalance capital structure through M&A activities. To further support these findings, the empirical evidence shows a significantly positive interaction between the bidder's pre-merger bankruptcy risk and reduction in leverage deviation after mergers. In conclusion, this paper finds strong evidence from M&As to support the concept of target leverage ratios and active capital structure rebalancing.

4.3 Sample and methodology

4.3.1 Sample selection

Our sample contains successful M&As in the US takeover market during the period from January 1980 to December 2009. The source of M&A data is the SDC Mergers & Acquisitions database. The selected time period is driven by the availability of SDC data and consistency with the previous chapter. Table 4.1 shows the selection criteria and the number of deals remaining after filtering for each criterion. We collect data on all deals with US public bidders and US public targets that are announced between 1 January 1980 and 31 December 2009, for a total of 34,123 deals. Since our research examines the capital structure status of both bidders and targets, deals with private or subsidiary targets are excluded due to lack of accounting data. Furthermore, based on our research design, the sample only contains the successful deals. Deals of unknown deal status or still pending are excluded from the sample, which reduces the sample size to 14,345. To exclude small and noise deals, deals valued at less than US$1 million are deleted, which leaves 12,270 deals. Following previous traditional M&A research, we eliminate deals involving firms in the financial or utility industry. Deals identified by the SDC as types of privatization, acquisitions of remaining interest, spinoffs, recapitalizations, repurchases, and self-tenders are also excluded from the entire sample, resulting in a sample of 4546 deals. After matching with both the Compustat and CRSP databases, our sample has 1548 M&A deals. Finally, following Harford, et al. (2009), we remain the deals in which the relative size between the target and bidding firms is at least 0.2. These deals are referred to as large M&A deals. The explanation for this criterion is that takeovers and target firm size should be large enough to have an impact on a merging firm's capital structure after deal completion. Our final research sample has 537 M&A deals.

4.3.2 Variable definition

As introduced in Chapter 3, we use the Tobit regression model to estimate a firm's optimal capital structure, following Kayhan and Titman (2007). As traditional trade-off theory suggests, we should identify a group of independent variables that can affect a firm's optimal financial leverage. We describe these determinant variables below and introduce their direction of impact on capital structure.

4.3.2.1 Firm size

Trade-off theory suggests that large firms are normally well diversified and have less financial distress and default risk. They also have easier access to the debt-financing market, with dramatically lower costs. Thus large firms are expected to have more corporate debt and a higher financial leverage ratio. Our research uses the natural logarithm of sales to proxy for firm size.

4.3.2.2 Profitability

Firm profitability is identified as one of the most important indicators of capital structure in the literature, which argues that profitable firms may have more free cash flow and less financial distress. The tax shield of interest for debt is more valuable for these firms. Therefore, traditional trade-off theory, based on corporate tax and bankruptcy costs, indicates that profitable firms have higher financial leverage ratios. Moreover, the theory based on agency costs also suggests that an important function of corporate debt is to help firms avoid free cash problems. As the theory developed by Jensen (1986) shows, corporate debt will benefit shareholders through the disciplinary mechanism of debt for firm managers. The author suggests that issuing a considerable amount of debt is an effective substitute for dividend payouts, which are helpful to resolve free cash flow

problems. Corporate debt is able to significantly reduce a firm's agency costs by reducing free cash flows for firm managers. Therefore Jensen (1986) predicts that profitable firms will have higher financial leverage.

However, unlike traditional static trade-off models, the dynamic trade-off model indicates that a firm's financial leverage ratio can be negatively related to its profitability. Strebulaev (2007) employs a calibrated dynamic trade-off model to examine firm cross-sectional capital structure performance. Both the empirical evidence and the simulated evidence suggest that the dynamic trade-off model better explains firm capital structure paths, compared to traditional static models. Furthermore, the empirical evidence shows that a firm's profitability is negatively related to its leverage level, which contradicts the prediction of traditional trade-off theory. A potential explanation is straightforward. Under costly adjustment conditions, firms rebalance their capital structure infrequently. An increase in a firm's profitability will significantly reduce its leverage ratio by boosting values. Systematic shocks to a firm's cash flow strengthen the negative relation between profitability and leverage.

On the other hand, pecking order theory also predicts that a firm's profitability is inversely related to its debt level. More profitable firms are less dependent on corporate debt financing since they have more free cash flow. Thus they prefer internal financing over costly external financing and decrease their debt levels.

We use the ratio of Earnings before Interests, Taxes, Depreciation, and Amortization (EBITDA) to Total Assets (TA) to proxy for firm's profitability.

4.3.2.3 Tangibility

Firm asset tangibility is also an important indicator of capital structure. Previous research suggests that firms with more tangible assets are able to more easily use debt financing since they have more assets for loan collateral. Therefore we predict that a firm's tangibility is positively related to its debt capacity and debt level. This chapter uses the ratio of Net Property, Plant, and Equipment to Total Assets (Tangible/TA) to represent the tangibility of firm assets.

4.3.2.4 Product uniqueness

As Titman (1984) argues, the uniqueness of a firm's industry and product also has a significant impact on firm capital structure. Firms in unique industries or that produce specialized products face higher financial distress in general and thus tend to have lower debt levels. The previous literature tends to use R&D expenses to represent the uniqueness of a firm's products. Firms with high R&D expenses have larger proportions of intangible assets, thus depressing their debt levels. In general, this suggests a negative relation between a firm's financial leverage and product uniqueness. This chapter uses the ratio of R&D expenses to sales to proxy for product uniqueness. Since many firms do not release their R&D expenses, we further develop a dummy variable to differentiate these firm observations. The R&D Miss Dummy variable will take the value one if the firm's R&D expense data are missing and zero otherwise. Furthermore, the ratio of Selling Expenses to Sales is also used to represent firm product uniqueness.

4.3.2.5 Growth opportunity

Growth opportunity is an important determinant of firm capital structure. Static trade-off theory predicts a negative relation between a firm's growth opportunity and financial

leverage ratio, because growth firms can incur much higher financial distress costs and lower agency costs of free cash flow. Therefore they tend to reduce their financial leverage. On the contrary, pecking order theory implies that firms with higher growth opportunities make more investments. To finance these investment projects, firms have to issue more debt. Thus the relation between a firm's growth opportunity and financial leverage ratio is positive. Numerous variables are considered to proxy for firm growth opportunity, such as asset changes and the earnings-to-price ratio. The most common proxy for growth opportunity in previous capital structure research is a firm's market-to-book ratio. Adam and Goyal (2008) indicate that the market-to-book ratio is the most reliable proxy for growth opportunities. Using a real option approach, they evaluate the performance of a group of proxy variables for growth opportunity. They show that the market-to-book asset ratio contains the highest information content with respect to firm growth. Rajan and Zingales (1995) examine the interaction between firm investment opportunities and financial leverage ratios. Empirical evidence from over 8000 firms in 31 countries shows that investment opportunity is a strong indicator of firm capital structure. Consistent with the prediction of trade-off theory, the variable market-to-book asset ratio is negatively related to the leverage ratio after controlling for other factors in all countries. This finding implies that firms with high growth opportunity tend to use equity financing rather than debt financing, since they do not want to pass up future profitable investment opportunities. Following previous research, we use Market-to-Book Assets ratio to proxy for firm growth opportunity.

4.3.2.6 Cash reserves

A firm's cash reserves are also significantly related to the financial leverage ratio. As pecking order theory suggests, firms tend to use internal financing rather than external debt financing, given sufficient internal funds. Therefore firms with large cash reserves

normally have low debt levels. We use the ratio of Cash Reserves to Total Assets (CASH/TA) to proxy for the size of internal funds.

4.3.2.7 Industry and market conditions

Historical data show that the financial leverage of firms in different industries varies dramatically. Industry conditions have a significant impact on firm's target capital structure. The previous literature also indicates that the industry effect may involve a group of factors common to firms in the same industry. To control for these effects, we adopt the 48-industry classification of Fama and French (1997) to develop 48 dummy variables for each specific industry.

As Welch (2004) argues, stock returns have substantial explanatory power for a firm's capital structure changes. Therefore firm managers may adjust their financial leverage according to market valuation timing. Our research uses the market's median leverage to control for market conditions.

4.3.3 Descriptive statistics

Table 4.2 presents the descriptive statistics for both firm and deal characteristics, including the number of observations and mean and median values. The left panel of Table 4.2 shows the descriptive statistics for a bidding firm's characteristics. It covers all variables used in this chapter. The results suggest no significant differences between our research sample and those of previous studies. The right panel mainly presents the results of deal characteristics. Compared to the descriptive results in Chapter 3, it is interesting to find that large deals are more likely to use a tender offer strategy. More than 20% of bidding firms use tender offers to acquire their targets. The results also show that fewer bidders use pure cash payments whereas more bidders choose pure stock payments in

large deals. On average, 17.86% of deals choose cash as the medium of payment but 35.59% of deals choose stock. Moreover, the percentage of unsolicited deals and the probability of targets using a poison pill in large deals are also significantly higher than for the whole sample.

4.3.4 Methodology

In this part, we briefly introduce the main steps of the methodology used in this chapter. The first step of the methodology is the estimation of target capital structure. Similar to the approach used in Chapter 3, we adopt the Tobit regression model in which the dependent variable – Firm's market leverage ratio is censored between 0 and 1. The independent variable of this regression is the variables which have determinant effect on firm's capital structure. All these variables are introduced in Section 4.3.2. The estimated value of this regression is considered as the optimal leverage ratio and the difference between firm's actual and optimal leverage ratio is defined as the leverage deficit. Following that, both the bidders and targets are divided into three groups according to their leverage deficit levels, over-leveraged, target-leveraged or under-leveraged. The regression model for target capital structure estimation is as following:

$$MarketLeverage = \beta_0 + \beta_1 Sale + \beta_2 EBITDA/TA + \beta_3 Tangible/TA + \beta_4 RD/TA + \beta_5 RDMiss + \beta_6 SE/Sale + \beta_7 MtB + \beta_8 Cash/TA + \beta_9 MML + \varepsilon \quad (4.1)$$

The next step of the research is the analysis on bidder's payment choices. The logistic regression model is adopted for analysis. To indicate firm's capital structure, both bidder and target's leverage deficit are included into the regression. In addition, six dummy variables for different deal types are also used in the second regression model. The following two models are the regression model for payment choice:

$$P(PureCash=1)=\beta_0+\beta_1 BLD+\beta_2 TLD+\beta_3 BML+\beta_4 MtB+\beta_5 Cash+\beta_6 Sales+\beta_7 RSize+\varepsilon$$

(4.2)

$$P(PureCash=1)=\beta_0+\beta_1 TYPE1+\beta_2 TYPE2+\beta_3 TYPE3+\beta_4 TYPE4+\beta_5 TYPE5$$
$$+\beta_6 TYPE6+\beta_7 BML+\beta_8 MtB+\beta_9 Cash+\beta_{10} Sales+\beta_{11} RSize+\varepsilon$$

(4.3)

Following the payment choice analysis, this chapter provides the analysis on bidder's short term announcement returns and their long term stock performances. This chapter uses the five-day [-2, +2] Cumulative Abnormal Returns (CAR) to represent bidder's short term announcement returns. The expected returns are estimated by the Fama-French Three factor plus momentum factor model. For long term performance, this chapter chooses the 12-monnth Buy-and-Hold Abnormal Returns (BHAR) in the post-merger period. Both univariate and multivariate analysis approach are used. The following is the regression models for multivariate analysis:

$$CAR[-2,+2]=\beta_0+\beta_1 BLD+\beta_2 MLD+\beta_3 Premium+\beta_4 Profit+\beta_5 PureCash+\beta_6 RelativeSize+\beta_7 MtB+\varepsilon$$

(4.4)

4.4 Empirical results

4.4.1 Estimation of target capital structure

As introduced above, we use the Tobit regression model to estimate a firm's target capital structure. The firm's actual market leverage ratio is regressed on a group of determinants of capital structure. The predicted value of this regression is chosen as the firm's optimal financial leverage ratio. To avoid a potential endogeneity problem between the financial

leverage ratio and these determinant variables, all the independent variables in this regression are lagged.

Table 4.3 presents the results of Tobit regression. The estimate for the variable Log of Sales is 0.0169 and statistically significant at the 1% level. This finding implies that large firms have higher optimal leverage ratios. Similarly, the impact of asset tangibility on firm capital structure is also positive (0.0411) and statistically significant at the 5% confidence level. Moreover, the estimate for the variables' median market leverage is positive (0.5151) and highly significant (P-value 0.0001). Our finding suggests that a firm's target leverage ratio varies with current market conditions. In contrast, consistent with the predictions of dynamic trade-off theory and pecking order theory, the coefficient of the profitability ratio in the regression is -0.4137, with a P-value less than 0.0001. The lower financial leverage of profitable firms is probably induced by both low debt levels and high stock returns. As predicted, the two product uniqueness proxies, the R&D expense ratio and the selling expense ratio, both have a negative (-0.2547 and -0.0137) and statistically significant influence on a firm's target capital structures. The positive and significant estimate for R&D Miss Dummy further confirms the effect of R&D expenses on capital structure. Furthermore, the estimates for a firm's cash reserve ratio and market-to-book ratio are both negative (-0.2313 and -0.0304) and highly significant at the 1% level. These results suggest that firms with large cash reserves and high growth opportunities are more likely to maintain less outstanding debt since they do not want to pass up potential profitable investments in the future.

The financial leverage deficit is calculated by the difference between a firm's actual leverage ratio and its optimal level. In line with previous research, we separate both bidders and targets into three groups according to their leverage deficit: Overleveraged, Target Leveraged, and Underleveraged. We develop three additional dummy variables to indicate a firm's leverage deficit status.

4.4.2 Payment choice analysis

This section adopts a logistic regression model to further investigate the relation between the payment choice of the takeover and the capital structure status of both the bidder and target. Since Harford, et al. (2009) suggests that a bidding firm's pre-acquisition leverage deficit affects the percentage of cash used in a takeover, we generate two main predictions: The first prediction is that a bidder's financial leverage deficit is inversely related to the probability of using a pure cash payment. This implies that overleveraged bidders are less likely to use pure cash payments, whereas underleveraged bidders are more likely to pay by cash. The second prediction is that deals in which bidders attempt to increase leverage deficit are more likely to involve pure cash payments.

Table 4.4 presents the results of the logistic analysis examining the considerations for using pure cash payments. The dependent variable in the regression is the dummy variable for pure cash payments. We control for several determinants that are able to affect payment decisions in a takeover. Following previous studies, the control variables are the bidder's market leverage ratio, market-to-book ratio, cash reserve, and firm size and the relative size between the target and bidder. The results for the first regression model in Table 4.4 show that a bidder's financial leverage deficit is negatively related to the probability of using a pure cash payment in M&A deals. The estimate for the bidder's leverage deficit is -4.9908 and both statistically and economically significant (P-value 0.0067). Consistent with our first prediction, the empirical evidence suggests that bidders with a substantially positive leverage deficit are less likely to using cash payments. Overleveraged bidders do not increase their financial leverage further since they have to issue more debt for cash payments. On the other hand, underleveraged bidders are more likely to eliminate the level of leverage deficit through takeovers.

The coefficient of the target leverage deficit is 0.9765 but it is statistically insignificant (P-value 0.1901). This finding suggests that the target's capital structure does not affect

bidder payment decisions. Moreover, the probability of using cash payments is also affected by several control variables. Consistent with the previous literature, the estimate for a bidder's actual financial leverage is positive (4.6885) and significant at the 1% confidence level. Similarly, there is a significantly positive relation between a bidder's market-to-book ratio and the probability of using pure cash payments. Bidders with high growth opportunities are more likely to choose pure cash payments. Consistent with our expectation, the coefficient of a bidder's cash reserve ratio is positive (1.8479) and significant at the 10% level (P-value 0.0970). As pecking order theory suggests, firms prefer to use internal financing over external financing. Therefore bidders with substantial internal funds are more likely to use cash than other bidders.

The second regression model in Table 4.4 provides evidence on whether the probability of choosing pure cash payment is influenced by different deal types. Six dummy variables for deal types are added to the regression. These six types of deals could be categorized into two major groups, first is the deals bidders tend to increase the leverage deficit and the second is the deals bidders tend to reduce the leverage deficit level. The results in the second model are very interesting: The estimates for deal types in the first group are all positive, at 0.8949, 0.6104, and 0.9749 respectively. However, the estimates for deal types in the second group are all negative. The evidence suggests that bidders in the first group are more likely to use pure cash payments, while bidders in the second group are less likely. The potential explanation is that all bidders in the first group are underleveraged and exhibit a leverage deficit-increasing trend. Therefore, they have more incentive to use cash payments rather than equity payments. In contrast, all bidders in the second group are relatively overleveraged and also willing to reduce their leverage deficits through takeovers. Thus they have less incentive to issue additional debt for cash payments compared to issuing new equities.

