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Corporate Restructure Activity: Investigation into Merger and Acquisition Mega Deals

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Corporate Restructure Activity: Investigation into Merger and

Acquisition Mega Deals

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Abstract

Mergers and acquisitions (M&As) are one of the most direct and dominant methods of corporate investment and have been investigated since many years. Deals with a large transaction value, or mega-deals, are not as common, but they play an essential role in the total value of M&As. This thesis aims to compare how mega-deals and non–mega-deals perform differently. Studies on mega-deals are limited and fail to compare many aspects. By studying deals announced between 1980 and 2018, this thesis analyses how mega-deals and non–mega-deals differ in selecting targets, post-acquisition performance, and affecting factors.

Generally, this thesis suggests that, though mergers, on average, receive negative market feedback, mega-deals significantly outperform non–mega-deals in the long run, but this pattern reverses on the short run. This result is inconsistent with past papers stating that massive acquisitions destroy value to some extent. In addition, many control variables seem to contribute to this scenario, especially the payment method, deal status, target publicity, and acquirer characteristics. Mega-deal acquirers prefer targets with a lower debt-to-equity ratio, and these acquirers' leverage ratio undergo more significant changes.

Overall, mega-deals are distinct from smaller deals in many aspects. The results of this thesis provide a deeper understanding of mega-deals and explain why large deals destroy value on a massive scale.

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Acknowledgements

1 Introduction

1.1 Motivation

Mergers and acquisitions (M&A), as companies' direct investments, play a dominant role in corporate and behavioural finance. M&As refer to the buying, selling, and combination of companies and the transfer of enterprise control. The term *merger* often means the combination of two or more companies in which the new firm undertakes the original firm's rights and obligations. On the other hand, acquisitions, which are also called *takeovers* or *buyouts*, often mean one company buys another, that is, a transaction in which a company purchases another company's assets, business, or stocks to gain control. Both terms involve transactions of (part of) the control of the company at some cost.

A popular tool for expanding enterprises, M&As have the advantage of being a faster and less risky process in comparison with internal expansion. They provide a method for companies to grow rapidly in an industry or even across industries without the need to develop another business entity internally. M&As can be classified based on three types of acquirer and target firm industries: horizontal M&As, vertical M&As, and conglomerate M&As. A horizontal M&A is a merger within an industry. It is the most common M&A type, and it aims to reduce competition and achieve a larger market share. It is essentially an M&A between competitors. On the other hand, a vertical M&A represents a merger across industries, and it can thus form an integration of production with sales. Vertical M&As can improve the coordination of upstream and downstream firms of an industry chain and thus achieve lower transaction costs and strategic synergy. All M&As that do not belong to one of these two types of M&As are conglomerate M&A, which usually aim to diversify business and lower business risks.

There are many other types of M&As. According to the attitudes of both parties, M&As can be classified as either friendly or hostile. The party in a friendly M&A is also known as a white knight, and the M&A involves negotiation between the management boards of both parties. A hostile M&A, where the acquirer is also known as a black knight, involves an attempt to take over the target without negotiation. Based on the different payment methods, M&A can be divided into four categories, namely, cash acquisitions, stock acquisitions, comprehensive securities acquisitions, and mixed acquisitions. Based on the share of the acquired equity, M&As can also be classified into two types: controlling M&As and comprehensive M&As. A controlling M&A means the acquirer firm obtains some of the target firm's assets or equity for the purpose of shareholding, which includes both relative and absolute shareholding. A comprehensive M&A means the acquirer obtains the entire target company and makes it a wholly owned subsidiary, such that the acquirer has full control over it.

Categorizing M&As in terms of acquirer and target firms' sizes, I define mega-M&As as follows. Following Alexandridis, Antypas, and Travlos (2017), acquisitions with a transaction value over $500 million are labelled mega-mergers, or mega-deals. Mega-deals account for a large part of total M&A deals in both quantity and value during the past decade (Alexandridis et al., 2017); for example, 547 mega-deals were announced in 2015, with a total value over $2 trillion (Hu et al., 2020). As data from the start of 2020 show, the COVID-19 epidemic has reduced the occurrence of mega-M&As. Some scholars conclude this to be due to a low period for markets, which encourages enterprises to be more risk averse. In the latter half of 2020, the global semiconductor industry ushered in a wave of M&As. In September, Nvidia Corporation agreed to acquire Arm Ltd., a chip design specialist firm, from SoftBank Group, with a transaction value of $40 billion in cash and stock, the largest transaction to date in this industry. This acquisition will extend Nvidia's business scope into the booming smartphone market. In addition, in July 2020, Analog Devices announced its intent to acquire

Maxim Integrated Products for more than $20 billion, to compete with Texas Instruments Incorporated. Another famous mega-deal was announced in the pharmaceutical sector. In September 2020, Gilead Sciences announced that it was going to acquire Immunomedics, a U.S. biotech corporation, for $88 per share, in cash. At that time, the total market value of Immunomedics was approximately $9.8 billion, and the transaction value was $21 billion. Gilead's chief executive officer (CEO) Daniel O'Day pointed out that the deal will help Gilead diversify into cancer research. In the same month, Bayer Corporation announced its acquisition of KaNDy Therapeutics Ltd., a British biotech corporation, for $425 million. This acquisition is aimed at expanding drug development channels in the area of women's health. As the economy recovers, the tendency towards mega-mergers once again appears to be growing.

A mega-M&A involves the combination of two large companies that are usually already the market leaders in their fields and can thus enhance their market power and boost their profitability. However, the higher level of uncertainty and integration complexity involved and even the greater influence on the industry make it difficult to predict the outcomes of mega-deals. Previous research usually suggests that M&A deals, especially those of large value, destroy value (Henry, 2002; Cools, 2007; Alexandridis, 2011). Henry and Jespersen (2002) suggest that more than 60% of mega-deals result in shareholder loss, and Cools et al. (2007) document that mega-deals above $1 billion destroy twice the shareholder value as small deals. Moeller et al. (2004) report that the gains of shareholders decrease as the size of the M&A deal increases. They find that shareholders of small acquirers have an announcement return that is an average of 2% higher, and this difference is independent of financing tools or whether the target is public or private. Alexandridis et al. (2013) find that deals with a larger target destroy value for the acquiring shareholders due to integration complexities and uncertainty, rather than overpayment. However, Alexandridis et al. (2017) report that this pattern has changed since the global financial crisis, and, since 2009, acquirer shareholders have been able to gain more from mega-deals. Hu et al. (2020)

investigate the impact of acquirers' previous acquisition experience on the outcome of mega-deals in terms of the completion rate and post-merger performance. The authors find that mega-deals conducted by very experienced firms are more likely to be completed and can produce both short- and long-run positive abnormal stock returns for shareholders.

Given the contradictory evidence and conclusions on mega-deals, this thesis aims to investigate the outcomes of mega-deals in contrast with those of non–mega-deals. It should be noted that the questions are not what the outcomes of mega-deals are, but, rather, how the characteristics of mega-deals affect their outcomes and how mega-deals acquirers make use of M&A deals. These aspects will be further elaborated below.

1.2 Research questions

The topic of whether M&A deals create or destroy value has received much attention. However, the evidence and the literature are limited in the context of mega-deals (Hu et al., 2020). A comparison of the post-merger performance between mega-deals and non–mega-deals in both the short and long run is thus necessary, as well as the impact of deal characteristics such as the payment method, whether the target is a public firm, and the capital structure. I thus ask the following research question.

Research Question: Do mega-deals underperform non–mega-deals?

Furthermore, since mega-deals often occur between large firms that are market leaders, they usually draw more attention from the public, the media, and the antitrust authority (Alexandridis et al., 2017). Therefore, mega-deals tend to attract greater scrutiny and suffer from more regulatory issues, which implies far more resources, effort, and time. To test whether these factors lower the likelihood of completion of mega-deals, their completion rate is further analysed in contrast to that of non–mega-deals. This leads to the following research question.

Research Question: Are mega-deals more likely to be withdrawn than non–mega-deals?

In addition, mega-deals are often conducted by large firms as a strategic move to accumulate revenue (Hu et al., 2020), which suggests that they can be used to optimize acquirers' capital structure. To test whether acquirer firms set capital structure optimization as an objective, this thesis will further investigate the change in leverage of acquirer firms around the takeover process. I thus ask the following research question.

Research Question: Do mega-deals experience larger changes in capital structure than non–mega-deals?

1.3 Research structure

In this thesis, the main research question involves the difference between the performance of mega-deals and non–mega-deals. This issue will be examined by analysing data on M&A deals conducted during the past 30 years, downloaded from the Thomson One Banker SDC database. The overall structure of the research takes the form of six chapters, including this one. The literature is reviewed in the next chapter, Chapter 2, in three parts, providing general insight into the academic research to date. The first part introduces the history of M&As and the corresponding theories of M&A motivation. The second part reviews mega-deals and cross-border deals, given that cross-border deals often have great value. The third part discusses the literature on the performance, status, and capital structure of M&As and presents the theoretical framework on which the qualitative research is built.

Chapter 3 compares the performance of mega-deals with that of non–mega-deals and analyses the roles of deal characteristics such as the payment method, whether the target is a public firm, and the acquirer's capital structure. Although non–mega-deals tend to have better short-term performance, mega-deals have a high likelihood of

performing better in the long term. Further, cash deals have a high likelihood of performing better than stock deals, whereas deals with a non-public target have a high likelihood of performing better than deals with a public target. In addition, mega-deals tend to have higher values than non–mega-deals in terms of acquirer characteristics such as market capitalization, the market-to-book ratio, the ratio of free cash flow to total assets, and the leverage ratio. Mega-deals are more likely to have higher values for deal characteristics such as the deal's value, relative size, and time to completion.

Chapter 4 compares the characteristics of withdrawn and completed deals and examines the differences in their performance. It finds that the mean ratio of deals with all-stock payments is significantly lower among withdrawn deals in mega-deals, which is contrary of the results for the full sample. In addition, the mean ratio of mixed-payment deals, the mean ratio of diversification, and the mean ratio of cross-border deals are significantly lower among the withdrawn deals of the full sample, but there is no significant difference between withdrawn and completed mega-deals. However, the mean ratio of hostile takeovers is significantly higher among withdrawn mega-deals, which could suggest that hostile takeovers have a higher chance of being rejected in mega-deals than in non–mega-deals. Among mega-deals, whether the deal is withdrawn or completed has no significant effect on short-term post-merger market performance. However, for the full sample, unsuccessful deals do underperform mergers' market performance in the short term. As for long-term post-merger market performance, unsuccessful deals significantly underperform mergers' market performance, especially among mega-deals.

Chapter 5 analyses change in capital structure around the takeover process by comparing the deal characteristics of mega-deals and non–mega-deals. It appears that the acquirer firms of mega-deals tend to have larger improvements in their leverage ratio, market-to-book ratio, and debt-to-total assets ratio than the acquirers of non–mega-deals, whereas the acquirer firms of non–mega-deals tend to have a higher

debt-to-equity ratio. The leverage ratio and debt-to-total assets ratio of target firms in deals with a larger change in the acquirer firms' leverage ratio are higher than those in deals with a smaller change in acquirer firms' leverage ratio. This is especially true for mega-deals. In contrast, the market-to-book ratio of target firms with a larger change in acquirer firms' leverage ratio is lower than that for deals with a smaller change in acquirer firms' leverage ratio. In addition, deals with a larger change in acquirer firms' leverage ratio tend to have higher ratios of free cash flow to total assets. Mega-deals play a significantly positive effect on both the change in acquirer firms' leverage ratio and the change in acquirer firms' debt-to-total assets ratio, and about half of the mega-deals in the sample involve mixed payments of both cash and stock.

Finally, Chapter 6 concludes by summarizing the research findings of this thesis. The results will draw upon the entire thesis and will focus on each research question, followed by the insights of the qualitative research. Recommendations will be given regarding the aspects that should be considered for a successful mega-deal. Suggestions for future research will also be offered, based on the interpretations and implications of the research findings.

2 Literature review

In this chapter, I first review the history of M&As from the perspective of M&A waves and various M&A motivation theories. Given the limited study on mega-M&As and because cross-border M&As usually involve large value, I then review the research on cross-border M&As. I further introduce the theories on the post-merger performance of M&As, on the completion of M&As, and on changes of capital structure and the choices of payment methods and financing tools in M&A activities.

2.1 M&A waves and M&A motivation

2.1.1 M&A waves

The takeover market exhibits cyclical patterns, with alternating M&A peaks and ebbs. In history of M&A activities in the United States, five major merger waves have been identified in the United States. The first merger wave occurred between 1897 and 1907, after the Depression of 1882–1885. A minority of industries, namely the energy, metal, food, and transportation industries, undertook the majority of M&A activities at that time. Horizontal mergers played an essential role in the first merger wave, such that related industries became highly concentrated. For instance, on March 2, 1901, J.P. Morgan formed U.S. Steel after acquiring Carnegie Steel and 700 other small steel companies, such that over 70% of the U.S. steel production was now managed by this massive steel company. Such monopolization accelerated the development of antitrust laws in the United States, and the Department of Justice broke up many large monopolies via the Sherman Antitrust Act of 1890.

The second M&A wave (1916–1929), which started during World War I, ended after the stock market crash of October 29, 1929. Unlike the previous wave, with its vast number of horizontal mergers, the second merger wave was characterized by a growing portion of vertical mergers. In addition, to avoid the monopoly-favouring conditions of the former wave, the federal authorities used the Clayton Antitrust Act

of 1914 to supplement the Sherman Antitrust Act, which led to oligopolies rather than monopolies.

The third M&A wave, which took place during a period of economic prosperity in the United States, began in 1965 and ended in 1969. This wave notably consisted of conglomerate mergers, since buyers typically acquired firms in unrelated industries. One reason could have been the tougher antitrust enforcement, with the establishment of the Celler–Kefauver Act in 1950.

The fourth M&A wave took place under the presidency of Ronald Reagan. This wave featured hostile 'bust-up' takeovers. Though friendly M&As still accounted for the majority of mergers during this fourth wave, there were more hostile takeovers than in the previous waves, and the deals were larger, with broader use of debt for payment.

The fifth M&A wave began in 1993, after the economic recession of 1990–1991, and lasted until 2000. Deals within this period were considered friendlier and were more often related-industry 'strategic' or 'global' deals, because they were conducted as part of long-run business strategies.

2.1.1.1 The history of the M&A waves

The history of merger waves has been intensively studied, mostly concentrating on the first, fourth, and fifth waves. Ralph (1959) is the first to have conducted an empirical analysis of the first three M&A waves and the first to propose the concept of M&A waves. The author points out that, in the 60 years from 1895 to 1956, there were three major M&A waves in the United States. Ralph's comprehensive study of M&A fluctuations, the industries involved, changes in industry structure, scale distribution, the proportion of M&As, the M&A conditions in different states, and so forth, show that M&A activities have their own cyclical pattern.

Markham (1955) points out that a market monopoly was the aim for only a minority of M&A activities in the first wave, or one-fifth of large-scale M&As, and most M&A activities aimed to profit from underwriting securities. In addition, a large number of M&As were conducted for neither monopolistic gains nor the benefit of underwriters, and were just normal business transactions between enterprises. Some M&As are undoubtedly rapid responses to technological innovation. For example, the first M&A wave was accompanied by rapid railway expansion, and the second wave was accompanied by the rise of the automobile and advertising industries.

Chandler (1962) demonstrates why large enterprises transitioned from horizontal to vertical mergers. Chandler states that, after horizontal integration, enterprises must inevitably expand their factory scale and sales facilities to increase production, the large resulting fixed costs then requiring continuously higher production. On the other hand, vertical mergers with companies in sales avoid the unreliability of external sale agencies, and vertical mergers with upstream companies avoid the constraints of raw material resources. Mergers with both upstream and downstream companies thus became a favoured choice for large enterprises.

Eis (1969) investigates the M&A activities from 1919 to 1930, analysing M&A time patterns, industry classifications, the merger process, merger patterns, and oligopolies. The author suggests that the second M&A wave was much smaller than the first one. However, Eis argues there were still several small waves during the research period, and they were consistent with macroeconomic activities.

Hurley (2006) conducts an in-depth study on why the third M&A wave in the United States involves diversified mergers. The author points out that the CEOs of many companies at the time believed that the diversification achieved through M&As of related and unrelated businesses could help companies improve efficiency and reduce

potential risks. Diversified companies would then appear to be more stable and profits per share would be greatly improved. At the same time, there seemed to be no better alternative M&A model under the circumstances.

Research on the fourth M&A wave focuses mainly on the causes, such as the industry shock theory proposed by Mitchell and Mulherin (1996). Industry shock refers to the impact of factors such as technological innovation, globalization, and industry deregulation on the industry. The authors investigate 51 industries and find large differences between industries in terms of M&A ratios and timing, but that M&As in the same industry usually exist within a certain time window, indicating that the factors affecting M&As within a single industry are the same, that is, the impacts are external.

Research on the fifth M&A wave focuses mainly on its multinational characteristics. Evenett (2003) points out that the fifth M&A wave was very different from the fourth one, which was dominated by multinational and strategic M&As, such as strategic alliances in the banking industry. The author argues that multinational M&A do not harm the benefits of banking customers, whereas multinational alliances can. Shleifer et al. (1990) study the development of leveraged M&As in the takeover wave in the 1980s and shows companies' return to specialization and focus. The external environment in the 1980s was also conducive to the takeover movement, given high stock prices and the government's intentional relaxation of antitrust enforcement. Shleifer argues that the 1980s takeover wave was a sublation of the 1960s collectivization wave.

Toxvaerd (2007) studies the pattern of the fifth M&A wave and notes that the wave of strategic M&As in the 1990s can be explained by the theory of seat grabbing, where strategic targets are scarce. Most of the M&As in the 1990s were strategic, and they

could be either postponed or speeded up at any time. By postponing, the acquirers could obtain better market conditions in the future, but they risked being replaced by other acquirers. In the end, a perfect subequilibrium was formed in which all acquirers initiated mergers at the same time, thus generating an M&A wave. Alexandridis and Travlos (2011) analyses the M&A wave from 2003 to 2007, assuming its driving factor was the abundance of capital liquidity. The competition for control in the market was not very fierce, and mergers were more cautious and rational. Corey (2010) investigates the concentration and union of capital. The author points out that the concentration mainly involved an increase in industry capital, while the unions involved the combination of financial and industry capital, both of which provide control over the competition and in markets, pricing, and employment.

2.1.1.2 M&A wave theories

2.1.1.2.1 Neoclassical theory

Neoclassical theory supporters suggest that external shocks, such as changes in economic policies and technology innovations, drive mergers waves, and a rational market will reallocate assets effectively to regain a new equilibrium. Healy et al. (1992) focus on the 50 largest takeovers in the United States in the five years after 1979. Their empirical data reveal that M&A activities result in significantly high returns on operating cash flow, due to the relative improvement of asset productivity. However, the implications are limited, due to the sample selection, with deal size playing a vital role. Under the assumption that a firm's capital is positively autocorrelated, with no fixed costs, Jovanovic and Rousseau (2002), find no significant differences in the growing pace for different-sized companies; the growing power is related only to technology. The authors suggest that opportunities for profitable reallocation created the 1900s, 1920s, 1980s, and 1990s merger waves, but the 1960s wave could be due to something else.

Jovanovic and Braguinsky (2004) present a unique equilibrium model for evaluating the gains and losses of both parties in a takeover. They find that, around deal

announcements, the targets benefit whereas acquirers suffer losses in terms of stock prices. Their work sheds light on both horizontal mergers and bidder discounts. However, their model assumes that the only aim of a merger is to transfer a business project to a better manager, and it does not consider variance in managers' personal abilities.

Wang (2018) refines Jovanovic and Braguinsky's (2004) argument, studying 7,185 domestic deals in the United States between 1980 to 2012. Wang reassesses the mergers' gains by constructing a structural model that considers the bidder's initial motives and links these endogenously to the market's reactions to the takeovers, a first in the literature. The model indicates that, contrary to the announcement return of -0.98% from empirical results, the acquirers of a typical takeover can earn 3.87%. Wang advocates that this mere 5% gap reveals biased merger gains due to market reassessment and self-selection. The author then uses the model to imitate a market without takeovers. Surprisingly, in comparison with a dynamic takeover market, acquirer and target firm values are 13% and 48% lower, respectively. This work presents a framework for the rationale of merger activity and provides evidence supporting the neoclassical theory of M&As.

Harford (2005) analyses 35 waves in 28 industries between 1981 and 2000 and finds the results strongly support the neoclassical hypothesis. This paper puts forward the importance of the cost-reducing role of capital liquidity in merger waves. The author suggests that evidence of market timing indeed reflects the capital liquidity effect. With higher capital liquidity, transaction costs can be reduced, leading to better conditions for acquisitions. In addition, this liquidity component results in industry M&A waves, leading to clusters of mergers at an aggregate level. Although the long-run performance of bidders can support behavioural hypothesis to a small extent, other factors, such as payment methods and stock returns, are all consistent with

neoclassical theory. Gorton et al. (2009) build a model to determine the relations between firm size, industry structure, and firms' post-merger performance. They check their results with two sample sets: 654 takeovers from Viscusi's (2000) paper and 1,334 takeovers from Harford's (2005) paper. Gorton et al. provide evidence that firms do undertake mergers competing for firm size (either to become a more attractive target or to lower the chance of becoming a target), and this race usually results in profitable takeovers, as long as private advantages are not overly high. Their work offers a rational for the clustering of mergers and the existence of merger waves. However, many of their predictions still need to be tested.

Another feature related to large-scale M&As is the changes in the country's laws and policies regarding M&As, including industry regulations, legal constraints, and rule relaxation. Changes in industry regulations, especially the relaxation of regulations, have been found to play a positive role in M&As, and M&A waves arise from companies' reallocation of resources with the aim of adapting to a new economic environment caused by an economic shock (e.g. Jensen, 1993; Andrade et al., 2001; Jovanovic and Rousseau, 2001; Harford, 2003; Harford, 2005).

Gort (1969) states that, some companies cannot adapt to external changes triggered by industry shocks (e.g. when technology is updated), due to restrictions on management and workers' technical capabilities. The companies then become the M&A targets of companies that can take advantage of the new technologies, which leads to M&As between companies in the same industry. M&As thus reallocate corporate resources and transfer them to companies that can efficiently use new technologies. A merger wave ends as the resource redistribution ends. Jensen (1993) shows that, in the 1980s, many companies continued to conduct large-scale M&As due to the large cost fluctuations caused by the large changes in product prices in the 1970s. Most M&A activities occurred because of the excessive production capacity caused by

technology and supply shocks in many industries. When a company is unwilling to shrink on its own, M&As have become the main way to reduce excessive production capacity.

Mitchell and Mulherin (1996) examine the impacts of industry shocks on U.S. M&A activities between 1982 and 1989. They argue that changes in the industry, technological, or regulatory environment will trigger an M&A wave. Such changes include deregulation, changes in input costs, and innovations in financial instruments. Observing the industry clustering of M&As in 200 industrial sectors in the United Kingdom from 1990 to 1995, Schoenberg and Reeves (1999) find that differences in industry regulations were the most important determinant of acquisition activities in different industries. The empirical research of Andrade et al. (2001) further confirms that deregulation, globalization, and other industry shock factors have led to frequent M&As. Their research suggests that changes in the technological innovation environment, such as supply shocks and laws, will lead to M&A waves. Harford (2003) show that shocks within a definite industry lead to beneficial M&As. For instance, technological progress and deregulation of an industry will cause essential changes in the industry's competitive environment.

M&A clusters develop in response to the simultaneous occurrence of several industry mergers. Neoclassical theory states that the cost of capital is another factor that drives the formation of M&A waves. Technological shocks and sufficient asset liquidity together lead to the formation of an M&A wave. M&A waves always occur when stock prices and interest rates are low (Weston et al., 2004). Furthermore, the determinants of M&A have been investigated from the perspective of industry policy uncertainties. Lee (1996) suggests that growth in total factor productivity might not be improved by industry policies, such as tax incentives and subsidized loans. In contrast, the less government intervenes in trade, the higher the productivity growth. Scholes and

Wolfson (1990) analyse the impact of U.S. tax law changes on company restructuring and find that tax changes are the most important factor to affect M&As. Grinblatt et al. (2011) classify the motivations for M&As in different periods and point out that the acquisition of operational synergies based on taxation and other operations is the key motivation for corporate strategic M&As.

2.1.1.2.2 Behavioural theory

Behavioural theory suggests that a rational management board uses irrational markets and gains from market misvaluation. Rhodes-Kropf and Viswanathan (2004) suggest that stock mergers are connected to market valuation. Payment methods and M&A waves can also be affected by market valuation. Rhodes-Kropf et al. (2005) analyse the impact of misvaluation on merger waves. Unlike previous researchers, they find that both targets and acquirers in a successful acquisition are more overvalued than non-merger firms, with targets less overvalued than bidders. This effect is especially obvious in stock transactions. Rhodes-Kropf et al. suggest that merger waves within a period usually cluster at the industry level. In addition, the a firm's increasing market-to-book ratio leads to a higher likelihood of stock transactions. While these authors show the important influence of misvaluation on merger waves, there are still many other determinants. Although neoclassical theory can explain merger waves to some extent, misvaluation has the greater explanatory power.

Analysing 2,944 U.S. deals, Bouwman et al. (2007) find evidence supporting behavioural hypothesis. While they do find that acquiring firms gain positive announcement returns in high-valuation periods, in the long run, the results reverse, possible because of managerial herding. Duchin and Schmidt (2013) find similar results. Savor and Lu (2009) analyse 1,773 completed US M&A deals announced from 1978 to 2003, with 355 failed takeover deals as the control group. The authors document that the failed deals result in one-year abnormal returns about 13% less than for the completed deals. The difference increases further by about 10% for a two-year window,

reaching 31.2% for a three-year window. This pattern disappears for cash-financed takeovers, however. The results are evidence that using overvalued equity as a payment method generates long-term value for the acquiring firm's stakeholders, supporting behavioural theory.

However, Jovanovic and Braguinsky (2004) suggest that, given agency problems, when mergers do generate value, the announcement of the acquisition can harm the acquirer's value, and even the acquirer and target's combined value. This also holds for rational investors. Thus, a low announcement abnormal return does not necessarily mean a bad deal. Furthermore, Epstein (2005) initially rejects a behavioural hypothesis from the start, arguing that it is nonsensical to categorize M&A success based on stock price changes during a short period. Although the author's paper provides insights, it is more like a literature review, with no empirical or model results or solutions.

2.1.2 M&A motivations

The most basic motivation for an M&A is to expand enterprises. Enterprises can expand both internally and by acquiring other companies. While the former approach can be slow and uncertain, the latter is quicker. More importantly, M&As can have synergy effects. Supporters of M&A transactions usually consider the achievement of a certain synergy as reason to pay the M&A price in question. Specifically, the first source of synergy is economies of scale and scope brought about by expansion (Given, 1996; Farrell and Shapiro, 2000; Lambrecht, 2004). The effect of economies of scale and scope can reduce the total cost by making full use of the resources and their integration, reducing management costs, raw material costs, production costs, and so on. The second source of synergy is monopoly gains, where merging with or acquiring a major rival enables an enterprise to increase its market share, reduce competition, and make it the leader in its industry (Trautwein, 1990; Fee and Thomas, 2004). However, this action can violate ant-trust laws and faces obstacles (Banerjee and Eckard, 1998; Carlton and Keating, 2015). The third source is when a firm undertakes

a conglomerate merger, where the acquirer can diversify its business and spread risk by entering a new industry through acquisition. Given intensified competition in an industry, companies will need to effectively expand in both scope and market share and thus gain higher profits, and they can lower the risks of industry competition through investment in other industries (Lewellen, 1971; Mueller, 1977; Amihud and Lev, 1981; Mooney and Shim, 2015). The fourth source of synergy is expertise. M&As can help enterprises improve their competitiveness by obtaining all the necessary primary assets and resources, which can greatly enhance the enterprise if the resources are efficiently reallocated (Blake and Mouton, 1985; Harrison et al., 1991). Other sources of synergy include tax savings and brand effect (Wiles et al., 2012).