In summary, the results in this section provide further evidence to support the argument that firms have target capital structure. They also suggest that some firms tend to

rebalance their leverage ratios towards optimal levels through M&A deals. On the basis of this consideration, the financing and payment choices of deals are both affected by the deviation of a bidder's actual leverage ratio toward the target level. Overleveraged bidders are willing to reduce their deficit levels by acquiring underleveraged or less overleveraged targets. They are more likely to use equity as the medium of payment. On the other hand, underleveraged bidders also have an incentive to acquire overleveraged targets by using cash payments. Consistent with our predictions, the results from the logistic regression model suggest that the probability of using pure cash payments is negatively related to a bidder's leverage deficit.

4.4.3 Univariate analysis for announcement CARs

4.4.3.1 Bidder and target capital structure status classifications

This section discussed the market reactions to deal announcements with different types of bidders and targets. Following previous research, we adopt the Fama–French three-factor plus momentum factor model, the most popular and reliable short-term performance evaluation model. Table 4.5 reports the five-day (-2, +2) CAR for a bidding firm's stock price with different capital structure statuses. The announcement CAR for the full sample is -2.20%, on average, and statistically significant in T-test. This is consistent with the statement that M&A is value destroying for bidding firm shareholders.

To determine whether stock markets reactions differ according to firm capital structure, we further evaluate the short-term CAR of deals classified by different types of bidder and target. The empirical evidence suggests that bidder capital structure has a significant impact on announcement CARs. The average CAR for deals announced by OLBs is 0.41% and insignificantly different from zero in a T-test. However, the deals announced by TLBs and ULBs seem to have much worse stock market reactions, with average CARs of -3.68% and -2.74, respectively, both statistically significant (P-values 0.0001 and 0.0044,

respectively). These findings suggest that deals made by TLBs have the lowest short-term CARs, on average. From the target's point of view, average CARs for deals acquiring OLTs, TLTs, and ULTs are -2.53%, -2.07%, and -1.66% respectively. The CARs of deals acquiring different types of targets are not dramatically different from each other. These results clearly show that deals announced by bidders with different capital structures should have diversified stock performances in short term. These differences could be attributed to different expectations of financial market on new merging firms. For deals made by target-leveraged bidders, investors may afraid that the capital structure of new merging firms will deviate from the optimal level. This deviation should have negative impact on firm's future performance. Therefore the market reactions to these deals are deeply negative. By contrast, for over-leveraged bidders, financial market predicts that the ongoing deals help them to reduce the debt ratio and relief the financial distress. These potential benefits could help them to get better responses from the financial markets.

To further support these findings, the right panel of Table 4.5 presents the results of comparison tests between different subsamples. As argued, the T-test results indicate that the short-term stock performance of deals with OLBs is significantly better than for either the full sample or the other subsamples. Deals with OLBs outperform the full sample by 2.61%, statistically significant at the 1% confidence level (P-value 0.0014). Similarly, deals made by OLBs are also significantly better than those made by TLBs or ULBs. The huge gaps between these deals are 4.09% and 3.15%, respectively, both statistically significant in T-tests (P-values 0.0013 and 0.0208, respectively). In contrast, deals made by TLBs significantly underperform the full sample. It is -1.48% on average with a P-value of 0.0208. Moreover, the average CARs of deals with ULBs are not significantly different from those of deals with both TLBs and the full sample. For deals acquiring different types of targets, consistent with our argument, there is no statistically significant difference between each group and the full sample.

The empirical evidence from comparison tests further confirms our univariate analysis findings. We conclude that deals announced by overleveraged bidders performed significantly better than other deals. The stock markets believe that the announcement of an M&A deal is a positive signal of an overleveraged bidder's stock price. The bidder's shareholders will benefit from these deals. However, market reactions to deals announced by target-leveraged bidders are on the opposite end: They obtain, on average, the lowest announcement abnormal returns. A potential explanation is that investors worry that firm financial leverage will deviate from optimal levels after takeovers. Thus these deals can hurt shareholder interests.

4.4.3.2 Classification by deal type

As introduced earlier, firm managers may rebalance their capital structure towards target levels through M&A activities. After combining the level deficit status of both the bidder and target, we further identify six types of deals that can drive the merging firm's capital structure towards its target level after deal completion. As introduced above, these six types of deals are classified into two major groups. The following will introduce these two groups of deals.

The first group of deals are consisted with three types of deals, in which underleveraged bidders acquire overleveraged targets, underleveraged bidders acquire target-leveraged targets and more underleveraged bidders acquire less underleveraged targets. On the other side, the second group of deals are also consisted with three types of deals, in which overleveraged bidders acquire underleveraged targets, overleveraged bidders acquire target-leveraged targets and more overleveraged bidders acquire less overleveraged targets.

After deal completion, the deviation of the acquirer's actual financial leverage to its optimal level is reduced to some extent or even eliminated. This study shows how stock markets initially react to such deals around the announcement period. The left panel of Table 4.6 presents the five-day (-2, +2) CARs for bidding firms for each type of deal. It clearly shows that the short-term performance of bidder stock price changes remarkably with deal type. For deals ULB acquire OLT, the bidder's announcement CAR is the lowest (-5.45%), on average, and highly significant. Similarly, the announcement CARs for another two types of deal in the first group are also negative (-4.42% and -2.30%, respectively) and significant (P-values 0.0038 and 0.0702, respectively). Interestingly, the bidders in these two types are underleveraged. The results in Table 4.4 show that the average CAR for deals made by underleveraged bidders is -2.74%. Combining these results, we find that deals with a ULB acquiring either an OLT or a TLT significantly underperform the full sample. In contrast, deals OLB acquire TLT obtain positive (2.84%) and statistically significant (P-value 0.0892) abnormal returns during the announcement period. This result is also much better than the average CAR of deals made by overleveraged bidders in Table 4.5 (0.41%). Their average CARs for another two types of deals in the second group are also outperformance.

The results of comparison tests are presented in the right panel of Table 4.6. Consistent with the above findings, the empirical evidence suggests deals in the first group significantly underperform the full sample However, the market reactions to deals in the second group are significantly better than for the full sample.

We further compare the performance of each type of deal in different groups by pair. The performance difference between deals ULB acquire OLT and deals OLB acquire ULT is -4.35% and significant at the 10% level. This finding implies that deals with an OLB acquiring a ULT obtain a more favourable response from the financial market than deals with a ULB acquiring an OLT. Similarly, deals OLB acquire TLT outperform deals ULB acquire TLT by 7.26%, significant at the 1% confidence level. This difference is even

larger than that between the previous pair. Furthermore, the difference between the last pair of deals is also negative (-3.61%) and statistically significant (P-value 0.0955).

From these results, we conclude that a bidder's financial leverage deficit has a large impact on stock performance around the announcement period. Deals with overleveraged bidders obtain significantly better market reactions compared to deals with other types of bidders. For specific types of bidders, the capital structure of the targets also affects the short-term performance of M&A deals. Therefore, though the financial leverage ratios of bidders in all six types of deals exhibit a potential trend, moving towards optimal levels through the takeover, their announcement returns are dramatically different.

4.4.4 Multivariate regression analysis for announcement CARs

4.4.4.1 Leverage deficit

The univariate analysis results suggest that the capital structure of both the bidder and target is able to influence market reactions to takeover announcements. However, these findings do not consider other factors that can affect stock returns. To control for these determinants of bidder announcement returns, we adopt a cross-sectional multivariate regression model for further analysis.

In the regression model of Table 4.7, the dependent variable is the bidder's five-day (-2, +2) CAR around the announcement period. The first regression model contains only two independent variables, the bidder's leverage deficit and the target's. Consistent with our univariate analysis findings, the estimate for the bidder's leverage deficit is positive (0.0964) and statistically significant (P-value 0.0088). This finding suggests a positive relation between the bidder's leverage deficit and announcement CARs. Bidders with a high leverage deficit receive a better response from the financial markets. The estimate of a target's leverage deficit is negative (-0.0277) but statistically insignificant (P-value

0.3818). The estimation of the first regression is consistent with the univariate analysis results in the preceding section.

We use the second regression model on a group of control variables. These control variables cover both deal and firm characteristics and are all considered to have an impact on announcement returns. The second column of Table 4.7 shows the estimation results after controlling for these variables. The estimate for the bidder's leverage deficit is still positive (0.0688) and statistically significant (P-value 0.0919). This finding indicates that the positive relation between bidder capital structure and announcement returns remains consistent after the regression controls for other determinants. Moreover, the coefficient of the target's leverage deficit is negative but statistically insignificant.

The estimates for the other control variables are generally consistent with our predictions. The bid premium is negatively related to bidder announcement returns. Market concerns about the overpaying problem can increase with bid premiums. Thus the estimate for the bid premium is -0.0191 (P-value 0.0748). The estimate for the pure cash dummy is 0.0583 and statistically significant at the 1% level. This finding is consistent with the previous finding, that deals paid in cash create value for the bidder's shareholders. For variables relating to firm characteristics, the estimate for bidder's profitability is 0.0587 and significant at the 10% level. On the other hand, the coefficient of the market-to-book ratio in this regression is -0.0099 and statistically significant (P-value 0.0025).

To further confirm the relation between a bidder's leverage deficit and announcement returns, we adopt three dummy variables to indicate the specific status of a bidder's capital structure. Table 4.8 displays the estimation results based on these three dummies. In regression model 1, the estimate for the OLB dummy is 0.0232, with a P-value of 0.0537. This result further confirms the positive relation between a bidder's financial leverage deficit and announcement returns. However, the estimate for the TLB dummy in model 2 is negative (-0.0228) and also statistically significant (P-value 0.0519). For the

ULB dummy in model 3, the coefficient is 0.0007 and insignificant. The estimates for the other determinant variables remain consistent with the results of previous regressions. The coefficients of the bid premium in all three models are negative and statistically significant. The bidder's market-to-book ratio also has a negative impact on stock returns. The bidder's profitability and the dummy variable of pure cash payment are both positive and significant.

Integrating our findings with those of the univariate analysis, we conclude that M&A deals made by OLBs will significantly increase bidder short-term stock performance around the announcement period. A potential explanation is that these OLBs are undervalued. In the previous section, on target capital structure estimation, we find that a firm's profitability is negatively related to its optimal leverage ratio, consistent with dynamic trade-off theory. This implies that profitable firms may have lower target leverage ratios, which can induce them to become overleveraged. As previous research shows, deals made by profitable bidders are more likely to obtain better stock performance. In contrast, deals announced by TLBs are a significantly negative signal for the financial markets. Bidder stock prices fall dramatically following takeover announcements. We attribute this poor performance to potential shocks on bidder capital structure, which can be modified from optimal levels. The empirical evidence also shows that M&A deals announced by ULBs do not significantly affect stock market response.

4.4.4.2 Deal type

In line with the univariate analysis stage, we also examine the interaction between bidder announcement returns and different deal types in a multivariate regression analysis. Table 4.9 presents the regression results of the analysis based on deal types. The empirical evidence shows that half of the six dummy variables for deal type are statistically significant but with inverse relations. The estimate for the first dummy is -0.0298, with a

P-value of 0.0692. Consistent with the univariate analysis findings, the deals where a ULB acquires an OLT significantly underperform other types of deals. However, the coefficients of the two dummies in the second group are both positive (0.0578 and 0.0392, respectively) and statistically significant (P-values 0.0015 and 0.0206, respectively). For the other three types of deals, the estimates are statistically insignificant, which implies that these deals do not have a substantial impact on bidder announcement returns. The estimates for the control variables are consistent with those in the previous section.

To summarize, we find that a bidding firm's short-term announcement returns are affected by different types of deals. The type of deal is classified by the capital structure status of both the bidder and the target. The first type deal, which involving an underleveraged bidder acquiring an overleveraged target, has the most significant and most negative impacts on bidder's announcement returns.

On the other hand, both deals where an overleveraged bidder acquires an underleveraged target and a more overleveraged bidder acquires a less overleveraged target obtain more positive reactions from stock markets. These findings imply that M&A deals in which bidders attempt to reduce their overleverage are more favoured than deals increasing the leverage deficit.

4.4.5 Univariate analysis of the BHARs

The analysis of the bidder's announcement CARs finds strong evidence that both the bidder's and the target's leverage deficit status affects market reactions to takeover announcements. However, since adjustment to a firm's capital structure also influence stock performance in a long period, this section explores merging firms' long-term stock performance. Following the general research on long-term stock returns, we use the BHAR methodology to evaluate merging firms' 12-month post-merger stock performance.

Table 4.10 reports the BHARs of merging firms classified by leverage deficit status. For the full sample, the average 12-month BHAR is -32.71% and significant at the 1% level. This finding is consistent with the previous literature, in which shareholders do not benefit from M&A deals in the long run. When the sample is categorized by bidder leverage deficit, the results for each subsample are slightly different. There is a clear increasing trend with the changes in bidder's leverage deficit. The CARs for OLB, TLB and ULB are -38.26%, -33.26% and -26.85%, respectively. We find that the differences in the BHARs between these three subsamples are significantly different from those between short-term CARs. Deals made by overleveraged bidders have the best stock performance in the short run but the worst in the long run. Similarly, deals classified by target firm's leverage deficit also have inconsistent long-term performance with their short-term stock returns. Deals that acquire a target-leveraged target significantly outperform deals acquiring an overleveraged target by 16.20% and are -24.86% and -41.06%, respectively.

When we analyse the stock performance of merging firms in specific deal types, the results are even more significant. Table 4.11 displays merging firms' long-term BHAR classified by different deal types. The 12-month average BHAR for under-leveraged bidders acquiring over-leveraged targets is -21.95%, while it is -48.54% for over-leveraged bidders acquiring under-leveraged targets. The comparison analysis shows that there is a 26.59% performance gap between these two types of deals on average, although it is statistically insignificant (P-value 0.1957). However, in short-term CAR analysis, the results from comparison tests are exactly different. However, in the long run, type 1 deals substantially outperform type 2 deals. The long-term performance of deals ULB acquiring OLT and OLB acquiring ULT is also significantly different. The average 12-month BHARs for these two types of deals are -39.07% and -15.98%, respectively. There is a negative (-23.09%) and statistically significant (P-value 0.0978) difference between these two types.

The empirical evidence from the long-term BHAR analysis suggests that merging firms' long-term stock performance may not be in line with short-term abnormal returns around the announcement period. Especially for the first group deals in which an underleveraged bidder acquires an overleveraged target, long term post-merger performance is much better than for other types of deals, although these deals significantly underperform in the announcement period. Deals OLB acquiring TLT significantly outperform the other deals in both short-term CARs and long-term BHARs, on average. They obtain significantly positive (2.84%) abnormal returns in a five-day window around the announcement period. Though their average 12-month BHAR is negative (-15.98%), it is dramatically less negative than the average for the full sample (-32.71%). Therefore, we argue that acquisition of a target-leveraged target is a favourable choice for overleveraged firms.

4.5 Summary and conclusions

This chapter investigates how bidders' financial leverage deficits affect their M&A decisions. Traditional trade-off theory predicts that firms modify their own target capital structure based on the trade-off between the benefits and costs of corporate debt. The deviation from a firm's actual financial leverage to its target level is the leverage deficit. Previous literature suggests that some firms actively adjust their capital structure through M&A activities. This chapter confirms this argument by analysing the interaction between the leverage deficit and payment decisions in takeovers. The empirical evidence suggests that the relation between a bidder's leverage deficit and the probability of using a pure cash payment is significantly negative. Consistent with our predictions, overleveraged bidders are less likely to choose pure cash payments, while underleveraged bidders are more likely. These findings further support the argument that capital structure rebalancing is potential motivation for takeovers.

Furthermore, this chapter examines how the stock market reacts to deals classified by the bidder's and target's leverage deficit levels. Our analysis classifies both bidders and targets by their leverage deficit status. The results from univariate analyses show that deals with overleveraged bidders perform better than deals with other types of bidders, with an average five-day CAR of 0.41% around the announcement period. This could be attributed to the undervaluation of bidder stock prices. In contrast, market reactions to deals with target-leveraged bidders are significantly lower. Investors may be afraid that takeover deals will drive their leverage ratios away from optimal levels. From the target point of view, the leverage deficit status for targets does not display a significant impact on market reactions to announced deals. The evidence from cross-sectional multivariate regressions further confirms these findings. After controlling for several determinants, the regression yields a positive and statistically significant estimate for the bidder's leverage deficit variable. In addition, the estimates for the leverage deficit dummies are consistent with our predictions.