Rani et al. (2020) investigate M&A motives from the perspective of synergy and agency categories. They show that synergy plays a larger role in post-deal performance than agency in the long run. Fukuda (2020) analyses how M&As affect the corporate performance of acquired companies in Japan and shows that takeovers significantly reduce employment, but not labour productivity. The author also shows that acquisitions by Japanese companies have a significantly positive effect on Tobin's Q, but not on the return on assets. Meckl and Röhrle (2016) use meta-analytical techniques to investigate whether M&A transactions create value. They show that transactions predominantly do not improve the chance of a company's success; however, the type of M&A and the time frame used for measurement affect how successful M&A transactions are perceived to be.

2.1.2.1 Efficiency theory

Efficiency theory assumes that the main motivation of M&A is synergy, and it is therefore also called synergy theory. Synergy refers to that a company's expected cash flow after an M&A exceeding the total cash flow of all/both merged companies before the M&A. Dutz (1989) states that synergy refers to the complementarity of enterprises after M&As, which can make the production value of new enterprises after M&As higher than the total production of the individual enterprises at any given output price.

Efficiency theory assumes that companies have two main purposes to engage in M&As: to increase revenue or reduce costs to increase profits, and to reduce risks and create so-called synergies through the improvement of financial operations and management efficiency.

The types of synergy acquired after corporate M&As have been researched and roughly divided categorized as operating synergy, management synergy, and financial synergy. The operating synergy generated by corporate M&As refers to real economies of scale, which means that, as an enterprise expands in scale, the input required in its production process, research and development, or sale process decreases after the merger. Management synergy refers to how, with the help of M&As, companies can increase the low efficiency of their management. Scholars therefore also call management synergy differential efficiency.

Weston et al. (1990), however, express doubts about the existence of management synergy and argue that, if management synergy prevails, it will result in 'one company with the best management efficiency in the world, which is impossible in reality'. Thus, the management efficiency of some industries is due to coordination and cooperation of the objective environment, such as job characteristics, cultural background, and organization. Therefore, horizontal mergers have the highest likelihood of producing management synergy.

Dewey (1961) has proposed the hypothesis of the dying company. The author argues that M&As are a wise choice for bankrupt companies, since they allow growing companies to obtain assets from dying companies and thus avoid bankruptcy costs. Therefore, companies that are no longer competitive in this type of M&A market should lead to increased market competition. In addition, unit management costs have declined. Enterprise M&As have led to the expansion of production scale, but

management expenses do not increase in proportion to production. Therefore, the average management cost of each unit is reduced. Excellent and innovative management methods can also be adopted through M&As in enterprises with insufficient resources or initiatives.

Financial synergy is the effect of reducing capital costs when two or more companies merge. Financial synergy in horizontal M&As mainly results from the cost reduction due to multiplant economies and improvements in debt capacity. Because of growth in transaction volumes, companies can obtain discounted prices from suppliers and thus achieve lower unit costs and higher profits. Lewellen (1971) propose that, in a good bond market, corporate M&As, with all their cash flow, provide insurance against debt and can thus reduce debtors' risks of default and bankruptcy. A post-merger enterprise can thus obtain a lower borrowing interest rate. Furthermore, the combination of unrelated cash flows by both parties to the merger will lower the debt default risk, which can prompt bondholders to provide more financing and thus increase the borrowing capacity of the post-merger enterprise. Increases in borrowing power lead to larger liabilities, in contrast with the total liabilities of firms before their merger.

Synergy has been one of the main reasons for merger activity. Mitchell and Mulherin (1996) show that M&As lead to synergies. Houston et al. (2001) analyse the largest bank acquisitions from 1985 to 1996 (since the banking industry experienced significantly increasing merger gains from the 1980s to the 1990s) to determine the source of the merger gains. First, Houston et al. examine a sample of 64 mergers to see the changes in the bank acquisition market and suggest that the cost savings from reducing overlapping operations are the dominant source of gains. Second, using a subsample of 41 mergers with managerial projections, the authors claim that both the acquirer's and target's abnormal returns increase with managers' estimated cost

savings. In addition, the authors suggest that managers are being too optimistic in their merger gain forecasts. Third, analysts also seem to focus primarily on cost savings, and sometimes on whether the bidding firm has overpaid for the target. Finally, the authors evaluate post-merger performance and advocate that most managers in acquisitions claim to reach their goals, with improvements in performance correlated with cost saving estimates.

By comparing taxes, market power, and efficiency improvements before and after acquisitions, Devos et al. (2009) suggest that combined firms do have significant synergies, but that these synergies create value through cutting back investments after the merger, rather than through increased market power or tax savings. There also exists a positive relationship between such gains and pre-deal capital expenditures. The authors show that significant synergies are generally expected from mergers, but that operating synergy is the dominant reason for the value increase, rather than financial synergy from tax savings. Among the components of operating synergy, investment cutbacks play the most essential role in operating synergy. However, market power does not appear to be a dominant reason.

2.1.2.2 Agency cost theory

Jensen and Meckling introduced the agency problem in 1976. Modern enterprises separate their management and ownership, with low ratios of high-level managerial shareholding, which leads to agency problems. M&As provide an external solution to the agency problem. The likelihood of a corporate M&A is an external threat to managers, which restrains them from firm-harming behaviours and improves their management behaviour. However, some believe that, rather than saying that M&As solve agency problems, it is better to say that M&As arise because of agency problems. Accordingly, Mueller (1969) puts forth the concept of managerialism, suggesting that managers tend to drive M&As for personal gain. Berle and Means (1932) conduct an empirical analysis of the 200 largest firms in the United States and propose a clear argument for the separation of ownership and management. Jensen and Meckling

(1976) further show that, when the ownership and management of a company are separate, the relationship between owners and the management board becomes a principal–agent relationship. Incomplete agreement between an owner and managers or when agreement cannot be implemented at a low price leads to agency cost problems. Agency problems in corporate M&As include the following.

(1) Corporate empire building and excessive investment. Baumol (1959), Marris (1964), and Donaldson (1984), among others, argue that corporate managers tend to build corporate empires, since the expansion of corporate scale will allow them to control more resources and thus earn higher salaries. In addition, an enterprise can obtain more promotion opportunities by expanding its scale, which thus gives the company's senior managers opportunities for rent seeking.

(2) High levels of free cash flow. Jensen (1986) defines free cash flow as 'the excess cash flow after satisfying all investment projects with positive net present value'. Company owners and managers can differ in their arrangements of free cash flows, since the latter tend to keep them for future use or for controlling more resources, which can lead to investing in more projects with lower profitability.

(3) The hypothesis of hubris and overconfidence theory. Roll (1986) proposes that professional (but not selfish) managers' hubris can lead to high prices paid for the target firm in M&As, regardless of their good intentions, and shareholders can thus suffer losses. Due to ambition or arrogance, managers can easily make the mistake of being overly optimistic when evaluating merger probabilities.

Mille and Ross (1975) show that individuals usually attribute success to personal behaviours and connect their failure with bad luck. Individuals at higher levels of management have a strong likelihood of overrating their own abilities. This superiority effect can easily be extended to large company decisions, such as investment. The survey results of March and Shapira (1987) show that managers are more likely to have a lower underestimation of their inherent instability and think they have full control of

their company's operation and development, while underestimating the possibility of new investment failure. Roll (1986) argues that corporate managers tend to overestimate their own management capabilities and are overoptimistic when assessing the future earnings of a target company, which results in acquisitions of companies with low or no revenue. Such acquisitions cannot achieve successful synergy, which eventually leads to the failure of the merger. Berkovitch (1993) proposes that synergy efficiency drives most M&As, but that agency problems and managerial arrogance can lead to the blind adoption of M&As by corporate management.

2.1.2.3 Monopoly theory

The theory of monopoly power is also called the market power hypothesis. It suggests that companies can reduce the number of competitors in the market through M&As and thus improve their control and share of the market and form monopolies to obtain excess benefits. The direct impact will be an increase in industry concentration. The change in market structure will result in increased market power for M&A companies, making it easier for competing companies in the market to collude to gain higher market prices. In some cases, corporate M&As are used as a method of closing prices and establishing industry discipline, which is another monopolistic motivation for M&As. Hovenkamp (1993) points out that the main reason why antitrust puts forward to the regulation of corporate M&As is that they lead to two dangers: monopolization and collusion. Companies can use M&As to reduce market competitors and increase their own market share to obtain excess profits as they approach a monopoly.

Muller (1995) states that it is not easy for companies to achieve a monopoly through M&As, especially since all countries currently have antitrust control systems. It is possible that M&As help reduce the number of companies in an industry, which facilitates enterprise collusion, which raises prices. Traditional economic theories (e.g. the Cournot model) implicitly suggest that firm profitability is proportional to industry

concentration, which leads to the concentration–merger–profit hypothesis for merger motivation among enterprises. This hypothesis suggests that the concentration of market structure is the main source of enterprise profits, making it very easy for enterprises to form cartel organizations through mergers and obtain exclusive profits. Since corporate M&As result in an increase in market concentration, antitrust agencies should focus on the regulations of M&As.

2.2 Mega-M&As and cross-border M&As

This section further reviews papers on mega-deals and then discusses cross-border M&As. It then introduces the relation between national politics, economies, and culture and the performance of cross-border mega-M&As.

2.2.1 Mega-M&As

Kumar (2002) analyses mega-deals in different industries and finds that their main purpose differs across industries. For example, the pharmaceutical industry aims to obtain greater scale and market share, enhanced geographical expansion, and increased technological capabilities, whereas the major drivers in the finance sector are advances in information technology, financial deregulation, the globalization of financial markets and real markets, increasing shareholder pressure for financial performance, and financial distress.

Alexandridis et al. (2013) use a sample of 3,691 U.S. public acquisitions announced between 1990 and 2007 to examine the relationships between deal sizes and offer premiums and between deal sizes, overpayment potential, and acquisition losses. The results show a strong negative relation between deal sizes and offer premiums and lower overpayment potential in acquiring large targets. The authors find that large deals destroy more value for acquirers around deal announcements due to the complexity inherent in large deals, rather than to overpayment.

Alexandridis et al. (2017) explore whether mega-deals create or destroy value by examining 26,078 M&A deals announced between 1990 and 2015. They find that the 2008 financial crisis changed 'the tendency of acquiring firms to destroy value for their shareholders', and acquiring shareholders have been experiencing positive abnormal returns since 2009. They also show that M&As, especially mega-M&As, create value on a large scale due to the sharp increase in synergistic gains, which could be caused by variation in conventional governance characteristics. To verify whether the findings of Alexandridis et al. also apply to the European market, Smit (2018) compares the returns on mega-deals for acquirer shareholders before and after 2009. The author shows that bidder cumulative average abnormal returns were negative before 2009 but significantly positive afterwards, verifying that the 2008 financial crisis was a turning point for the performance of mega-deals.

Hu et al. (2020) examine the role of acquisition experience in the completion and performance of mega-deals. Instead of independent events, they consider mega-deals as dependent events and find that mega-deals conducted by firms with strong experience (having completed more than 12 deals) have a much higher likelihood of completion, and the resulting abnormal stock returns for shareholders are higher in both the short and long term. The authors argue that firms with more experience perform better in post-merger integration and can thus experience great improvements in performance.

2.2.2 Cross-border M&As

Bae et al. (2013) analyse 672 cross-border M&As announced by firms in the United States and arrive at the following conclusions. First, pure cash deals occur more generally for public targets, whereas private targets frequently involve more stock and mixed payments. Second, horizontal deals account for more than 60% of all deals, with a significantly high percentage of private targets in the high-tech industry. Third, acquiring firms generate higher returns when purchasing targets in lower-liquidity countries. Rossi and Volpin (2004) point out that better investor protection leads to

more frequent M&A activity. Domestic investors' protection of environmental quality is an important condition for establishing an active M&A market. Compared to acquiring parties, the acquired parties of cross-border M&As are more likely to be from a country with poorer investor protection. Cross-border M&As could thus become an important force at the investor protection level and could promote the convergence of corporate governance mechanisms on an international scale.

Hitt et al. (1998) find that companies involved in many cross-border M&A activities can obtain general experience that includes foreign firm acquisition knowledge strategies and routines and which is developed from many perspectives, such as financial and legal sources (Hitt et al., 1998). Very and Schweiger (2001) further find that local external consultants are often involved in cross-border M&As, to help acquirer firms obtain generalized knowledge on the business network and employment in other countries. Dikova et al. (2010) find that acquirer's cumulative experience in international M&As helps diminish the negative effects of institutional distance on the completion rate of international M&A deals. Doidge and Dyck (2015) find that the operations of multinational companies tend to be located in countries with low tax rates, such that trust holdings and fixed asset investments will decrease and expenditures will increase.

The absolute status of advanced economies in global cross-border M&As is being challenged by the increase in the proportion of emerging economies, which further poses challenges for related theories. Sun et al. (2012) propose a new theoretical analysis framework, the comparative ownership advantage framework, to explain the changes to global M&A activities brought about by the rise of emerging markets in the 21st century. The authors' analysis of 1,526 cross-border M&As in China and India from 2000 to 2008 provides realistic evidence for the analysis framework mentioned above. Deng and Yang (2015) start with resource dependence theory and conduct a

comparative study of emerging market countries achieving internationalization through M&As. Using panel data from 2000 to 2012 from nine emerging economies, they find that the intensity of access to key resources by companies from emerging markets has increased the likelihood of cross-border M&As, and there is a negative relation between this effect and the host country's adjustment of institutional factors, such as government efficiency.

In term of legality, Li et al. (2017) investigate issues of national security in international M&As. M&As initiated by state-owned enterprises from other countries are often considered to be related to the countries' political intentions (Globerman and Shapiro, 2009; Cui and Jiang, 2012). Li et al. (2020) show no significant differences in the likelihood of deal completion between the cross-border M&As of state-owned enterprises from other countries and other cross-border M&As in the United States, except that the M&As of state-owned enterprises take longer to complete. Moreover, when the target company has more research and development knowledge, the M&As of state-owned companies have a higher likelihood of being withdrawn.

Cioli et al. (2020) analyse how cross-border M&As affect post-deal profitability, leverage ratios, and the growth of the ratio of sales to invested capital for the bidder and the target. They suggest that cultural distance positively affects the post-merger performance of acquirer companies, with a negative impact on target companies, while both effects depend on the acquirer's experience and capability in cross-border M&As.

Dowling and Vanwalleghem (2018) study the institutional determinants of the selection of target nations for M&As of Cooperation Council for the Arab States of the Gulf cross-border deals. The authors show that effective formal institutions (good

governance) and close informal institutions (e.g. cultural similarity) in a target nation have positive effects on the attractiveness of potential targets.

Farsi (2017) analyses how cultural differences affect the performance of cross-border M&As from national and corporate perspectives and demonstrate their multifaceted impact on cross-border M&A processes, especially in terms of integration and long-run outcomes. The author further points out the importance of examining cultural characteristics of a specific industry and the ownership structure of certain companies in target selection.

2.2.3 Relationship between country distance and the performance of cross-border M&As

Intensive research has been conducted on the impact and mechanism of political, economic, cultural, and other factors on the performance of cross-border mega-M&As. The studies mainly focus on the completion of cross-border M&As, the stock market response, and long-run post-merger performance. Until now, the dimensions of distance between countries investigated include cultural distance (e.g. Chakrabarti et al., 2009; Du and Boateng, 2015), policy distance (e.g. Yang, 2015; Liou et al., 2017), geographical distance (e.g. Di Guardo et al., 2016), economic distance (e.g. Dong et al., 2019), language distance (e.g. Dow et al., 2016), and time distance (e.g. Gulamhussen et al., 2016). Scholars have not formed a unified conclusion on how the distances (differences) between countries affect the performance of international M&As.

Based on institutional, political economy, and migration theory, the distance between countries is expected to generate additional transaction costs, which negatively affects the performance of cross-border M&As (e.g. Di Guardo et al., 2016; Dow et al., 2016; Boateng et al., 2019). On the other hand, from a resource-based view and the perspective of knowledge-based theory, the distance between countries is expected to bring complementary resources and expertise, which helps to improve the performance of cross-border M&As (e.g. Ellis et al., 2017; Dong et al., 2019). Still other

scholars suggest that the impropriate geographical distance between countries will lead to the worse performance of international M&As, based on information asymmetry theory (Malhotra and Gaur, 2014).

In reality, there is much evidence of M&As failing due to various macro-environmental differences. For example, in 1998, Daimler Benz and Chrysler carried out a world-famous M&A, once known as the 'perfect marriage', but it later proved to be a big failure. The main reason is that the two enterprises operate in different countries, with different cultural backgrounds and attitudes. Since the two enterprises were merged inefficiently, the corporate culture within the individual enterprises was not appropriately integrated, resulting in conflicts and inevitable failure.

Morosini et al. (1998) find that national cultural distance positively affects the performance of international acquisitions and suggest that managers consider national cultural distance when making cross-border acquisition decisions. Stahl and Voigt (2005) present a literature review of cultural differences in M&As and study their effects on M&A performance. They find that the empirical research has produced inconsistent conclusions, and they provide a model to synthesize the impact of culture in M&As. Weber et al. (2006) find that cultural differences can lead to different degrees of implementation difficulty and synergy potential. In addition, cultural dimensions and traits cause acquirers to prefer certain levels of integration, and these aspects should therefore be considered in the integration strategy of M&As. Consequently, managers will have better chances of implementing their plan for optimal M&A performance to handle different levels of integration.

Teerikangas and Very (2006) examine the contradictions in the literature on the relationship between cultural differences and M&A performance and develop a theoretical framework to summarize the complexities that could explain them. The

authors suggest that future research study the relations between cultural distance and the M&A process and its outcomes rather than focusing merely on the effect of cultural differences on M&A performance. Chakrabarti et al. (2009) find that cultural disparity positively affects the performance of cross-border M&As, which is inconsistent with general perceptions. Viegas-Pires (2013) provides a theoretical model of the culture–integration relationship to explain the inconsistent results of previous studies on the effects of cultural distance. The authors argues that the relationship between culture and integration is a chain of reactions instead of static reactions. For instance, the cultural challenge can be altered by changes in organizational culture at the national level and be affected by integration decisions and actions at the global level. Contractor et al. (2014) explore what explains partial FDI acquisitions by examining the distance in institutions and cultures and the sectoral relatedness between the acquirer country and the target country. They find that a lesser institutional distance and a greater uncertainty avoidance distance increase the chances of minority acquisition over a majority, whereas industry relatedness decreases them.

Du and Boateng (2015) examine how factors such as formal institutional distance and state ownership affect shareholder value and value creation in the internationalization of emerging market companies by international M&As. Deng and Yang (2015) apply resource dependence theory to international M&As in emerging market firms. They argue that, in M&As, resource dependence theory presents a unique explanation for the internationalization for emerging market firms via international M&As. The authors discover a positive relationship between the tendency to receive vital resources to overcome constraints in emerging market firms and the likelihood of completion in international M&As. This effect is weakened by host government effectiveness.

Ahern et al. (2015) provide the first large-scale evidence to demonstrate the multiple substantial impacts of cultural differences on cross-border mergers. Specifically, more culturally distant countries tend to have lower numbers of cross-border M&As, whereas countries with larger trust and individualism differences have higher potential to reduce combined announcement returns. Importantly, a series of factors, such as time-varying country–pair, year, and country-level fixed effects, do not affect the robustness of the authors' results. Koerniadi et al. (2015) find that cross-border M&As reduce the risk of default in acquiring firms, and post-merger default risk is significantly affected by geographical distance and industry relatedness.

Popli et al. (2016) explore how deal abandonment and cultural differences affect the cultural experience reserve and industry affiliation at the firm level in cross-border acquisitions. They suggest that the cultural experience reserve of a local firm negatively affects the positive influence of cultural differences on the withdrawal of cross-border deals, and they assume that the industry context of one firm indeed influences the uncertainties associated with cultural differences. Malhotra et al. (2016) study the relationship between control levels in cross-border M&As and cross-national uncertainty, which is measured by cultural, geographical, and institutional distance. By analysing 9,000 cross-border M&As made by Latin American and U.S. multinational enterprises between 1996 and 2013, the authors find a negative relationship between cross-national uncertainty and firms' propensity to opt for shared ownership. However, these effects are all significantly weaker for Latin American multinational enterprises than for U.S. multinational enterprises.

Guo et al. (2016) study the effect of state ownership on the high acquisition premiums paid by multinationals in emerging markets. With data of 450 Chinese outward acquisitions from 1990 to 2011, they find that Chinese state-owned multinational enterprises tend to pay higher premiums than non–state-owned multinational

enterprises, and this effect is more obvious for target firms in developed countries. Guardo et al. (2016) examine the impacts of political, cultural, and temporal distance on international M&As and find that political–institutional, geographical, and cultural distances negatively affect the likelihood of M&A deals, which could be due to the higher associated uncertainty and thus greater risks for foreign investors. Rao et al. (2016) examine the panel data of 4,444 companies in different industries and countries from 1992 to 2008. They find that similarities in national culture and technical knowledge have positive impacts on the selection of partners and innovation after M&As. However, the expected subindustry synergy effect was not achieved in post-merger innovation.

Ngo and Susnjara (2017) show that deal hostility and the probability of deal completion are negatively related, and this effect is stronger when there is substantial information leakage about the deal. The authors find that substantial information leakage about an impending deal is an additional tangible obstacle in the process of hostile deals, and avoiding such leakage is therefore crucial to merger negotiation success. Huang et al. (2017) analyse data on 2,115 M&As in the global information technology industry from 1995 to 2004 and find that the power distance and value difference between two parties is negatively correlated with the long-term performance of the acquirer. This effect is stronger when the acquirer has a greater power distance compared to the target and there is a difference in status between the two parties, and it is weaker when the business relevance of both parties is stronger. Borochin and Cu (2017) conduct a text analysis of 797 articles covering M&As in China and find that the media in developing countries are vulnerable to pressure, and media reports are more inclined to address government goals, especially those involving powerful local companies. Media coverage also affects the performance of non–state-owned enterprise M&A transactions. As another channel of corporate governance, the media inform the market through information dissemination, which affects the performance of M&As. Xie et al. (2017) examine country-based factors of cross-border

M&As via a comprehensive literature review and summarize the country-level determinants. They suggest that the frequency of inward acquisitions is positively affected by the institutional laws in the target country.

Liou and Rao‑Nicholson (2019) show that the recency of foreign acquisitions is beneficial to the acquirers, and differences in economic have moderating effects on the results. Older firms, with the advantage of economic distance, can make better use of their experience to achieve a higher rate of post-acquisition success. In contrast, new firms with less economic freedom in their home country benefit more from cross-border mergers. Li et al. (2020) investigate the relationship between institutional distance and the performance of cross-border M&As. They show that the performance of cross-border M&As is negatively affected in the short term and positively affected in the long term by formal institutional distance, and the opposite is true for informal institutional distance.

2.3 Failure and success in M&As

2.3.1 Post-merger performance of M&As

Renneboog and Vansteenkiste (2019) review more than a 100 related papers about corporate control market, providing an outline of performance around mergers from previous studies. They document that post-merger performance can be influenced by various factors, including CEO overconfidence, the relative level of industry, and shareholder decision making. Moreover, market reactions in the short term to a takeover usually do not last in the long term.

Trejo-Pech et al. (2021) examine the financial and transaction factors of M&As in U.S. agribusinesses. They indicate that acquirers' low leverage, cash levels, and market valuations have negative effects on the chance of a company becoming an acquirer. For target firms, the authors show that firm leverage plays a positive role on the

probability of being a target company, while its profitability has a negative effect. They also find that M&A market experience plays a positive role in the chances of acquisition completion, while nonhorizontal deals are easier to complete than horizontal deals.

2.3.1.1 Industry structure and M&A types

As mentioned before, M&As can be classified into horizontal, vertical, and conglomerate mergers. The biggest advantage of horizontal mergers is that they can lead to a decrease in the cost and depreciation of the company's production without affecting other operations, thus providing certain economies of scale to enterprises. Studies around vertical mergers and horizontal mergers have always been concerned. Mitchell and Mulherin (1996) show that industry-level information best explains the merger wave in the 1980s. By analysing data in different industries during 1982 and 1889, the authors find that industry shocks can explain takeovers and restructuring to some extent. First, half of the takeovers in the 1980s wave occurred within a mere two-year period in certain industries. Second, interindustry variation is significantly related to industry shocks. Finally, specific industry factors influence firm takeover and restructuring activity. Williamson (1971) argues that the transaction costs of M&As are unavoidable, because M&As are inherently risky and unique in the economic system.

The empirical research of Singh and Montgomery (1984) shows that M&As between related firms create higher value than M&As between unrelated firms, but the impact on the target company is still unclear. Many scholars followed these authors' research ideas, roughly defining the relevance of the M&A industry according to four different subdivision standards: (1) mixed and non-mixed mergers; (2) horizontal, vertical, and conglomerate mergers; (3) industry overlap levels; and (4) changes in company concentration. These different measurement standards yield three different conclusions: (1) related M&As perform better. For example, Healy et al. (1992) adopt industry crossover levels as the test standard and find that M&As with high industry

crossover levels have better performance than mergers with low industry crossover. (2) The differences between related and unrelated mergers in terms of long-term performance and shareholder value creation are not significant. Ghosh (2001) and Linn and Switzer (2001) use corporate concentration as the standard and find that corporate concentration and long-run operating performance are not positively corrected. (3) Unrelated M&As create higher value than related M&As. Agrawal, Jaffe and Mandelker (1992) use the test criteria of M&As being mixed or non-mixed as and find that mixed (diversified) M&As produced better long-run stock prices than non-mixed (concentrated) mergers.

David (1987) states that, if a company undertakes a conglomerate M&A, the two parties in the transaction can make full use of production resources, market resources, and other resources, so that the acquirer can obtain additional economic benefits after the merger is completed. Paul (1992) notes that conglomerate M&As can play a greater role, because they can eliminate the opportunity costs of both parties to the transaction, so that the company's strategic transformation has a better layout and operation.

Hayward's (2002) evolutionary thinking argues that enterprises take advantage of better experience, experimenting, and temporal patterns (e.g. Brown and Eisenhardt, 1997). From this perspective, acquirers obtain expertise to expand current opportunities and discover new ones. Hayward's paper encourages firms to make cross-sectional acquisitions. However, future research is required to study the conditions of these conclusions in other strategic domains. Shahrur (2005) shows that, in most cases, firms' customer and supplier returns all move in the same direction as the firm's. Thus, the author finds the strongest evidence to support the production efficiency hypothesis. The author then compares the three most well-known hypotheses and finds that, rather than collusion, production efficiency is the main

reason for downstream acquisition. It seems suppliers and corporate customers can benefit from M&A activities with positive wealth effects to both target and acquirer firms. Shahrur finds that industry concentration caused by M&As does not affect the abnormal returns of suppliers and customers, but it can reduce the abnormal returns of the acquiring firm. Generally speaking, a lenient antitrust policy is suggested as being responsible for predominantly anticompetitive takeovers.

Analysing the U.S. acquisition market, Bhattacharyya and Nain (2011) find a positive relationship between horizontal mergers and buying power. The performance of dependent suppliers is affected by downstream consolidation and they thus experience adverse changes in selling price. The results shed light on a possible reason of merger wage: downstream industries can enjoy countervailing consolidations caused by the consolidation in their upstream industry. To better understanding conglomerate and horizontal takeovers, Mooney and Shim (2015) refine Leland's (2007) model and test 828 consummated takeovers announced between 1978 and 2007. The authors verify that conglomerate mergers outperform horizontal mergers, and this synergy is due to higher asset liquidity.

2.3.1.2 Friendly and hostile M&As

So-called friendly M&As involve the mutual negotiation and discussion of key issues, such as asset evaluation and merger conditions, between the two parties during the merger process (Schwert, 2000). There exists a special type of friendly M&A, called agreement mergers. Agreement M&As generally involve the acquiring enterprise directly contacting the target enterprise without going through the stock exchange and achieving the goal of the M&A through negotiation. A hostile M&A involves the acquiring company forcibly carrying out the M&A, even when the target firm is unwilling. Instead of negotiating with the target company's managers at the beginning of the merger, the merging company offers a price directly to the target company's controlling (participating) shareholders. In hostile deals, shareholders matter a great

deal to acquirers, and the target's management board usually adopts defensive actions, such as poison pills, which require the acquirer to strategize decisions, countermeasures, and premiums (Muehlfeld et al., 2012). For example, a possible white knight appeared in Rupert Murdoch's News International's acquisition of William Collins, which involved a two-month takeover battle and a substantial increase in the offer price because of negotiations between Collins and Presses de la Cité before the deal was completed. As pointed by Schwert (2000), compared to friendly M&As, hostile M&As address issues in the public phase rather than in the earlier stage before the IPA, and thus attract greater publicity.

A tender offer refers to a special type of hostile M&A, often called an open M&A or a bid purchase. A tender offer refers to an M&A activity in which the merging company does not obtain the permission of the management board of the target firm, but directly invites bidding from the target company's controlling (participating) shareholders with a price above the market's. Since a tender offer does not require the prior consent of the target company and involves collecting equity in the market, it is often regarded as a compulsory merger. Tender offers generally produce higher short-term benefits for the bidders and targets than friendly merger negotiations do (e.g. Bouwman et al., 2009; Eckbo, 2011). Tender offers also have a high likelihood of being completed faster and a higher rate of completion with higher premiums comparing to other deals, due to the acquirer's greater confidence, higher bidder demand, and higher potential competition (Offenberg and Pirinsky, 2015). As a kind of hostile deal that bypasses the management board and presents a price directly to the target's shareholders, along with typically higher premiums, tender offers tend to have higher target returns than friendly M&As. This is especially true for offers rejected by the target board, since these can lead to upward bid revisions (e.g. Martynova and Renneboog, 2011). On the other hand, hostile M&As can have lower bidder returns than friendly M&As, since overbidding can exceed the expected synergy value and thus cause a decrease in the share price of the acquirer firm. However, there is debate that

hostile deals can also result in larger, positive bidder returns and combined returns, as long as the bidder's decisions are rational and favourable outcomes can therefore be expected (Schwert, 2000). In addition, the bidder's standalone value can experience an upward revision (Bhagat et al., 2005).

To study the characteristics of the board and the ownership structure of hostile takeover targets, Shivdasani (1993) compares 214 hostile target firms with a control group of the same number of nontarget firms. The author finds the ratio of outside directors on board does not affect the likelihood of a hostile takeover, supporting the work of Hermalin and Weisbach (1991). Ownership by large unrelated shareholders increases the likelihood of a hostile control contest, whereas ownership by associated blockholders has the reverse effect. Schwert (2000) uses accounting and stock performance indicators to examine whether hostile acquisitions can be clearly distinguished from bona fide acquisitions. Although, theoretically speaking, the gains from hostile acquisitions mainly come from the replacement of unqualified managers and the gains from friendly acquisitions mainly come from strategic synergies, the comparison of economic conditions alone cannot clearly distinguish between hostile and friendly acquisitions.

Moeller et al. (2005) find that, in M&As in the 1980s, the shareholdings of the target company were negatively correlated with the takeover premium. In M&A events in the 1990s, shareholder control of the target company and the takeover premium were positively related. In the 1980s M&A wave in the United States, mainly hostile takeovers were carried out; in the wave of M&As in the 1990s, mainly friendly M&As were carried out. The literature shows that, in the M&A activities from the 1960s to the mid-1990s, the shareholders of the acquiring company at least did not lose their wealth before or after the announcement date. However, during M&A activities from the end of the 1990s into the 21st century, the shareholders of the acquiring company

suffered huge wealth losses. Muehlfeld et al. (2010) find that organizations tend to classify M&As based on the contextual differences between hostile and friendly deals, because only experience in the same context plays a significant role in the probability of completion. In addition, the authors show that a high degree of deal heterogeneity in the same category affects firms' learning from hostile acquisition experience, which can lead to inappropriate generalizations from one hostile deal to another within the same category. Cuypers et al. (2017) find that the past M&A experience of M&A parties affects post-merger value, where a party with rich M&A experience can obtain higher value. When the target's product market is wider, the difference in M&A experience between the two parties is more closely related to the value the acquirer obtains from the M&A activity; if the transaction is friendly, the difference in M&A experience between the two parties is less related to the value the acquirer obtains from the M&A activity.

2.3.1.3 CEO overconfidence

Whether a merger can achieve decisive success relies on an excellent and professional management board in most cases. Outstanding managers can accurately grasp the timing and rhythm of M&As, correctly choose powerful investment banks for M&A consulting services and financial support, effectively integrate internal factors after the completion of the M&A, and ultimately consummate the deal. However, principal–agent theory (e.g. Jensen and Meckling, 1976) points out that excellent professional managers do not necessarily aim to maximize shareholder profits, but, rather, their own interests, which can damage the interest of principals. This section reviews how firm CEOs can influence merger gains.

Roll (1986) aims to reassess the issue from another perspective and finds a deeper explanation for corporate takeovers based on former empirical evidence. First, the author presents the hypothesis and prerequisites. Second, the issue is divided into three parts that are analysed with empirical evidence: target firms, total gains, and bidding firms. Finally, Roll concludes that bidding firms pay too much for their targets

due to CEO hubris, and therefore there will be a decrease in the value of bidders, an increase in target value, and a slight drop in the firms' combined value.

Much previous evidence shows that acquisitions have mixed results for the shareholders of acquiring companies. One view is that poor results are caused by managers' hubris, and another view is that they are due to managers' personal objectives. Morck et al. (1990) show that various managerial behaviours (e.g., diversifying and expanding the business, buying rapidly growing targets, performing poorly before an M&A) motivate bad acquisitions. The authors also note that premiums tend to overestimate the efficiency benefits from hostile takeovers.

Moeller et al. (2004) study consummated domestic U.S. takeovers from 1980 to 2001. Compared with smaller acquirers, large acquiring firms pay higher offer premiums (68%, compared to 62% by smaller firms), have lower dollar synergy (-$55.501, compared to $5.337 for small firms), and enjoy a lower abnormal return (2.242% less than that of small acquirers) around deal announcements. These results strongly support the CEO hubris hypothesis. Small acquiring firms' shareholders will benefit from about 2% higher announcement returns. However, Moeller et al. do not explore the rationale behind the size effect or influences over managerial motivations and firm governance. Humphery-Jenner and Powell (2011) further scan 17,647 acquisitions from 45 countries and find that the acquirer size effect holds worldwide. However, in markets with looser governance, large acquirers perform better in terms of both stock market reactions and post-merger firm operations. The extent to which governance affects the acquirer size effect requires further study.

After studying 714 completed deals announced between the start of 1990 and the end of 1998, Lehn and Zhao (2006) argue that compared to those who conduct better takeovers, the probability of CEO turnover increases with the likelihood of a value-

destroying takeover. On the other hand, if managers promptly withdraw from a bad deal, which reduces the firm's stock price after the announcement, their chances of being replaced drop significantly. Lehn and Zhao propose that managers who make unwise takeover decisions are punished. The authors also empirically find that the likelihood of CEO turnover is not related to the payment method firms choose, contradicting Shleifer and Vishny (2003).

To determine the origins of managerial overconfidence in takeover activity, specifically whether self-attribution bias is the source, Billett and Qian (2008) study 3,702 domestic takeover deals in United States from 1985 to 2002. All the deals are further required to be publicly traded targets and completed takeovers, weakening the impact of other variables. The authors reveal that the cumulative abnormal returns (CARs) around the deal announcements of frequent buyers (i.e., firms that have completed more than one deal within a five-year period) are significantly negative (-0.0150), compared to the cross-sectional standard deviation. In comparison, there appears to be a significant gap between the performance of frequent and infrequent buyers' first deals, indicating that decision makers' hubris arises from previous takeover experience and harms firms' well-being. The authors also apply the Gompers–Ishii–Metrick index to 3,935 mergers conducted by U.S. acquirers between 1990 and 2005, to classify managers as running either a democracy or a dictatorship. Billett and Qian refine the work of Masulis et al. (2007), showing that, when dictators make merger decisions, they not only choose targets with limited synergy, but they also overpay for poor targets. This phenomenon is caused by dictators' selfishness in avoiding the dispersal of power. Dictator CEOs' avoidance of the use of stock to buy either private or public targets with concentrated shareholders supports this idea.

Using the deals of U.S. acquirers announced during the merger wave from 1979 to 2006, Goel and Thakor (2010) construct two samples of 5,417 deals and 4,134 deals,

according to the price-to-earnings ratio of the Standard & Poor's 500 and the market to book of the stock market merger wave criteria, respectively. The authors confirm the dependence of merger waves on the degree of envy among CEOs. Consistent with the work of Rhodes-Kropf and Viswanathan (2004), M&A waves have a higher possibility of appearing in bull stock markets. The authors also find that deals in the early period of a merger wave involve smaller targets and higher synergies. Further work could be done using more refined proxies to evaluate the level of CEO envy.

The primary aim of Zhu et al. (2017) is to complete Bernanke's (2010) work. The authors build a model for the timing of bank takeovers with the aim of becoming 'too big to fail' (TBTF). Zhu et al. reveal that the TBTF motive is strong enough for bank managers to undertake acquisitions without economies of scale. One solution to avoid such circumstances is for the authorities to tighten the capital requirements applied to TBTF banks. The idea provides a useful framework to better understand the banking industry, but the model assumptions for simulating oligopoly are too idealized. More empirical data are needed to further demonstrate the theory.

The hubris hypothesis is not only limited to CEOs making acquisitions, but also applies to traders. Gervais and Odean (2001) build a multiperiod market model to investigate trader overconfidence. They reveal that traders become overconfident from previous success, and this overconfidence, in turn, triggers traders to make trades with larger volumes but lower profit. Barber and Odean (2000) discover a similar pattern for individual investors. However, this phenomenon occurs early in traders' careers, and experienced traders are better at self-assessment and gradually become less overconfident.

Not all scholars support the hubris hypothesis. Aktas et al. (2009) develop a theoretical model explaining that declining acquirer CARs are not sufficient to support the hubris

hypothesis. They argue that rational CEOs, who learn from previous takeovers, should bid more aggressively later, resulting in a higher success rate in competition and a declining acquirer CAR, increasing target synergies. But the model makes assumptions under which synergies are assessed without considering potential competing bidders. Future efforts are needed to refine this model. Aktas et al. (2011) find empirical results supporting the CEO learning hypothesis and reveal how CEOs' learning interacts with their experience and hubris.

Some researchers find that specific CEO compensation contracts can motivate less confident CEOs to participate in M&A activities and penalize those who make bad decisions. Minnick et al. (2011) study the effect of CEO compensation on acquirer gains in the financial industry. They choose bank holding companies for their sample, to better constrain the effects of cross-industry mergers. The authors find that high pay-for-performance sensitivity (PPS) leads to significantly better CEO acquisition decisions overall. The authors then analyse the correlation between firm long-term performance following acquisitions and PPS. Not surprisingly, similar patterns are found. Firms with high PPS significantly outperform those with low PPS, regardless of whether the return on assets, the return on equity, the efficiency ratio, or buy-and-hold abnormal returns are the dependent variable. This implies that PPS can not only improve the long-run performance for stakeholders and shareholders, but also enhance employee efficiency.

Harford and Li (2007) aim to determine the impact of CEO compensation on firm performance after investment. Datta et al. (2001) analyse the impact of executive compensation structure on corporate acquisition decisions and show that acquiring managers' equity-based compensation is positively related to the stock price performance around acquisition announcements. Phan (2014) examines the effect of CEO inside debt holdings on M&As and verifies that it tends to be associated with a

low level of corporate risk taking. The author shows that CEO inside debt holdings positively affect long-term operating performance and M&A announcement abnormal bond returns, but negatively affect the abnormal stock returns of M&A announcements.

2.3.2 Transaction status

Whether an announced takeover has completed or failed delivers a signal to the market, and the deal status affects firm benefits. A large number of M&A contracts have been terminated after the announcement of the deal. Bates and Lemmon (2003) point out that about a fifth of announced deals are withdrawn, which is almost the same figure as reported by Securities Data Company. The failure rate is even higher in China, at 47%, while other Asian countries, such as India and Japan, have slightly high completion rates, around 58% (Han et al., 2014). In the banking industry, about 5% of announced deals, on average, are not completed, of which over 10% are in countries with advanced finance. Furthermore, withdrawn deals play a vital role among the uncompleted deals (Caiazza and Pozzol, 2016).

Mirvis (1992) states that the reason for the failure of M&As is that, before the M&A, the acquirer focused on finances and seldom implemented correct strategic planning, not paying enough attention to the risks. A research report by the Boston Consulting Group (Cools et al., 2007) shows that, before mergers, less than 20% of the companies consider how to effectively integrate afterwards. Hviid and Prendergast (1993) build a theoretical model to test the correlation between deal status and firm profitability. The model shows that, compared to their pre-merger status, a failed deal can raise the target's earnings but decrease the acquirer's profitability. Future empirical work is needed to test the theory, and the bargaining structure (i.e. take it or leave it) in the model is too restrictive and unrealistic.

Hooke (1997) presents the entire M&A process As through a large number of case studies. The author argues that choosing the right target company and paying

attention to the risks in the transaction and the risks after integration affect the success or failure of the merger, and these risk factors should be fully considered. Lajoux (1999) analyses the risks of M&As from the perspectives of due diligence, financing, and integration in the early stage of M&As, as well as many risks in the M&A process, such as decision making risks, negotiation risks, and integration risks. Wong and O'Sullivan (2001) present a thorough literature review on takeover failure and explore the determining factors of takeover outcomes. They suggest that the failure of M&As can be caused by the intervention of the regulatory authorities, the target company's successful defensive strategies, or the voluntary withdrawal from the acquired company due to unexpected circumstances.

The relationships between corporate capital structure, geographical distance, and uncertainty in macro policies with the completion of M&A activities have been explored, providing a perspective for understanding the success and economic outcomes of M&A activities. Morellec and Zhdanov (2008) propose a dynamic takeover framework to analyse the effects of the combination of the acquirer's financial strategy, market timing, and takeover terms on takeovers. They find that the capital structure has a central effect on takeover activity and determines the consequences of the bid. Acquirers with lower leverage have a higher chance of winning the takeover. Almazan et al. (2010) show that companies in an industry cluster have more opportunities for M&As, and companies will maintain financial slack to compete in M&As. The authors adopt an empirical test and find that, in contrast with companies outside the industry cluster, companies located in the industry cluster have more M&A possibilities, lower leverage ratios, and higher cash flow levels.

Chakrabarti and Mitchell (2016) use a logit model to analyse 2,476 domestic M&As of 933 chemical manufacturing companies established after 1980 in the United States from 1980 to 2004. Their study finds that, compared with unrelated M&As, long

geographical distances reduce the likelihood of completion of related mergers; the likelihood of completion of related mergers increases, however, if the environmental information of the region the acquirer is entering is relevant or if the acquiring party is a secondary source of information. Chen et al. (2018) investigate domestic M&As between 1997 and 2008 with a logit model and find that the greater the geographical overlap between the acquirer company and potential target companies, the higher M&A matching potential, and the acquiring firm's size has only a negative effect on the relationship between geographical overlap and M&A matching. The degree of geographical dispersion of the acquiring company also has a negative effect on the relationship between geographical overlap and M&A matching, and product differences between the two parties positively affect the relationship between geographical overlap and M&A matching. Kaul and Wu (2016) analyse the M&A activities of Chinese brewing companies between 1998 and 2007 and find that acquirers are more likely to choose potential M&A targets in the existing market. The possibility of acquisition increases with the target's manufacturing productivity, and this relation is strengthened when the target is in the same market as the acquirer, and weakened when the acquirers' acquisition ability is strong.

Bloom (2009) argues that a higher level of uncertainty will increase the value of real options, which will cause companies to postpone investments and encourage them to postpone acquisitions. Garfinkel and Hankins (2011) state that the participation of managers will be encouraged by higher uncertainty to reduce risk. Duchin and Schmidt (2013) argue that uncertainty encourages managers to believe that they can build empires without direct consequences, thereby increasing the probability of taking over poorly managed companies. Gulen and Ion (2015) study how corporate investment is affected by uncertainty related to future policy and regulatory results at the company and industry levels and show that policy uncertainty negatively affects the investment level of companies and industries. Bhagwat et al. (2016) argue that uncertainty hinders M&A announcements, due to the increased possibility of the

target company's value changing between the announcement and the completion period. Chen et al. (2016) find that M&As carried out in a governor election year are more likely to be financed entirely through stocks. Nguyen and Phan (2017) explore the relation between policy uncertainty and M&As. and find that policy uncertainty negatively affects corporate acquisition willingness and is positively related to the completion time of M&A transactions. In addition, policy uncertainty prompts acquirers to use stock payments and pay lower bid premiums. Generally speaking, acquirers create greater shareholder value in M&A transactions conducted during periods of high policy uncertainty, because of their caution and the transfer of wealth from financially restricted targets to acquirers.

Muehlfeld et al. (2007) determine the factors that affect the likelihood of M&A completion in their investigation of the completion of announced transactions in the newspaper industry after the 1980s. They find that the transaction-specific elements and regulatory aspects of related local M&As weight over firm-level characteristics in determining whether an acquisition is ultimately consummated, whether the transaction is hostile or friendly, and the payment method and percentage demanded by the acquirer are more determining factors. The latter, in particular, again confirm the prevailing role of regulatory influences on media M&As. Meyer and Altenborg (2008) investigate the problems of incompatible strategies in cross-border M&As. They find the parties' strategies were incompatible in three distinctive areas, which could not be resolved due to national governance structures established to protect national interests.

Krishnan and Masulis (2013) show that acquirer firms with a good M&A law firm usually lead to bid premiums and higher deal completion rates. However, when the targets have top law firms, the bid premiums are also higher, but the probability of deal completion is considerably lower. This means that good acquirer law firms

improve the likelihood of completion, whereas good target law firms facilitate takeover premiums. Krishnan et al. (2012) report that deals associated with lawsuits tend to be more difficult to complete, although they can produce higher premiums, conditional on completion. Butler and Sauska (2014) show that termination fees greatly improve the chances of an M&A deal being completed. They find that very low termination fees (approximately 2.8% of the deal amount) improve the chances of the deal being terminated, and the absence of termination fees substantially improves the probability of the deal being withdrawn. Therefore, the imposition of a reasonable termination fee signals to both shareholders and management the increased interest in acquiring the company and is a good choice if management is committed to making the acquisition.

Han et al. (2016) analyse the data of 2,370 Chinese firms involved in 2,187 global M&A deals drawn from the Zephyr M&A database. They find that organizational learning theory and the concept of experience can be determinants of global M&A deal completion. Their logit regression analysis reveals that M&A experience has either a neutral or negative effect on the likelihood of deal completion, M&A deals with the help of more advisors have a higher completion rate, and deals with a large number of participating firms have a lower completion rate. Marquardt and Zur (2015) suggest that the accounting quality of the target firm and the likelihood of deal completion are positively related. They find that deals with high accrual quality have a higher chance of being completed, and auctions can further strength this effect, compared to negotiations.

Muehlfeld (2015) investigate the effect of experiential learning in the acquisition process in 4,973 acquisitions in the newspaper industry from 1981 to 2008, studying whether and, if so, how the completion of an announced acquisition is affected by organizational learning. They find that the completion of domestic deals is affected by

domestic experience, while the completion of cross-border deals is not affected, and the knowledge obtained from success and failure differs based on context. Caiazza and Pozzol (2016) analyse the characteristics behind the failure of M&A operations in the banking industry, covering all major domestic and international deals in the banking industry worldwide from 1992 to 2010. The results show that the key influencing factors of success or failure are deal specific, particularly the attitude of the bidder and the existence of multiple potential acquirers. The authors find that lengthier negotiations negatively affect the likelihood of success, while international M&As are more likely to succeed than domestic ones. Renneboog and Vansteenkiste (2019) present a literature review of the corporate control market that suggests that the performance of serial acquisitions declines with increases in firm acquisitiveness. They show that this declining performance is mainly due to CEO overconfidence.

To obtain an overview of the reasons behind failed mergers, Attah-Boakye et al. (2020) analyse 137,116 takeovers from 140 countries announced between 1977 and 2014. They observe that the likelihood of takeover failure is affected by several factors. At the macro environment level, a merger is more prone to be withdrawn if the legal attitude towards the market in the acquiring (target) enterprise's country is more lenient (tougher). At the firm level, the likelihood of a deal being withdrawn is positively correlated with the target's size, but negatively with the bidder's size. At the deal level, whether the deal is friendly or hostile, stock or cash financed, and state owned or private all contribute to the status of an announced acquisition. However, Attah-Boakye et al. do not discuss important factors mentioned in the literature, such as internal corporate governance and the role of the voting process. Zhang et al. (2021) investigate the data of cross-border M&As in China and find that acquisition completion is negatively related to government affiliation. The chances of completing a cross-border M&A increase if the operations of both the target and acquirer countries are in the same industry. However, the likelihood of M&A completion will

decrease when there are many foreign acquirers, because the host country can feel threatened.

2.3.3 Capital structure, payment methods, and financing tools

One of the consequences of M&A activities is that it changes the acquirers' capital structure. The choices of payment method and financing tools are closely related to the capital structure of both the acquirer and the target.

2.3.3.1 Capital structure

Jensen (1986) finds that acquirers with a high level of free cash flow tend to pay for mergers in cash to expand their own empires. This idea is also supported by Garfinkel et al. (2011), who study the correlation between certain types of mergers, merger waves, and risk management. They show that cash flow volatility is positively related to merger activities, especially vertical mergers. Thus, vertical integration can be seen as a managerial way of reducing costs and gaining hedging benefits.

Lang et al. (1989) analyse 87 tender offers completed between October 1968 and December 1986. Their results imply that, for acquirer firms, shareholders with a higher Tobin's Q benefit significantly more, but the pattern is reversed for target firms. Though this work needs updating and the sample size is small, it provides directions for further research. Servaes (1991) advances the paper of Lang et al., suggesting that both parties gain higher returns when targets have a lower Tobin's Q value and acquirers a higher one.

Modigliani and Miller (1958) establish a mathematical model to prove that, in a perfect market, capital structure is not related to corporate value. This conclusion is very different from the situation in reality. They further relax the assumptions and consider the impact of corporate income tax and show that the company has the greatest value when all debt financing is used (Modigliani and Miller, 1963). After relaxing the assumptions, their model shows a correlation between capital structure and corporate value; namely, corporate value increases with debt value, but decreases with equity

ratio. In actual economies, however, few firms operate exclusively with liabilities, and in actual economic operations, companies seldom fully adopt debt management. In contrast, a great deal of companies choose to operate with zero leverage.

Target firm managers are more likely to be influenced by reputation effects, where managers will choose a project with a higher success rate even if it has a lower expected return, and these firms tend to hold more debt (Hirshleifer and Thakor, 1989). Anti-takeover measures initiate reductions in debt holding. Although the two papers draw the same conclusion, the explanations are dissimilar. Hirshleifer and Thakor argue that the conflict between equity holders and debt holders contributes to the situation, whereas, in Slutz's view, the struggle between equity holders and managers is the dominant factor.

Graham and Harvey (2001) and Bancel and Mittoo (2004) indicate that firms take advantage of the debt market by issuing debt during low interest rate periods. However, there is no consensus on whether this goal is achievable. A large portion of scholars emphasize managers' ability to time the debt market (e.g. Datta et al., 2000; Baker et al., 2003); however, others (e.g., Barry et al., 2008) indicate that firms seldom benefit from such timing behaviour. These contradictory results are due to the divergence in influences on managers' decisions. Butler et al. (2006) propose two hypotheses: first, these reactions are in response to existing market circumstances, which the authors refer to as backward-looking market timing, and, second, the reactions are based on upcoming market forecasts, defined as forward-looking market timing.

Based on the research of Graham and Harvey (2001), market interest rates can signal managers' timing behaviour. Managers endeavour to issue debt when interest rates are comparatively low, such that they either observe the interest rates and grasp the

opportunity when interest rates hit the bottom in a recent period (reaction hypothesis) or they forecast that future interest rates will escalate (prediction hypothesis). Zhou et al. (2012) investigate these two hypotheses further, using a sample of 3,040 available cases of U.S. corporate public debt issuance during the 37 years from January 1970 to December 2006. All transactions are converted into 2006 dollars, based on the monthly Consumer Price Index, to exclude inflation and economic growth effects. The authors employ two dimensions to describe firms' debt issuance activity: the volume and the number of issues. Bond excess returns are used to evaluate the managers' timing ability in issuance decision making. By analysing a temporal lead–lag model, Zhou et al. find that debt issuance prospects, in terms of both the number of deals and deal volume, are negatively related to market conditions. More importantly, the coefficients for each forward or backward time interval do not appear to have certain patterns of difference. This means that firms issue debt as usual, before market growing costs, indicating that they have failed to predict market.

This result support the reaction hypothesis, consistent with Baker et al. (2003). A horse race model indicates that the predictions are mostly inaccurate, supporting the backward-looking hypothesis (also called the reaction hypothesis by Zhou et al., 2012). Using the horse race model, Zhou et al. (2010) analyse the impact of debt issues on bond index returns, measured by monthly compounded returns, which can be seen as an indicator of market interest rate change and debt issuance costs. Again, consistent with the reaction hypothesis, the debt issue volume and number of issues are positively related with six-, 12-, 24-, and 36-month backward returns at the 1% significance level, with coefficients of 0.048, 0.030, 0.036, and 0.057, respectively. However, the debt issue volume follows the same trend as forward excess returns, but not significantly. The number of debt issues is only 1.5% positively related with forward returns, strongly rejecting the prediction hypothesis. The authors find similar results when they use different interest levels as the independent variable, instead of excess bond returns.

The temporal lead–lag model of Zhou et al. (2010) finds connections between debt issuance and market environments, but the causality is unclear. To reveal the causal relationship between debt issuance and market condition, Zhou et al. apply a vector autoregression model that regresses debt issuance and debt excess returns on their lagged values. The authors find that debt issuance is heavily and negatively influenced by previous debt issue activity. In terms of both the volume and number of debt issues, the more a firm has issued in the past, the less managers will issue currently. This effect fades with time, since the coefficients for the volume and number of issues one month prior are -0.37 and -0.50, respectively, and these decline to -0.08 and -0.06 four months prior. This result is evidence that managers use previous market conditions as a reference when making financial decisions, supporting the prediction hypothesis. On the contrary, prior debt issue activity has barely any impact on current excess returns. The coefficients of the lagged debt volume and number of issues are approximately equal to zero and appear to be nonsignificant. If managers can time the market effectively, the bond excess returns should be negatively related to previous debt issuance, since managers can foresee current high returns in the past and issue less to take advantage of the situation. Thus, the prediction hypothesis is rejected.