We also examine bidder announcement CARs by deal type, based on different combinations of bidders and targets. Deals with underleveraged bidders and overleveraged targets underperform the worst, on average. However, deals in which overleveraged bidders acquire target-leveraged targets obtain significantly positive (2.84%) reactions from the stock markets. The multivariate analysis evidence further demonstrates these relations. The estimate for the dummy variable of first type of deals is negative and significant at the 10% level. For dummies of second group of deals, the estimates are both positive and statistically significant after controlling for other determinant factors. The results of the analysis on merging firms' long-term stock performance differ dramatically from their short-term announcement returns. Deals made by overleveraged bidders have worse long-term performance than other deals. Though first type deals obtain the lowest announcement returns in the short run, their long-term BHARs are relatively higher. Overall, deals in which overleveraged bidders acquire

target-leverage targets perform better than other types of deals in both the short and long run.

This chapter's main contribution is further empirical evidence for the concept of target capital structure. Our findings strongly support the argument that firm managers actively rebalance their capital structure through M&As. We clearly show the interaction between a firm's leverage deficit and M&A payment choices. Moreover, this chapter sheds further light on merging firms' short- and long-term stock performance.

Table 4.1 Sample Selection

This table presents the sample selection process for the research of this chapter. The M&A data are from Securities Data Corporation (SDC) M&A Database. The accounting data is from COMPUSTAT Database. The stock price data is from CRSP Database.

Selection Criteria		Size
Acquirer Nation	United States of America	274248
Target Nation	United States of America	234574
Acquirer and Target Public Status	Public	36749
Date Announced	01/01/1980 to 12/31/2009	34123
Deal Status	Completed	14345
Deal Value	Larger Than $1 Million	12270
Firm Industry	Exclude Finance and Utility Firms	7625
Deal Type	Exclude Other M&A	4546
Accounting and Share Price Data Availability	Exclude Unmatched Deals	1548
Large Deal Selection	Relative Size > 20%	537

Table 4.2 Descriptive Statistics

This table presents the firm and deal characteristics for deals from 1980 and 2009. It reports the number of observation, mean and median value for each variable. The variable Market Value is the bidder's market value of total assets. The Log of Sales is the natural logarithm of sales in given year. The Market-to-Book ratio is the market value divided by the book value of total assets. R&D/TA represents expenses in research and development (R&D) over total assets. EBITDA/TA is the ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) over total assets. Tangible Asset/TA is defined as the ratio of net property, plant, and equipment over total assets. Selling Expense/Sales is the ratio of firm's total selling expense over total sales. Cash/AT is the ratio of cash reserves over total assets. Market Leverage is the ratio of book debt to market value of assets. The Leverage Deficit is the difference between firm's actual leverage and its target level. The variable Deal value is the value recorded in SDC Database. Relative Size is the total value of target over acquirers. Toehold Size is the percentage of common shares held by the acquirers before takeover. Hostile Deal is the percentage of hostile takeovers in each sample. Tender Offer is the percentage of acquirers using tender offers. Pure Cash is the percentage of deals paid 100% by cash. Pure Stock is the percentage of deals paid 100% by stock. Unsolicited Deal is the percentage of deals where acquirers make the offer without prior negotiations. Poison Pill is the percentage of targets using poison pill defences.

Table 4.2 Continued from Previous Page

Descriptive Statistics							
Firm Characteristics				Deal Characteristics			
	Obs.	Mean	Median		Obs.	Mean	Median
Market Value	537	4270.10	671.49	Deal Value	537	1910.92	244.55
Log of Sales	537	5.9208	5.9256	Relative Size	537	0.6766	0.4673
Market to Book Ratio	537	2.5447	1.9997	Toehold Size	33	22.99%	17.83%
R&D/TA	537	0.0490	0.0035		Obs.	Mean	
EBITDA/TA	537	0.1055	0.1339	Hostile Deal	537	3.35%	
Tangible Asset/AT	537	0.2821	0.2031	Tender Offer	537	20.48%	
Selling Expense/Sales	537	0.4006	0.1933	Pure Cash	537	16.01%	
Cash/AT	537	0.1173	0.0574	Pure Stock	537	35.75%	
Acquirer Market Leverage	537	0.3088	0.2810	Unsolicited Deal	537	5.40%	
Acquirer Leverage Deficit	537	-0.0017	-0.0056	Poison Pill	537	1.49%	
Target Market Leverage	537	0.3692	0.3482				
Target Leverage Deficit	537	0.0107	-0.0137				

Table 4.3 Target Capital Structure Estimation

This table presents the Tobit estimates of target leverage ratio for each bidder. The dependent variable is the market leverage ratio of bidder. The independent variable Log of Sales is the natural logarithm of firm's total sales. The EBITDA/TA is EBITDA over total assets. Tangible Asset/TA is defined as the ratio of net property, plant, and equipment over total assets. R&D/TA is the ratio of R&D expense over total assets. Selling Expense/Sales is the ratio of selling expense over total sales. Market to Book ratio is the ratio of market value over book value of total assets. Cash/TA is the ratio of cash reserves over total assets. Market Median Leverage is the median value of all firms' market leverage. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

$$MarketLeverage = \beta_0 + \beta_1 Sale + \beta_2 EBITDA/TA + \beta_3 Tangible/TA + \beta_4 RD/TA + \beta_5 RDMiss + \beta_6 SE/Sale + \beta_7 MtB + \beta_8 Cash/TA + \beta_9 MML + \varepsilon$$

	Market Leverage		
Variable	Coefficient	Standard Error	P-Value
Intercept	0.2259***	0.0751	0.0026
Log of Sales	0.0169***	0.0015	0.0001
EBITDA/TA	-0.4137***	0.0252	0.0001
Tangible Asset/TA	0.0411**	0.0193	0.0332
R&D/TA	-0.2547***	0.0427	0.0001
R&D Miss Dummy	0.0603***	0.0086	0.0001
Selling Expense/Sales	-0.0137***	0.0028	0.0001
Market to Book Ratio	-0.0304***	0.0016	0.0001
Cash/TA	-0.2313***	0.0249	0.0001
Market Median Leverage	0.5151***	0.0484	0.0001
Observations		537	

Table 4.4 Payment Choice Analysis

This table presents the results of Logistic regression for using pure cash payment. The dependent variable is the dummy variable for whether using pure cash payment. The independent variable Bidder Leverage Deficit is the difference between bidder's actual leverage ratio and its optimal level. Target Leverage Deficit is the difference between target's actual leverage ratio and its optimal level. The deal type 1 is the deals in which under-leveraged bidders acquiring over-leveraged targets. The deal type 2 is the deals in which over-leveraged bidders acquiring under-leveraged targets. The deal type 3 is the deals in which under-leveraged bidders acquiring target-leveraged targets. The deal type 4 is the deals in which over-leveraged bidders acquiring target-leveraged targets. The deal type 5 is the deals in which more under-leveraged bidders acquiring less under-leveraged targets. The deal type 6 is the deals in which more over-leveraged bidders acquiring less over-leveraged targets. The variable Market Leverage is bidder's market leverage ratio. The variable Market-to-Book ratio is the ratio of market value over book value of total assets. Cash/TA is the ratio of cash reserves over total assets. Log of Sales is the natural logarithm of firm's total sales. Relative Size is the ratio of target's total assets over bidder's total assets. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following are the models:

Model 1

$$P(PureCash=1)=\beta_0+\beta_1 BLD+\beta_2 TLD+\beta_3 BML+\beta_4 MtB+\beta_5 Cash+\beta_6 Sales+\beta_7 RSize+\varepsilon$$

Model 2

$$P(PureCash=1)=\beta_0+\beta_1 TYPE1+\beta_2 TYPE2+\beta_3 TYPE3+\beta_4 TYPE4+\beta_5 TYPE5+\beta_6 TYPE6+\beta_7 BML+\beta_8 MtB+\beta_9 Cash+\beta_{10} Sales+\beta_{11} RSize+\varepsilon$$

Table 4.4 Continued from Previous Page

Logistic Analysis for Payment Selection				
	P (Pure Cash = 1)			
	Model (1)		Model (2)	
Variable	Coefficient	P-Value	Coefficient	P-Value
Intercept	-1.0003	0.2340	-0.6422	0.3598
Bidder Leverage Deficit	-4.9908***	0.0067		
Target Leverage Deficit	0.9765	0.1901		
ULB Buy OLT			0.8949*	0.0755
ULB Buy TLT			0.6104	0.0295
More ULB Buy Less ULT			0.9749**	0.2107
OLB Buy ULT			-0.9904**	0.1904
OLB Buy TLT			-0.5733	0.0391
More OLB Buy Less OLT			-0.0897	0.8452
Market Leverage	4.6885***	0.0056	3.2645***	0.0035
Market-to-Book ratio	0.4967***	0.0001	0.4417***	0.0001
Cash/TA	1.8479*	0.0970	1.4394	0.1734
Log of Sales	-0.0573	0.4041	-0.0260	0.6978
Relative Size	0.2772	0.2308	0.2638	0.2427
Pseudo R-Square	0.0690		0.0863	
Observations	537		537	

Table 4.5 Bidder's Announcement Returns Classified by Firm Capital Structure Status

This table shows short-term cumulative abnormal returns for all bidding firms around the takeover announcement. In left panel, the full sample is classified by the leverage deficit status of bidder and target. The CAR [-2, +2] denotes the five-day cumulative abnormal return measured by Fama-French three-factor plus momentum factor model. The estimate period is [-346, -91]. The right panel of this table presents the results of difference tests which are based on T-tests for mean values. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Bidder's [-2 ,+2] Cumulative Announcement Abnormal Returns						
Sample Selection	Obs.	Mean	P-Value	T-Test for Difference	Mean	P-Value
Full Sample	536	-2.20%***	0.0001	O-L Bidder – U-L Bidder	3.15%**	0.0208
				O-L Bidder – T-L Bidder	4.09%***	0.0013
Deals with Over-Leveraged Bidder	167	0.41%	0.6711	T-L Bidder – U-L Bidder	-0.95%	0.4479
Deals with Target-Leveraged Bidder	186	-3.68%***	0.0001	O-L Bidder – Full Sample	2.61%***	0.0014
Deals with Under-Leveraged Bidder	183	-2.74%***	0.0044	T-L Bidder – Full Sample	-1.48%**	0.0208
				U-L Bidder – Full Sample	-0.54%	0.3736
Deals with Over-Leveraged Target	177	-2.53%***	0.0046	O-L Target – U-L Target	-0.87%	0.4767
Deals with Target-Leveraged Target	177	-2.07%**	0.0407	O-L Target – T-L Target	-0.46%	0.7323
Deals with Under-Leveraged Target	182	-1.66%*	0.0535	T-L Target – U-L Target	-0.42%	0.7530
				O-L Target – Full Sample	-0.33%	0.5516
				T-L Target – Full Sample	0.13%	0.9893
				U-L Target – Full Sample	0.54%	0.5633

Table 4.6 Bidder's Announcement Returns Classified by Deal Type

This table shows short-term cumulative abnormal returns for all bidding firms around the takeover announcement. In left panel, the full sample is classified by different types of M&A. Deal Type 1 is the deals Under-Leveraged Bidder acquiring Over-Leveraged Target. Deal Type 2 is the deals Over-Leveraged Bidder acquiring Under-Leveraged Target. Deal Type 3 is the deals Under-Leveraged Bidder acquiring Target-Leveraged Target. Deal Type 4 is the deals Over-Leveraged Bidder acquiring Target-Leveraged Target. Deal Type 5 is the deals More Under-Leveraged Bidder acquiring Less Under-Leveraged Target. Deal Type 6 is the deals More Over-Leveraged Bidder acquiring Less Over-Leveraged Target. The CAR [-2, +2] denotes the five-day cumulative abnormal return measured by Fama-French three-factor plus momentum factor model. The estimate period is [-346, -91]. The right panel of this table presents the results of difference tests which are based on T-tests for mean values. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Bidder's [-2 ,+2] Cumulative Announcement Abnormal Returns						
Sample Selection	Obs.	Mean	P-Value	T-Test for Difference	Mean	P-Value
Full Sample	536	-2.20%***	0.0001	ULB Buy OLT – OLB Buy ULT	-4.35%*	0.0678
				ULB Buy OLT – Full Sample	-3.25%*	0.0591
ULB Buy OLT	47	-5.45%**	0.0144	OLB Buy ULT – Full Sample	1.10%	0.5713
OLB Buy ULT	38	-1.10%	0.5328			
				ULB Buy TLT – OLB Buy TLT	-7.26%***	0.0061
ULB Buy TLT	59	-4.42%***	0.0038	ULB Buy TLT – Full Sample	-2.22%*	0.0955
OLB Buy TLT	53	2.84%*	0.0892	OLB Buy TLT – Full Sample	5.04%**	0.0137
More ULB Buy Less ULT	73	-2.30%*	0.0702	MULB Buy LULT – MOLB Buy LOLT	-3.61%*	0.0955
More OLB Buy Less OLT	63	1.32%	0.4907	MULB Buy LULT – Full Sample	-0.10%	0.9335
				MOLB Buy LOLT – Full Sample	3.51%**	0.0475

Table 4.7 Cross-sectional Regression for CARs based on Leverage Deficit

This table shows the results of cross-sectional multivariate regressions for which the dependent variable is bidder's five-day [-2, +2] cumulative abnormal returns. The estimates and P-Values are both reported for each variable. The variable Bidder Leverage Deficit is the difference between bidder's actual leverage and its optimal level. Target Leverage Deficit is the difference between target's actual leverage and its optimal level. Premium is the four week premiums of each deal recorded by SDC database. Profit is the ratio of EBITDA over total asset. Pure Cash is a dummy variable indicating whether deals are paid by 100 percent cash. Relative Size is the total value of the target over acquirers. Market-to-Book ratio is the ratio of firm's market value of assets over the book value of assets. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following is the regression models:

Model 1

$$CAR[-2,+2] = \beta_0 + \beta_1 BLD + \beta_2 TLD + \varepsilon$$

Model 2

$$CAR[-2,+2] = \beta_0 + \beta_1 BLD + \beta_2 MLD + \beta_3 Premium + \beta_4 Profit + \beta_5 PureCash + \beta_6 RelativeSize + \beta_7 MtB + \varepsilon$$

Table 4.7 Continued from Previous Page

Regression for CAR				
	CAR [-2,+2]			
	Model (1)		Model (2)	
Variable	Coefficient	P-Value	Coefficient	P-Value
Intercept	-0.0204***	0.0001	-0.0101	0.4508
Bidder Leverage Deficit	0.0964***	0.0088	0.0688*	0.0919
Target Leverage Deficit	-0.0277	0.3818	-0.0469	0.1697
Premium			-0.0191*	0.0748
Profit			0.0587*	0.0860
Pure Cash			0.0583***	0.0001
Relative Size			0.0021	0.8072
Market to Book			-0.0099***	0.0025
Adjusted R-Square	0.0130		0.0869	
Observations	536		469	

Table 4.8 Cross-sectional Regression for CARs based on Leverage Deficit Dummy

This table shows the results of cross-sectional multivariate regressions for which the dependent variable is bidder's five-day [-2, +2] cumulative abnormal returns. The estimates and P-Values are both reported for each variable. The variable Over-Leveraged Bidder is the dummy variable for over-leveraged bidders. Target-Leveraged Bidder is the dummy variable for target-leveraged bidders. Under-Leveraged Bidder is the dummy variable for under-leveraged bidders. Premium is the four week premiums of each deal recorded by SDC database. Profit is the ratio of EBITDA over total asset. Pure Cash is a dummy variable indicating whether deals are paid by 100 percent cash. Relative Size is the total value of the target over acquirers. Market-to-Book ratio is the ratio of firm's market value of assets over the book value of assets. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following is the regression models:

Model 1

$$CAR[-2,+2] = \beta_0 + \beta_1 OLB + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Model 2

$$CAR[-2,+2] = \beta_0 + \beta_1 TLB + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Model 3

$$CAR[-2,+2] = \beta_0 + \beta_1 ULB + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Table 4.8 Continued from Previous Page

Regression for CAR						
	CAR [-2,+2]					
	Model (1)		Model (2)		Model (3)	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	-0.0199	0.1528	-0.0063	0.6431	-0.0121	0.3921
Over-Leveraged Bidder	0.0232*	0.0537				
Target-Leveraged Bidder			-0.0228*	0.0519		
Under-Leveraged Bidder					0.0007	0.9497
Premium	-0.0198*	0.0637	-0.0203*	0.0579	-0.0206*	0.0549
Profit	0.0640*	0.0576	0.0789**	0.0202	0.0699**	0.0431
Pure Cash	0.0596***	0.0001	0.0598***	0.0001	0.0593***	0.0001
Relative Size	0.0002	0.9831	-0.0004	0.9593	0.0014	0.8735
Market to Book	-0.0088***	0.0067	-0.0086***	0.0081	-0.0096***	0.0030
Adjusted R-Square	0.0866		0.0867		0.0792	
Observations	469		469		469	