According to previous literature, whether mega-deals overpay is a heated debate. The reasons large acquisitions are thought to pay more include, first, managerial overconfidence or hubris (Roll, 1986; Hayward and Hambrick, 1997), which leads managers to overestimate the profits a deal can bring to the corporation. The second reason is acquisition decision making driven by private benefits (e.g. Grinstein et al., 2004; Harford et al., 2007). Yet another reason is that integration costs reduce synergy, and this cost is associated with target size (Shrivastava, 1986; Hayward, 2002). The larger the merger deal, the greater the integration costs (Ahern, 2010).

On the contrary, many advocate that the acquirers of large deals pay a lower offer premium. Several explanations are provided that support mega-deals spending less than rather small deals. First, the higher value at stake makes bidders more cautious towards large deals, and they might thus assess the target's value more accurately. Moreover, this caution makes managers less generous in terms of offering price, since the complexity of a mega-deal can contain uncertain costs that harm expected post-merger synergies. Third, fully absorbing a big corporation is a difficult task, such that only limited numbers of rivals will compete for the deal (Gorton et al., 2009). Mitigated competition leads to a lower offer premium (Alexandridis et al., 2010). Fourth, compared to small firms, the management boards of large firms are more unwieldy and less concentrated. Therefore, it is easier for large targets to accept a low premium (Bauguess et al., 2009).

Strebulaev and Yang (2012) study nonfinancial companies listed in the United States from 1962 to 2009 and show that about 10.2% of all firms have a zero debt account, but merely 22% of firms have a book leverage ratio below 5%. Zero-leverage behaviour is not a short-lived phenomenon, but a continuous one. The percentage of zero-leverage companies who did not borrow debt within five continuous years is about 30%. The reason is that they considered merely the debt tax shield effect and neglected the risk of debts upon bankruptcy. Jensen and Meckling (1976) put forward the idea of agency cost and suggest that, besides their shield effect, debts also result in agency costs. They indicate that firms can optimize the structure of capital to lower agency costs. DeAngelo and Masulis (1980) show that the capital structure of enterprises reaches an equilibrium when the expected marginal revenue of debt is the same as the expected cost of marginal bankruptcy.

Agyei-Boapeah et al. (2019) investigate the relationship between leverage deviations and acquisition probability in the United Kingdom and show that firms can suffer

asymmetrically from deviations from optimal financial leverage over firms and deal types. They find that firms' existing capabilities can weaken the negative effects of leverage deviation on acquisition probability, and cross-industry and/or cross-country M&As improve the likelihood of growth of these deviating firms. Ahmed and Elshandidy (2020) examine the impact of leverage deviation on the types and results of M&A deals. They show that overleveraged firms are more likely to participate in public acquisitions than in non-public acquisitions, because of information asymmetry. Alexandridis et al. (2020) investigate corporate financial leverage and M&As choices in the shipping industry and analyse the effects of capital structure deviations on M&As. They show that higher debt levels negatively affect acquisitiveness and positively affect the quality of corporate investment.

Kalsie and Singh (2020) investigate the impact of cash deals on realized synergies and the impact of equity payment on bidder leverage. They analyse a sample of 120 major Indian M&A deals between 2005 and 2015 with three years of pre- and post-merger data and show that cash payments increase the profitability of M&As for bidder companies and that synergies exist. They further show that leverage decreases with equity payments, indicating that equity payments are associated with a reduction in borrowing after a merger.

2.3.3.2 Factors affecting M&A payment method choices
M&A transactions can involve many kinds of payment methods, such as cash, debt, and stock payments. The selection of M&A payment methods has been intensively researched.

Amihud et al. (1990), Martin (1996), and Ghosh and Ruland (1998) study the key factors of M&A payment methods and examine the impact of managers' shareholdings on M&As. The results show that stock payments in M&As negatively affect managers' shareholdings, confirming the motivation of the maintenance of

corporate control. Martin (1996) argues that, if a company believes that it has better development opportunities in the future, it will be more willing to use its own equity as a means of payment. Ghosh and Ruland (1998) state that whether the managers of the acquired company are willing to work in the new company after the merger directly affects the payment method of the acquisition, whether an equity payment or a direct cash settlement. If the managers continue to work in the new company, they are more inclined to accept an equity payment for the acquisition. Harford (1999) empirically tests the relationship between cash holdings and corporate M&As and finds that the former positively affects the likelihood of companies launching M&As. Cash-rich acquiring companies suffer losses in their stock returns after M&As, negatively affecting operating performance in the long term. Zhang (2003) studies about 100 hundred M&As on the London Stock Exchange and show that the dividend payment level of acquirers is significantly positively correlated with cash payments. This result indicates that the likelihood of cash payment increases with the acquirer's level of free cash flow.

Faccio and Masulis (2005) analyses European M&As during 1997–2000 and empirically find that the purchaser's choice of payment method is affected by the control of the company and constraints on debt. They find that, motivated to maintain control, companies choose to use cash payments in M&As, especially when the controlling shareholder of the acquirer has 20–60% of the voting rights. Further research finds that, when the control of major shareholders is threatened, they tend to use cash payments in M&As. The financial strength of the acquirer significantly affects the choice of payment methods. Three indicators can be used to measure companies' financial strength: its collateral, its financial leverage, and its asset size. The results show that the stronger the company's financing ability, the greater the likelihood of cash payments. When the acquirer has access to bank chain directors for obtaining bank loans, cash payments are more likely to be used in M&As.

Large firms have easier access to the capital market, and mega-deals involve more cash deals (Alexandridis et al., 2013). The outcomes in Yook's (2003) paper imply that cash deals and stock deals have different sources of value creation. The advantages of debt appear to be the main origin of value creation in cash acquisitions. To achieve optimal capital structure, a firm needs to find the balance point between the agency costs of debt and the benefits of debt (Jensen and Meckling, 1976). Based on this theory, three conclusions can be drawn. For one, agency costs triggered by asset substitution effects require avoiding bond contracts. For another, sectors with severe restrictions in asset substitution tend to have higher debt levels.

Swieringa and Schauten (2007) study the choice of payment methods in 227 M&As in the Netherlands from 1996 to 2005. Unlike Faccio and Masulis (2005), who do not consider M&As in the Netherlands, the results of Swieringa and Schauten show that the choice of payment method is not significantly affected by constraints on debt financing for Dutch M&As. Instead, company size, growth, transaction scale, and industry relevance play significant roles in the payment method choice. Harford et al. (2009) provide evidence suggesting that the decision of whether to pay in cash or stock should strongly consider the firm's capital structure, which depends on the leverage ratio before acquisition and the potential change in leverage the acquisition will cause. Alshwer and Sibilkov (2010) analyse the impact of financing barriers on the purchaser's choice of payment methods for M&As and find that companies with financing constraints tend to adopt share-based payments, in contrast with non-financing acquirers. The authors show that financing-constrained companies tend to adopt stock payments not because of a lack of cash, but, rather, because the amount of cash held by financing-constrained companies is much greater than that of non–financing-constrained companies.

Further research finds that the purchaser's choice of payment method impacts companies with and without financing constraints differently. Among financing-constrained companies, there is a negative correlation between the purchaser and the paying in cash, while this relationship is not significant among non–financing-constrained companies. The use of a single financing tool can cause companies to be unable to obtain funds for M&As. The premise of these studies is that the financial market is well developed, and companies can choose financing tools according to their own needs. For the sake of revealing the relationships between liquidity and credit conditions, merger payment methods, and performance around merger announcements, Campa and Hernando (2009) build an empirical model to analyse 470 deals from the European Union from 1999 to 2007. They find that the target firm's leverage ratio and cash flow level are positively related to cash payments, and more returns can be provided for target firms by cash payments, even though they may not create value. Bruslerie (2012) argues that the payment method for M&As is an endogenous factor for both parties of the merger, and the choice of cash payment and its payment ratio have an important impact on the financing results and post-merger integration.

2.3.3.3 Factors affecting the selection of M&A financing tools

Modigliani and Miller's (1958) famous theory suggests that, not considering taxation, the value of an enterprise has nothing to do with the structure of its assets; in reality, however, when an enterprise needs to pay income tax, its value has a strong relationship with its asset structure, and in this case its value is directly proportional to the degree of debt. Meyers (1984) proposes optimal sequence theory, which suggests that the financing sequence is very important to a company's capital structure, because a company announcing its capital structure will cause corresponding stock price changes. This information effect has no connection to achieving the capital structure; therefore, the best approach to a company's financing is to first conduct internal financing, then debt financing, and, finally, equity financing.

Harris and Raviv (1988) argue that companies can determine their financing methods by strengthening their control rights and maximizing their revenue flow. The authors thus propose a new theory of financing methods from the perspective of control rights, which explains why stocks and bonds have become the most important financing methods. Stulz (1988) investigate how corporate financing methods affect the control of the company. For example, with more debt and tradable shares, managers and owners can maintain control of the company and reap the resulting gains from increasing control. This is mainly because the use of debt to replace external equity financing can reduce active investor support for M&As. Stulz also point out that companies with high financial leverage face strict creditor terms and conditions and debt loan capacity, which can reduce the company's attractiveness as a target. Raising funds for projects through debt financing or endogenous financing can be used as a strategy to defend against takeovers. However, Harris and Raviv (1988) disagree on this point. They argue that increases in debt increase a company's bankruptcy risk, leading to more cash payments in the future and restrictive clauses, which can reduce the likelihood of maintaining control.

Bharadwaj and Shivdasani (2003) empirically study the funding sources of 115 cash tender offers that occurred in the 1990s. They find that 70% of the external funds in the tender offer came from bank loans, and 50% of the tender offers were paid entirely by bank loans. When a company's internal cash holdings are low, the likelihood of using a bank loan in an M&A is higher. In addition, the authors show that bank M&A loans positively affect acquirers with poor operating performance and serious information asymmetry. The authors state that these empirical results show that bank debt has an important effect on the main parties of a tender offer. Schlingemann (2004) empirically studies the impact of company financing decisions and finds that the acquirer's excess income during the announcement period increases with the amount of equity financing one year before the acquisition, especially for companies with a high Tobin's Q. The author further shows that the

company's cash holding level negatively affects the acquirer's returns. This relationship is more significant in companies that are classified as having no good investment opportunities, and the company's debt financing before the announcement is not significantly related to acquirer returns. Financing theory (Myers, 1984) and the free cash flow hypothesis (Jensen, 1986) support these results, which mainly shed light on the mechanism and influence of modern financing methods on the economic consequences of M&As.

Morellec and Zhdanov (2006) argue that financial leverage has a strong relationship with M&As. The lower the financial leverage, the higher the success rate of M&As. However, after successful M&As, companies tend to increase their leverage. Daniel and Rosenbloom (2006) note that both international and domestic M&As require financing, and companies carrying out M&As all expect and do their best to obtain financing with higher flexibility and lower costs. Meyers (2007) studies convertible bonds and proposes the sustainable financing hypothesis. The author argues that direct equity financing can be replaced by convertible bonds, which not only can be used as convertible options to reduce companies' issuance costs incurred in continuous financing, but also can effectively prevent managers from overinvesting. Thus, direct equity financing is a very good way of financing M&As. Marina and Luc (2008) study M&As in the European market from 1993 to 2001 and find that, although many M&As have adopted the same payment method, their financing methods are not the same. The authors state that companies' choice of financing for M&As depends on the macro environment in which the company is located, the potential development of the acquiree, and the order of financing for M&As.

3 Market reaction differences towards mega-deals and non–mega-deals

3.1 Introduction

Mergers and acquisitions (M&As) are among the most common and most direct methods of firm investment and have long been a heated topic of debate, with the majority of scholars arguing whether merger generates value. In this field, the mainstream view holds that mergers destroy value, but this does not prevent firms from making acquisitions, particularly large deals recently. U.S. private equity company Sycamore Partners agreed to acquire the huge local office supply firm Staples in June 2017 at the price of $6.9 billion. By the beginning of 2018, top European pharmaceutical firm Sanofi-Aventis announced its takeover of the U.S. biotechnology company Bioverativ for $11.6 billion. Such deals involving huge amounts of asset transfers have raised academic interest.

Alexandridis et al. (2017) analyse how mega-M&As perform differently from other deals. Interestingly, the authors find mega-merger deals in the 2010s sample achieve significant positive abnormal returns around announcements, which is contrary to previous evidence that acquisitions harm acquirer firm shareholder welfare. In addition, the interaction of mega-mergers and after-2010-year dummy is positive and significant, even after taking various control variables into consideration. More surprisingly, this gain from mega-merger deals is more significant for takeovers involving public targets, as well as for stock deals. However, stock deals are viewed as being overvalued and could decrease acquirer's return, which may also happen for transactions with public targets. Not only acquirer short-term returns, but also long-term performance and synergies are positively related with the mega-merger indicator dummy in the 2010s subsample. With evidence to show that more efficient investment allocation strategies are being undertaken by acquiring firms, the authors give one

possible explanation: the 2008 financial crisis has contributed to more efficient management in large firms, benefiting the shareholders of acquirer firms.

Jurich and Walker (2019) examine the influential factors of M&A outcomes in terms of the combined gain of both parties, with a focus on corporate strategy and negotiating procedure. They find that geographical expansion plays a positive role in merging firms' combined wealth, while a broadening product line has a negative effect. It is also shown that diversification produces value. The authors show that acquiring firm shareholder gains are positively (negatively) affected by the acquirer (target) firm's size.

Cartwright and Cooper (2020) examine whether M&A activities create value and suggest that lagged synergy can be achieved during the M&A process, given that acquirer firms effectively make full use of acquired firm resources. Choi, Shin, and Lee (2020) analyse the effect of M&As activities on industry-level performance. They find that M&A activities indicate whether industries have potential and whether strategic investment can be planned from both industry and time lag perspectives. By delineating emerging industries, the authors show that forward-looking investment processes can produce expected positive returns.

Chkir et al. (2020) study the effect of target geographical complexity on M&A performance. They show that it results in lower acquirer abnormal returns and higher acquisition premiums, which may be caused by acquirer firms' overestimation of synergistic gains from geographically diversified targets, while acquirer shareholders' reactions are less positive.

Ahmed et al. (2020) analyse Hong Kong domestic acquisitions between 2012 and 2016. They show that bidders' post-merger abnormal returns first decrease then increase with the competition level in the target market. They find that, for deals with Hong

Kong targets, factors that positively affect abnormal returns include cash payments, a large relative target size, single acquisitions, a low market value, high levels of free cash flow level and probability, and a low leverage ratio.

Rani et al. (2020) study the effect of the motive's category and governance on the long-run performance of M&As. They suggest that deals with synergy motivation tend to result in higher long-run performance than with agency motivation. They prove that firm-level governance quality has a significantly higher impact on the positive effect of M&A motives on long-run performance, while country-level governance does not have such a significant effect.

Hu et al. (2020) explore the outcomes of mega-deals. They show that the acquirer's previous acquisition experience positively affects the completion likelihood of mega-deals and both short- and long-run abnormal stock returns. They suggest that more experienced acquirers are more likely to conduct better post-merger integration, which results in a significant increase in operating performance.

By analysing 5,949 M&A deals from the beginning of 1990 to the end of 2016, I find different results from past papers. First, no matter the deal type, bidder shareholders gain in the short term (three- and five-day windows), but lose in the long run (12-, 24-, and 36-month windows). More interestingly, mega-deals seem to perform poorly comparing to non–mega-deals, with only half the abnormal returns. However, the results are reversed in the long run, as mega-deals perform significantly better than non–mega-deals. This reflects a sequence of a combination of factors, particularly the payment method, market valuation, the market-to-book (M/B) ratio, and free cash flow. Attention grabbing is also another explanation.

Second, cash deals perform obviously better than equity deals, even during periods of high market valuation, which is consistent with the behavioural theory of merger waves. Moreover, contrary to agency cost theory, I find more deals with a higher ratio of free cash flow to total asset gains.

This paper contributes to an overall statistical screening between mega- and non–mega-deals. I break down each unique variable that is argued to affect acquisition performance for more explicit subsamples. By comparing these, a more straightforward outcome shed lights on the other underlying factors explaining why mega-mergers are more profitable.

The remainder of this chapter is organized as follows. Section 3.2 presents hypothesis development. Section 3.3 presents the data, sample criteria, and the methodology. Section 3.4 presents univariate and multivariate empirical results. Section 3.5discusses the robustness tests. Section 3.6 draws the paper's conclusions.

3.2 Hypothesis development

Given the contradictory conclusions on post-merger performance and deal size, I first want to examine the role of mega-deals in the short- and long-term performance of M&A deals. I thus present the first hypothesis as follows.

H1: Mega-deals destroy value, and their performance is worse than non–mega-deals in both the short and long run.

No previous paper has related mega-mergers with industry concentration. According to Gorton et al. (2009), firms tend to have different incentives for different industry structures. For an industry with firms of similar size, defensive acquisitions are more likely when private benefits are high, thus hurting acquiring firm interests. For an

industry with a dominant firm, firms tend to make positioning mergers, to attract the dominant firm. Under such circumstances, acquisitions are profitable, no matter whether the private benefits are high or low. For an industry with firms of partly similar size, both defensive and positioning acquisitions may happen. In addition, Shahrur (2005) suggests that the coefficient on the Herfindahl index of the takeover industry is positively and significantly related with bidder gains at the 1% level, according to both the weighted least squares and maximum likelihood estimation models. I consider industry structure and see whether the gains from mega-mergers could be due to different acquisition types. The empirical results confirm the view that industry structure influences market return. I thus propose the second hypothesis, as follows.

H2: A higher-concentration industry plays a positive role in the performance of both mega-deals and non–mega-deals.

3.3 Data and methodology

3.3.1 Sample selection

The primary data set is obtained from the Thomson One Banker SDC database, with historical merger information on the financial statistics of targets and bidders. Firm accounting information, such as stock prices, are downloaded from Compustat (via Wharton Research Data Services). The acquirer country is set to be the United States only, with no restrictions on the target firm countries. The sample period is between January 1, 1990, and December 31, 2016. Following Fuller et al. (2002), the following criteria are set:

1. The acquirer is a U.S. firm listed on the New York Stock Exchange, American Stock Exchange, or NASDAQ with valid data available from the Center for Research in Security Prices, to evaluate bidder market performance in the short and long term.

2. The deal must have been announced between January 1, 1990, and December 31, 2016.

3. The acquirer owned no more than 20% of the target firm before the merger and ended up with no less than half of the target firm after the merger.

The above requirements result in a preliminary sample of 17,556 deals. Since there are only four uncompleted deals, I exclude these, to eliminate outliers in the following analysis. Each unique firm is categorized into 12 Fama–French industries, based on their Standard Industry Classification (SIC) codes. Target firms belonging to the utilities, healthcare, and finance industries are omitted from the final sample, as in the literature, since these industries perform quite differently from other industries and can cause unreliable results. The final sample contains 5,949 acquisitions.

For each deal, the transaction value is converted into 2010 dollars, to exclude the effect of inflation. Following Alexandridis, Antypas, and Travlos (2017), acquisitions transaction values over $500 million are labelled as mega-mergers.

Following Hou and Robinson (2006) and the U.S. Department of Justice standard, I use the Herfindahl–Hirschman index (HHI) to estimate the concentration of industries, which is given by

$$\text{HHI}_q = \sum_{p=1}^{I} s_{pq}^2 \qquad (3.1)$$

where s_{pq} is the market share of firm p in industry q. Thus, a firm's HHI should be between zero and 10,000, with 10,000 indicating a pure monopoly, where only one firm exists in the industry, and zero indicating perfect competition. A larger HHI represents a more concentrated industry and less competition.[1]

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[1] The closer a market is to a monopoly, the higher the market's concentration (and the lower its competition). For instance, under conditions of monopoly, the industry consists of only one firm, and that firm would have 100% market share. Therefore, the HHI equals 10,000. However, in an industry with perfect competition, there exist thousands of firms, and each firm would hold merely a 0% market share, and the HHI would thus be close to zero.

Following Bouwman et al. (2007) and Antoniou et al. (2008), the market index price-to-earnings ratio (P/E) is applied to denote the level of market valuation. All calendar months are classified into high, neutral, and low valuations, based on the P/E of the value-weighted market Standard & Poor's 500 stock index. Using ordinary least squares for the P/E of the month of the acquisition deal and the five preceding years, each month is detrended according to detrended P/E rank. The top quartile of months are classified as high valuation, and the bottom one-fourth are classified as low valuation. The remainder of the months are classified as neutral valuation.

Each firm's primary SIC code is used to define the merger types. If the acquirer and target have the same two-digit SIC codes, the merger is defined as horizontal; otherwise, it is a diversified merger, denoted by *Diversification* taking the value of one.

To evaluate deal payment methods, I follow Ang and Cheng (2006) and classify acquisitions completed with 100% cash as cash deals, denoted by the variable *CASH*, and acquisitions transferred with 100% equity as stock deals, labelled *STOCK*. Acquisitions are otherwise labelled *MIX*, to denote mixed payments.

Since the acquirer is limited to U.S. firms, deals with U.S. targets are defined as domestic mergers. Deals with non-U.S. targets are defined as cross-border deals, denoted by the variable *Cross-border*. The variable *Time to Completion* denotes the gap between the announcement date and the effective date of the merger.

To better detect the differences between mega-deals and non–mega-deals, I further divide the data set into the following subsamples: mega-deals and non-mega-deals, based on deal value; cash and stock deals, based on payment method; public and non-public target groups, based on the target's status; the top 25%, middle 50%, and

bottom 25% of HHI groups, based on the acquirer's industry market concentration; hot, neutral, and cold market groups, based on the market valuation in the month of the deal announcement; the top 25%, middle 50%, and bottom 25% relative size groups, based on deal relative size, which is the ratio of the deal's value (target's value) to the acquirer's market value (bidder's value); and the top 25%, middle 50%, and bottom 25% acquirer characteristics groups, based on the acquiring firm's M/B, leverage ratio, and free cash to total assets.

3.3.2 Short-term analysis

For each subsample, I compute the deals' short- and long-term abnormal returns *AR* to study the post-merger market performance. Cumulative abnormal returns (CARs), *CAR*, that is, total abnormal returns, are applied to evaluate short-term performance, which is given by

$$R_e = \ln\left(\frac{P_j}{P_{j-1}}\right) \tag{3.2}$$

$$AR_e = R_e - R_m \tag{3.3}$$

$$CAR_e = \sum_{k-l}^{k+l} AR_e \tag{3.4}$$

where R_e is the daily return of firm e on day j, and R_m is the value-weighted market return on day j. To obtain CARs, I add up the l days of abnormal returns around the deal announcement date k, where $l = 1, 2,$ or 5 for the three-, five-, and 11-day CARs, respectively.

3.3.3 Long-term analysis

I adopt 12-, 24- and 36-month buy-and-hold abnormal returns (BHARs) to analyse long-term performance. A reference portfolio is first constructed, and its returns ($R_{ref,T}$) calculated. I then have

$$R_{ref,T} = \sum_{i=1}^{n} \frac{\prod_{t=0}^{T}(1+R_{i,t})-1}{n} \tag{3.5}$$

$$BHAR_i = \prod_{t=0}^{T}(1 + R_{i,t}) - R_{ref,T} - 1 \tag{3.6}$$

where $R_{i,t}$ is the return of firm i in month t (the month of the deal announcement), n is the number of firms at $t = 0$, and T is the length of the

holding period. Here, I use $T = 12, 24,$ and 36 for 12-, 24-, or 36-month BHARs, respectively.

3.3.4 Univariate tests

I use a series of univariate tests to find the key differences between mega-deals and non–mega-deals from the perspective of deal and acquirer firm characteristics. Common variables from previous studies are included. For the sake of comparing two kinds of merger deals more explicitly, I further divide the sample into the top 25% and bottom 25% subsamples for each significant influential variable. I adopt Student's *t*-test for statistical significance and additionally conduct bootstrap tests to eliminate sample distribution problems.

3.3.5 Multivariate analysis

An ordinary least squares regression is adopted after obtaining the CAR and BHAR, which are given by

$$CAR_e = \alpha + \gamma \times \text{Mega} + \sum_{v=1}^{N} \beta_u \times X_v + \varepsilon_u, \ e = 3, 5, 11 \tag{3.7}$$

$$BHAR_i = \vartheta + \mu \times \text{Mega} + \sum_{v=1}^{N} \beta_\delta \times X_v + \varepsilon_i, \quad i = 12, 24, 36 \tag{3.8}$$

where X_v is a control variable, such as deal characteristics and acquirer firms' characteristics, including a mega-deal dummy, a high-valuation market, payment method, acquirer firms' M/B, and acquirer firms' leverage ratio. A detailed list of all the control variables is presented in Table 3.11.

3.4 Empirical results

This section reports the empirical results and differences between mega-deals and non–mega-deals during the sample period from 1990 to 2016. Descriptive results are followed by multivariate analyses. All dollar figures are in millions of 2010 dollars.

3.4.1 Comparison of deal characteristics between mega-deals and non–mega-deals

Table 3.1 reports the yearly number of mergers of different deal status over the 26-year sample period. Overall, the volume of deals appears to have an upward trend followed by an obvious decline, peaking around 2000 (at 1,261 deals). This

phenomenon can be explained by the fifth merger wave, from 1993 to 2000. There are two other peaks, around 2007 and 2015. On the other hand, the percentage of mega-deals has a similar pattern, with a change in merger volume before 2013. However, mega-deals account for more than a third of all deals in 2015 and 2016, reaching a peak at that time.

Table 3.2 compares the characteristics of mega-deals and non–mega-deals. The mean HHI value of mega-deals is slightly lower than that of non–mega-deals, which suggests that non–mega-deals may have a more concentrated industry and less competition. However, the difference between mega-deals and non–mega-deals is not significant. The deal values of mega-deals are far larger than those of non–mega-deals, which is expected. The ratio between targets' deal value and acquirers' deal value in mega-deals is also significantly larger than in non–mega-deals. The ratio of mega-deals with all-stock payments is significantly higher, by 5%, than that of non–mega-deals, while the ratio of non–mega-deals with all-cash payments is significantly higher, by 7%, than that of mega-deals. The percentage of competition of mega-deals is significantly higher, by 2.7%, than that of non–mega-deals. The ratio of public targets in mega-deals is nearly three times that of non–mega-deals, while the ratio of hostile deals in non–mega-deals is six times that of non–mega-deals. The differences in both cases are significant, which is not surprising. In contrast, the difference in diversification between mega-deals and non–mega-deals is not significant. The time to completion of mega-deals is double that of non–mega-deals, which is also reasonable, since mega-deals are large deals and usually have a more complex process. The ratio of tender offers in mega-deals is more than twice that in non–mega-deals, higher by 7%, which suggests that acquirers of mega-deals may tend to offer high prices. The ratio of cross-border mega-deals is 2.4% lower than in non–mega-deals, which is somewhat surprising.

The differences in acquirer firm characteristics and acquisition performance are also presented in Table 3.2. The mean market cap of mega-deals is far larger than that of

non–mega-deals, which is expected. The ratio of free cash flow to total assets of mega-deals is slightly higher than that of non–mega-deals. The M/B of mega-deals is about 1.5 times that of non–mega-deals. In contrast, the leverage ratio of mega-deals is about 7% higher than that of non–mega-deals. As for acquisition performance, the short-term market performance of mega-deals is much worse than that of non–mega-deals. In detail, the three-day CAR of mega-deals is a great deal lower than that of non–mega-deals. The difference between mega-deals and non–mega-deals decreases slightly for the five-day CAR. In contrast, the long-term market performance of mega-deals is better than that of non–mega-deals. The difference in the 12-month BHAR between mega-deals and non–mega-deals is not significant, while the differences between the 24- and 36-month BHARs are. Furthermore, the difference in the 36-month BHAR between mega-deals and non–mega-deals is larger than that for the 24-month BHAR.

3.4.2 Impact of deal characteristics

Table 3.3 presents the comparisons between cash payment and stock payment methods. For the HHI, only the difference in non–mega-deals' HHI between cash and stock deals is significant. The differences in deal values are significant for all the cases. Especially, for those mega-deal, the average transaction value of stock deals is $541 million more than for cash deals, but $16 million less for non–mega-deals. For cash deals, the difference in relative size between mega-deals and non–mega-deals is significant, but no significant difference exists for stock deals. However, the differences between stock deals and cash deals are significant for both mega-deals and non–mega-deals. Mega-deals have significantly higher competition than non–mega-deals in cash deals, and stock deals have significantly higher competition than cash deals among mega-deals. The differences in public targets are significant for all the cases, and mega-deals always have a higher ratio of public targets than non–mega-deals do, while stock deals always have a higher ratio than cash deals. In stock deals, mega-deals have a significantly higher ratio of hostile deals and a significantly lower ratio of

diversification than non–mega-deals do, whereas, in non–mega-deals, cash deals have a significantly higher ratio of hostile deals than stock deals do.

As for time to completion, mega-deals always need much longer than non–mega-deals, and stock deals always need much longer than cash deals. In contrast, cash deals always have higher ratios of tender offers and cross-border deals than stock deals do. As for acquirer characteristics, the differences between mega-deals and non–mega-deals in all four characteristics are significantly positive for stock deals, while only the difference in market cap is significant between mega-deals and non–mega-deals for cash deals. Mega-deals in stock deals have a significantly lower market cap, free cash flow to total assets, and leverage ratio, and a significantly higher M/B than in cash deals. In contrast, non–mega-deals in stock deals have a significantly higher market cap and M/B than in cash deals, while non–mega-deals in stock deals have a significantly lower free cash flow to total assets than in cash deals. The acquisition performance of both mega-deals and non–mega-deals in stock deals is significantly worse than in cash deals for the three- and five-day CARs and the 12-, 24-, and 36-month BHARs, whereas, in stock deals, mega-deals have significantly worse short-term performance and significantly better long-term performance. In cash deals, mega-deals also have a significantly higher 36-month BHAR.

Table 3.4 comparer deal characteristics, acquirer characteristics, and acquisition performance between public and non-public targets. Generally, most of the differences between mega-deals and non–mega-deals are not significant for non-public deals. Only the differences in deal value, relative size, competition, time to completion, market cap, M/B, and leverage ratio are significant, and mega-deals always have higher values in these terms. In contrast, for public target deals, there are more significant differences between mega-deals and non–mega-deals. In terms of deal characteristics, mega-deals have significantly higher deal value, relative size, and time to completion than non–mega-deals, and non–mega-deals have a significantly

higher all-cash payment ratio, diversification ratio, and tender offer ratio. In terms of acquirer characteristics, mega-deals have a significantly higher market cap, free cash flow to total assets, and leverage ratio than non–mega-deals. In terms of acquisition performance, mega-deals have worse short-term performance and better long-term performance. Most of the differences in characteristics between non-public and public target deals are significant for both mega-deals and non–mega-deals. Only the differences in the diversification ratio, market cap, and M/B are not significant for either mega-deals or non–mega-deals. Non–mega-deals in stock deals have significantly better short- and long-term performance than in cash deals, while mega-deals in stock deals have significantly better short-term performances than in cash deals.

In Table 3.5, deals are grouped into the top 25%, middle 50%, and bottom 25%, based on their HHI value. For the top 25% HHI group, mega-deals have a significantly higher deal value, relative size, competition ratio, public target ratio, time to completion, ratio of tender offers, market cap, and leverage ratio, while non–mega-deals have a significantly higher ratio of all-cash payments and better short-term performance. For the bottom 25% HHI group, only the differences in all-stock payments, all-cash payments, free cash flow to total assets, and 12- and 24-month BHARs between mega-deals and non–mega-deals are not significant. Among all the terms with significant differences, only non–mega-deals have significantly higher values for their diversification ratio, cross-border ratio, and short-term performance. As for the differences between the bottom 25% group and top 25% group of mega-deals, the former only have significantly higher values for the ratios of all-stock payments and hostile deals, while the latter have significantly higher values for their diversification ratio, leverage ratio, and short-term and long-term performance (36-month BHAR). For non–mega-deals, the bottom 25% group have significantly higher values in terms of deal value, the ratio of all-stock payments, and free cash flow to total assets, while the

top 25% group has significantly higher values in terms of the competition ratio, diversification value, leverage ratio, and both short- and long-term performance.

In Table 3.6, the deals are grouped into a hot market group, a neutral market group, and a cold market group, based on their market valuations. In the hot market group, mega-deals have a significantly higher deal value, relative size, ratio of all-stock payments, public target ratio, hostile deal ratio, time to completion, tender offer ratio, and market cap, while non–mega-deals have a significantly higher ratio of all-cash payments and short-term performance. In the cold market group, mega-deals have a significantly higher deal value, relative size, competition, public target ratio, time to completion, tender offer ratio, market cap, and leverage ratio, while non–mega-deals only have a significantly higher diversification ratio. As for the differences between groups, hot market mega-deals have a significantly higher ratio of hostile deals, diversification ratio, time to completion, free cash flow to total assets, and 12-month BHAR, while cold market mega-deals have a significantly higher leverage ratio and 36-month BHAR. In contrast, hot market non–mega-deals have a significantly higher all-cash payment ratio, competition, public target ratio, and 12-month BHAR, while those in a cold market have a significantly higher all-stock payment ratio, M/B, leverage ratio, and 24- and 36-month BHARs.

In Table 3.7, deals are grouped into the top 25%, middle 50%, and bottom 25%, based on their relative sizes. For the top 25% group, only the difference in the HHI between mega-deals and non–mega-deals is not significant. Among the terms with significant differences between mega-deals and non–mega-deals, only non–mega-deals have higher values for the ratio all-cash payments, diversification ratio, and short-term performance. For the bottom 25% group, only the differences in the all-stock payment ratio, all-cash payment ratio, hostile deal ratio, cross-border ratio, and short-term performance (except the five-day CAR) and long-term performance between mega-deals and non–mega-deals are not significant. Among the terms with significant

differences between mega-deals and non–mega-deals, only non–mega-deals have a higher five-day CAR. As for the differences between groups, among mega-deals, only differences in the HHI, all-stock payment ratio, competition, tender offer ratio, M/B, and 12-month BHAR are not significant. Among the terms with significant differences between groups, for mega-deals, the bottom 25% group has a significantly higher all-cash payment ratio, diversification ratio, cross-border ratio, market cap, free cash flow to total assets, and long-term performance, and the top 25% group has significantly higher values for the remainder of the terms. For non–mega-deals, only the differences in the HHI, all-stock payment ratio, and hostile deal ratio between the two groups are not significant. Among the terms with significant differences between groups, only the bottom 25% group has a significantly higher all-cash payment ratio, diversification ratio, cross-border ratio, market cap, M/B, free cash flow to total assets, and long-term performance.

In Table 3.8, the deals are grouped into the top 25%, middle 50%, and bottom 25%, based on their M/B. For the top 25% group, mega-deals have a significantly higher deal value, relative size, all-stock payment ratio, public target ratio, time to completion, tender offer ratio, and acquirer characteristic values such as the market cap, free cash flow to total assets, and leverage ratio. On the other hand, non–mega-deals have a significantly higher cross-border deal ratio and better short-term performance. For the bottom top 25% group, only the differences in the HHI, cross-border deal ratio, free cash flow to total assets, leverage ratio, and long-term performance between mega-deals and non–mega-deals are not significant. Among the terms with significant differences between mega-deals and non–mega-deals, only non–mega-deals have a higher all-cash payment ratio and diversification ratio and better short-term performance. As for the differences between groups, the bottom 25% group of mega-deals have a significantly higher HHI, relative size, competition, leverage ratio, short-term performance, and 12-month BHAR, while the top 25% group of mega-deals have a significantly higher all-stock payment ratio, public target ratio, market cap, and free

cash flow to total assets. For non–mega-deals, the bottom 25% group has a significantly higher HHI, relative size, all-cash payment ratio, three-day CAR, and 12-month BHAR, while the top 25% group has a significantly higher all-stock payment ratio, cross-border ratio, market cap, free cash flow to total assets, and 36-month BHAR.

In Table 3.9, the deals are grouped into the top 25%, middle 50%, and bottom 25%, based on their leverage ratio. For the top 25% group, non–mega-deals have a significantly higher all-cash payment ratio and short-term performance, while the values of almost all the other characteristics for mega-deals are significantly higher than those for non–mega-deals. For the bottom 25% group, non–mega-deals have a significantly higher cross-border deal ratio and short-term performance, while mega-deals have significantly higher values for all the other characteristics, except the HHI, all-cash payment ratio, and diversification ratio. As for the comparisons between groups, the top 25% group of mega-deals has a significantly higher HHI, deal value, relative size, time to completion, cross-border deal ratio, and short-term performance, while the bottom 25% group has a significantly higher all-stock payment ratio, public target ratio, tender offer ratio, market cap ratio, and free cash flow to total assets. For non–mega-deals, the top 25% group have a significantly higher HHI, deal value, relative size, all-cash payment ratio, time to completion, and short- and long-term performance, while the bottom 25% group has a significantly higher all-stock payment ratio, competition, public target ratio, and acquirer characteristic values such as the market cap, free cash flow to total assets, and M/B.

In Table 3.10, the deals are grouped into the top 25%, middle 50%, and bottom 25%, based on their ratio of free cash flow to total assets. For the top 25% group, non–mega-deals have a significantly higher all-cash payment ratio, diversification ratio, and short-term performance, while mega-deals have significantly higher values in all the other terms, except the HHI, cross-border ratio, leverage ratio, and long-term performance. For the bottom 25% group, mega-deals have significantly higher values

in the deal value, relative size, competition, public target ratio, hostile deal ratio, time to completion, tender offer ratio, and acquirer characteristics such as the market cap, M/B, and leverage ratio. In contrast, only non–mega-deals have significantly higher short-term performance. As for the comparisons between groups, for mega-deals, the bottom 25% group has a significantly higher relative size, diversification ratio, time to completion, and leverage ratio, while the top 25% group has a significantly higher all-cash payment ratio, public target ratio, market cap, and long-term performance. For non–mega-deals, the bottom 25% group has a significantly higher relative size, time to completion, and leverage ratio, while the top 25% group has a significantly higher cross-border deal ratio, market cap, and long-term performance.

3.4.3 Regression results of multivariate analyses

Tables 3.11 and 3.12 present the regression results of the short- and long-run multivariate analyses, respectively. The mega-deal dummy has a significantly negative effect on both the three- and five-day CARs, whether acquirer firm characteristics are controlled for or not. Therefore, the short-term performance of mega-deals is significantly higher than that of non–mega-deals, which is consistent with the results of Table 3.2. In contrast, the mega-deal dummy has a significantly positive effect on the 12-, 24-, and 36-month BHARs without controlling for acquirer firms' characteristics. Thus, mega-deals tend to have better performance than non–mega-deals in the long run, which is also consistent with the results in Table 3.2. However, when controlling for acquirer firm characteristics, the mega-deal dummy no longer has a significant effect on the 24- or 36-month BHAR.

The stock payment method plays a negative role in all the three-day, five-day, and 11-day CARs and all the 12-, 24-, and 36-month BHARs, whether acquirer firm characteristics are controlled for or not. In other words, the stock payment method always has a negative effect on both short- and long-run performance, which is consistent with the results in Table 3.3. On the other hand, the high market valuation does not have significant effect on the three-, five-, or 11-day CARs, which is consistent

with the results in Table 3.6. In contrast, it has a significantly negative effect on the 12-, 24-, and 36-month BHARs. Although the effect on the 12-month BHAR is only significant at the 1% level, it conflicts with the results in Table 3.6, which show that the 12-month BHAR of the cold market group is significantly lower than that of the hot market group at the 10% significance level. However, both the 24- and 36-month BHARs of the cold market group are significantly higher than those of the hot market, which is consistent with the significantly negative effect of the high market valuation here.

Public targets have a significantly negative effect on the three-, five-, and 11-day CARs, whether acquirer firm characteristics are controlled for or not, but they have no significant effect on the 12-, 24-, and 36-month BHARs. The former result is consistent with the results in Table 3.4, which shows that, for both mega-deals and non–mega-deals, those with non-public targets have a significantly higher CAR than those with public targets. As for the latter finding, non–mega-deals with non-public targets have significantly higher BHARs than those with public targets, while there is no significant difference between public and non-public targets among mega-deals. Tender offers have a significantly positive effect on the three-, five-, and 11-day CARs, whether acquirer firm characteristics are controlled for or not, while they have no significant effect on the 12-, 24-, and 36-month BHARs.

Industry concentration, indicated by Log(HHI), has a significantly positive effect on both short- and long-run performance. Its effect on the three-, five-, and 11-day CARs is significant, whether acquirer firm characteristics are controlled for or not, which is consistent with the results in Table 3.5. However, the effect of industry concentration on the 24- and 36-month BHARs is affected by acquirer firm characteristics. The results in Table 3.5 show that the effect of industry concentration is pronounced for non–mega-deals, since there exists a significant difference in BHARs between the top and

bottom 25% HHI groups. However, it only has a significant effect on the 36-month BHAR at the 1% level for mega-deals.

The relative deal size has a significantly negative effect on the three-, five-, and 11-day CARs, whether acquirer firm characteristics are controlled for or not, whereas it has no significant effect on the 12-, 24-, and 36-month BHARs. The former result is consistent with the results in Table 3.7, suggesting that a significant difference does exist in short-run performance between the top and bottom relative size groups. However, although the top relative size group has significantly lower BHARs than the bottom relative size group, the effect of relative size on long-term performance is not significant.

As for acquirer firm characteristics, the high M/B significantly lowers long-term performance, since it has a significantly negative effect on the 12-, 24-, and 36-month BHARs. However, it does not have a significant effect on short-term performance. The leverage ratio has a significantly positive effect on both the three- and five-day CARs, which is consistent with the results in Table 3.9. However, it does not have any significant effect on any of the three BHARs, although Table 3.9 shows that, for non–mega-deals, the bottom acquirer leverage group has significantly lower BHARs than the top acquirer leverage group. Neither the ratio of free cash flow to total assets nor the return on assets has any significant effect on the three CARs, while the ratio of free cash flow to total assets has a significantly positive effect on the 36-month BHAR and the return on assets has a significantly positive effect on the 12-month BHAR, both at the 1% significance level. In contrast, Table 3.9 shows that the bottom M/B group has significantly lower BHARs than the top M/B group for both mega-deals and non–mega-deals.

3.5 Discussion

3.5.1 Impact of deal characteristics on performance

In conclusion, most of the characteristics vary considerably between mega-deals and non–mega-deals. More mega-deals prefer paying in stock, and fewer paying in cash. As Chang (1998) and Moeller et al. (2005) point out, equity acquisitions are more likely to destroy shareholder benefits, and my results are in line with the previous literature to a degree. Mega-deals suffer from 2.7% more competition, which may lead to a higher offer premium, hurting stockholders in the short run, consistent with Bradley et al. (1988). On average, deals involving large transaction values take nearly 52 days longer to complete, which can be explained from two aspects: larger target firms need more time to value assets, and there are more rivals to compete with, which also takes time. Surprisingly, 30.9% more public targets are involved in mega-deals, compared to non–mega-deals. More tender offers, hostile deals, and domestic mergers is associated with mega-deals. However, only industry concentration appears to have a small and nonsignificant difference. For firm characteristics, mega-merger acquirers have a critically higher M/B (2.7), higher leverage (0.01), and higher free cash flow to assets (0.07), suggesting bidder firms are more likely to be overvalued, to have a greater multiplier, and to have more excess cash. Interestingly, although all takeovers gain in the short run, non–mega-deals slightly outperform mega-deals, whereas the opposite happens in the long run. With more than a 10% loss, on average, after 24 and 36 months of the announcement date, mega-deals lose 2.5% and 3.8% less than other deals, respectively. This result is in conformity with the finding of Alexandridis et al. (2017), where mega-deals outperform non–mega-deals, but inconsistent with the finding of Dong et al. (2006), where deals with huge transaction values harm shareholder benefits.

As for the influence of the payment method, the value of stock deals is significantly larger than that of cash deals among mega-deals, while the former is significantly

lower than the latter for non–mega-deals. Takeovers paid with equity prefer domestic, public targets and take more time to complete. The M/B of mega-deals paid with equity is 10.4 higher than mega-deals paid in cash, and, even for non–mega-deals, the M/B of stock mergers is 5.7 higher than that of non–mega-mergers overall. This result is in line with Shleifer and Vishny's (2003), where overvalued firms can 'ride the merger wave' by setting equity as the payment method. Since more overvalued bidders in mega-deals transfer their shares into rather undervalued target firms, a sequence of better long-run performance can be expected. Moreover, contrary to the findings of Lang et al. (1991) and Harford (1999), in my study, cash deals generate a better market reaction, ceteris paribus, supporting Gao et al. (2018). Supporting Moeller et al. (2005), deals involving public targets tend to destroy value in every aspect.

Overall, Table 3.5 reveals that takeovers in a more competitive industry seem to generate significant loss after the acquisition. This finding strongly supports the model of Gorton et al. (2009), where a higher mega-merger deal return is a result of the industry structure. Within a higher-concentration industry, mega-deal bidders tend to gain more. There are two possible explanations. First, within a more concentrated industry, there is less competition and the bidder can focus more on the deal itself, rather than other managerial objectives, leading the bidder to make better decisions. Second, as Gorton et al. (2009) point out, more positioning mergers occur under such circumstances, bringing about advantages to the bidder's shareholders.

Table 3.6 shows significant long-run performance, indicating that, whatever the deal type, mergers announced during a cold market tend to lose less in the long run. This result only appears after 24 months. In particular, three years after the announcement date, cold market mega-deals gain 15.7% more than hot market mega-deals, and this figure is 14.7% for non–mega-deals. By one year, the hot market deals still outperform the deals in other periods. This finding is consistent with Table 3.3, where cash deals gain more than deals with other payment methods. Consistent with Maloney et al.

(1993), Table 3.9 shows that bidder firm leverage and post-announcement returns are positively related. In contrast to Harford's (1999) view, where bidders with excess free cash tend to make value-destroying acquisitions, Table 3.10 rejects the explanation of the agency cost of free cash flow. The results show that bidders with a higher ratio of free cash flow make better acquisition decisions.

3.5.2 Do mega-deals underperform non–mega-deals?

As shown in Table 3.2, mega-deals have significantly lower three- and five-day CARs than non–mega-deals, which suggests that mega-deals underperform non–mega-deals in the short term. The regression results in Table 3.11 further confirm this result, since the mega-deal dummy has a significantly negative effect on both the three- and five-day CARs at a significance level of 10%. This conclusion is consistent with that of Alexandridis et al. (2017). However, the above conclusion does not hold for long-term performance. From Table 3.2, mega-deals are known to have significantly higher 24- and 36-month BHARs than non–mega-deals do, and the regression results in Table 3.12 confirm that the mega dummy plays a significantly positive role in long-term performance.

In Table 3.2, mega-deals are shown to have 30.9% more public targets than non–mega-deals do. Since public targets have a significantly negative effect on short-term performance at the 10% level, they may contribute greatly to the underperformance of mega-deals in the short term. Although the average relative size of mega-deals is 24.5% higher than that of non–mega-deals and relative size plays a significantly positive role in short-term performance, its effect is not as strong as that of public targets. However, neither public targets nor relative size has a significant effect on long-term performance, which may help explain why mega-deals outperform non–mega-deals in the long run. In summary, H1 holds for the short term, but not in the long run.

3.5.3 Does a higher-concentration industry improve the performance of mega-deals?

Table 3.5 shows that the bottom HHI group has significantly lower three- and five-day CARs than the top HHI group for both mega-deals and non–mega-deals. This result suggests that a higher-concentration industry may result in better short-term performance. Furthermore, the regression results confirm that a higher-concentration industry has a significantly positive effect on short-term performance at the 10% level.

As for the long-term performance, a higher-concentration industry still leads to better performance for non–mega-deals, since the bottom HHI group has significantly lower 12-, 24-, and 36-month BHARs. However, for mega-deals, there is no significant difference in the 12- and 24-month BHARs between the top and bottom HHI groups. The regression results show that a higher-concentration industry has a significantly positive effect on the 12-month BHAR at the 5% significance level, whether acquirer firm characteristics are controlled for or not. However, it only has significant effect on the 24- and 36-month BHARs when acquirer firm characteristics are not considered, and the effect is significant at the 1% level.

Therefore, a higher-concentration industry does play a significantly positive role in the short-term performance of both mega-deals and non–mega-deals. However, its effect on long-term performance is not as pronounced as on short-term performance, especially not among mega-deals.

3.6 Conclusion

In this paper, I mainly compare how mega-deals and non–mega-deals perform differently when controlling for other factors, and investigate the role of higher-concentration industry. Comparisons between mega-deals and non–mega-deals, between cash and stock payments, and between public and non-public targets are made, and the comparisons between the top 25% group and the bottom 25% group

are also analysed. A regression analysis is run to analyse the impact of deal characteristics on short- and long-term performance.

While non–mega-deals tend to have better short-term performance, mega-deals have a higher likelihood of better performance in the long term. A higher-concentration industry plays a positive role in the short-term performance of both mega-deals and non–mega-deals, but its effect on long-term performance is not as pronounced, especially not among mega-deals. Further, cash deals have a higher likelihood of better performance than stock deals, and stock payments significantly decrease both short- and long-term performance. While deals with non-public targets tend to have better performance than deals with public targets, public targets only have a significantly negative effect on short-term performance, and no significant effect on long-term performance. More than 30% of mega-deals involve public targets, which may contribute strongly to their short-term underperformance.

By analysing the 5,949 takeovers during a 26-year period, mega-deals are found to be outperform, in that they tend to lose less in the long run. Not only do firm and deal characteristics matter, but the acquirer's industry structure can also explain this difference in performance to some extent. This paper investigates the problem only from an overall macro perspective, and many detailed questions remain unanswered. Not only can industry structure affect merger deals, but huge deals can also affect competition in the entire industry as well. The mechanisms and how diversification and policy restriction affect acquisition performance are left for future research.

Table 3.1 Full Sample Year Descriptive Statistics

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers.

	ALL				MEGA					NON-MEGA				
YEAR	N	Mean	Median	SD	N	Percentage	Mean	Median	SD	N	Percentage	Mean	Median	SD
1990	13	579.79	136.43	1,333.32	1	7.69	4,993.35	4,993.35	.	12	92.31	212.00	127.79	144.69
1991	49	321.51	202.53	304.20	11	22.45	801.49	696.85	293.16	38	77.55	182.57	163.06	92.21
1992	74	264.67	154.94	305.38	9	12.16	912.33	802.98	479.18	65	87.84	174.99	142.00	102.54
1993	91	299.26	168.12	365.11	15	16.48	947.74	792.00	513.27	76	83.52	171.27	142.91	100.42
1994	147	341.09	157.78	721.77	17	11.56	1,661.35	1,121.26	1,609.24	130	88.44	168.44	138.21	93.03
1995	175	657.67	167.93	2,240.15	27	15.43	3,253.19	1,565.03	5,023.27	148	84.57	184.17	140.43	117.74
1996	233	498.17	180.88	1,208.50	44	18.88	1,870.47	890.68	2,337.07	189	81.12	178.70	153.75	98.23
1997	310	449.33	205.16	801.03	68	21.94	1,375.20	842.36	1,343.15	242	78.06	189.17	165.09	106.33
1998	360	647.82	180.15	1,595.07	75	20.83	2,442.22	1,343.04	2,859.67	285	79.17	175.61	140.52	106.04
1999	366	875.10	233.26	4,133.64	95	25.96	2,819.33	1,022.60	7,819.85	271	74.04	193.54	158.03	116.16
2000	381	920.65	248.91	2,293.44	117	30.71	2,561.78	1,085.67	3,643.93	264	69.29	193.33	157.48	118.70
2001	211	637.71	217.54	1,143.26	50	23.70	2,069.87	1,351.39	1,675.74	161	76.30	192.94	147.05	124.45
2002	207	360.00	148.79	716.91	33	15.94	1,379.72	961.37	1,402.58	174	84.06	166.60	128.57	110.21
2003	185	462.51	135.37	1,370.76	25	13.51	2,382.97	1,224.39	3,145.36	160	86.49	162.44	124.64	102.80
2004	262	675.51	170.37	2,986.70	46	17.56	3,010.53	1,546.19	6,701.75	216	82.44	178.24	134.04	116.14
2005	254	1,005.12	169.08	4,775.92	55	21.65	4,029.44	1,097.52	9,743.07	199	78.35	169.26	122.14	114.55
2006	256	845.57	181.94	5,175.94	55	21.48	3,333.96	1,067.58	10,882.78	201	78.52	164.67	129.18	107.13

2007	292	627.88	192.90	1,536.88	66	22.60	2,172.71	1,137.65	2,719.18	226	77.40	176.73	140.39	119.79
2008	182	561.80	172.87	1,321.36	42	23.08	1,903.69	1,043.64	2,296.10	140	76.92	159.24	122.39	105.81
2009	143	1,197.48	229.20	4,120.91	37	25.87	4,052.17	1,759.52	7,459.02	106	74.13	201.03	169.55	128.10
2010	211	671.55	210.00	2,037.08	48	22.75	2,331.29	1,150.77	3,854.00	163	77.25	182.79	145.00	115.66
2011	227	610.57	230.25	1,471.45	54	23.79	1,963.96	934.02	2,595.67	173	76.21	188.13	155.03	119.45
2012	251	471.81	175.57	746.45	60	23.90	1,444.38	1,034.20	1,028.29	191	76.10	166.30	129.97	110.73
2013	249	658.28	236.69	1,543.59	77	30.92	1,741.54	1,097.69	2,455.06	172	69.08	173.33	142.01	108.72
2014	277	836.12	195.32	3,308.29	66	23.83	2,952.49	1,246.34	6,361.06	211	76.17	174.13	143.24	110.64
2015	295	1,048.20	257.66	2,539.01	99	33.56	2,759.20	1,371.96	3,854.89	196	66.44	183.97	147.85	119.45
2016	248	959.79	249.93	2,348.37	88	35.48	2,390.50	1,303.36	3,524.79	160	64.52	172.90	130.80	113.83
TOTAL	**5,949**	**695.36**	**195.00**	**2,541.29**	**1,380**	**23.20**	**2,406.75**	**1,096.48**	**4,898.73**	**4,569**	**76.80**	**178.46**	**142.00**	**112.36**

Table 3.2. Mega deal and non-mega deal comparison.