Table 4.9 Cross-sectional Regression for CARs based on Deal Type

This table shows the results of cross-sectional multivariate regressions for which the dependent variable is bidder's five-day [-2, +2] cumulative abnormal returns. The estimates and P-Values are both reported for each variable. The variable Deal Type is the dummy variable for six types of deals. Premium is the four week premiums of each deal recorded by SDC database. Profit is the ratio of EBITDA over total asset. Pure Cash is a dummy variable indicating whether deals are paid by 100 percent cash. Relative Size is the total value of the target over acquirers. Market-to-Book ratio is the ratio of firm's market value of assets over the book value of assets. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following is the regression models:

Model 1

$$CAR[-2,+2] = \beta_0 + \beta_1 TYPE1 + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Model 2

$$CAR[-2,+2] = \beta_0 + \beta_1 TYPE2 + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Model 3

$$CAR[-2,+2] = \beta_0 + \beta_1 TYPE3 + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Model 4

$$CAR[-2,+2] = \beta_0 + \beta_1 TYPE4 + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Model 5

$$CAR[-2,+2] = \beta_0 + \beta_1 TYPE5 + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Table 4.9 Continued from Previous Page

Model 6

$$CAR[-2,+2] = \beta_0 + \beta_1 TYPE6 + \beta_2 Premium + \beta_3 Profit + \beta_4 PureCash + \beta_5 RelativeSize + \beta_6 MtB + \varepsilon$$

Regression for CAR												
	CAR [-2,+2]											
	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	-0.0090	0.5037	-0.0106	0.4329	-0.0105	0.4370	-0.0138	0.2971	-0.0141	0.3049	-0.0161	0.2296
ULB Buy OLT	-0.0298*	0.0692										
OLB Buy ULT			-0.0159	0.4649								
ULB Buy TLT					-0.0133	0.4487						
OLB Buy TLT							0.0578***	0.0015				
MULB Buy LULT									0.0115	0.4804		
MOLB Buy LOLT											0.0392**	0.0206
Premium	-0.0193*	0.0728	-0.0207*	0.0532	-0.0202*	0.0602	-0.0211**	0.0472	-0.0201*	0.0608	-0.0195*	0.0673
Profit	0.0619*	0.0684	0.0702**	0.0373	0.0680**	0.0440	0.0592*	0.0771	0.0731**	0.0321	0.0666**	0.0471
Pure Cash	0.0593***	0.0001	0.0601***	0.0001	0.0589***	0.0001	0.0588***	0.0001	0.0598***	0.0001	0.0601***	0.0001
Relative Size	0.0023	0.7940	0.0012	0.8886	0.0016	0.8528	-0.0014	0.8688	0.0014	0.8682	-0.0012	0.8914
Market to Book	-0.0098***	0.0023	-0.0097***	0.0027	-0.0096***	0.0029	-0.0098***	0.0021	-0.0096***	0.0029	-0.0092***	0.0041
Adjusted R-Square	0.0839		0.0802		0.0803		0.0990		0.0802		0.0898	
Observations	469		469		469		469		469		469	

Table 4.10 Bidder's 12-month Post-Merger BHARs Classified by Firm Capital Structure Status

This table shows long-term buy-and-hold abnormal returns for all merging firms in post-merger period. In left panel, the full sample is classified by the leverage deficit status of bidder and target. The 12-month BHAR denotes the 12 months buy and hold abnormal returns measured by Fama-French three-factor plus momentum factor model. The right panel of this table presents the results of difference tests which are based on T-tests for mean values. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Bidder's 12-month Post-Merger BHARs						
Sample Selection	Obs.	Mean	P-Value	T-Test for Difference	Mean	P-Value
Full Sample	524	-32.71%***	0.0001	O-L Bidder – U-L Bidder	-11.41%	0.2381
				O-L Bidder – T-L Bidder	-4.90%	0.6097
Deals with Over-Leveraged Bidder	165	-38.26%***	0.0001	T-L Bidder – U-L Bidder	-6.50%	0.5318
Deals with Target-Leveraged Bidder	182	-33.36%***	0.0001	O-L Bidder – Full Sample	-5.55%	0.3172
Deals with Under-Leveraged Bidder	177	-26.85%	0.0004	T-L Bidder – Full Sample	-0.65%	0.9067
				U-L Bidder – Full Sample	5.86%	0.3038
Deals with Over-Leveraged Target	173	-41.06%***	0.0001	O-L Target – U-L Target	-8.85%	0.3994
Deals with Target-Leveraged Target	173	-24.86%***	0.0001	O-L Target – T-L Target	-16.20%*	0.0798
Deals with Under-Leveraged Target	178	-32.21%***	0.0001	T-L Target – U-L Target	7.35%	0.4623
				O-L Target – Full Sample	-12.47%	0.1487
				T-L Target – Full Sample	11.71%	0.1469
				U-L Target – Full Sample	0.75%	0.9345

Table 4.11 Bidder's 12-month Post-Merger BHARs Classified by Deal Type

This table shows long-term buy-and-hold abnormal returns for all merging firms in post-merger period. In left panel, the full sample is classified by different types of M&A deals. The 12-month BHAR denotes the 12 months buy and hold abnormal returns measured by Fama-French three-factor plus momentum factor model. The right panel of this table presents the results of difference tests which are based on T-tests for mean values. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Bidder's 12-month Post-Merger BHARs						
Sample Selection	Obs.	Mean	P-Value	T-Test for Difference	Mean	P-Value
Full Sample	524	-32.71%***	0.0001	ULB Buy OLT – OLB Buy ULT	26.59%	0.1957
				ULB Buy OLT – Full Sample	10.75%	0.4118
ULB Buy OLT	46	-21.95%	0.1547	OLB Buy ULT – Full Sample	-15.83%	0.2758
OLB Buy ULT	38	-48.54%***	0.0006			
				ULB Buy TLT – OLB Buy TLT	-23.09%*	0.0978
ULB Buy TLT	57	-39.07%***	0.0002	ULB Buy TLT – Full Sample	-6.36%	0.5101
OLB Buy TLT	53	-15.98%	0.1259	OLB Buy TLT – Full Sample	16.73%*	0.0998
More ULB Buy Less ULT	70	-48.78%***	0.0001	MULB Buy LULT – MOLB Buy LOLT	-7.81%	0.6306
More OLB Buy Less OLT	63	-40.97%***	0.0016	MULB Buy LULT – Full Sample	-16.07%*	0.0976
				MOLB Buy LOLT – Full Sample	-8.26%	0.4521

Chapter 5

5. M&As and Financial Media

5.1 Introduction

This chapter investigates the relation between stock market reactions to M&As and quantitative media information. It is generally believed that financial newspapers play an important role in disseminating information to financial market participants. These newspapers have a direct impact on investor sentiment concerning either the whole market or individual stocks. Their impact significantly affects the future movement of stock prices. There are few studies on media's relation with the financial market. As Tetlock (2007) shows, the content of news is able to predict future movements of the whole stock market. More specifically, Tetlock, et al. (2008) suggests that media reports can predict an individual firm's stock returns. On the other hand, previous media studies also show that the media can report a firm's unreleased fundamental information and have predictability for the firm's future performance. The new information released by news will naturally affect stock market valuations.

However, a significant gap exists in the research. The literature shows that the financial media have a strong influence on firm stock performance. To our knowledge, however, only a few papers examine the relation between the financial media and corporate events such as M&As. Therefore, the original motivation of this chapter is to examine the potential interaction between financial media and M&A deals. Based on previous findings on the relation between financial media and the financial market, we expect M&A deals to interact with the financial media through two major channels. First, according to previous M&A papers, the stock market's reaction to a takeover announcement is an indispensable research object. It is generally believed that stock market reactions to a takeover announcement mainly reflect investor recognition of this corporate event. Since

investor recognition can vary with the news released by the financial media, we expect to observe a significant relation between financial news and the acquirer's abnormal returns around takeover announcements. In addition, Tetlock et al. (2008) proves that the fundamental information transmitted by the financial news is able to resolve the problem of information asymmetry. This news provides additional information for investors to adjust their prospects in M&A deals and long-term valuations. Thus we expect an acquirer's long-term post-merger performance to be affected by media reports. Based on these two channels, this chapter develops three major research questions. The first research question is that whether news released in pre-merger period affects the market reactions to takeover announcement. The analysis for this question would improve our understandings on bidder's announcement effects. The second research question is that whether financial media could predict new merging firm's long term stock performance. Moreover, it is also necessary to explore the reliable explanation for above two questions.

Using a sample of US M&A deals during 2000–2009, this chapter examines the market reactions to M&A events based on different levels of media coverage and media attitude. In contrast to the previous literature, which focuses on the relation between financial media and the entire stock market, we shed light on one of the most representative corporate events, the M&A, to further investigate the effect of media news on financial markets.

To conduct our research, we construct a unique and comprehensive data set that contains 478,830 financial news articles, as well as data on 288 M&A deals. The M&A deals are split into subsamples according to the level of relative media coverage and attitude, respectively. To evaluate the performance of M&A deals, both short-term CARs and long-term BHARs are calculated for each firm. Comparing the average CARs of the two subsamples, we show that the market appears to have a more favoured response to takeover deals announced by firms with relatively better media attitudes. However, the announcement returns of firms with different levels of media attitude are not dramatically

different. The regression results further support these findings. After controlling for variables that have an impact on bidder short-term stock returns, the empirical results show that there is a statistically significant relation between CARs and the media attitude measure. For robustness, we study a group of CARs with different time windows to further validate this relation. The results from these complementary models also suggest that media attitude should significantly affect a bidding firm's short-term performance, especially its announcement abnormal returns. For long-term BHARs, we find evidence that media attitude around the takeover event can partially predict a bidder's post-merger performance. We also find that the premiums paid by bidders are related to both media attitude and coverage before takeover announcements.

Our research makes several contributions to the literature. This study is the first to investigate the relation between financial media and M&As based on stock market performance. Extending previous literature on the interaction between financial media and stock market movements, this chapter refines the research window. Our research time window is specified by the most important corporate event, M&A activities. This chapter finds substantial empirical evidence that news from popular and powerful financial newspapers has a large impact on stock market reactions to takeover announcements. The research particularly focuses on short-term reactions to takeover announcements. These important findings promote a better understanding of acquirer's short-term abnormal returns around an M&A deal announcement and subsequent reversion to pre-announcement levels in the following days. Moreover, we classify news stories into two data sets, by media attitude and media coverage. The empirical evidence suggests that media attitude has a more significant impact on short-term returns than media coverage. This conclusion has further implications for investor sentiment research and suggests that media attitude could be considered an effective proxy for investor sentiment.

This chapter is organized as follows. Section 5.2 reviews the related literature. Section 5.3 presents the main hypotheses. Section 5.4 introduces the sample selection and descriptive statistics. Section 5.5 presents the empirical results and related discussions. Section 5.6 concludes the chapter.

5.2 Literature review

5.2.1 Media content and the financial market

Few studies examine media's relation with the financial market. The interaction between financial media and the stock market is considered linked to investor psychology and sociology, but the direction of causality is still debatable. Tetlock's (2007) study determines whether the financial media news induces, amplifies, or simply reflects the interpretations of financial market performance. It is the first paper to examine the relation between the content of financial media and future stock market activities. To quantitatively measure the content of the influential column 'Abreast of the Market' in *The Wall Street Journal* during 1984–1999, Tetlock uses the famous quantitative content analysis program General Inquirer and generates a measure of media pessimism. The author then uses vector autoregression to estimate the interaction between the media pessimism factor and the stock market. The empirical results suggest that a high level of media pessimism is able to predict future downward pressure on the stock market. But this pattern is also followed by a reversion to fundamental values, which implies that the influence of media news is temporary. Moreover, this finding shows that media pessimism also has an impact on market trading volume. High market trading volume is attributed to unexpected high or low values of the media pessimism factor. On the other hand, low market returns also induce high media pessimism. Tetlock's findings suggest that the content of financial media would be a reliable proxy for investor sentiment. However, the empirical evidence does not support the hypothesis that media news contains additional information about a firm's fundamental values.

Tetlock, et al. (2008) refines their research target from the whole stock market to individual firms. They quantify the content of financial news in an effort to forecast individual firm stock returns and accounting earnings. The media source is not limited to 'Abreast of the Market' in *The Wall Street Journal* and extends to all news stories in *The Wall Street Journal* and Dow Jones News Service about individual Standard & Poor's 500 firms during 1980–2004. Similar to Tetlock, the authors calculate the fraction of negative words to the total number of words as the media pessimism factor.

Tetlock, et al. (2008) points out two significant advantages to using a content analysis framework to examine the interaction between media news and individual firm stock returns. First, by quantifying the content of news, they can select all types of corporate events and not just one particular event type. The more complete set of events provides a clearer pattern with which to investigate the impact of financial media on stock returns. Second, it is believed that a news story published by financial media is a potentially important source of firm fundamental information. In addition to traditional main sources of firm fundamental information, such as analyst forecasts and firms' public disclosures, firm-specific news may provide incremental explanatory power for a firm's future stock returns and accounting earnings.

As Tetlock, et al. (2008) argue, the evidence shows that the negative information delivered by financial news is before stock analysts' forecasts. This result suggests that the financial media are considered a reliable supplemental source of fundamental information. Furthermore, it shows that firm stock prices respond to information embedded in the financial news with a one-day delay. However, a trading strategy based on exploring this small delay is not profitable since a reasonable trading cost must be considered. In addition, the results suggest that the news relating to firm fundamentals is able to more effectively predict a firm's future stock returns and accounting earnings.

To further test the results of the previous study (Tetlock et al, 2008), Tetlock (2010) examines how the financial media resolve the problem of information asymmetry. The author uses a uniquely comprehensive media data set to test the hypotheses from the asymmetric information model. This media set contains more than 2.2 million financial news items covering the 29-year period from 1979 to 2007. Tetlock proposes that public financial news is able to eliminate the information asymmetry between informed and uninformed investors. There are four major hypotheses in the author's analysis: (1) firm abnormal returns on the news day are positively related to stock returns on following days, (2) news days with higher trading volume have more predictive power than days with lower trading volume, (3) financial news increases the correlation between a firm's trading volume and stock returns, and (4) the trading behaviour of informed investors has less of an impact on stock prices since financial news reduces information asymmetry. The author uses daily cross-sectional regressions to examine the stock returns and trading volume on both news days and non-news days. Consistent with predictions, the empirical results suggest that the reversals of abnormal returns on news days are significantly lower than on non-news days. Moreover, they show that the cross-sectional correlation between a firm's abnormal returns and abnormal trading volumes is 35% higher on news days than on non-news days. The impact of order flow on stock prices is also temporarily 3.3% lower on news days. This evidence shows that financial news releases new information to uninformed investors, whereas informed investors have already acted on this information.

The relation between financial news and the reduced reversal of abnormal returns also varies according to different characteristics. The effect of financial news is much stronger for small and illiquid firm stocks than others, since it resolves more information asymmetry. The content of financial news also affects its impact on return reversals and trading volumes. News with newswire and earnings-related information has a significantly larger impact than other types of news.

To further investigate the effect of financial news on resolving information asymmetry, Tetlock (2011) tests whether investors distinguish between old and new information from the content of financial news. The author adopts a variable for staleness to evaluate how much new information is included in the financial news. Staleness is measured by average textual similarity to the 10 previous news items relating to the same stock. After examining the cross-sectional stock returns and trading volumes of firms on news days, the author shows that the staleness of news has a significant impact on market reactions. Both the stock returns and trading volumes on news days with low average staleness significantly exceed those for news days with high staleness financial news. The results further suggest that the staleness of news is an effective predictor of future stock returns. There is a significant and negative relation between the staleness of financial news and the future returns of related stocks. Furthermore, the empirical results show that institutional investors are less likely to react to stale news than individual investors.

5.2.2 Media coverage and the financial market

For researchers, the media news normally involves two sets of information: media content and media coverage. Tetlock's (2007, 2010, 2011) papers mainly employ a content analysis methodology to evaluate the general attitude of financial news. In contrast, Fang and Peress (2009) use media coverage to investigate the relation between the media and the financial market. They examine the cross-sectional relation between mass media coverage and stock returns during the period 1993–2002. The empirical evidence shows a significant return premium for firms with no or less media coverage compared to firms with massive media coverage. After controlling for financial market, firm size, book-to-market, momentum, and liquidity factors, the authors show that a portfolio of stocks with no media coverage has a 3% higher annual return than a portfolio of stocks with high media coverage. The differences of abnormal returns between the two portfolios are particularly large for small firms and firms with low analyst coverage, high individual ownership, or high idiosyncratic volatility. The authors propose two

explanations for these differences. The first one is the liquidity-related hypothesis: Mispricing for stocks with no media coverage persists only because market friction is too high to exploit it. Another explanation is the investor recognition hypothesis: Firms with low media coverage are naturally associated with low investor recognition. These firms should provide additional returns to compensate for imperfect diversification.