The table gives a summary of Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced from January 1, 1990 to December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least half of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to reduce the impacts of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Competition* takes the value of one if the deal has more than one firm to compete the deal, otherwise equals zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Mega (1)	Non-mega (2)	Difference (1)-(2)
Deal characteristics					
HHI	mean	1025.02	1018.018	1027.133	-9.114
	n	5,949	1,380	4,569	(-0.2998)
Deal value ($mil)	mean	637.96	2222.364	159.408	2062.956***
	n	5,949	1,380	4,569	(30.7179)
Relative size	mean	0.29	0.482	0.238	0.245***
	n	5,949	1,380	4,569	(7.9479)
All stock	mean	0.16	0.193	0.147	0.046***
	n	744	233	511	(3.7306)
All cash	mean	0.46	0.411	0.482	-0.071***
	n	2.167	496	1,671	(-4.2861)
Competition	mean	0.02	0.036	0.010	0.027***
	n	94	50	44	(6.9719)
Public Target	mean	0.23	0.466	0.156	0.309***
	n	2,208	643	715	(25.2528)
Hostile	mean	0.00	0.012	0.002	0.009***
	n	27	16	11	(4.4562)

Diversification	mean	0.41	0.394	0.416	-0.021
	n	2,443	544	1,899	(-1.4178)
Time to Completion	mean	70.88	110.547	58.894	51.653***
	n	5,949	1,380	4,569	(21.7083)
Tender Offer	mean	0.07	0.123	0.053	0.070***
	n	411	170	241	(9.1041)
Cross Border	mean	0.20	0.186	0.209	-0.024*
	n	1,213	256	957	(-0.9735)
Acquirer characteristics					
Market Cap ($mil)	mean	14921.32	30583.45	10190.8	20392.65***
	n	5,949	1,380	4,569	(15.4231)
FCF-to-asset	mean	0.08	0.083	0.074	0.010***
	n	5,908	1,380	4,569	(2.6519)
Market-to-book	mean	0.32	6.734	4.034	2.700***
	n	5,937	1,380	4,569	(2.9817)
Leverage	mean	0.321	0.375	0.304	0.071**
	n	5,937	1,380	4,569	(2.3175)
Acquisition performance					
CAR(-1,+1)	mean	0.008	0.0008	0.0107	-0.0099***
	n	5,949	1,380	4,569	(-5.8282)
CAR(-2,+2)	mean	0.009	0.0014	0.0110	-0.0096***
	n	5,949	1,380	4,569	(-4.9891)
BHAR(0,+12)	mean	-0.038	-0.0319	-0.0400	0.0081
	n	5,506	1,254	4,252	(0.7163)
BHAR(0,+24)	mean	-0.1199	-0.1004	-0.1256	0.0252**
	n	5,506	1,254	4,252	(2.0056)
BHAR(0,+36)	mean	-0.194	-0.1646	-0.2030	0.0383***
	n	5,506	1,254	4,252	(2.7762)

Table 3.3. Cash and stock comparison

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. The sample is divided into two groups (cash deals and stock deals) based on the deal's payment method. Cash deals are mergers paid with full cash, and stock deals with full stock. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Cash deals			Stock deals			Difference	
			Mega	Non-mega	Difference	Mega	Non-mega	Difference	(3)-(1)	(4)-(2)
			(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)		
Deal characteristics										
HHI	mean	1025.02	1009.53	1017.93	-8.406	920.45	903.86	16.596	-89.076	-114.077**
	n	5,949	496	1,671		233	511			
Deal value ($mil)	mean	637.96	1581.98	167.95	1414.03***	2123.16	151.70	1971.455***	541.174**	-16.251***
	n	5,949	496	1,671		233	511			
Relative size	mean	0.29	0.31	0.17	0.141***	0.49	0.40	0.091	0.174***	0.224***
	n	5,949	496	1,670		233	511			
Competition	mean	0.02	0.04	0.01	0.030***	0.01	0.01	-0.005	-0.032**	0.003
	n	94	20	18		2	7			
Public Target	mean	0.23	0.42	0.19	0.235***	0.72	0.35	0.373***	0.300***	0.162***
	n	2,208	209	312		168	178			
Hostile	mean	0.00	0.01	0.01	0.004	0.01	0	0.013***	0.003	-0.006*
	n	27	5	10		3	0			
Diversification	mean	0.41	0.43	0.43	0.001	0.37	0.44	-0.067*	-0.058	0.010

	n	2,443	214	719		87	225		
Time to Completion	mean	70.88	94.06	52.95	41.11***	116.98	80.60	36.384***	22.922***	27.651***
	n	5,949	496	1,671		233	511			
Tender Offer	mean	0.07	0.20	0.10	0.095***	0.03	0.03	-0.006	-0.176***	-0.076***
	n	411	98	172		5	14			
Cross Border	mean	0.20	0.21	0.22	-0.009	0.09	0.13	-0.039	-0.124***	-0.093***
	n	1,213	106	372		21	66			
Acquirer characteristics										
Market Cap ($mil)	mean	14921.32	40168.51	11413.11	28755.39***	29916.13	16867.71	13048.42***	-10252.4**	5454.60***
	n	5,949	496	1,671		233	511			
Market-to-book	mean	4.66	3.83	3.42	0.407	14.22	9.19	5.039*	10.397***	5.766***
	n	5,949	469	1,671		233	511			
FCF-to-asset	mean	0.08	0.09	0.09	0.005	0.08	0.05	0.026**	-0.015**	-0.036***
	n	5,908	496	1,671		233	511			
Leverage	mean	0.32	0.38	0.27	0.104	0.28	0.20	0.081***	-0.098***	-0.075
	n	5,937	469	1,671		233	511			
Acquisition performance										
CAR(-1,+1)	mean	0.008	0.009	0.012	-0.003	-0.027	0.000	-0.028***	-0.037***	-0.012***
	n	5,949	496	2,167		233	511			
CAR(-2,+2)	mean	0.009	0.009	0.013	-0.004	-0.024	-0.002	-0.023***	-0.034***	-0.015***
	n	5,949	496	2,167		233	511			
BHAR(0,+12)	mean	-0.038	-0.005	-0.016	0.011	-0.098	-0.146	0.048	-0.093***	-0.130***
	n	5,506	448	1,584		205	483			
BHAR(0,+24)	mean	-0.120	-0.076	-0.106	0.030	-0.148	-0.215	0.066*	-0.072**	-0.109***
	n	5,506	448	1,584		205	483			
BHAR(0,+36)	mean	-0.194	-0.144	-0.180	0.037*	-0.203	-0.297	0.094**	-0.059*	-0.117***
	n	5,506	448	1,584		205	483			

Table 3.4. Public target and non-public target comparison

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. The sample is divided into two groups (public and non-public) based on the target firm's public status. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero.*Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Public target deals			Non-public target deals			Difference	
			Mega	Non-mega	Difference	Mega	Non-mega	Difference	(3)-(1)	(4)-(2)
			(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)		
Deal characteristics										
HHI	mean	1025.02	992.31	942.88	49.429	1040.47	1042.77	-2.293	48.164	99.886***
	n	5,949	643	715		737	3,854			
Deal value ($mil)	mean	637.96	3137.08	187.25	2949.829***	1424.31	154.24	1270.072***	-1712.768***	-33.010***
	n	5,949	643	715		737	3,854			
Relative size	mean	0.29	0.46	0.31	0.151***	0.50	0.22	0.276***	0.039	-0.086***
	n	5,949	643	715		737	3,854			
Competition	mean	0.02	0.06	0.05	0.015	0.01	0.00	0.011***	-0.049***	-0.045***
	n	94	40	32		10	5			
All cash	mean	0.46	0.33	0.46	-0.130***	0.50	0.49	0.015	0.174***	0.029
	n	2,167	209	312		287	1,359			
All stock	mean	0.16	0.26	0.26	0.002	0.11	0.12	-0.006	-0.150***	-0.142***
	n	744	168	178		65	65			
Hostile	mean	0.00	0.25	0.15	0.009	0	0		-0.025***	-0.0154***
	n	27	16	11		0	0			
Diversification	mean	0.41	0.38	0.43	-0.053**	0.41	0.41	-0.003	0.033	-0.016

	n	2,443	242	307		302	1,592		
Time to Completion	mean	70.88	128.93	95.47	33.462***	94.50	52.11	42.397***	-34.430***	-43.365***
	n	5,949	643	715		737	3,854		
Tender Offer	mean	0.07	0.26	0.33	-0.067***	0.00	0.00	0.001	-0.259***	-0.327***
	n	411	168	235		2	6		
Cross Border	mean	0.20	0.13	0.21	-0.075***	0.23	0.21	0.022	0.100***	0.003
	n	1,213	85	148		171	809		
Acquirer characteristics									
Market Cap ($mil)	mean	14921.32	31449.95	9334.73	22115.22***	29827.47	10349.62	19477.84***	-1622.479	1014.894
	n	5,949	643	715		737	3,854		
Market-to-book	mean	4.66	7.53	4.43	3.096	6.04	3.96	2.080***	-1.489	-0.473
	n	5,949	643	715		737	3,854		
FCF-to-asset	mean	0.08	0.09	0.07	0.018***	0.78	0.07	0.004	-0.012***	0.002
	n	5,908	643	715		737	3,854		
Leverage	mean	0.32	0.35	0.29	0.058***	0.40	0.31	0.093**	0.053***	0.018
	n	5,937	643	715		737	3,854		
Acquisition performance									
CAR(-1,+1)	mean	0.008	-0.014	0.001	-0.015***	0.014	0.012	0.001	0.027***	0.011***
	n	5,949	643	715		737	3,854		
CAR(-2,+2)	mean	0.009	-0.013	-0.000	-0.013***	0.014	0.013	0.001	0.026***	0.013***
	n	5,949	643	715		737	3,849		
BHAR(0,+12)	mean	-0.038	-0.033	-0.064	0.031	-0.031	-0.035	0.005	0.002	0.028**
	n	5,506	590	684		664	3,568		
BHAR(0,+24)	mean	-0.120	-0.100	-0.163	0.062***	-0.101	-0.119	0.018	-0.001	0.044***
	n	5,506	590	684		664	3,568		
BHAR(0,+36)	mean	-0.194	-0.160	-0.250	0.090***	-0.168	-0.194	0.026	-0.008	0.056***
	n	5,506	590	684		664	3,568		

Table 3.5. Top 25% and bottom 25% HHI group comparison

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. The sample is divided into three groups (top 25%, middle 50%, and bottom 25%) based on acquirer's industry market concentration, which I use Herfindahl-Hirschman Index (HHI) to evaluate. A unique industry's HHI is calculated following Hou and Robinson's (2006) methodology, same as that of the U.S. Department of Justice, by summing the squares of market share in percentage of each single firm existing in the same industry. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Top 25% HHI Mega (1)	Top 25% HHI Non-mega (2)	Top 25% HHI Difference (1)-(2)	Middle 50% HHI Mega (3)	Middle 50% HHI Non-mega (4)	Bottom 25% HHI Mega (5)	Bottom 25% HHI Non-mega (6)	Bottom 25% HHI Difference (5)-(6)	Difference (5)-(1)	Difference (6)-(2)
Deal characteristics												
Deal value ($mil)	mean	637.96	2107.54	158.42	1949.12***	2110.37	155.75	2511.19	168.20	2342.99***	403.648	9.781**
	n	5,949	341	1,148		651	2,324	388	1,097			
Relative size	mean	0.29	0.61	0.25	0.365***	0.42	0.21	0.47	0.28	0.193***	-0.144	0.028
	n	5,949	341	1,148		651	2,324	388	1,097			
All stock	mean	0.16	0.12	0.10	0.022	0.24	0.17	0.17	0.14	0.026	0.047*	0.044***
	n	744	36	83		140	309	36	83			
All cash	mean	0.46	0.40	0.46	-0.060*	0.40	0.50	0.44	0.47	-0.025	0.036	0.001
	n	2,167	118	382		231	907	118	382			
Competition	mean	0.02	0.04	0.01	0.022***	0.04	0.01	0.03	0.01	0.023***	-0.007	-0.008*
	n	94	12	15		27	23	12	15			
Public Target	mean	0.23	0.42	0.13	0.292***	0.51	0.18	0.44	0.14	0.295***	0.188	0.159
	n	2,208	143	146		330	412	143	146			
Hostile	mean	0.00	0.00	0.00	0.000	0.01	0.00	0.02	0.00	0.015***	0.013*	-0.002
	n	27	1	3		9	7	1	3			

Diversification	mean	0.41	0.52	0.49	0.033	0.38	0.40	0.31	0.36	-0.054**	-0.216***	-0.128***
	n	2,443	179	565		245	935	179	565			
Time to Completion	mean	70.88	109.90	58.58	51.322***	115.65	60.12	102.55	56.61	45.942***	-7.349	-1.968
	n	5,949	341	1148		651	2,324	388	1,097			
Tender Offer	mean	0.07	0.11	0.05	0.061***	0.15	0.06	0.10	0.04	0.051***	-0.016	-0.006
	n	411	28	58		95	134	38	58			
Cross Border	mean	0.20	0.19	0.21	-0.018	0.19	0.20	0.18	0.22	-0.045*	-0.013	0.014
	n	1,213	65	239		122	474	65	239			
Acquirer characteristics												
Market Cap ($mil)	mean	14921.32	29941.6	7800.10	22141.5***	34726.45	13042.9	24196.28	6650.47	17545'.8***	-5745.31	-1149.63
	n	5,949	341	1,148		651	2,324	388	1,097			
Market-to-book	mean	4.66	4.13	3.46	0.666	5.29	4.42	11.44	3.81	7.630**	7.311	0.347
	n	5,949	341	1,148		651	2,324	388	1,097			
FCF-to-asset	mean	0.08	0.08	0.07	0.136	0.08	0.07	0.09	0.08	0.006	0.004	0.011**
	n	5,908	341	1,148		651	2,324	388	1,097			
Leverage	mean	0.32	0.42	0.38	0.038**	0.36	0.27	0.36	0.30	0.062***	-0.054***	-0.078***
	n	5,937	341	1,148		651	2,324	388	1,097			
Acquisition performance												
CAR(-1,+1)	mean	0.008	0.007	0.015	-0.010***	-0.002	0.009	-0.001	0.008	-0.009***	-0.008*	-0.009***
	n	5,949	341	1,148		651	2,324	388	1,097			
CAR(-2,+2)	mean	0.009	0.010	0.018	-0.007**	-0.003	0.009	0.000	0.008	-0.008**	-0.010**	-0.009***
	n	5,949	341	1,148		651	2,324	388	1,097			
BHAR(0,12)	mean	-0.038	-0.006	-0.014	0.008	-0.047	-0.053	-0.029	-0.039	0.010	-0.023	-0.025*
	n	5,506	311	1,053		604	2,191	339	1,008			
BHAR(0,24)	mean	-0.120	-0.074	-0.100	0.026	-0.105	-0.130	-0.116	-0.142	0.264	-0.042	-0.042**
	n	5,506	311	1,053		604	2,191	339	1,008			
BHAR(0,36)	mean	-0.194	-0.129	-0.162	0.033	-0.170	-0.207	-0.188	-0.237	0.049*	-0.060*	-0.076***
	n	5,506	311	1,053		604	2,191	339	1,008			

Table 3.6. Top 25% and bottom 25% Market valuation comparison

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. The sample is divided into three groups (hot market, neutral market, and cold market) based on the market valuation of the deal announced month. Following Bouwman, Fuller and Nain (2007) and Antoniou, Guo and Petmezas (2008), I use market index P/E ratio as a way to present market valuations. A hot market is defined as deals announced in the top 25% market valuation, with a cold market in the bottom 25% market valuation, and a neutral market else times. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Hot market			Neutral market		Cold market			Difference	
			Mega (1)	Non-mega (2)	Difference (1)-(2)	Mega (3)	Non-mega (4)	Mega (5)	Non-mega (6)	Difference (5)-(6)	(5)-(1)	(6)-(2)
Deal characteristics												
HHI	mean	1025.02	1055.84	1058.29	-2.45	985.22	980.88	1047.91	1089.25	-41.34	-7.93	30.96
	n	5,949	296	1,192		696	2,278	388	1,099			
Deal value ($mil)	mean	637.96	2367.12	166.00	2201.11***	2003.97	150.24	2503.70	171.25	2332.44***	136.58	5.25
	n	5,949	296	1,192		696	2,278	388	1,099			
Relative size	mean	0.29	0.42	0.19	0.23***	0.55	0.28	0.41	0.20	0.21***	-0.01	0.01
	n	5,949	296	1,192		696	2,278	388	1,099			
All stock	mean	0.16	0.09	0.04	0.05***	0.30	0.24	0.08	0.07	0.01	-0.01	0.03**
	n	744	23	39		185	412	25	60			
All cash	mean	0.46	0.49	0.61	-0.12***	0.34	0.43	0.49	0.46	0.03	-0.00	-0.16***
	n	2.167	126	547		210	733	160	391			
Competition	mean	0.02	0.02	0.01	0.01	0.04	0.01	0.04	0.00	0.03***	0.01	-0.01***
	n	94	7	17		29	24	14	3			
Public Target	mean	0.23	0.44	0.15	0.29***	0.52	0.18	0.39	0.11	0.29***	-0.05	-0.04***
	n	2,208	131	177		359	421	153	117			

Hostile	mean	0.00	0.02	0.00	0.02***	0.01	0.00	0.00	0.00	0.00	-0.01**	0.00
	n	27	5	1		10	9	1	1			
Diversification	mean	0.41	0.45	0.40	0.04	0.39	0.42	0.36	0.43	-0.07***	-0.09**	0.02
	n	2,443	132	480		274	950	138	469			
Time to Completion	mean	70.88	116.89	52.38	64.52***	111.66	65.71	103.71	51.84	51.87***	-13.18*	-0.54
	n	5,949	296	1,192		696	2,278	388	1,099			
Tender Offer	mean	0.07	0.10	0.05	0.06***	0.13	0.06	0.13	0.04	0.09***	0.02	-0.01
	n	411	31	54		90	148	49	39			
Cross Border	mean	0.20	0.24	0.21	0.03	0.15	0.21	0.21	0.21	0.00	-0.03	-0.01
	n	1,213	71	253		104	477	81	227			
Acquirer characteristics												
Market Cap ($mil)	mean	14921.32	32498	9981.23	22516.77***	29364.24	11116.42	31309.9	8499.51	22810.4**	-1188.09	-1481.73
	n	5,949	296	1,192		696	2,278	388	1,099			
FCF-to-asset	mean	0.08	0.09	0.08	0.01	0.08	0.07	0.08	0.07	0.01	-0.01*	-0.01
	n	5,949	296	1,192		696	2,278	388	1,099			
Market-to-book	mean	4.66	3.30	2.51	0.79	9.71	4.94	4.02	3.82	0.20	0.72	1.31***
	n	5,949	296	1,192		696	2,278	388	1,099			
Leverage	mean	0.32	0.36	0.23	0.13	0.36	0.31	0.41	0.35	0.06***	0.05**	0.12**
	n	5,949	296	1,192		696	2,278	388	1,099			
Acquisition performance												
CAR(-1,+1)	mean	0.008	0.002	0.009	-0.007**	-0.003	0.011	0.007	0.012	-0.004	0.005	0.002
	n	5,949	296	1,192		696	2,278	388	1,099			
CAR(-2,+2)	mean	0.009	0.005	0.010	-0.005*	-0.003	0.012	0.007	0.011	-0.004	0.003	0.002
	n	5,949	296	1,192		696	2,278	388	1,099			
BHAR(0,+12)	mean	-0.038	0.020	-0.002	0.022	-0.053	-0.066	-0.042	-0.026	-0.016	-0.076***	-0.049***
	n	5,506	295	1,167		667	2,172	292	913			
BHAR(0,+24)	mean	-0.120	-0.138	-0.152	0.014	-0.087	-0.126	-0.093	-0.085	-0.008	0.039*	0.056***
	n	5,506	295	1,167		667	2,172	292	913			

| BHAR(0,+36) | mean | -0.194 | -0.307 | -0.301 | -0.005 | -0.109 | -0.166 | -0.154 | -0.165 | 0.011 | 0.157*** | 0.147*** |
| | n | 5,506 | 295 | 1,167 | | 667 | 2,172 | 292 | 913 | | | |

Table 3.7. Top 25% and bottom 25% relative size comparison

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers.   The sample is divided into three groups (top 25%, middle 50%, and bottom 25%) based on the deal's relative size which is the ratio of deal value (target's value) to acquirer's market value (bidder's value). Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Top 25% relative size Mega (1)	Top 25% relative size Non-mega (2)	Difference (1)-(2)	Middle 50% relative size Mega (3)	Middle 50% relative size Non-mega (4)	Bottom 25% relative size Mega (5)	Bottom 25% relative size Non-mega (6)	Difference (5)-(6)	Difference (5)-(1)	Difference (6)-(2)
Deal characteristics												
HHI	mean	1025.02	1045.46	1013.40	32.060	965.05	1065.06	1077.17	964.02	113.15*	31.707	-49.383
	n	5,949	579	908		565	2,410	236	1,251			
Deal value ($mil)	mean	637.96	2818.42	177.77	2640.66***	2018.21	157.87	1248.76	149.05	1099.72***	-1569.66***	-28.719***
	n	5,949	579	908		565	2,410	236	1,251			
All stock	mean	0.16	0.20	0.16	0.047**	0.18	0.14	0.20	0.15	0.045	-0.006	-0.004
	n	744	107	118		88	258	38	135			
All cash	mean	0.46	0.24	0.32	-0.072***	0.50	0.49	0.64	0.62	0.022	0.397***	0.303***
	n	2,167	128	237		245	889	123	545			
Competition	mean	0.02	0.04	0.02	0.027***	0.03	0.01	0.03	0.01	0.027***	-0.011	-0.010**
	n	94	26	16		16	19	8	9			
Public Target	mean	0.23	0.53	0.24	0.290***	0.43	0.14	0.40	0.12	0.275***	-0.132***	-0.117***
	n	2,208	307	218		242	343	94	154			
Hostile	mean	0.00	0.02	0.00	0.017***	0.01	0.00	0	0.00	-0.001	-0.019**	-0.001
	n	27	11	2		5	8	0	1			
Diversification	mean	0.41	0.32	0.38	-0.062**	0.4	0.40	0.56	0.48	0.084**	0.244***	0.099***

	n	2,443	185	346		226	953	133	600			
Time to Completion	mean	70.88	128.94	80.55	48.388***	96.07	53.19	100.09	54.16	45.938***	-28.843***	-26.393***
	n	5,949	579	908		565	2,410	236	1,251			
Tender Offer	mean	0.07	0.10	0.07	0.032**	0.15	0.05	0.13	0.05	0.083***	0.033	-0.018*
	n	411	57	60		82	121	31	60			
Cross Border	mean	0.20	0.12	0.13	-0.005	0.22	0.19	0.27	0.30	-0.037	0.144***	0.176***
	n	1,213	71	116		122	461	63	380			
Acquirer characteristics												
Market Cap ($mil)	mean	14921.32	4016.81	336.08	3680.73***	20390.21	1867.10	120165.1	33378.83	86786.27***	116148.3***	33042.8***
	n	5,949	579	908		565	2,410	236	1,251			
Market-to-book	mean	4.66	7.96	3.00	4.957*	5.16	3.56	7.50	5.70	1.798**	-0.460	2.699***
	n	5,949	579	908		565	2,410	236	1,251			
FCF-to-asset	mean	0.08	0.06	0.05	0.017*	0.09	0.07	0.11	0.09	0.015***	0.045***	0.047***
	n	5,908	579	908		565	2,410	236	1,251			
Leverage	mean	0.32	0.43	0.36	0.076***	0.33	0.29	0.33	0.30	0.034*	-0.099***	-0.056***
	n	5,937	579	908		565	2,410	236	1,251			
Acquisition performance												
CAR(1-,+1)	mean	0.008	0.003	0.027	-0.023***	-0.001	0.010	-0.001	0.002	-0.002	-0.006*	-0.033***
	n	5,949	579	908		565	2,410	236	1,251			
CAR(-2,+2)	mean	0.009	0.005	0.026	-0.021***	0.000	0.010	-0.004	0.003	-0.007***	-0.010**	-0.030***
	n	5,949	579	908		565	2,410	236	1,251			
BHAR(0,+12)	mean	-0.038	-0.043	-0.073	0.030*	-0.033	-0.050	-0.018	-0.003	-0.015	0.017	0.062***
	n	5,506	525	853		510	2,227	219	1,172			
BHAR(0,+24)	mean	-0.120	-0.124	-0.169	0.045**	-0.098	-0.138	-0.040	-0.060	0.020	0.054*	0.087***
	n	5,506	525	853		510	2,227	219	1,172			
BHAR(0,+36)	mean	-0.194	-0.179	-0.246	0.066***	-0.171	-0.217	-0.084	-0.126	0.041	0.081**	0.101***
	n	5,506	525	853		510	2,227	219	1,172			

Table 3.8. Top 25% and bottom 25% market-to-book ratio comparison

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. The sample is divided into three groups (top 25%, middle 50%, and bottom 25%) based on the acquiring firm's market-to-book ratio. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Top 25% Market-to-book			Middle 50% Market-to-book		Bottom 25% Market-to-bood			Difference	
			Mega (1)	Non-mega (2)	Difference (1)-(2)	Mega (3)	Non-mega (4)	Mega (5)	Non-mega (6)	Difference (5)-(6)	(5)-(1)	(6)-(2)
Deal characteristics												
HHI	mean	1025.02	930.57	943.85	-13.275	969.55	1007.43	1245.58	1141.68	103.903	315.013***	197.835***
	n	5,949	392	1,095		691	2,284	297	1,190			
Deal value ($mil)	mean	637.96	2403.97	157.55	2246.42***	2011.91	162.49	2472.32	155.20	2317.11***	68.345	-2.343
	n	5,949	392	1,095		691	2,284	297	1,190			
Relative size	mean	0.29	0.29	0.16	0.134**	0.38	0.18	0.98	0.42	0.561***	0.687***	0.260***
	n	5,949	392	1,095		691	2,284	297	1,190			
Competition	mean	0.02	0.02	0.01	0.009	0.04	0.01	0.04	0.01	0.030***	0.026**	0.004
	n	94	7	10		30	18	13	16			
All stock	mean	0.16	0.36	0.31	0.047*	0.13	0.10	0.10	0.07	0.034*	-0.262***	-0.248***
	n	744	129	285		79	169	25	57			
All cash	mean	0.46	0.32	0.36	-0.043	0.48	0.53	0.37	0.51	-0.135***	0.054	0.146***
	n	2,167	114	329		288	900	94	442			
Public Target	mean	0.23	0.48	0.17	0.318***	0.48	0.15	0.40	0.16	0.249***	-0.081**	-0.012
	n	2,208	190	183		333	347	120	185			
Hostile	mean	0.00	0.01	0.00	0.004	0.01	0.00	0.01	0.00	0.012***	0.008	0.001

Diversification	n	27	2	1		10	8	4	2			
	mean	0.41	0.39	0.39	-0.003	0.42	0.42	0.35	0.42	-0.070**	-0.034	0.033
Time to Completion	n	2,443	152	428		287	967	105	504			
	mean	70.88	112.83	57.30	55.535***	106.24	58.04	117.59	62.00	55.56***	4.725	4.704
Tender Offer	n	5,949	392	1,095		691	2,284	297	1,190			
	mean	0.07	0.09	0.05	0.037***	0.16	0.05	0.09	0.06	0.037**	0.008	0.007
Cross Border	n	411	34	55		108	118	28	68			
	mean	0.20	0.18	0.22	-0.040*	0.19	0.22	0.17	0.18	-0.013	-0.009	-0.036**
	n	1,213	71	242		134	495	51	220			
Acquirer characteristics												
Market Cap ($mil)	mean	14921.32	49983.97	25625.35	24358.63***	27320.87	6575.78	12568.08	2926.85	9641.23***	-37415.89***	-22698.5***
	n	5,949	392	1,095		691	2,284	297	1,190			
FCF-to-asset	mean	0.08	0.10	0.08	0.024***	0.08	0.08	0.06	0.05	0.009	-0.040***	-0.024***
	n	5,908	392	1,095		691	2,284	297	1,190			
Leverage	mean	0.32	0.36	0.29	0.075***	0.35	0.30	0.44	0.33	0.112	0.082***	0.045
	n	5,937	392	1,095		691	2,284	297	1,190			
Acquisition performance												
CAR(-1,+1)	mean	0.008	-0.006	0.009	-0.015***	0.003	0.010	0.005	0.013	-0.008**	0.023***	0.003*
	n	5,949	392	1,095		691	2,284	297	1,190			
CAR(-2,+2)	mean	0.009	-0.005	0.010	-0.016***	0.004	0.011	0.004	0.012	-0.007*	0.023***	0.004
	n	5,949	392	1,095		691	2,284	297	1,185			
BHAR(0,+12)	mean	-0.038	-0.084	-0.065	-0.019	-0.015	-0.039	-0.003	-0.019	0.016	0.081***	0.046***
	n	5,506	351	1,021		636	2,124	267	1,107			
BHAR(0,+24)	mean	-0.120	-0.120	-0.121	0.001	-0.094	-0.133	-0.089	-0.115	0.026	0.310	0.006
	n	5,506	351	1,021		636	2,124	267	1,107			
BHAR(0,+36)	mean	-0.194	-0.158	-0.176	0.018	-0.169	-0.216	-0.163	-0.203	0.040	-0.022	-0.052**
	n	5,506	351	1,021		636	2,124	267	1,107			