The empirical evidence supports both hypotheses. Consistent with the liquitidy-related hypothesis, the impact of media coverage is much stronger among small firms with high bid–ask spreads. According to the investor recognition hypothesis, firms with a high percentage of individual ownership, low levels of analyst coverage, or high idiosyncratic volatility present higher premiums for the lack of media coverage. However, the illiquidity hypothesis is only able to explain the persistence of media effect and not the cause. Thus Fang and Peress (2009) conclude that the return premium of media coverage mainly reflects different levels of investor recognition and the illiquidity of stocks helps perpetuate this phenomenon.

Engelberg and Parsons (2009) also investigate the causal relation between media coverage and stock market reactions. Specifically, they focus on whether media coverage can affect investor response to financial events. To exploit the geographic variation of local newspapers, they identify 19 local financial markets covering major US cities, using retail brokerage data and a major information source for each market. The empirical results mainly suggest that the presence of local media coverage has a strong impact on the trading activity of local financial markets. After controlling for several factors, the authors show that the interaction between local media coverage and local trading activities remains strong for both local and non-local firms. Evidence from examining the effect of exogenous shocks further supports their conclusions: It shows that if the normal delivery of local media is disrupted for exogenous reasons, the relation between media coverage and the local financial market is temporary broken. The evidence also shows that trading activity patterns depend strongly on local media coverage.

Not only are the trading activities of local financial markets affected by media coverage, but Fang, et al. (2009) indicates that mutual fund trading activities are also related to stock media coverage. The authors examine whether mutual fund manager decisions are influenced by media coverage. They believe that media coverage can draw fund managers' attention to specific firms. Using unique media coverage data from 1993 to 2002, the authors analyse the relation between a mutual fund's trading propensity and media coverage. The empirical results suggest that mutual funds generally present a high intensity of trading for high media coverage firms. Furthermore, mutual funds tend to buy more high media coverage stocks than sell them. However, not all funds trade with media coverage. The evidence indicates that the attitudes of mutual funds with media coverage differ substantially, on average, from those without media coverage. On the other hand, the cross-sectional variation in trade with media coverage (PTMC) has a large impact on mutual fund performance. When the mutual funds are sorted into PTMC-based quintiles, there is a significantly negative relation between PTMC and fund alpha values. Thus TPMC measures can be used to partially predict a fund's future performance.

5.2.3 The media and corporate events

The relation between financial media and a firm's corporate events is also an interesting and popular research field. Bhattacharya et al. (2009) investigate the role of the media in the Internet IPO bubble. They construct a sample of 458 Internet IPOs between 1996 and 2000 and a matching sample of 458 non-Internet IPOs with related financial news. Each news report is classified as good, neutral, or bad news according to the news content. Overall media sentiment for each IPO is measured by the number of good news items minus the number of bad news items. The descriptive results show that Internet IPOs had significantly higher media coverage than non-Internet IPOs in both the bubble and post-bubble periods. In the bubble period, the average sentiment of news for Internet IPOs was more positive than for matching-sample IPOs. On the contrary, in the

post-bubble period, average media sentiment for Internet IPO fell dramatically and became even more negative than for non-Internet IPOs. After controlling for several factors, the results consistently suggest that the interaction between stock returns and media sentiment was more positive in the bubble period and more negative in the post-bubble period. Overall, these empirical results strongly support the argument that the media played an important role in the Internet IPO bubble.

The empirical evidence of Bhattacharya et al. (2009) also suggests that the marginal effects of the media on stock returns are distinctly different between Internet and non-Internet IPOs. The impact of news sentiment on risk-adjusted returns is much lower for Internet IPOs than for non-Internet IPOs in both the bubble and post-bubble periods. However, media coverage is not a significant factor for the Internet bubble and only explains 2.9% of the difference in stock returns between Internet and non-Internet firms.

More generally, Liu, et al. (2013) examines the long-term role of the media in US IPOs. They argue that media coverage in the pre-IPO period significantly relates to long-term measures of investor attention and firm valuations. The measure of media coverage is the total number of news items related to IPO firms during the filing period. The empirical evidence suggests that the pre-IPO media coverage is positively related to a firm's long-term stock performance, which is measured by the price-to-earnings before interest and taxes ratio and the price-to-sales ratio. Moreover, media coverage also has a significant impact on firm liquidity, institutional ownership, and analyst coverage in the years following an IPO. Both these findings support Merton's investor recognition theory and clearly define media's long-term role in IPOs.

For M&As, Buehlmaier (2013) first determine that whether the media can predict takeover outcome. The author develops a theoretical model to explain how the financial media affects takeover outcome and empirically demonstrates that. The model uses a naïve Bayes framework to quantify the content of financial news. It shows that the

information released by the media is able to mitigate the information asymmetry between the shareholders of both acquirers and targets. Target shareholders especially receive more fundamental information about the future valuation of merging firms, which may encourage them to approve the deal. Therefore the model predicts that positive media content increases the probability of takeover success. Using a logistic model, the empirical evidence strongly supports the argument that positive media predict takeover success. After controlling for several deal and firm characteristics that may affect takeover success, the estimate for the media attitude measure is highly significant and positive. The media attitude measure also significantly increases the regression's goodness of fit. Therefore, the author concludes that media content about the acquirer is the most important explanatory variable in predicting takeover success in terms of significance, goodness of fit and marginal effects.

In addition, Ahern and Sosyura (2012) investigate whether a firm actively manages media coverage to influence takeover outcome by examining the acquirer's corporate press releases during the M&A period. Most importantly, the authors collect a unique and novel data set on merger negotiations and a comprehensive media coverage data set. The results show that in stock mergers, acquirers release significantly more news during the negotiation period. The average attitude of the media news also turns out to be more positive, since the number of news items with negative information falls dramatically. Increases in media coverage and attitude would boost stock prices in the short run and provide substantial advantages in merger negotiations. The authors further argue that this phenomenon cannot be explained by such hypotheses as merger timing, passive media management, and merger rumours. The only reliable explanation is that acquirers have an incentive to influence their stock prices by actively managing news releases during merger negotiations.

5.3 Hypothesis

As stated previously, acquirer stock returns around the announcement day is a major topic in M&A research. The literature identifies numerous factors that can affect acquirer announcement returns. Both deal and firm characteristics can affect stock returns in M&A deals.

Loughran and Vijh (1997) and Moeller, et al. (2007) both suggest a relation between methods of payment for takeovers and acquirer abnormal returns, in terms of either short-term CARs or long-term post-merger returns. In addition, Luo (2005) argues that experience is also an important factor that influences M&A gains. The author suggests that multiple bidders have the ability to learn from previous deals they made and to improve their gains in subsequent transactions.

Moreover, Baker and Savasoglu (2002) document that the limits of arbitrage can produce higher stock returns in M&A deals. Chang (1998) shows that both types of target and methods of payment have an impact on stock market reactions. The stock market presents a more favoured response to deals with private targets than with public targets. From another point of view, Moeller, et al. (2004) find that different acquirer types exhibit different levels of performance in M&As. Small acquirers perform significantly better than large acquirers.

Based on above findings, this chapter examines whether the financial media are able to influence takeover gains. As Tetlock (2007, 2010) and Fang and Peress (2009) show, both the attitude and coverage of financial media have a significant impact on the stock market in different ways, as in affecting investor sentiment or resolving information asymmetry. This finding suggests that when a takeover announcement is made, previous news stories released by the financial media are able to partially influence market reactions to bidder stock prices in the short term. More specifically, favourite news will drive bidder stock

prices up. This chapter evaluates media attitude by the fraction of negative words to the total number of words, called the media pessimism factor. Thus the greater a bidder's media pessimism is, the lower its short-term abnormal returns around the takeover announcement period. This intuition is formalized in the following hypothesis.

H1: There is a significantly negative interaction between media pessimism and market response to takeover announcements.

However, bidder announcement abnormal returns represent only the market's initial opinions to each M&A deal. Generally, merging firms' long-term post-merger stock returns are used to assess the deal's real performance. As previous papers argue, the content of news stories released by the financial media can contain unrealized fundamental information that helps resolve information asymmetry between different groups of investors. Consequently, the financial media have the ability to predict a firm's future stock performance. Based on this argument, we believe that news relating to takeover deals also has the ability to forecast bidder post-merger performance. Following previous studies, news stories reported between the deal announcement day and the day before the effective day are considered the most relevant news for M&A deals. These relevant news items should focus on the takeover deal and the disclosure of both the bidder's and the target's fundamental information. This information mechanism provides a clear prospect of merging firms for the financial market and individual investors and helps them better understand and adjust the valuations for the merging firms. This leads to the following hypothesis.

H2: The news relating to takeover deals can partially predict the merging firm's post-merger long term performance.

In conclusion, we believe that the financial media have two functional aspects for stock market and firm M&A events. First, the news stories released by the financial media will

partially bias market and investor sentiment. This effect is quickly reflected in the firm's stock price movements. This function is generally effective in the short term rather than the long term. Thus H1 examines whether this function is still valid in the announcement returns of M&A deals. On the contrary, H2 concerns more the relation between merging firms' long-term post-merger performance and the financial media. As we know, the merging firms' post-merger stock performance is an important criterion for judging the success of takeover deals. The second function of the financial media is the disclosure of unreleased information and resolution of potential information asymmetry. Our second hypothesis assumes that the news stories during a specific event window are able to predict a merging firm's future stock performance.

5.4 Data and Methodology

5.4.1 Sample selection criteria

Our M&A data are from the SDC Mergers & Acquisitions database. They include all successful deals during the period from January 2000 to December 2008. Table 5.1 shows the selection criteria used and the number of deals remained after filtering by each criterion. We collect the data on all deals in which both the acquirer and target firms are US public listed companies, for a total of 133,067 deals. Deals involving firms in the financial and utility industries are deleted from the sample, which reduces the sample to 88,492 deals. Moreover, only deals announced between January 2000 and December 2008 and successfully completed are included in our sample, for a total of 20,177 deals. Deals identified by the SDC as types of privatization, acquisitions of remaining interest, spinoffs, recapitalizations, repurchases, and self-tenders are also excluded, leaving a sample with 19,566 deals. Furthermore, takeover deals of less than US$100 million are deleted, leaving a sample with 2793 deals. The basic motivation for deleting small deals is that large deals are generally more attractive than small deals from the financial media's point of view. These deals will receive more media coverage, which can be

helpful in eliminating potential sample bias. Based on the same reasons, our research includes only public acquirers and targets. Finally, after matching with both the accounting data from Compustat and the stock price data in the CRSP databases and combining these with the media data, our final initial sample contains 288 M&A deals.

5.4.2 Media Construction Methodology

The primary source of media data is the Dow Jones' Factiva database. The financial news articles come from two major US financial media, the Dow Jones News Service and *The Wall Street Journal* (*WSJ*). For each acquirer, the news three years before and three years after the takeover announcement is collected, for a total of 478,830 news articles. We use the number of news articles about acquirers to proxy for media coverage. For our media content analysis, following the framework of Tetlock (2007) and Tetlock, et al. (2008), we choose the ratio of negative words to the total number of words to represent media attitude. Similar to previous literature, each single word in the document-term matrix was categorized into two groups, using positive and negative word categories. Unlike previous studies that use the *Harvard IV-4 Psychosocial Dictionary*, this chapter uses Loughran and McDonald's (2011) alternative financial word list. The general motivation for this choice is applicability. A well-known, commonly used source for word classification, the *Harvard IV-4 Psychosocial Dictionary* was originally developed for psychology and sociology contexts. It is doubtful whether it applies well to the realm of finance. As a result, Loughran and McDonald (2011) provide evidence that the Harvard IV-4 list substantially misclassifies words when used in financial applications. As a result they created a new word category list that typically has negative implications in a financial sense.

$$MediaPessimism = NegativeWords / TotalWords \quad (5.1)$$

As indicated previously, our primary measure of media attitude is the fraction of negative words in each news story. We use the media pessimism factor to represent the media's negative emotion in news that could directly influence investor sentiment. This measurement is widely used in the previous literature, for example, by Tetlock (2007), Tetlock, et al. (2008), and Loughran and McDonald (2011). Those measures combine the frequencies of positive (P) and negative (N) words, as in (P – N)/Total number of words. However, consistent with previous studies, using measures integrating positive words produces weaker results. As Tetlock's (2007) study shows, negative words summarizes common variations better than any other single category of words, including positive words. The negative words present a stronger correlation with stock market performance than the other categories. The main explanation is that negative information has more of an impact than positive information, as a large body of the psychology literature indicates (Baumeister et al., 2001). When processing within a wide range of contexts, negative information attracts more public attention and inducesm stronger reactions (Rozin and Royzman, 2001). Another potential explanation is that either the Harvard IV-4 list or Loughran and McDonald's (2011) financial words list has a tendency for negative words. The word count in the positive list is significantly smaller than for the negative list, which creates potential bias when used in content analysis.

Another consideration for a single negative measure is that reporting the empirical evidence based on multiple measures of media attitude can mitigate the potential problem of data mining. Based on the reasons described at the beginning of this chapter, we choose the ratio of negative words to total words in the news as the measure of media content. The steps for processing financial news in our sample are as follows:

(1) Use content analysis programming to obtain the fraction of negative words for each news story, Negative Fraction = Number of negative words/Number of total words.
(2) Identify and group all related qualifying news items for each single deal in a given time window.

(3) Calculate the mean values of the media pessimism factor for all available deals. These mean values are considered to be representative of the media attitude for each bidder.

5.4.3 Sample description

Table 5.2 presents the annual description of M&A characteristics for the whole sample from 2000 to 2008, covering the period of the Internet bubble until the financial crisis. Since the Internet bubble broke in 2000, the sum of deal value decreased from US$155.94 trillion in 2000 to US$28.23 trillion in 2003. The new merger wave starts in 2004 and is stopped by the financial crisis in 2008. Both the mean and median deal values move in a similar trend with the sum value. Interestingly, the percentage of deals paid in pure cash exhibits a continuing increasing trend, from only 12.31% in 2000 to 68.75% in 2008; on the other hand, the percentage of deals paid in pure stock decreased from 38.46% to 6.25% during the same period.

The summary statistics for all qualifying news stories are reported in Table 5.3. We summarize the length and counts of positive and negative words in the news titles and content for each news story. The last variable is a measure for media attitude: the number of negative words over the total number of words. A comparison of the mean and median values for each variable suggests that there is no substantial skewness caused by outliers. The average frequency of negative words to total words is 1.74% and 1.47% in the median. These results are similar to that of Loughran and McDonald (2011), 1.39%, and significantly lower than the results using the Harvard IV-4 word criterion. A reasonable explanation is that Loughran and McDonald's Financial Negative List has only about half as many words as the Harvard IV-4 Negative List. As discussed above, a comparison between the frequencies of positive and negative words easily shows that negative words appear more often in news stories than positive words. This finding is consistent with those of previous studies.

Furthermore, Table 5.4 provides descriptive statistics for both firm and deal characteristics and subsamples categorized by media data. The subsamples in Panel A are categorized by the media pessimism factor. We use the natural logarithm of the market value to represent firm size. The significant difference in market value between the two subsamples indicates that large acquirers are more likely to receive pessimistic news stories. Another variable that differs significantly between the two subsamples is the ratio of a firm's R&D expenses over total assets. This ratio is a proxy for a firm's product uniqueness. However, there is no significant difference between the two subsamples for most acquirer characteristics, in either a T-test for the mean value or a Wilcoxon test for the median value. The market-to-book ratio variable represents a firm's growth opportunity. The ratio EBITDA/TA is a proxy for profitability. These results imply that there is no potential self-selection bias in the financial media with new, differentiated pessimism factors. The comparisons for deal characteristics present similar results. For the deal value variable, there is no significant difference in either the mean or median test between the two subsamples. The T-test for the mean value of the relative size ratio is statistically significant but turns out to be insignificant in the Wilcoxon median test. The percentage of hostile deals and unsolicited deals between the two subsamples is also very similar. On average, the payment media between the positive and negative subsamples also differ insignificantly.

In Panel B of Table 5.4, the subsamples are categorized by different levels of media coverage. Unlike the results in Panel A, more variables show significant differences in the statistical tests. First, as Fang and Peress (2009) and Buehlmaier (2013) show, financial news released by the media normally focuses on large listed firms. The market value of acquirers under high media coverage is much higher than for those with low media coverage, in terms of either the mean or the median value. The average firm size of the high media coverage subsample is more than six times that of the low media coverage subsample. Large acquirers prefer larger targets than small acquirers. Therefore, the average deal value made by the high media coverage subsample is significantly higher

than that for acquirers with low media coverage. However, comparison of the variable Relative Size reveals an opposing trend. The differences in capital structure between high and low media coverage acquirers are also distinctive. We use the market leverage ratio and the interest coverage ratio to represent a firm's capital structure. The empirical results show that both measures differ significantly between the T-test and Wilcoxon test. In terms of deal characteristics, the percentages of hostile deals, tender offers, and unsolicited deals are all insignificantly different from zero. In addition, there is no significant difference between the payment media used by acquirers with high and low media coverage.

5.5 Empirical results

5.5.1 Univariate analysis for short-term announcement returns

Table 5.5 reports the five-day (-2, +2) CAR for acquirers' stock prices classified by different types of media reports and payment media. We adopt the Fama–French three-factor plus momentum factor model to evaluate the market reactions to bidding firms when takeover announcements are made. As discussed above, this chapter selects financial news released in the time window (-60, -3) to represent the pre-merger media. As previous media research shows, there is a dual causality relation between the media and the financial market. The financial news affects the reactions of the financial market, but firm stock performance is also able to influence the financial media. To solve the potential endogeneity problem between firm stock returns and media reports, our pre-merger time window ends three days prior to the takeover announcement, since the time window of the CAR is (-2, +2). Thus we avoid overlap between the time windows of the pre-merger media and CARs.

Panel A of Table 5.5 reports the CARs for the full sample of acquirers and two subsamples classified by different attitudes of pre-merger media, positive and negative.

Generally, the CAR is negative (-1.79%) and statistically significant for all 288 deals (P-value 0.0015). When we differentiate the returns on the basis of pre-merger media attitude, the performances of the two subsamples are dramatically different. Compared to the full-sample CARs, the average CAR for acquirers with positive media attitude is less negative (-0.95%) and statistically insignificant (P-value 0.3088). The average CAR for acquirers in the negative subsample displays an opposite trend that is more negative (-2.61%) and highly significant (P-value 0.0003). The comparison between the positive and negative subsamples shows a notable difference: Acquirer announcement abnormal returns in the positive group are 1.66% higher than those in the negative group, on average. The T-test for the mean value yields a P-value of 0.0688 to support this argument. This finding is consistent with our first hypothesis, that financial media do have a large influence on the announcement effect of acquirer stock price during M&As. The stock market responds differently to acquirers with positive and negative attitudes in the pre-merger financial news. The potential reason is that the news released in pre-merger period has direct impact on investor's sentiment. This effect will magnify the market reactions to the announcement of M&A deals. Positive news has a positive shock on bidder's announcement returns and negative news has an opposite shock.

To determine whether the announcement CAR of acquirers differs widely for different methods of payment in M&As (Loughran and Vijh, 1997 and Moeller, et al., 2007), we divide our original sample into three subsamples according to deal payments: pure cash payments, pure stock payments, and mixed payments. Generally, the results show that the CAR for pure cash payment deals is negative (-0.66%) but statistically insignificant (P-value 0.1477). Consistent with previous studies (Fishman, 1989, Moeller, et al., 2004), our empirical evidence shows no abnormal announcement return for deals buying a public target with pure cash. This finding implies that the financial market responds better to cash deals, on average. The CARs of subsamples with positive and negative media attitude are very close to those for the whole pure cash sample and insignificantly different from each other, at -0.63% and -0.69%, respectively, both statistically

insignificant. Thus, in summary, in pure cash takeovers the CARs during the announcement period are relatively small and insignificant. The attitudes of pre-merger media reports do not have an obvious impact on such deals.

On the other hand, when we examine deals using pure stock payments, the evidence may be different. Travlos (1987) and Martin (1996) both show that the announcement abnormal returns for pure stock deals are significantly negative. Consistent with their findings, our results show that the average CARs for all pure stock takeovers are negative (-4.24%) and significant at the 1% level (P-value 0.0042). The comparison between the two subsamples indicates that acquirers with positive media attitude have 1.66% less negative CARs than negative media acquirers, which have CARS of -3.49% and -5.15%, respectively. However, the T-test results suggest that this difference is not statistically significant.

Moreover, the results of mixed payment deals are very similar to the results of the full sample. The average CAR for all mixed payment deals is -1.77% and statistically significant (P-value 0.0267). For acquirers with positive attitude news, the CAR is slightly positive (0.25%) but insignificantly different from zero (P-value 0.8154). In contrast, the average CAR of acquirers with bad news is highly negative (-3.75%) and also statistically significant at the 1% level (P-value 0.0014). This finding shows that there is a 4.00% gap between the abnormal announcement returns of the two groups of acquirers, which is also statistically significant in T-tests.

Panel B of Table 5.5 presents the CARs for acquirers classified by level of media coverage and payment media. For all deals, the CARs for the both high and low coverage subsamples are all negative (-1.28% and -2.24%, respectively) and significant (P-values 0.0153 and 0.0024, respectively). The difference between the two subsamples is 0.96%, but it is statistically insignificant (P-value 0.2825). Following previous analysis, we take the payment media into account. For pure cash deals, there is no significant difference

between the acquirers in the high and low media coverage groups. The CARs for the two groups are -0.57% and -0.77%, respectively, and both are insignificant. The results of the T-test in the return difference also confirm this finding. Moreover, the announcement abnormal returns for acquirers using either pure stock or mixed payments are negative and statistically significant. However, the announcement effects between the high and low media coverage groups are not dramatically different. For pure stock payments, the announcement abnormal returns for acquirers in the high and low coverage groups are -3.35% and -4.77%, respectively. There is a 1.42% difference between the two groups, but it is statistically insignificant in T-tests. Similarly, the difference between the two groups using mixed payments is 0.74% and also insignificant (P-value 0.6272). Compared with the T-test results in Panel A, these results easily show that the difference between acquirers with high and low media coverage is insignificant, regardless of the medium of payment. This finding implies that the pre-merger media coverage does not affect acquirer announcement returns.

5.5.2 Regression analysis

The univariate analysis in Table 5.5 suggests that the general attitude of the financial media during the pre-merger period is able to influence market reactions to takeover announcement, although the media coverage does not display any impact on announcement returns. However, the results of univariate analysis do not consider that the findings are driven by other factors. To control for other determinants of acquirer announcement returns, this chapter adopts multivariate regressions and controls for a group of firm and deal variables. The regression models are as following:

$$CAR[-2,+2] = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \varepsilon \quad (5.2)$$

\

$$CAR[-2,+2] = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \beta_3 Premium + \beta_4 InterestCoverage + \beta_5 Profit + \beta_6 PureCash + \beta_7 RelativeSize + \beta_8 MtB + \varepsilon \quad (5.3)$$

In the regression models of Table 5.6, we choose acquirer five-day (-2, +2) CARs around the takeover announcement as the dependent variable. The first regression model includes only two independent variables: media attitude and media coverage. Consistent with our prediction, the estimate for media attitude is negative (-0.9362) and statistically significant (P-value 0.0545). This finding suggests a negative relation between the announcement CARs and the acquirer's pre-merger media attitude measure and it is statistically and economically significant. In detail, the CARs around takeover announcements decrease when the media pessimism factor rises. For the media coverage variable, the estimate is positive (0.0054) but statistically insignificant (P-value 0.1299). The estimation result from the first regression is consistent with those from the univariate analysis in the previous section. The market reactions to the takeover announcements will vary according to pre-merger media attitude but this is irrelevant with pre-merger media coverage.

The second regression model uses a group of control variables. These control variables cover both deal and firm characteristics that are identified as influencing announcement returns in previous studies. Roll's (1986) hubris hypothesis predicts that acquirer managers are overconfident and have an incentive to overpay in takeovers. Malmendier and Tate (2005, 2008) find further evidence to support this argument and show that these overpaid takeovers have significantly lower announcement abnormal returns. To control for this effect, the variable bid premium is included in the regression model. A group of studies also shows that the medium of payment is the dominant factor in acquirer's announcement abnormal returns. Travlos (1987) and others indicate that acquisitions of public targets paid in pure cash are accompanied by higher announcement returns. A dummy variable for pure cash deals should be included in the model to control for the

effect of payment method. This dummy variable will be set to one for deals using pure cash payments and to zero for stock and mixed payments.

For the control variables relating to firm characteristics, Maloney, et al. (1993) finds that bidders with higher leverage have higher announcement returns. Our regression model uses the variable Interest Coverage to proxy for the acquirer's capital structure. Lang, et al. (1991) and Servaes (1991) both reveal a positive relation between the acquirer's market-to-book ratio and announcement returns. The variable market-to-book ratio is calculated as the ratio of the firm's market value of assets over the book value. It is normally used to proxy for a firm's future growth opportunity. Furthermore, the relative size between the target and the acquirer is also an indispensable control variable in previous M&A studies (Asquith, et al, 1983; Travlos 1987). Thus both the market-to-book ratio and Relative Size are controlled for in this regression.

The second column of Table 5.6 shows the regression results after controlling these variables. The results suggest that the correlation between the announcement CARs and media attitude is still valid. The estimate for the media pessimism factor is -1.5047 and statistically significant at the 1% level (P-value 0.0048). Moreover, the estimate for the variable Media Coverage is still insignificant (P-value 0.8089).

Consistent with our prediction, the estimate for the bid premium is negative (-0.0224) but marginally insignificant (P-value 0.1430). The response of the stock market to takeover announcements may decrease as the bid premium increases. Because investors believe that takeover deals with a high premium are probably made by overconfident managers, firm value is destroyed. The estimate for the pure cash dummy is 0.0047 and insignificant (P-value 0.6652). On the contrary, the estimates for the variables Interest Coverage and Relative Size are both statistically significant. As predicted, the relation between announcement returns and relative size is negative (-0.0686) but relate positively to the

acquirer capital structure measure (0.0949). Finally, the estimate for the market-to-book ratio is only 0.0003 and insignificant (P-value 0.8896).

To summarize, the empirical results from our univariate and multivariate regression analyses indicate that the media attitude of news released in the pre-merger period has a large impact on the reaction of the financial market. This evidence strongly supports the first hypothesis of this chapter. After controlling for various effects, we find a statistically significant and negative relation between bidding firms' five-day (-2, +2) CARs and the media pessimism factor. We also find that the variable for media coverage in the pre-merger period does not affect acquirer stock performance.

5.5.3 Univariate analysis for long-term post-merger performance

So far, this chapter has investigated the interaction between the pre-merger media and acquirer announcement returns. We find significant and reliable evidence to support the first hypothesis of this chapter. This section explores the relation between the media during the event window and acquirer post-merger performance and tests whether the second hypothesis is supported by empirical results. We choose the BHAR methodology to evaluate merging firms' long0term stock performance in the post-merger period. The time window of the BHARs is 12 months.

Table 5.7 reports acquirers' 12-month BHARs classified by different types of media and payment media. Similar to the CAR analysis, the entire sample is split into two subsamples on the basis of media attitude and coverage, respectively, in Panels A and B. First, for the whole sample, the average BHARs for all acquirers is negative (-14.59%) and statistically significantly different from zero (P-value 0.0001). This finding is consistent with Loughran and Vijh's (1997) argument that firms buying public targets suffer substantial losses on future stock performance. When taking into account the different payment media, the results change. For deals using pure cash payment, acquirer

long-term performance, with a mean of -6.62%, is much better than that of other payments. For pure stock deals, acquirers have much more negative (-22.46%) and statistically significant (P-value 0.0056) long-term average BHARs. The average BHAR of mixed payment deals is -19.76% and significant at the 1% level (P-value 0.0005).

When the full sample is differentiated on the basis of media attitude in the event window, acquirer long-term performances show great differences. A comparison between the two subsamples shows that acquirers with good event window news have relatively better performance than acquirers with bad news (-12.20% versus -17.93%). Although the T-test results show that the difference between the two groups is statistically insignificant (P-value 0.3570), the outperformance is considerable. The results from different payment samples also support this conclusion. In pure cash deals, the average BHAR for acquirers with good news is -0.08% and insignificantly different from zero (P-value 0.9893). For acquirers with bad news, the average BHAR is -13.33% and significant at the 1% level (P-value 0.0074). The gap is 13.24% and statistically significant (P-value 0.0885) regarding media attitude. For pure stock and mixed payment deals, the long-term performance of merging firms with positive and negative media reports also differs dramatically. Generally, firms with positive news in the event window period outperform firms with negative news.

We also report the results of BHARs based on the media coverage classification in Panel B of Table 5.7. Similar to the findings of the short-term CAR analysis, differentiation of BHARs between merging firms with high and low media coverage is diversified and insignificantly different from zero.

To sum up, consistent with previous research, we find that merging firms obtain negative abnormal returns, on average, in the long-term post-merger period. Takeover deals paid 100% in cash have much better future stock performance than deals paid 100% in stocks. The comparison analysis indicates that the general attitude of news released in the event

window period is able to predict merging firms' long-term stock returns. Nevertheless, the predictive power does not seem to be very strong, since the differences are statistically insignificant under certain conditions. A potential explanation can be attributed to the analysis methodology. Since merging firms' long-term stock returns depend on various factors, the results from univariate analysis do not control for these effects. Therefore, the next section presents the results of a cross-sectional multivariate analysis after controlling for those factors.

5.5.4 Regression analysis for long-term BHARs

We use multivariate regression analysis to further investigate the relation between financial media and merging firms' long-term stock performance. Table 5.8 presents the results of these tests. The dependent variables for the two regression models are the six- and 12-month merging firms' BHARs, respectively. Consistent with the CAR regression model, the regression model controls for the bid premium, the pure cash dummy variable for deal characteristics, and interest coverage, profitability, relative size, and the market-to-book ratio for firm characteristics. The followings are the regression models:

$$BHAR[+25,+126] = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \beta_3 Premium + \beta_4 InterestCoverage + \beta_5 Profit + \beta_6 PureCash + \beta_7 RelativeSize + \beta_8 MtB + \varepsilon \quad (5.4)$$

$$BHAR[+25,+252] = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \beta_3 Premium + \beta_4 InterestCoverage + \beta_5 Profit + \beta_6 PureCash + \beta_7 RelativeSize + \beta_8 MtB + \varepsilon \quad (5.5)$$

The estimates for the media attitude variable in the two models are both negative (-5.0076 and -10.884, respectively) and significant at the 10% level (P-values 0.0842 and 0.0717, respectively). However, the estimates for the media coverage variable are statistically insignificant in Table 5.8. This finding suggests that a merging firm's post-merger performance decreases with the media pessimism factor. This finding provides further

evidence for the argument that the attitude of news released in the event-window period can partially predict a merging firm's future stock performance after controlling for various influential factors noted by previous research. On the other hand, there is no evidence to support the argument that media coverage affects a merging firm's post-merger long-term performance.

Furthermore, the empirical evidence suggests that the effect of deal characteristics on merging firms' long-term performance seems to be weaker than the effect on short-term abnormal returns. The estimates for the bid premium in the two regression models are all insignificant. Only the estimate for the pure cash dummy in the second regression model is positive (0.1437) and statistically significant (P-value 0.0941). Compared to deal characteristics, variables relating to a firm's fundamental information exhibit a much stronger influence. The variable market-to-book ratio consistently achieves negative (-0.0123 and -0.067, respectively) and significant (P-values 0.0825 and 0.0001) estimates in both regression models. In addition, the estimate for variable profitability is positive (1.0599) and significant at the 5% level (P-value 0.0421) in the second model.

In conclusion, the above analysis shows that merging firms' long-term BHARs are affected by financial news released during the event-window period. The event window is specified here as the number of days since the takeover announcement day to the day before the effective day. It supposes that news released in this time window should closely follow related takeover deals. As Tetlock, et al. (2008) argue, financial media are able to forecast a firm's future earnings and stock returns. This predictability is demonstrated in the news that relates to a firm's fundamental information. In the case of M&As, the news released during the period from the announcement day to the effective day will naturally focus on the topic of ongoing takeovers. Thus such news stories are supposed to have strong predictability for determining whether these takeover deals benefit merging firms' shareholders in the long term. Our empirical evidence partially supports this hypothesis. The increase in the media pessimism factor predicts

significantly lower stock returns in the post-merger period. However, the financial media coverage in this period does not affect the future performance of merging firms.