Table 3.9. Top 25% and bottom 25% acquirer leverage

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. The sample is divided into three groups (top 25%, middle 50%, and bottom 25%) based on the acquiring firm's leverage. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Top 25% leverage			Middle 50% leverage		Bottom 25% leverage			Difference	
			Mega (1)	Non-mega (2)	Difference (1)-(2)	Mega (3)	Non-mega (4)	Mega (5)	Non-mega (6)	Difference (5)-(6)	(5)-(1)	(6)-(2)
Deal characteristics												
HHI	mean	1025.02	1135.69	1149.18	-13.49	985.89	1052.65	923.96	874.79	49.17	-211.73**	-274.39***
	n	5,949	393	1,103		758	2,211	229	1,255			
Deal value ($mil)	mean	637.96	2348.05	159.71	2188.34***	2354.62	167.47	1568.90	144.93	1423.97***	-779.15**	-14.78***
	n	5,949	393	1,103		758	2,211	229	1,255			
Relative size	mean	0.29	0.74	0.36	0.381***	0.37	0.20	0.41	0.20	0.210***	-0.33**	-0.16***
	n	5,949	393	1,103		758	2,211	229	1,255			
All stock	mean	0.16	0.12	0.09	0.027	0.18	0.11	0.37	0.24	0.135***	0.26***	0.15***
	n	744	39	67		117	181	77	263			
All cash	mean	0.46	0.41	0.49	-0.072**	0.43	0.55	0.35	0.39	-0.036	-0.06	-0.10***
	n	2.167	139	366		285	881	72	424			
Competition	mean	0.02	0.03	0.00	0.023***	0.04	0.01	0.03	0.01	0.238***	0.01	0.01*
	n	94	11	5		31	25	8	14			
Public Target	mean	0.23	0.38	0.13	0.253***	0.60	0.16	0.53	0.18	0.351***	0.14***	0.05***
	n	2,208	151	145		371	347	121	223			
Hostile	mean	0.00	0.01	0.00	0.006*	0.01	0.00	0.009	0	0.009***	0.00	-0.00

	n	27	3	2		11	9	2	0			
Diversification	mean	0.41	0.40	0.39	0.015	0.40	0.45	0.35	0.39	-0.039	-0.05	0.00
	n	2,443	158	427		306	984	80	488			
Time to Completion	mean	70.88	131.20	67.17	64.03***	104.14	59.27	96.32	50.95	45.366***	-34.88***	-16.22***
	n	5,949	393	1,103		758	2,211	229	1,255			
Tender Offer	mean	0.07	0.09	0.04	0.051***	0.13	0.06	0.14	0.05	0.090***	0.05*	0.01
	n	411	36	45		102	133	32	63			
Cross Border	mean	0.20	0.18	0.17	0.001	0.21	0.24	0.12	0.19	-0.063**	-0.05*	0.01
	n	1,213	69	193		159	531	28	233			
Acquirer characteristics												
Market Cap ($mil)	mean	14921.32	26475.64	6682.78	19792.86***	27994.13	9359.79	46203.84	14737.99	31465.9***	19728.2***	8055.21***
	n	5,949	393	1,103		758	2,211	229	1,255			
FCF-to-asset	mean	0.08	0.05	0.05	0.001	0.09	0.09	0.11	0.07	0.042***	0.06***	0.02***
	n	5,908	393	1,103		758	2,211	229	1,255			
Market-to-book	mean	0.32	11.02	3.065	7.37**	3.64	3.13	9.63	5.97	3.665***	-1.39	2.32***
	n	5,937	393	1,103		758	2,211	229	1,255			
Acquisition performance												
CAR(-1,+1)	mean	0.008	0.007	0.015	-0.008***	0.000	0.011	-0.008	0.007	-0.015***	-0.015***	-0.008***
	n	5,949	393	1,103		758	2,211	229	1,255			
CAR(-2,+2)	mean	0.009	0.006	0.014	-0.008***	0.001	0.011	-0.009	0.006	-0.015***	-0.016***	-0.010***
	n	5,949	393	1,103		758	2,211	229	1,255			
BHAR(0,+12)	mean	-0.038	-0.014	-0.004	-0.010	-0.035	-0.023	-0.049	-0.101	0.052*	-0.037	-0.097***
	n	5,506	342	1,003		698	2,211	214	1,175			
BHAR(0,+24)	mean	-0.120	-0.101	-0.106	0.005	-0.105	-0.113	-0.099	-0.173	0.074**	-0.019	-0.077***
	n	5,506	342	1,003		698	2,211	214	1,175			
BHAR(0,+36)	mean	-0.194	-0.159	-0.182	0.023	-0.172	-0.198	-0.162	-0.239	0.076**	-0.026	-0.068***
	n	5,506	342	1,003		698	2,211	214	1,175			

Table 3.10. Top 25% and bottom 25% free cash flow to total asset

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. The sample is divided into three groups (top 25%, middle 50%, and bottom 25%) based on the acquiring firm's free cash flow to total asset. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Top 25% Cash flow			Middle 50% Cash flow		Bottom 25% Cash flow			Difference	
			Mega (1)	Non-mega (2)	Difference (1)-(2)	Mega (3)	Non-mega (4)	Mega (5)	Non-mega (6)	Difference (5)-(6)	(5)-(1)	(6)-(2)
Deal characteristics												
HHI	mean	1025.02	941.92	999.69	-57.77	1043.64	1039.56	1047.44	1030.61	16.84	105.53	30.92
	n	5,949	358	1,160		721	2,234	301	1,175			
Deal value ($mil)	mean	637.96	2315.30	159.80	2155.51***	2297.52	161.70	1931.79	154.67	1777.12***	-383.51	-5.12
	n	5,949	358	1,160		721	2,234	301	1,175			
Relative size	mean	0.29	0.33	0.17	0.16***	0.42	0.20	0.81	0.37	0.44***	0.48***	0.20***
	n	5,949	358	1,160		721	2,234	301	1,175			
All stock	mean	0.16	0.25	0.20	0.05**	0.15	0.09	0.24	0.20	0.04	-0.01	0.00
	n	744	79	175		92	156	62	180			
All cash	mean	0.46	0.41	0.48	-0.07**	0.45	0.55	0.32	0.36	-0.04	-0.08**	-0.12
	n	2.167	128	420		284	928	84	323			
Competition	mean	0.02	0.03	0.01	0.02**	0.04	0.01	0.03	0.01	0.03***	0.01	-0.00
	n	94	9	10		31	25	10	9			

Public Target	mean	0.23	0.53	0.16	0.37***	0.45	0.16	0.42	0.15	0.27***	-0.11***	-0.02
	n	2,208	191	191		326	352	126	172			
Hostile	mean	0.00	0.01	0.00	0.01*	0.02	0.00	0.01	0.00	0.01**	-0.00	-0.00
	n	27	3	2		11	8	2	1			
Diversification	mean	0.41	0.33	0.40	-0.07**	0.42	0.43	0.42	0.40	0.02	0.083**	-0.01
	n	2,443	119	469		300	962	125	468			
Time to Completion	mean	70.88	104.59	56.11	48.48***	108.23	57.45	123.18	64.39	58.79***	18.60**	8.28***
	n	5,949	358	1,160		721	2,234	301	1,175			
Tender Offer	mean	0.07	0.14	0.05	0.09***	0.12	0.06	0.10	0.04	0.06***	-0.03	-0.01
	n	411	49	56		90	139	31	46			
Cross Border	mean	0.20	0.18	0.19	-0.01	0.20	0.24	0.16	0.16	0.00	-0.02	-0.03**
	n	1,213	66	224		142	547	48	186			
Acquirer characteristics												
Market Cap ($mil)	mean	14921.32	45835.97	17533.75	28302.2***	25719.59	8713.63	24093.22	5750.11	18343.1***	-21742.75***	-11783.6***
	n	5,949	358	1,160		721	2,234	301	1,175			
Market-to-book	mean		7.01	4.64	2.37**	3.69	3.52	13.70	4.42	9.28***	6.69	-0.22
	n	5,949	358	1,160		721	2,234	301	1,175			
Leverage	mean		0.28	0.17	0.11	0.34	0.33	0.48	0.39	0.09***	0.20***	0.22***
	n	5,949	358	1,160		721	2,234	301	1,175			
Acquisition performance												
CAR(-1,+1)	mean		-0.005	0.012	-0.017***	0.003	0.010	0.001	0.010	-0.009**	0.006	-0.003
	n		358	1,160		721	2,234	301	1,175			
CAR(-2,+2)	mean		-0.006	0.012	-0.018***	0.005	0.011	0.001	0.011	-0.009**	0.008	-0.001
	n		358	1,160		721	2,234	301	1,175			
BHAR(0,+12)	mean		-0.018	0.018	-0.036	-0.011	-0.025	-0.084	-0.065	-0.020	-0.052*	-0.067***
	n		344	1,094		645	2,093	265	1,065			
BHAR(0,+24)	mean		-0.097	-0.115	0.017	-0.088	-0.116	-0.150	-0.174	0.024	-0.029**	-0.071***

BHAR(0,+36)	n	344	1,094		645	2,093	265	1,065			
	mean	-0.153	-0.192	0.039*	-0.159	-0.195	-0.216	-0.250	0.033	-0.069**	-0.065***
	n	344	1,094		645	2,093	265	1,065			

Table 3.11. Short-run multivariate analysis

The table OLS regression model of acquirer short-run post-acquisition market performance of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer's 3-day, 5-day cumulative abnormal return (*CAR*) are used to evaluate the short-run post-acquisition performance, which are used as the dependent variable of the models. Independent variables include deal characteristics, acquirer and target characteristics. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero.*Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. Acquirer characteristics includes free cash flow to total asset, market-to-book ratio, leverage ratio. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

	CAR[-1,+1]	CAR[-1,+1]	CAR[-2,+2]	CAR[-2,+2]	CAR[-5,+5]	CAR[-5,+5]
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Mega Dummy	-0.710***	-0.696***	-0.597***	-0.579***	-0.479	-0.443
Stock payment	-1.473***	-1.478***	-1.541***	-1.538***	-1.526***	-1.479***
High market valuation	-0.071	-0.137	0.252	0.175	-0.501	-0.587
Diversification	-0.242	-0.245	-0.191	-0.200	-0.284	-0.290
Public Target	-2.005***	-1.999***	-2.132***	-2.103***	-2.054***	-2.079***
Competition	-0.442	-0.457	-0.885	-0.96	-1.159	-1.167
Hostile	0.169	0.160	0.390	0.389	-1.043	-1.053
Tender	0.824**	0.842**	0.803**	0.789*	1.091**	1.121**
Log(TimeToResolution)	0.073	0..64	0.108	0.101	0.031	0.027
Log(HHI)	0.647***	0.653***	0.664***	0.661***	0.662***	0.661***
Cross-border	-0.005	-0.005	-0.020	-0.017	0.212	0.227
Relative size	0.416***	0.407***	0.394***	0.386***	0.389***	0.381***
A_M2B		0.001		-0.000		-0.004
A_CF2TA		-0.686		-2.068		-0.499
A_Leverage		0.139*		0.201***		0.095
A_ROA		0.496		1.665		0.510
Constant	-2.831	-2.822	-2.728	-2.598		-1.967
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	No	No	No	No

Observations	4,070	4,070	4,070	4,070	4,070	4,070
Adjusted R2 (%)	6.18	6.19	4.66	4.73	2.56	2.54

Table 3.12. Long-run multivariate analysis

The table OLS regression model of acquirer long-run post-acquisition market performance of full sample deals. The sample consists of 5,949 deals announced between January 1, 1990 and December 31, 2016. In order to be considered into our sample, the deal must mergers involving U.S. acquirer owning at least 50% of the target firm's value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, all deals are completed acquisitions. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer's 12-month, 24-month, 36-month BHAR are used to evaluate the long-run post-acquisition performance, which are used as the dependent variable of the models. Independent variables include deal characteristics, acquirer and target characteristics. Deal characteristics include Herfindahl-Hirschman Index (HHI), deal value ($mil), target relative size, paid by fully stock or fully cash, competition, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. Acquirer characteristics includes free cash flow to total asset, market-to-book ratio, leverage ratio. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

	BHAR(0,+12)	BHAR(0,+12)	BHAR(0,+24)	BHAR(0,+24)	BHAR(0,+36)	BHAR(0,+36)
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Mega Dummy	2.651**	2.124*	2.299*	1.677	1.922*	1.271
Stock payment	-5.837***	-4.608***	-4.340***	-3.085*	-5.126***	-3.951**
High market valuation	-6.106*	-6.218*	-8.213**	-8.271**	-15.652***	-15.815***
Diversification	0.434	0.066	0.377	-0.035	-0.084	-0.450
Public Target	-0.323	-0.581	-0.253	-0.515	-0.114	-0.378
Competition	2.858	3.121	4.676	4.987	5.419	5.682
Hostile	2.406	2.046	-0.885	-1.274	0.694	0.252
Tender	-0.299	-0.489	-0.888	-1.115	-1.852	-1.958
Log(TimeToResolution)	0.281	0.435	0.285	0.449	0.250	0.432
Log(HHI)	1.945**	1.827**	1.662*	1.542	1.640*	1.542
Cross-border	-1.377	-1.398	-1.757	-1.796	-1.903	-1.948
Relative size	-0.580	-0.337	-0.622	-0.346	-0.196	0.057
A_M2B		-0.217***		-0.220***		-0.198***
A_CF2TA		7.523		13.019		19.022*
A_Leverage		-0.054		0.116		0.094
A_ROA		19.013*		17.665		10.987
Constant	6.654	4.884	-3.747	-6.149	-19.054	-21.963
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	No	No	No	No

Observations	4,070	4,070	4,070	4,070	4,070	4,070
Adjusted R2 (%)	3.73	4.68	12.06	13.05	26.67	27.52

4 The relationship between deal size and deal status

4.1 Introduction

There are two strands of research regarding the cause of merger waves: neoclassical theory, which declares the reason to be outside shocks, and behavioural theory, where rational managers take advantage of irrational markets and gain from market misvaluation. Behavioural theory is growing more popular, as the literature shows little evidence that acquisitions genuinely bring synergy for bidders overall. Rhodes-Kropf and Viswanathan (2004) find that stock M&As affect market valuation. Shleifer and Vishny (2003), Rau and Vermaelen (1998), and Erel et al. (2012) support the view that mispricing does have an impact on merger activity. Bekkum et al. (2011) find acquisition intensity to be positively connected to the level of firm overpricing. According to the literature, overpricing is a dominant reason why M&As destroy value. For instance, Moeller et al. (2005) note that bidders lose 12% upon announcement. Whether the failure of these 'bad deals' can compensate for the loss of bidders is the primary interest of this paper.

Studies have been conducted on how status of a deal influences its outcome. The majority of scholars find acquisition failure to be value reducing. Masulis et al. (2011) find that bidder and target firms suffer losses upon the announcement of failed deals. By analysing bidder performance in 60- and 100-day announcement window, the authors suggest that failed cash deals underperform successful cash deals by more than 10%. This rate is even higher for equity-paid deals. Investigating the first merger wave (1897–1903) in the United States, Banerjee and Eckard (1998) claim that trust participants in successful mergers gain 12–18%, whereas unsuccessful bidders suffer from losses, thus rejecting the mispricing view. Kaplan and Weisbach (1992) put forward an innovative perspective by studying the behaviour of bidders

divesting their former target. The authors find that these unsuccessful divested bidders underperform successfully divested and non-divested bidders.

However, the debate is still on, since Malmendier et al. (2016) find contradicting results. After studying failed acquisitions from 1980 to 2008, the authors advocate that cash targets gain 15%. Since, like many others, Moeller et al. (2005) claim that mergers significantly destroy value, failing these deals could leave bidders better off, compared with the situation in which they complete the merger.

Jandik, Lallemand, and McCumber (2017) investigate the value implications of target debt issuance in withdrawn takeovers, with a focus on changes in targets' incremental leverage ultimately withdrawn takeover. The authors find that a withdrawn takeover results in significantly negative long-term returns for target shareholders.

Renneboog and Vansteenkiste (2019) present a literature overview on M&A performance and try to identify whether short-term returns can sustain in the long term. They find that the key determinants of post-takeover deal performance include serial M&As and CEO overconfidence. Thompson and Kim (2020) investigate the impacts of completion time, acquirer firm post-merger performance, and the likelihood of failure. They test the complementary overdue and due diligence hypotheses and show that deal completion time can proxy for a number of risk factors affecting post-M&A performance and success. They find inverse U-shaped relationships between time until deal completion and performance and between completion time and post-merger performance and the probability of failure.

Attah-Boakye et al. (2020) analyse the reasons some M&A deals fail, with a focus on countries' economic and legal environment. They suggest that deals have a higher

chance of being withdrawn if the level of economic freedom/quality is higher in the acquirer's country or lower in the host country. They also suggest that the likelihood of deal withdrawal tends to increase for target firms of larger size or lower profitability or for acquiring firms of smaller size, showing that the result of announced deals is influenced by deal characteristics such as deal attitude, payment method, size, and ownership sought.

The highlight of my paper is that I further consider mega-deal status and payment method. The mega-deal specialty has never been considered regarding deal status in the literature. By the beginning of 2018, top European pharmaceutical firm Sanofi-Aventis announced its takeover of the U.S. biotechnology company Bioverativ, with a transaction amount of $11.6 billion. The U.S. telecommunications company T-Mobile acquired Sprint for $26 billion in April, 2020. Within the same year, BB&T Corporation and SunTrust Bank merged to become one of the top 10 largest banks, Truist Bank, with a transaction fee of $66 million. In the 21st century, there has been a growing trend of such huge deals, thus inspiring this study.

Another contribution of my study is my analysis of the further actions of failed firms. By analysing 1,197 merger deals with 1,413 individual advising banks, Haushalter and Lowry (2011) justify their hypotheses of both information flow and conflicts of interest. The consistency of analyst recommendation changes and manager shareholding changes only appears after mergers, which is strong support for the information flow hypothesis. Using recommendation downgrades as a proxy for a lower degree of conflict, the authors also find that post-merger acquirer abnormal returns are higher for firms with managers following analysts' advice when the level of conflicts of interest is low. Furthermore, the returns decrease least when the firm relies less on the revenue of the investment banking department, which is evidence of conflicts of interest. Minnick, Unal, and Yang (2011) analyse the correlation between firm long-term performance following acquisitions and PPS. Not surprisingly, similar patterns are

found. Firms with high PPS significantly outperform those with low PPS, regardless of whether the dependent variable is the return on assets, the return on equity, the efficiency ratio, or BHARs. This implies that PPS can not only improve the long-run performance for stakeholders and shareholders, but also enhance employee efficiency. It is evident that size does affect the decision of acquisitions and agency costs, indicating that mega-deal performs contrarily to other, rather small deals.

Since previous papers have investigated how personal board connections affect M&A deals, Cai et al. (2012) analyses the influence of professional board connections. They divide connections into two types: first-degree connections and second-degree connections. Using data on 1,664 U.S. acquisitions between 1996 and 2008, they claim that deals with either type of board connection can achieve higher acquirer abnormal returns. The authors then investigate the mechanism of each connection type. A first-degree connection with one person can pay a lower offer premiums due to sufficient information and lower transaction costs from easier negotiation. On the other hand, second-degree connections involving two persons, with one on each side, can increase the value-creating ability of the combined firm in both the short and long term. The reason could be that, since both directors want to gain from the deal, they may see things differently and gain in different ways.

The paper by Cai et al. (2012) is the first to classify professional board connections and define how they contribute to M&A transactions. It also sheds light on how other manager and governance characteristics can influence takeovers. The authors separate board connections into two categories: first-degree connections and second-degree connections. The former represents the case in which a common director is shared by two firms before the announcement, while the latter represents the case in which the acquirer and the target both have their own director on the board before the announcement of the deal. Since, in the former case, only one person is involved in the connection, this person could have more information on both sides of the deal.

Especially when the director is an executive at the acquirer firm, the director could prefer deals that benefit the bidder more, and this incentive can be realized via a lower offer price. Since the director has more inside information about the target, the director can avoid overpaying for the target. In the latter case, with a second-degree connection, two persons, with one on each end, are involved. Since both directors want to gain from this deal, they may see things differently and gain from different angles, which can increase the value-creating ability of the acquisition. Thus the two kinds of connections have different mechanisms. In examining the differences and sequences, Cai et al. find that professional board connections play an important role in M&A activities and have different mechanisms. While the first-degree connection brings about an information advantage and better negotiation, deals with a first-degree connection tend to have a lower offer premium and lower transaction costs. On the other hand, combined firms with second-degree connections prior to acquisition perform better both around the announcement date and in the long run.

The remainder of the chapter is organized as follows. Section 4.2 develops three hypotheses. Section 4.3 describes the data set, sample criteria, and empirical methodology. Section 4.4 presents the univariate and multivariate results. Section 4.5 discuss the results. Section 4.6 presents the conclusions of the paper.

4.2 Hypothesis development

Since mega-deals often happen between large firms that are market leaders, they usually draw more attention from the public, the media, and the antitrust authority (Alexandridis et al., 2017). Mega-deals thus tend to undergo more pronounced scrutiny and more regulation issues, which means a requirement of far more resources, efforts, and time (Hu et al., 2020). To test whether this leads to a lower likelihood of completion, the completion rate of mega-deals is further analysed in contrast to non–mega-deals. I thus propose the following hypothesis.

H1: Mega-deals have a higher likelihood of being withdrawn.

Most papers indicate that acquisition failure reduces value. I assume that the results are consistent with the majority of the literature. Slusky and Caves (1991) conclude that the merger premium and the scope of managerial behaviour are positively related, and a larger deal would involve more consulting agents, increasing agent costs. Alexandridis et al. (2017) conclude that mega-deals outperform non–mega-deals, especially those announced after 2009. Above all, the results predict that failing a mega-deal will not only induce higher costs, but also forgo the benefits of this so-called smart mega-deal (Alexandridis et al., 2017). I thus propose the second hypothesis.

H2: Successful mega-deals underperform failed ones.

4.3 Data and methodology

4.3.1 Sample selection

The primary data set of acquisition deals is downloaded from the Thomson One Banker SDC database, including past merger information and target and bidder financial statistics. To analyse post-merger performance, firm stock prices and other accounting information are obtained from Compustat (via Wharton Research Data Services). The acquirer nation is specified as the United States only, to control for exchange rate effects, but there is no restriction on the target nation. Thus, I can further examine the difference between domestic deals and cross-border deals. In addition, the full sample period is set from January 1, 1980, and December 31, 2016. Two more years are then added, to obtain firms' long-term stock performance. Following Fuller et al. (2002), my sample meet the following criteria:

1. The acquirer is a U.S. public firm listed on the New York Stock Exchange, American Stock Exchange, or NASDAQ with valid stock and financial data available from the

Center for Research in Security Prices, so that bidder's short- and long-term market performance can be evaluated.

2. The target firm is either a public company or a private company.

3. The deal must have been announced between January 1, 1980, and December 31, 2016. The deal status must be either completed or withdrawn, but the effective or withdrawal date is not restricted.

4. The deal transaction value must be at least $1 million.

These requirements leave me with a preliminary sample of 44,476 deals. After taking into account deals with available market and company fundamental data, the final full sample contains 17,946 acquisitions, with 1,425 failed mergers, and 16,521 successful mergers.

Following Alexandridis, Antypas, and Travlos (2017), I label acquisitions with a transaction value over $500 million as mega-mergers. The full sample contains 1,733 mega-deals and 16,213 non–mega-deals. To evaluate the CEO turnover hypothesis, I further build a subsample in which the same bidder has conducted at least two deals, including both failed and successful mergers. After filtering, the subsample contains 6,520 deals conducted by 146 different acquirers, with 1,186 withdrawals (18.2%) and 5,334 successful takeovers.

To evaluate the deal payment method, I follow Ang and Cheng (2006) and classify acquisitions completed with 100% cash payments as cash deals, denoted by the variable *CASH*; acquisitions transferred with 100% equity are classified as stock deals, denoted by the variable *STOCK*; the remainder of the deals are denoted by the variable *MIX*, which refers to mixed payments. The firms' primary Standard Industrial Classification (SIC) codes are used to evaluate their merger type. Mergers are considered diversified mergers if the target and bidder have different two-digit SIC

codes, and these mergers are denoted by the variable *Diversification* equalling one, and zero otherwise.

Since the acquirer is limited to U.S. firms, deals with U.S. targets are defined as domestic mergers. Deals consisting of non-U.S. targets are defined as cross-border and denoted by the variable *Cross-border*. The variable *Time to Resolution* is the gap between the announcement date and the effective (withdrawal) merger date.

4.3.2 Short-term market analysis

For each subsample, I compute the deals' short- and long-term abnormal returns, *AR*, to study their post-merger market performance. Cumulative abnormal returns (CARs), *CAR*, that is, total abnormal returns, are applied to evaluate short-term performance, written as follows:

$$R_e = \ln \left(\frac{P_j}{P_{j-1}}\right) \tag{4.1}$$

$$AR_e = R_e - R_m \tag{4.2}$$

$$CAR_e = \sum_{k-l}^{k+l} AR_e \tag{4.3}$$

where R_e is the daily return of firm e on day j, and R_m is the value-weighted market return on day j. To obtain the CAR, I use l days of abnormal returns around the deal announcement date k, where $l = 1, 2, or\ 5$ for three-, five-, and 11-day CARs, respectively.

4.3.3 Long-run market analysis

I adopt 12-, 24-, and 36-month BHARs to analyse long-term performance. A reference portfolio is first constructed, and its returns ($R_{ref,T}$) calculated. Then, I have

$$R_{ref,T} = \sum_{i=1}^{n} \frac{\prod_{t=0}^{T}(1+R_{i,t})-1}{n} \tag{4.4}$$

$$BHAR_i = \prod_{t=0}^{T}(1 + R_{i,t}) - R_{ref,T} - 1 \tag{4.5}$$

where $R_{i,t}$ is the return of firm i in month t (the month of the deal announcement), n is the number of firms at $t = 0$, and T is the length of the

holding period. Here, I take $T = 12, 24,$ or 36 for 12-, 24-, or 36-month BHARs, respectively.

4.3.4 Univariate tests

I use a series of univariate tests to find the key differences between successful and failed deals and to determine how these change between mega-deals and non–mega-mergers from the perspective of deal and acquirer firm characteristics. Common variables from previous studies are included. The following variables for deal characteristics are taken into account: the deal transaction value, the payment type, the deal type, whether the deal is a tender offer or a hostile takeover, whether the target is public, whether the deal is cross-border, the time to resolution, and the deal premium. For acquirer firm characteristics, I include the market-to-book ratio, the return on assets, cash flow to total assets, leverage, and the firm's Tobin's Q. The Student *t*-test is used to test for statistical significance, and I additionally conduct bootstrap tests to eliminate sample distribution problems. The results are presented in Section 4.4.