5.5.5 Premium analysis

Our research on acquirer short-term abnormal returns and long-term stock performance demonstrates the interaction between financial media and M&As. This section further examines the relation between the pre-merger media and bid premiums. The research made by Buehlmaier (2013) shows that the media can mitigate the information asymmetry between target shareholders and bidding firms. As the author argues, good news improves acquirer ratings by target shareholders and promotes them to accept takeover offers. Thus positive media can predict takeover success. Taking into account the effect of bid premiums, we predict a negative relation between the pre-merger financial media and bid premiums in the takeover. A potential explanation is that acquirers with good news have less incentive to overpay for their targets. Since the positive media already predict the future success of M&A offers, it does not seem necessary to offer a high premium bid for target shareholders to ensure offer success. On the other hand, the bad news released before takeover announcements will force bidder managers to increase their offer prices to compensate for the negative effect caused by the financial media. Otherwise target shareholders are more likely to reject the M&A offer and these deals will eventually fail. To capture this phenomenon, we regress bid premiums on the measures for media attitude and media coverage, as well as a group of control variables. The regression model is as following:

$$\begin{aligned} Premium = {} & \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \beta_3 TenderOffer \\ & + \beta_4 PureStock + \beta_5 CompeteDeal + \beta_6 Profit + \beta_7 MtB + \varepsilon \end{aligned} \tag{5.6}$$

Table 5.9 describes the results of a cross-sectional regression for the above settings. The dependent variable of the two models is the premium paid by acquirers for target shares

in each deal. The first regression model includes only the measures for media attitude and coverage, without control variables. The estimate of the media attitude variable is positive (3.3359) and statistically significant (P-value 0.0978). The estimate of media attitude in the second regression model further supports this finding, with a value of 3.8314 and significant at the 10% level (P-value 0.0773). Consistent with our prediction, the empirical evidence indicates a positive relation between the bid premium and media pessimism factors. This result implies that the bidding firm's managers have to improve their bid prices to offset the media's negative influence. The role of media coverage on bid premium is similar to that of media attitude and it yields positive (0.0290 and 0.0343) and statistically significant (P-values 0.0523 and 0.0337) estimates in both regression models. In the second regression model, we further control for certain common effects for takeover premiums. Only the estimate for the tender offer dummy is significant (P-value 0.0001) and positive (0.2460).

In conclusion, the analysis of bid premiums shows that the financial news released in the pre-merger period has a significant impact on the premiums paid by bidding firms to target shareholders. The empirical results suggest that, generally, bid premiums are negatively related to media attitude but positively related to media coverage. Combining these findings with those on acquirer CARs shows a clear, rational route from financial media to announcement returns. Since good news in the pre-merger period has a positive impact on the financial market and target shareholder sentiment and recognition, it also significantly improves the probability of takeover success. Therefore, acquirers do not necessarily need to offer a higher premium to promote the success of their M&A deals. They pay significantly lower premiums than others, on average. This advantage significantly reduces the probability of overpaying for bidding firms. Finally, the stock market reacts much better to these deals and bidding firm stock performs better in the announcement period.

5.6 Summary and conclusion

This chapter examines the interaction between the financial media and market reactions to M&As. The previous literature shows that either media attitude or media coverage affects firm stock performance. However, this finding has not been applied to M&A research. This chapter addresses the issue of whether the financial media affect or predict takeover returns in the short and long term.

First, this chapter provides empirical evidence to support the hypothesis that the general attitude of financial news released during the pre-announcement period strongly affects the reactions of the financial market to takeover deals. It shows that the increasing level of media pessimism in the pre-announcement time window significantly reduces the acquirer's five-day announcement abnormal returns (-2.61% compared to -0.95%). This hypothesis is still holds in a cross-sectional multivariate analysis after controlling for various known factors. Furthermore, the study on bid premium shows that not only the announcement returns but also the bid premiums are affected by financial news released in the pre-announcement period. Acquirers' managers have to boost their bid price to compensate for previous pessimistic news stories. The general causality route is that the pre-merger media affects both the financial market's rating of the acquirer and the premium paid to target shareholders, which affects the acquirer's stock performance during the takeover announcement period.

This chapter also investigates the potential relation between acquirer post-merger long-term stock performance and the financial media. Previous studies determine that the media are able to report unreleased fundamental information to resolve the problem of information asymmetry between different groups of investors. We expect financial news stories on the topic of takeover deals to have predictive power for merging firms' long-term stock returns. Both the univariate and multivariate analysis provide quantitative

results to support our hypothesis that financial news during the M&A event period influences merging firms' future stock performance.

This chapter's main contribution to the literature is to provide a comprehensive study on the financial media's role in M&As. It is an effective supplement to media research. However, the relation between the media and M&As provides some implications for future research. For instance, the diversity of media attitudes between various news stories is a potential proxy for the diversity of opinions in the stock market. Moreover, our research does not control for the effect of stale news.

Table 5.1 Sample Selection

This table presents the sample selection process for research. The Merger & Acquisition data is from Securities Data Corporation (SDC) M&A Database. The accounting data is from COMPUSTAT Database. The stock price data is from CRSP Database. The source of media data is from FACTIVA Database.

Selection Criteria		Size
Acquirer Nation	United States of America	257376
Target Nation	United States of America	220726
Acquirer and Target Public Status	Public	133067
Firm Industry	Exclude Finance and Utility Firms	88492
Date Announced	01/01/2000 to 12/31/2008	28323
Deal Status	Completed	20177
Deal Type	Exclude Other M&A	19566
Deal Value	Larger Than $100 Million	2793
Accounting, Share Price and Media Data Availability	Exclude Unmatched Deals	288

Table 5.2 Yearly M&A Deals

This table presents the sample of M&A deals used in this chapter in each year from 2000 to 2009. This table presents the number of deals, the sum, mean and median values of deal value for all deals. It also presents the percentage of pure cash deals, pure stock deals and the average bid premiums.

Year	Deal Number	Sum Deal Value	Mean Deal Value	Median Deal Value	Percent of Cash	Percent of Stock	Bid Premium
2000	65	155940.3	2399.1	794.21	12.31%	38.46%	56.36%
2001	30	82927.3	2764.2	777.09	16.67%	36.67%	44.49%
2002	30	82482.8	2749.4	434.29	40.00%	23.33%	36.33%
2003	26	28225.7	1085.6	502.36	46.15%	7.69%	43.14%
2004	20	69925.1	3496.3	908.89	55.00%	25.00%	38.01%
2005	38	199882.9	5260.1	1418.5	55.26%	7.89%	35.19%
2006	31	105990.6	3419.1	1458.8	64.52%	9.68%	32.01%
2007	32	67482.5	2108.8	1298.1	71.88%	3.13%	40.64%
2008	16	60377.2	3773.6	1003.6	68.75%	6.25%	77.82%

Table 5.3 Descriptive Statistics for Media Data

This table shows descriptive statistics for all 478830 media data. Variable News Length is the number of total words in the content of news. Variables Title Positive and Title Negative are the number of positive and negative words in news title respectively. Content Positive and Content Negative are the number of positive and negative words in news content. Variable Media Pessimism is the major measure in this paper. It is the ratio of negative words over news length.

Variables	Mean	Median	SD	10 percentile	90 percentile
News Length	629.29	525	461.92	185	1164
Title Positive	0.1386	0	0.3792	0	1
Title Negative	0.3029	0	0.5915	0	1
Content Positive	5.3203	4	5.6692	0	13
Content Negative	10.9852	8	12.0129	1	25
Media Pessimism	0.0174	0.0147	0.0138	0.0026	0.0348

Table 5.4 Descriptive Statistics of Deal and Acquirers characteristics

This table presents firm and M&A deal characteristics for acquiring firms from 2000 to 2008. Panel A includes the descriptive statistics for the full sample and two subsamples that are classified by media attitude. Panel B reports the results classified by media coverage. The variable Market Value is bidder's market value. The Market-to-Book ratio is the ratio of firm's market value divided by its book value. R&D/TA represents expenses in research and development (R&D) over total assets; EBITDA/TA is earnings before interest, taxes, depreciation, and amortization (EBITDA) over total assets (TA); Tangible asset/TA is defined as net property, plant, and equipment over total assets; Market Leverage is the ratio of book debt to market value; Interest Coverage is the ratio of interest expense over EBIT; Operating Cash Flow is the ratio of sales minus the cost of goods sold, sales and general administration, and working capital change then over total assets. Deal Value, as recorded in SDC database, is the total amount paid by acquirers. Relative Size is the total value of the target over acquirers; Toehold Size is the percentage of common shares outstanding held by the acquirer as of the announcement date; Pure Cash is the percentage of deals paid 100% in cash in each sample; Pure Stock is the percentage of deals paid 100% in stock in each sample; Unsolicited Deals is the percentage of deals where acquirers make an offer for a target without prior negotiations. This table also provides results of T-test for the difference of mean value, Wilcoxon-test for the difference of median value between two subsamples. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Table 5.4 Continued from Previous Page

Panel A

	Whole Sample			Positive Attitude			Negative Attitude			T-Test		Wilcoxon Test
Variable	Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	Diff	P-Value	P-Value
Market Value	255	54750.8	17228.0	124	39194.5	15891.5	131	69475.8	24798.5	-30281.3***	0.0061	0.0524
Market-to-Book Ratio	255	3.192	2.100	124	3.479	2.154	131	2.921	2.092	0.558	0.3695	0.7559
R&D/TA	288	0.048	0.035	142	0.040	0.020	146	0.056	0.050	-0.016***	0.0077	0.0096
EBITDA/TA	286	0.156	0.159	141	0.153	0.168	145	0.158	0.153	-0.005	0.6456	0.1940
Tangible Asset/TA	288	0.224	0.159	142	0.247	0.168	146	0.202	0.151	0.045**	0.0425	0.3466
Market Leverage	255	0.244	0.221	124	0.243	0.223	131	0.245	0.220	-0.002	0.9433	0.7559
Interest Coverage	263	0.091	0.057	124	0.095	0.065	139	0.087	0.049	0.008	0.5214	0.1227
Operating Cash Flow	286	0.123	0.123	141	0.118	0.124	145	0.127	0.120	-0.009	0.3489	0.5550
Deal Value	288	2962.6	887.7	142	2798.2	976.3	146	3122.5	864.3	-324.3	0.6811	0.4802
Relative Size	255	0.191	0.080	124	0.227	0.083	131	0.157	0.073	0.070*	0.0572	0.7559
Toehold Size	288	2.18%	0.00%	142	1.81%	0.00%	146	2.54%	0.00%	-0.74%	0.5905	0.5483

	Mean	Mean	Mean	T-test
Hostile Deal	0.97%	0.70%	2.05%	0.3275
Pure Cash	38.80%	40.14%	45.21%	0.3850
Pure Stock	22.78%	22.54%	17.81%	0.3173
Tender Offer	25.10%	27.46%	29.45%	0.7087
Unsolicited Deal	5.02%	4.23%	6.85%	0.3311

Table 5.4 Continued from Previous Page

Panel B

Whole Sample	Low Media Coverage			High Media Coverage			T-Test		Wilcoxon Test
	Obs.	Mean	Median	Obs.	Mean	Median	Diff	P-Value	P-Value
Market Value	134	15152.2	6817.0	121	98603.7	62272.8	-83451.5***	0.0001	0.0001
Market-to-Book Ratio	134	2.875	1.738	121	3.544	2.329	-0.669	0.2822	0.0006
R&D/TA	154	0.044	0.018	134	0.053	0.050	-0.009	0.1114	0.0004
EBITDA/TA	152	0.146	0.152	134	0.166	0.165	-0.020*	0.0627	0.1558
Tangible Asset/TA	154	0.238	0.163	134	0.208	0.150	0.030	0.1697	0.4792
Market Leverage	134	0.264	0.243	121	0.221	0.183	0.043**	0.0347	0.0691
Interest Coverage	139	0.113	0.077	124	0.066	0.045	0.047***	0.0002	0.0004
Operating Cash Flow	152	0.114	0.122	134	0.133	0.131	-0.021**	0.0431	0.6361
Deal Value	154	1958.6	793.6	134	4116.5	1090.3	-2157.9***	0.0095	0.1570
Relative Size	134	0.266	0.144	121	0.107	0.027	0.159***	0.0001	0.0001
Toehold Size	154	2.49%	0.00%	134	1.83%	0.00%	0.66%	0.6183	0.7898

	Mean	Mean	T-test
Hostile Deal	0.65%	2.24%	0.2503
Pure Cash	35.71%	50.75%	0.0101
Pure Stock	23.38%	16.42%	0.1419
Tender Offer	29.87%	26.87%	0.5731
Unsolicited Deal	3.90%	7.46%	0.1875

Table 5.5 Cumulative Abnormal Returns

This table shows short-term cumulative abnormal returns for all bidding firms around takeover announcement. Panel A the full sample is classified by media attitude. The classification criterion is the value media pessimism factor of news relating to bidders. The full sample is divided into two equal groups according the media pessimism factor, named as Positive Media Attitude and Negative Media Attitude. Panel B is classified by media coverage. The classification criterion is the total number of news relating to bidders in pre-merger period. The full sample is also divided into two equal groups, named as High Media Coverage and Low Media Coverage. The CAR [-2, +2] denotes the five-day cumulative abnormal return measured using Fama-French three factor plus momentum factor model. The estimate period is [-346, -91]. Pure Cash is the subsample that deals paid by 100 percentage of cash. Pure Stock is the subsample in which paid by 100 percentage of stocks. Mixed is the deals neither paid by pure cash or pure stock. The difference tests are based on T-tests for equality in means. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Panel A

CAR [-2, +2]	Obs.	All Acquirers			Positive Media Attitude			Negative Media Attitude			Differences	
		Mean	Median	P-Value	Mean	Median	P-Value	Mean	Median	P-Value	Mean	P-Value
All Deals	288	-1.79%***	-0.43%	0.0015	-0.95%	-0.29%	0.3088	-2.61%***	-0.96%	0.0003	1.66%*	0.0688
Pure Cash	123	-0.66%	-0.12%	0.1477	-0.63%	-0.15%	0.7807	-0.69%	0.13%	0.4533	0.06%	0.9509
Pure Stock	58	-4.24%***	-3.86%	0.0042	-3.49%*	-3.22%	0.0751	-5.15%***	-4.20%	0.0040	1.66%	0.5659
Mixed	107	-1.77%**	-0.61%	0.0267	0.25%	0.07%	0.8154	-3.75%***	-2.74%	0.0014	4.00%**	0.0105

Table 5.5 Continued from Previous Page

Panel B

CAR [-2, +2]	Obs.	All Acquirers			High Media Coverage			Low Media Coverage			Differences	
		Mean	Median	P-Value	Mean	Median	P-Value	Mean	Median	P-Value	Mean	P-Value
All Deals	288	-1.79%***	-0.43%	0.0015	-1.28%**	-0.34%	0.0153	-2.24%***	-0.61%	0.0024	0.96%	0.2825
Pure Cash	123	-0.66%	-0.12%	0.1477	-0.57%	-0.25%	0.3252	-0.77%	0.49%	0.2936	0.20%	0.8281
Pure Stock	58	-4.24%***	-3.86%	0.0042	-3.35%*	-2.23%	0.0646	-4.77%**	-6.24%	0.0253	1.42%	0.5969
Mixed	107	-1.77%**	-0.61%	0.0267	-1.34%	0.36%	0.1804	-2.07%*	-2.73%	0.0772	0.74%	0.6272

Table 5.6 Cross-sectional regression analysis of announcement abnormal returns

This table shows cross-sectional regressions for which the dependent variable is the five-day [-2, +2] cumulative abnormal returns. The estimates and P-values are both reported for each variable. The variable Media Attitude is the average media pessimism factor for all news reported in time window [-60, -3] for each acquirer. The Media Coverage is the average number of news reported in time window [-60, -3] for each acquirer. Premium is the four week premiums of each deal recorded by SDC database. Interest Coverage is the ratio of firm's EBITDA over its interest expense. Profit is the ratio of EBITDA over total asset. Pure Cash is a dummy variable indicating whether deals are paid by 100 percent cash. Relative Size is the total value of the target over acquirers. Market-to-Book ratio is the ratio of firm's market value of assets over its book value. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following is the regression models:

Model 1

$$CAR[-2,+2] = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \varepsilon$$

Model 2

$$CAR[-2,+2] = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \beta_3 Premium + \beta_4 InterestCoverage + \beta_5 Profit + \beta_6 PureCash + \beta_7 RelativeSize + \beta_8 MtB + \varepsilon$$

Table 5.6 Continued from Previous Page

Regression for CAR				
	CAR [-2,+2]			
	Model (1)		Model (2)	
Variable	Coefficient	P-Value	Coefficient	P-Value
Intercept	-0.0121	0.2435	0.0101	0.6235
Media Attitude	-0.9362*	0.0545	-1.5047***	0.0048
Media Coverage	0.0054	0.1299	0.0010	0.8089
Premium			-0.0224	0.1430
Interest Coverage			0.0949*	0.0789
Profit			0.0593	0.3702
Pure Cash			0.0047	0.6652
Relative Size			-0.0844***	0.0001
Market-to-Book Ratio			0.0003	0.8896
Adjusted R-Square	288		226	
Obs.	0.0125		0.0942	

Table 5.7 Buy-Hold Abnormal Returns

This table shows long-term Buy-and-Hold abnormal returns for all bidding firms after deal completed. In Panel A the full sample is classified by media attitude. The classification criterion is the value media pessimism factor of news relating to bidders. The full sample is divided into two equal groups according the media pessimism factor, named as Positive Media Attitude and Negative Media Attitude. Panel B is classified by media coverage. The classification criterion is the total number of news relating to bidders, named as High Media Coverage and Low Media Coverage The full sample is also divided into two equal groups. Panel B is classified by media coverage. The BHAR [+25, +252] denotes the 12-month buy-and-hold abnormal return measured using Fama-French three factor plus momentum factor model. Pure Cash is the subsample that deals paid by 100 percent cash. Pure Stock is the subsample in which paid by 100 percent stocks. Mixed is the deals neither paid by pure cash or pure stock. The difference tests are based on T-tests for equality in means. P-value has been adjusted by bootstrapping. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level.

Panel A

BHAR	Obs.	All Acquirers			Positive Media Attitude			Negative Media Attitude			Differences	
		Mean	Median	P-Value	Mean	Median	P-Value	Mean	Median	P-Value	Mean	P-Value
All Deals	284	-14.59%***	-12.86%	0.0001	-12.20%***	-8.50%	0.0081	-17.93%***	-16.86%	0.0001	5.73%	0.3570
Pure Cash	123	-6.62%*	-7.55%	0.0836	-0.08%	-3.23%	0.9893	-13.33%***	-12.71%	0.0074	13.24%*	0.0885
Pure Stock	54	-22.46%***	-25.25%	0.0056	-17.46%	-0.59%	0.1370	-30.25%***	-31.83%	0.0096	12.79%	0.4245
Mixed	107	-19.76%***	-17.34%	0.0005	-21.21%***	-16.20%	0.0059	-18.00%**	-17.93%	0.0433	-3.21%	0.7770

Table 5.7 Continued from Previous Page

Panel B

BHAR	Obs.	All Acquirers			High Media Coverage			Low Media Coverage			Differences	
		Mean	Median	P-Value	Mean	Median	P-Value	Mean	Median	P-Value	Mean	P-Value
All Deals	288	-14.59%***	-12.86%	0.0001	-12.62%***	-12.46%	0.0009	-17.38%***	-14.06%	0.0006	4.76%	0.4438
Cash	123	-6.62%*	-7.55%	0.0836	-8.36%	-12.46%	0.1159	-6.00%	-5.50%	0.3049	-2.36%	0.7622
Stock	54	-22.46%***	-25.25%	0.0056	-25.11%*	-23.09%	0.0589	-21.93%**	-29.24%	0.0409	-3.18%	0.8446
Mixed	107	-19.76%***	-17.34%	0.0005	-12.58%**	-7.60%	0.0209	-26.94%***	-28.95%	0.0087	14.35%	0.2033

Table 5.8 Cross-sectional regression analysis of BHAR

This table shows cross-sectional regressions for which the dependent variable is the 6-month and 12-month buy-and-hold abnormal returns respectively. The estimates and P-values are both reported for each variable. The variable Media Attitude is the average media pessimism factor for all news reported between announcement day and the day before effective day [DA, DE-1] for each acquirer. The Media Coverage is the average number of news reported between announcement day and the day before effective day [DA, DE-1] for each acquirer. Premium is the four week premiums of each deal recorded by SDC database. Interest Coverage is the ratio of firm's EBITDA over its interest expense. Profit is the ratio of EBITDA over total asset. Pure Cash is a dummy variable indicating whether deals are paid by 100 percent cash. Relative Size is the total value of the target over acquirers. Market-to-Book Ratio is the ratio of firm's market value of assets over its book value. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The following is the regression models:

Model 1

$$BHAR[+25,+126] = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \beta_3 Premium + \beta_4 InterestCoverage + \beta_5 Profit + \beta_6 PureCash + \beta_7 RelativeSize + \beta_8 MtB + \varepsilon$$

Model 2

$$BHAR[+25,+252] = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \beta_3 Premium + \beta_4 InterestCoverage + \beta_5 Profit + \beta_6 PureCash + \beta_7 RelativeSize + \beta_8 MtB + \varepsilon$$

Table 5.8 Continued from Previous Page

Regression for BHAR				
	[+25, +126]		[+25, +252]	
	Model (1)		Model (2)	
Variable	Coefficient	P-Value	Coefficient	P-Value
Intercept	0.0333	0.6993	-0.1049	0.5596
Media Attitude	-5.0076*	0.0842	-10.884*	0.0717
Media Coverage	-0.0119	0.4121	0.0465	0.1230
Premium	0.0732	0.2032	-0.0378	0.7516
Interest Coverage	-0.3295	0.1297	0.7156	0.1143
Profit	0.2102	0.3993	1.0599**	0.0421
Pure Cash	0.0532	0.1961	0.1437*	0.0941
Relative Size	0.0344	0.6416	-0.0446	0.7721
Market-to-Book Ratio	-0.0123*	0.0826	-0.0670***	0.0001
Adjusted R-Square	0.0229		0.1061	
Obs.	221		221	

Table 5.9 Cross-sectional regression analysis for bid premium

This table presents cross-sectional regressions for which the dependent variable is four-week bid premium. The estimates and P-values are both reported for each variable. The variable Media Attitude is the average media pessimism factor for all news reported in time window [-60, -3] for each acquirer. The Media Coverage is the average number of news reported in time window [-60, -3] for each acquirer. Pure Cash is a dummy variable indicating whether deals are paid by 100 percent cash. Tender Offer is a dummy variable which indicates whether acquirers provide tender offer to target shareholders. Compete Deal is a dummy variable indicating existence of competing deal. Profit is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) over total assets (TA). Market-to-Book Ratio is the ratio of firm's market value divided by its book value. The numbers are followed by ***, **, * if it is significantly different from zero with 1%, 5%, 10% confidence level. The regression models are as following:

Model 1

$$Premium = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \varepsilon$$

Model 2

$$Premium = \beta_0 + \beta_1 MediaAttitude + \beta_2 MediaCoverage + \beta_3 TenderOffer + \beta_4 PureStock + \beta_5 CompeteDeal + \beta_6 Profit + \beta_7 MtB + \varepsilon$$

Table 5.9 Continued from Previous Page

Regression for Premium				
	Premium			
	Model (1)		Model (2)	
Variable	Coefficient	P-Value	Coefficient	P-Value
Intercept	0.2683***	0.0001	0.1320**	0.0298
Media Attitude	3.3359*	0.0978	3.8314*	0.0773
Media Coverage	0.0290*	0.0523	0.0343**	0.0337
Tender Offer			0.2460***	0.0001
Pure Stock			0.0403	0.4534
Compete Deal			-0.0803	0.3268
Profit			0.2886	0.1851
Market-to-Book Ratio			0.0003	0.9437
Adjusted R-Square	0.0183		0.1240	
Obs.	278		246	

Chapter 6

6. Conclusion

6.1 Summary and conclusion

This thesis focuses on two aspects of M&As: factors affecting takeover success and the determinants of M&A performance. We extend previous M&A research to two important fields of financial research: capital structure and the financial media. Evidence on the interaction between firm capital structure and M&A activity is bidirectional. From M&A to capital structure, the results indicate that M&As are an effective approach to adjust firm capital structure. Under costly adjustment conditions, the previous literature shows that firms do not continuously adjust the capital structure to tally with their target levels. Therefore M&A deals can help firms greatly adjust their leverage ratios, which is consistent with the prediction of dynamic trade-off theory. In line with the previous literature, this thesis confirms that the consideration of capital structure is a reliable explanation for the motivation of M&A activity. Furthermore, this thesis indicates that firm capital structure also has a strong impact on takeover success and deal performance. In general, this thesis resolves several empirical issues concerning the relation between capital structure and M&As.

First, this thesis documents empirical evidence of the interaction between bidder capital structure and the probability of success in takeovers. Using a large and comprehensive M&A data set that contains 19,203 successful and failed deals during 1980--2009, our logistic regression results indicate a strongly negative relation between a bidder's leverage deficit and the probability of successful deal completion. By adopting three dummy variables to proxy for a bidder's leverage deficit levels, we further show that overleveraged bidders have a lower success rate, while target-leveraged bidders have the highest. More specifically, we show that the relation between capital structure and

takeover success is also dramatically different for different payment media. Moreover, to determine a reliable and convincing explanation for our findings, we explore the potential relation between bidder capital structure and offer premiums. Consistent with the findings for takeover success, the empirical evidence suggests that overleveraged bidders are unable to offer high premiums, which can reduce their success rates. In contrast, target-leveraged firms can significantly improve offer premiums to achieve success in M&As. In addition to the leverage deficit variable, our studies in Chapter 3 identify several determinant factors that also have explanatory power for takeover success. The bidder's firm size, growth opportunity, profitability, and adoption of a tender offer all have significantly positive effects on takeover success. On the negative side, these findings suggest that the probability of success in M&As decreases in the presence of managerial resistance or competing offers.

As the thesis shows, Chapter 3 focuses on examining the interaction between bidder capital structure and the probability of success based on the concept of leverage deficit. We obtain strong evidence to support the prediction that overleveraged bidders are less likely to be successful in M&As. To further explore the relation between the theory of target capital structure and M&As, Chapter 4 examines the influence of bidder capital structure on M&A decisions and deal performance. The empirical evidence shows that the leverage deficit level can affect bidder decisions on deal payments. Bidders with high deficit levels are more likely to use pure stock payments, while underleveraged bidders tend to use cash payments. This finding implies that overleveraged bidders have a strong incentive to reduce their leverage deficit by acquiring other firms with equity. The findings in Chapter 4 provide reliable evidence to support the concept of target capital structure and more clearly illustrate the connection between capital structure and M&A activity.

The influence of firm capital structure on M&A performance is also demonstrated in Chapter 4. In general, consistent with the previous literature, M&A deals are value

destroying for shareholders, on average. However, their performance differs dramatically with the bidder's pre-merger leverage deficit and the targets chosen. In terms of short-term announcement returns, deals made by overleveraged bidders outperform those made by other types of bidders. In contrast, the announcement returns of deals made by target-leveraged bidders are significantly lower. We attribute these performance differences to potential shocks of M&A activities to the firm's capital structure.

Besides the univariate analyses, the Chapter 4 also uses cross-sectional multivariate regressions to examine the determinant effect of the leverage deficit on bidder announcement returns. Consistent with the univariate analysis findings, after controlling for several well-known factors, the regression results strongly confirm the significant interaction between the bidder's leverage deficit and short-term stock returns around the announcement period. Deal types, based on different combination of bidders and targets, also have a large impact on deal performance. In particular, deals in which an overleveraged bidder acquires a target-leveraged target obtain significantly positive abnormal returns. However, the analysis on merging firms' BHARs suggests that the long-term performances of new merging firms may not reflect their short-term abnormal returns.

Since Chapter 4 shows that a firm's leverage deficit significantly affects both short- and long-term stock performance in M&As, we identify more factors that may also determine M&A performance. Chapter 5 investigates the potential interaction between the financial media and M&A performance. The empirical evidence from both univariate analysis and multivariate regression suggests that the attitude of news released in the pre-announcement period is an important determinant of bidder announcement returns. Bidders with positive media attitude in the pre-announcement period may have significantly better stock returns during the announcement period. This result is still holds in cross-sectional multivariate regressions after controlling for a group of determinant variables. Moreover, it also shows that the pre-announcement media attitude is negatively

related to bid premiums that bidders offered to target shareholders. Based on these findings, we conclude that bidders with positive media attitude do not necessarily have to offer high premiums for takeover success. Thus these bidders effectively avoid the overpayment problem in M&As and obtain better reactions from the financial markets.

In addition to examining bidder announcement returns in the short run, Chapter 5 discusses the predictive power of the financial media on merging firms' post-merger long-term performance. The evidence from univariate analysis and multivariate regression consistently suggests that merging firms' long-term BHARs are differ dramatically with the content of news released during the takeover period. Both the coverage and attitude of related news can partially predict the long-term BHARs of merging firms. We attribute the media's predictive power to unreleased information in the financial news. This previously unreleased information can help individual investors and the whole market obtain plain prospects for M&A deals under way.

Generally, the studies in this thesis contribute to a deeper understanding of how M&A deals become successful and how they perform in the future. We mainly identify that bidder capital structure has a large impact on the probability of success in takeovers after controlling for a group of determinant variables, both statistically and economically significant. Furthermore, this thesis argues that bidder capital structure and the pre-merger media news are very important factors for determining M&A performance, in both the short and long run.

6.2 Potential implications

This thesis has potential implications for investors as well as firm managers. First, it shows that a bidder's leverage deficit is a major determinant of takeover success. Using the models in our research, investors could predict the final outcome of M&A proposals more precisely. Since the success or failure of deals should have entirely different impacts

on both bidders' and targets' stock prices, investors could modify their investment strategies in advance. In addition, this thesis determines that both the bidder's leverage deficit and the pre-merger media have great explanatory power for merging firms' stock performance, both statistically and economically significant. Since the stock performance of M&A deals changes dramatically with these factors, our research may help investors find profitable investment strategies that are based on M&A events. They could potentially buy outperform bidders and short-sell underperforming bidders following the guidance of determinant factors.

Our studies also have potential implications for corporate managers. As we show above, M&As are an effective way to adjust firm capital structure. More specifically, under costly adjustment conditions, M&As can be considered a relatively cheap and fast approach to rebalance a firm's financial leverage towards target levels. Therefore our study sheds additional light on firm capital structure decisions. Moreover, in addition to the potential implications for capital structure decisions, the research in this thesis is also helpful for M&A decisions. Firm managers could consider actively reducing leverage deficit levels in the pre-announcement period to receive advantages in takeover success. In addition, our analyses show that M&A deals with different combinations of bidder and target have significantly different performance in both the short and long run. Based on our findings and various well-known determinant factors, the corporate managers of bidding firms should carefully select appropriate targets and takeover strategies. Both firm managers and shareholders may then obtain gains from M&A deals. To summarize, this thesis suggests that both capital structure decisions and M&A decisions should consider the leverage deficit and media factors.

6.3 Proposal for future research

While our research makes several contributions to the literature, it also raises a set of interesting issues for future research. Addressing these issues in future investigations can be valuable. Chapter 2 finds that the relation between a bidder's leverage deficit and the

probability of takeover success is significantly negative. This relation is explained by the effect of bid premiums in our research. However, due to the limitation of bid premium data availability, the sample of bid premiums for analysis is dramatically smaller than the full sample. Therefore it is very important to further explore the interaction between leverage deficit and takeover success. Welch (2004) argues that changes in a firm's financial leverage could be mainly explained by the firm's issuing activities and stock price volatilities. Therefore our future research will focus on how these two factors affect firm target capital structure and subsequently influence M&As.

There are still numerous questions about the impact of capital structure on M&A performance. The results in Chapter 4 especially indicate that there are significant diversifications between short- and long-run stock returns in specific types of M&A deals. It would be interesting to explore the potential reasons for these performance differences. It would also significantly improve our understanding of capital structure theory and M&A activities.

Although research on the financial media has become popular in recent years, numerous areas remain for future study. Financial media research mainly focuses on two aspects. The first aspect is the media source. In line with previous media studies, this thesis collects news from traditional financial newspapers considered professional and influential by the financial markets. However, due to the rapid development of the Internet and communication websites, Internet-based financial news is becoming increasingly important and influential. Thus, the diversification of media sources is an important area for financial media research. Information from Google searches, Twitter, and personal blogs should be potential sources of media data. Furthermore, in existing media papers, evaluations of media content are relatively simple. Chapter 5 uses a media pessimism factor to evaluate the content of financial news. The media pessimism factor is calculated as the ratio of negative words to the total number of words and is the most popular estimation for media attitude in recent papers. However, the content of news is

too complicated to be evaluated by a simple ratio. Recently, certain studies have started to consider the staleness of content in financial news. They argue that stale news should have a significantly smaller impact compared to news with fresh information. Therefore, to represent the attitude of news more precisely, financial media research should adopt a more content analysis-driven approach.

In conclusion, the aspects of M&A research discussed in this thesis are potentially popular topics for future studies. They remain largely unexplored by the previous literature.

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