4.3.5 Multivariate analysis

An ordinary least squares (OLS) regression is adopted after obtaining the CARs and BHARs, which are given by

$$CAR_e = \alpha + \gamma \times \text{Mega} + \varphi \times \text{Success} + \sum_{v=1}^{N} \beta_u \times X_v + \varepsilon_u, \ e = 3, 5, 11 \qquad (4.6)$$

$$BHAR_i = \vartheta + \mu \times \text{Mega} + \varphi \times \text{Success} + \sum_{v=1}^{N} \beta_\delta \times X_v + \varepsilon_i, \quad i = 12, 24, 36 \qquad (4.7)$$

where X_v is a control variable, such as a deal characteristic or an acquirer firm characteristic. The deal characteristic variables are the dummy variables *Success, Mega, Stock, Diversification, Tender, Public Target,* and *Cross-border*. For acquirer and target firm characteristics, the market-to-book ratio, the leverage ratio, the ratio of free cash flow to total assets, the return on assets, and Tobin's Q are considered.

I also construct the cross-sectional variable *Mega*Success,* which equals the product of the *Mega* dummy and the *Success* dummy, to further testify the hypotheses, such that I now have

$$CAR_e = \alpha + \tau \times \text{Mega} * \text{Success} + \sum_{v=1}^{N} \beta_u \times X_v + \varepsilon_u, \ \ e = 3, 5, 11 \qquad (4.8)$$

$$BHAR_i = \vartheta + \tau \times \text{Mega} * \text{Success} + \sum_{v=1}^{N} \beta_\delta \times X_v + \varepsilon_i, \quad i = 12, 24, 36 \qquad (4.9)$$

To analyse whether the deal size affects the deal status, I run the following regression:

$$Success = \theta + \omega \times \text{Mega} + \sum_{v=1}^{N} \beta_u \times X_v + \varepsilon_u \qquad (4.10)$$

4.4 Empirical results

4.4.1 The yearly distribution of M&A deal volumes

Figure 4.1 and Table 4.1 report the yearly distributions of the number of mergers of different deal status over the 36-year sample period. Overall, the volume of deals appears to have an upward trend followed by an obvious decline, peaking around 1998 (with 1,261 deals). This phenomenon can be explained by the fifth merger wave from 1993 to 2000. In addition, the percentage of failures was higher during the 1980s, since this was during the fourth takeover wave, which is characterized by hostile takeovers.

As mentioned above, the percentage of failed M&A deals was very high in the 1980s. The highest percentage of failures in the entire 36 years occurred in 1988, and it is more than six times the lowest percentage of failures, in 2004. The annual failure percentage for the 1980s is higher than almost all of the 1990s and 2000s, with only one exception, where the failure percentage in 2000 is 12.7%, which is at an intermediate level compared to those in the 1980s. The annual failure percentage is slightly higher for the 2010s, in which the failure percentages during three years are higher than the lowest level in the 1980s, and all of them are below the average level of the 1980s.

The high failure percentage in the 1980s may be explained by the features of the fourth M&A wave, including its high percentage of hostile takeovers and the popular adoption of leveraged financing. Compared to the previous M&A waves, many more takeovers are hostile in the fourth M&A wave and did not have the approval of the targeted company's management. Mitchell and Mulherin (1996) analyse 1,064 M&As during 1982–1989: 27% of them underwent a friendly takeover and 23% of them became the targets of hostile takeovers, while another 7% underwent reorganization to avoid a hostile takeover. The combination of the high percentage of hostile takeovers and the defence actions adopted by the targeted companies is one of the major causes of the high number of failures in the 1980s. At the same time, while the number of hostile takeovers every year was not always high, deal values were often very large in the fourth M&A wave. The sizes of M&As expanded significantly in the 1980s, and the number of mega-takeovers above $1 billion significantly increased, a transaction value that would have been almost impossible in the previous M&A waves.

The innovation of financing contributed greatly to the prevalence of hostile M&As and mega-M&As in the fourth M&A wave, and leveraged financing became one of the main financing methods. By mortgaging the assets or future cash flow of the merged company, leveraged financing obtains funds from financial institutions during the merger, and thus the funds are mainly from financing and borrowing. M&A deals with leveraged financing comprise about 8% of all M&A deals in the 1980s. The development of leveraged financing goes together with the popularity of junk bonds, high-risk bonds that are usually issued by small companies and which involve higher profits and risk. Although junk bonds already existed before the fourth M&A wave, the initial market for such low-grade bonds was unimaginable before 1977. Junk bonds were regarded as a new type of financing tool, and they became an important financing tool for M&A attackers in the 1980s. The high risks involved in leverage financing and junk bonds also heightened the chance of failure in M&A deals in the 1980s. The most typical case in the fourth M&A wave was the acquisition of RJR

Nabisco by the merger fund KKR in 1986. This merger combines the most notable features of the fourth M&A wave, that is, leveraged mergers, hostile mergers, and mega-deals. At that time, the merger caused a sensation in the United States: the 19th largest company in the United States was being attacked by a small professional organization with only six partners and a small number of employees. That was the general public opinion at the time. The total value of this acquisition was $31 billion, 90% of which came from borrowings. This merger also marked the end of the fourth M&A wave.

Compared to the number of M&A deals in the 1980s, the 1990s witnessed a dramatic increase. As shown in Figure 4.1, the maximum annual volume of deals in the 1990s is more than twice that in the 1980s. After a small decrease in 1991, the number of M&A deals increased continuously for several years, with a slight decrease in 1995, reaching its maximum in 1998. Compared to the lowest level in 1991, the maximal level in 1998 increased by nearly four times. The number of M&A deals in 1998 is more than twice the highest level in the 1980s, nearly 2.5 times the highest level in the 2000s, and almost 3.4 times the highest level in the 2010s. On the other hand, the lowest number of M&A deals in the 1990s is 12 times that in the 1980s, about 1.4 times that in the 2000s, and nearly 1.3 times that in the 2010s. If one considers the difference between the highest number of M&A deals in the 1990s and the lowest level in the 1980s, the ratio of the two levels would soar dramatically, by nearly 50 times.

The sharp increases in the number of M&A deals are due to the rapid development of economies and new technologies. In the 1990s, the United States entered a new economic era centred on the Internet and biotechnology, industries that have rapidly developed. For example, the proportion of the U.S. information technology industry in the economy has increased from 5.5% to 8.2%, which has further upgraded the U.S. economic structure. The contribution of this new economy to the growth of the U.S.

gross domestic product and decline in inflation was very large. Another reason for the large number of M&A deals in the 1990s is the acceleration of the integration process of the global economy. Capitalist society changed from having a single-level leading director, namely, the United States, to a tripartite situation dominated by the United States, Europe, and Japan. Economic strengths changed greatly, and the United States' international status was challenged. With the end of the Cold War and the rapid development of information technology, competition among enterprises further broke through national barriers. In the face of international competition, U.S. companies that were trending in the new economy naturally improved their competitiveness through M&As.

In contrast with the high volume of deals during this period, the failure percentage was quite low during the 1990s. As mentioned above, all the annual failure percentages in the 1990s are lower than in the 1980s, and the average annual failure percentage is lower than in the 1980s and 2010s. Unlike in the fourth M&A wave, hostile M&As no longer dominated the fifth M&A wave. Since the last M&A wave received fierce public criticism, together with entry into the new economic era with more and more detailed divisions of labour and specialization in society, seeking strategic cooperation through M&As has become the original intention of many large companies. Therefore, the fifth M&A wave is characterized by   strong alliances. Hostile M&As account for only 5% of the share. Strategic M&As are also reflected among the spin-offs of large numbers of big companies. In the 1990s, the entire economy was undergoing a strategic reorganization through M&As in response to global competition. Spin-offs were a strategic attempt by large companies to enhance their competitiveness. From January to September 1995 alone, 53 companies in the United States announced business spin-offs, involving tens of billions of dollars and setting a record for business spin-offs in the United States. Second, strategic M&As were also reflected in the complementarity of the two parties of mergers. Even two parties in the same industry can have differences in market, technology, and industry chain links. They can thus

complement each other and enhance their overall competitiveness through synergy obtained in their merger.

Figure 4.1 shows that the number of M&A deals reached a minimum in 2002. Afterwards, it began to increase again, reached a maximum in 2005, and gradually decreased from 2006 on. The fifth M&A wave ended because of the burst of the Internet bubble, which resulted in the decline in the volume of M&A deals. The NASDAQ Index reached a historical high of 5,132.52 in March 10, 2000, and then began to gradually decline. However, after three years, the M&A market became active again in 2003 and peaked in 2006. The total value of domestic M&As in the United States exceeded $1 trillion. The increased confidence of the U.S. business community in the economic recovery prompted the growth of M&As in this period. The economic uncertainty caused by the 911 terrorist attacks gradually subsided. The stock market continued to grow since March 2003, and mergers in the telecommunications industry became active again, as did M&As in the information industry. The software giant Oracle acquired PeopleSoft for US$10.3 billion in 2004. U.S. M&As continued to increase strongly in 2005 and were mainly concentrated in industries such as finance, food, computer and information technology, telecommunications, and transportation. After the global financial crisis broke out in 2007, this wave of M&As, also called the sixth M&A wave, gradually subsided.

The percentage of failed M&As in this period is slightly higher than that in previous five waves. In this M&A wave, the scale of both parties of the merger is larger than in the fifth M&A wave. However, from the perspective of M&A valuation, this time it is more pragmatic; that is, compared to the fifth wave, there is less overvaluation. Moreover, in the fifth M&A wave, the valuation of acquirers was much higher than the valuation of target companies, which is not the situation in this sixth wave. The M&A premium also dropped significantly, indicating that acquirers could obtain more

potential benefits from the transaction and, at the same time, create more value for shareholders. However, in turn, the profits of the shareholders of the target company fell. In addition, the proportion of stocks used as a means of payment dropped significantly. In contrast, the proportion of cash doubled.

The reason for this change is related to the low interest rates and companies' greater cash reserves at the time. The main interest rate on Wall Street in 2003–2007 was 6.14%, whereas it was as high as 7.84% in 1998–1999. In terms of corporate governance structure, institutional investors represented by private equity funds vigorously promoted shareholder activism, which was accompanied by the re-emergence of leveraged M&As. Private equity funds entered a period of steady growth after the fifth M&A subsided, but they also grew rapidly with the advent of the sixth wave. During this sixth M&A wave, private equity funds exhibited explosive growth in terms of quantity and scale. According to Capital IQ statistics, the total value of leveraged buyout transactions from 2005 to 2007 amounted to US$1.6 trillion. From 1984 to 2007, one-third of the total, and the total value accounted for 43%. On the other hand, the fight for control among listed companies was much milder than before. Moreover, the offensive nature of M&A initiators also weakened. The proportion of M&As made by those who participated in at least two M&A transactions within two years was 42.78% in 1993–1999, but this proportion was only 28.12% in 2003–2007, showing that the driving force of managerial overconfidence in merger decisions was weakening. Hostile M&As were greatly reduced and were at their lowest level relative to the fourth and fifth waves. During 2002–2005, the Thomson One Banker SDC database recorded 28 hostile M&As in the United States; in the first three years of the fifth wave (1993–1996), there were 229 hostile M&As, and in the first four years of the fourth M&A wave, there were 217 cases.

4.4.2 Characteristics of deals and firms

Summary statistics comparing the key characteristics of completed and withdrawn deals are recorded in Tables 4.3 and 4.4. Table 4.3 provides the statistics for deal characteristics. The average transaction value of failed deals is $942 million, significantly higher than for completed deals, whose average deal value is $286 million. Regarding the payment method, there were higher fractions (3.5% and 8.5%) of failed deals that appeared to involve only one payment method, either stock and cash, respectively.

Table 4.3 shows that the average valuation of withdrawn deals is much higher than that of completed deals. The difference between these two is $876.431 million, more than three times the average deal value of completed deals, with a significance level of 1%. This result may suggest that M&A deals with a large transaction value have a higher probability of failure. This is also true for mega-M&As, and the gap between the average deal values of withdrawn and completed deals is even larger, with a value of $1.837 billion at a significance level of 1%. However, the ratio between the average values of withdrawn and completed deals in mega-deal sample is not as large as in the full sample. Therefore, although the average merger valuation of withdrawn deals is higher than that of completed deals, the ratio between these two terms is much lower than in the full sample. This result may imply that the effect of deal value on the likelihood of failure in mega-M&As is not as strong as in the full sample. One possible reason is that the deal value of mega-M&As is already very large, and thus the effect of deal value on the failure or success of the deal becomes weaker.

There are also significant differences in the payment methods between withdrawn and completed deals. In the full sample, 17.25% of the deals were paid by equity, 20.49% of the deals were withdrawn, and 16.97% were completed. In contrast, there more deals were paid by cash, 33.63% of the full sample, and 41.47% of the deals failed and

32.96% were successful. Almost half of the deals were paid by both cash and equity. However, the proportion of deals with mixed payments is much higher among completed deals than among withdrawn deals. As shown in Table 4.3, there are significantly positive differences in both the ratio of stock payment methods and the ratio of cash payment methods between withdrawn and completed deals in the full sample. The difference for the latter is much larger, which may be due to the high ratio of all-cash payments in the samples. The difference between the ratio of all-cash payments is still significantly positive between withdrawn and completed mega-deals, although the difference is slightly lower compared to that of the full sample. However, the difference between the ratios of all-stock payments is significantly negative between withdrawn and completed mega-deals. Therefore, while the ratio of all-stock payments is significantly higher for withdrawn deals in the full sample, it is significantly lower for withdrawn deals among the mega-deals. As for the ratio of mixed payments, there exists a significantly difference between withdrawn and completed deals in the full sample, but no significant difference between withdrawn and completed deals among the mega-deals. Based on the above analyses, it seems that, among withdrawn deals in the full sample, both the ratio of all-stock payments and the ratio of all-cash payments are higher, whereas, among withdrawn mega-deals, the ratio of full cash payment deals is higher and the ratio of full stock payments is lower.

A total of 35.08% of the deals in the full sample are across industries, with 30.04% among withdrawn deals and 35.51% among completed deals. There is a significantly difference in the ratio of diversification between withdrawn and completed deals in the full sample, but no significant difference in the ratio of diversification among mega-deals. This means that the ratio of diversification is lower among withdrawn deals only for the full sample, and not for mega-deals. Tender offers account for less than 1/10th of the full sample, and there is a significantly positive difference in their number between withdrawn and completed deals in the full sample. However, this is not true for mega-deals, where no significant difference between the ratios of tender offers is

found. There are significantly positive differences in public target companies between withdrawn and completed deals in both the full sample and among mega-deals, with a much larger difference for the former than for the latter. Cross-border deals account for about 1/10th of the full sample, and there is a significantly negative difference between withdrawn and completed deals in the full sample, but no significant difference among mega-deals. This may be because most mega-deals are cross-border deals. Only 1.21% of the full sample comprises hostile deals; however, there is therefore a significant positive difference between withdrawn and completed mega-deals, which means that hostile takeovers are more likely to be rejected in mega-deals. However, this is not the case for the full sample, where no significant difference exists. The time spent finishing a deal significantly increases the difference between withdrawn and completed deals in both the full sample and mega-deals. Both differences are positive and large, which is not surprising, since the longer a deal lasts, the more likely it is to fail. However, surprisingly, there is no significant difference in the premiums between withdrawn and completed deals in both the full sample and among mega-deals.

In terms of the characteristics of the acquirer and target firms in Tables 4.4 and 4.5 respectively, the market-to-book ratio of neither the acquirer firm nor the target firm leads to a significant difference between withdrawn and completed deals in either the full sample or the mega-deal sample. On the other hand, the ratio of the return on assets and the ratio of cash flow to total assets of the acquirer firm both produce a significantly negative difference between withdrawn and completed deals for the full sample, but no significant difference among mega-deals. However, these significant differences on the full sample are very small. In contrast, the ratio of the return on assets and the ratio of cash flow to total assets of the target firm both produce a significantly positive difference between withdrawn and completed deals for the full sample, but no significant difference among the mega-deals. These significantly positive differences on the full sample are very small, too. The ratio of leverage of

neither the acquirer firm nor the target firm produce a significant difference between withdrawn and completed deals for either the full sample or the mega-deals. The Tobin's Q value for acquirer firms only shows a significantly negative difference between withdrawn and completed deals among the mega-deals, while the Tobin's Q of target firms shows no significant difference between withdrawn and completed deals for either the full sample or the mega-deals.

Figures 4.1 and 4.2 show the industry distributions of the acquirer firms and target firms, respectively. They show that the ratio of mega-deals among withdrawn deals is much higher than among completed deals. The utility, telephone and television transmission, and energy industries have the highest ratios of mega-deals in both the withdrawn deals and completed deals. In contrast, the financial and business equipment industries have the lowest ratio of mega-deals among both withdrawn and completed deals. From the perspective of acquirer firms, the gap between the ratios of mega-deals in withdrawn and completed deals is the largest for the utility industry, and second largest for the energy industry, while it is the smallest for the healthcare industry and second smallest for the financial industry. However, from the perspective of target firms, the difference between the ratios of mega-deals among withdrawn and completed deals is the largest for the telephone and television transmission industry, and second largest for the energy industry, while it is the smallest for the healthcare industry and second smallest for the business equipment industry. Based on the above analyses, mega-deals account for a higher ratio among withdrawn deals than among completed deals, especially for the utility industry, the telephone and television transmission industry, and the energy industry.

In summary, the characteristics of deals lead to more significant differences between withdrawn and completed deals, namely, the status of deals. The deal value, all-stock payments, all-cash payments, tender offers, whether the target company is publicly

owned, and the time needed to finish the deal all show positive differences between withdrawn and completed deals in the full sample. In other words, these deal characteristics result in a higher chance of withdrawn deals. On the other hand, the characteristics of deals such as mixed payments, the ratio of diversification, and whether the deal is cross-border all show significantly negative differences between withdrawn and completed deals, that is, they can help reduce the chances of withdrawal. As for the characteristics of acquirer and target firms, only the ratio of the return on assets and the ratio of cash flow to total assets of the acquirer firm lead to a significantly negative difference between withdrawn and completed deals, while these two characteristics among target firms result in significantly positive differences. All the other characteristics of acquirer and target firms fail to show significant differences between withdrawn and completed deals in the full sample.

In terms of the mega-deals, deal characteristics such as deal value, all-cash payments, whether the target company is publicly owned, and the time needed to finish the deal all show positive differences between withdrawn and completed deals, the same as in the full sample. However, the all-stock payment method shows a significantly negative difference between withdrawn and completed mega-deals, which is to the contrary of the result in the full sample. On the other hand, hostile takeovers show a significantly positive difference between withdrawn and completed mega-deals, which may suggest that hostile actions tend to lead to failed mega-deals. Mixed payments, diversification, tender offers, and whether the deal is cross-border do show significant differences in the case of mega-deals. As for the characteristics of acquirer and target firms, only the Tobin's Q of acquirer firms produces a significantly negative difference between withdrawn and completed mega-deals. All the other characteristics of acquirer and target firms fail to produce a significant difference between withdrawn and completed mega-deals.

4.4.3 Post-merger market performance

Table 4.6 presents the descriptive results for short-term post-merger market performance. Three-, five-, and 11-day CARs are used to evaluate short-run post-acquisition performance. Table 4.6 shows that the mean three-day CAR for the full sample is 0.101, while it is 0.848 for withdrawn deals and 1.025 for completed deals. The differences between the mean and median of all three cases are very large, which suggests that the three-day CARs of the full sample, withdrawn deals, and completed deals all follow a (negatively) skewed distribution. Among mega-deals, the average three-day CAR is -0.236 for withdrawn deals and -0.370 for completed deals, both negative. However, the differences between the mean and median in these two cases are not as large as in the full sample cases. Contrary to the full sample case, the median is larger than the mean in mega-deals for both withdrawn and completed deals, which suggests a slightly positively skewed distribution for the three-day CAR for the mega-deals. The average three-day CAR of the non–mega-deals is 1.1197 for withdrawn deals and 1.151 for completed deals, both positive and higher than those of the full sample. The differences between the mean and median in the non–mega-deals are very large for both cases, and the three-day CAR has a negatively skewed distribution, the same as in the full sample. However, the average three-day CAR has no significant effect on the difference between withdrawn and completed deals.

The average five-day CAR of the full sample decreases greatly compared to the average three-day CAR, which is only 0.012, while the median is the same as that of the three-day CAR. This result implies that the coefficient of skewness decreases in the five-day CAR. However, the average five-day CARs for both withdrawn and completed deals are higher than those of the three-day CARs, while their medians do not change much, which suggests a much higher asymmetry coefficient. The average five-day CAR in the mega-deals is still negative for both withdrawn and completed deals, while it increases slightly for withdrawn deals and increases for completed deals. The median of the five-day CAR of withdrawn mega-deals is positive, which implies a much higher asymmetry

coefficient. On the contrary, the median of the five-day CAR in completed mega-deals further decreases, suggesting a lower asymmetry coefficient.

The changes of the mean and median of the five-day CARs in the non–mega-deals still follow those of the full sample, which is similar to the changes of the three-day CARs. The average five-day CAR does not have a significant effect on the difference between withdrawn and completed deals either. The average and median 11-day CARs for the full sample do not change much. However, the average 11-day CAR of withdrawn deals decreases by a third, while there is small increase in the average 11-day CAR of completed deals. The mega-deals' average 11-day CAR among completed deals becomes positive, while that of withdrawn deals decreases further. However, the median in both cases is still negative, which suggests a negatively skewed distribution in the former case. The 11-day CAR has a significantly negative effect on the difference between withdrawn and completed deals in the full sample. However, no significant effect exists for the mega-deals.

Table 4.7 presents the descriptive results for long-term post-merger market performance, where 12-, 24-, and 36-month BHARs are used to proxy for long-run acquisition performance. Both the mean and median BHARs are negative in all the cases, which is expected. The corresponding values of the 24-month BHAR are much lower than those of the 12-month BHAR, and the corresponding values of the 36-month BHAR are much lower than those of the 24-month BHAR. Furthermore, the median is smaller than the mean in almost all the cases, which implies a negatively skewed distribution. For the 12-month BHAR, the mean of the mega-deals is the smallest for both withdrawn and completed deals, and the mean of the mega-deals for withdrawals is smaller than for all the other six cases, while the mean of the full sample is the largest in all the cases. However, the 12-month BHAR has no significant effect on the difference between withdrawn and completed deals. Compared to the

values of the 12-month BHAR, the values of 24-month BHAR decrease by a large amount in all seven cases. This is especially true among for the cases in the completed deals, which have values of less than -1 for the 12-month BHAR and less than -10 for the 24-month BHAR. The median of the 24-month BHAR also declines by even larger amounts, which suggests that the decreases in the mean 24-month BHAR are not caused by particular deals with a very low BHAR, but, rather, by the features of most deals. The 24-month BHAR has a significantly negative effect on the difference between withdrawn and completed mega-deals, but no significant effect on this difference in the full sample. In contrast, the 36-month BHAR has a significantly negative effect on the difference between withdrawn and completed deals for both the mega-deals and the full sample. The mean and the median of the 36-month BHAR decrease further by large amounts.

Table 4.8 compares the post-acquisition bidder performance of mega-deals and non–mega-deals. I use three-, five-, and 11-day CARs to evaluate short-run acquisition performance, which is the same as in Table 4.6. The mean three-day CAR has significantly positive effects on the difference between non–mega-deals and mega-deals in both the withdrawn deals and completed deals. This finding implies that the three-day CAR of non–mega-deals tends to be higher than that of mega-deals. The mean three-day CAR of mega-deals is negative in both cases, as is the median, while the mean and median of the three-day CAR of non–mega-deals are both positive, which further verifies that non–mega-deals tend to have a higher three-day CAR than mega-deals. However, the three-day CAR has no significant effects on the difference between withdrawn and completed in both thee mega-deals and non–mega-deals cases, which is consistent with the results in Table 4.6.

The mean five-day CAR also has significantly positive effects on the difference between non–mega-deals and mega-deals in both the withdrawn deals and completed deals

cases, and the differences in both cases increase further. The mean five-day CAR of non–mega-deals further increases compared to the three-day CAR in both the withdrawn and completed deals cases. In contrast, the mean five-day CAR of mega-deals decreases slightly in the withdrawn deals case and increases slightly in the completed deals case. The mean five-day CARs of mega-deals in both cases are still negative, while the median in the withdrawn deals becomes positive, which suggests that the five-day CAR of mega-deals in this case follows a positively skewed distribution with a high asymmetry coefficient.

The mean 11-day CAR still has a significantly positive effect on the difference between non–mega-deals and mega-deals in both the withdrawn deals and the completed deals cases. However, the differences in both cases decrease and become the lowest among the three types (three day, five day, and 11 day) of CARs. This is because, for the case of withdrawn deals, the mean 11-day CAR of non–mega-deals decreases by a third, and for the case of completed deals, the mean 11-day CAR of mega-deals double that of 5-day CAR and becomes positive. Therefore, although the mean 11-day CAR of mega-deals further decreases in the withdrawn deals case and the mean 11-day CAR of non–mega-deals further increases in the completed deals case, the differences in the 11-day CARs between non–mega-deals and mega-deals decline in both cases.

Neither of the three types of CARs has a significant effect on the differences between withdrawn and completed deals in both the mega-deals case and the non–mega-deals case. For the three- and five-day CARs, this result is consistent with Table 4.6. The 11-day CAR has a significantly negative effect on the difference between withdrawn and completed deals in the full sample, and no effect in the mega-deals case, as shown in Table 4.6. However, one can see that a significant effect in the full sample does not mean a significant effects in either the mega-deals or the non–mega-deals case.

In Table 4.8, 12-, 24-, and 36-month BHARs are used to proxy for long-run acquisition performance, similar to Table 4.7. Both the mean and median of the BHARs are negative in all the cases in Table 4.7. Combining the results in Table 4.7 shows that the values of all the types of BHARs are negative in the full sample, the mega-deals, and the non–mega-deals for both the withdrawn deals case and the completed deals case. The 12-month BHAR has no significant effects on the differences between non–mega-deals and mega-deals for both the withdrawn deals and completed deals cases, as well as the differences between withdrawn and completed deals in both the mega-deals case and the non–mega-deals case. The mean 24-month BHAR has significantly negative effects on the difference between the non–mega-deals case and the mega-deals case in completed deals, and on the difference in mega-deals between withdrawn and completed deals. However, the mean 24-month BHAR does not have a significant effect on either the difference between the non–mega-deals case and the mega-deals case in withdrawn deals, or on the difference of non–mega-deals between withdrawn deals and completed deals. In contrast, only the mean 36-month BHAR has no significant effects on the difference between non–mega-deals and mega-deals in the withdrawn deals case, but it has significantly negative effects on the other three types of differences.

In summary, the mean values of the three types of CARs (three day, five day, and 11 day) all have significantly positive effects on the differences between non–mega-deals and mega-deals within the same kind of deal (withdrawn or completed). However, they seldom have significant effects on the differences between withdrawn and completed deals. In contrast, the mean 36-month BHAR has significant effects on the differences between withdrawn and completed deals in all three cases (i.e. for the full sample, mega-deals, and non–mega-deals), and the mean 24-month BHAR has a significantly negative effect on the difference between withdrawn and completed deals in mega-deals. However, only the mean 36-month BHAR and the mean 24-month BHAR have significant effects on the differences between non–mega-deals and mega-

deals in the completed deals case, and no type of BHAR has a significant effects on the differences between non–mega-deals and mega-deals in the withdrawn deals case. Based on the above analyses, the mean 24-month and 36-month BHARs of mega-deals in withdrawn and completed deals do have significant differences, and the mean 36-month BHARs of non–mega-deals in withdrawn deals and in completed deals do have significant differences.

4.4.4 OLS regressions of acquirer stock performance

Table 4.9 presents the OLS regression estimates of acquirers value-related measures on the measure of experience and other deal, firm, and market characteristics. The dependent variable is the acquirer's short-run cumulative abnormal stock returns. The models use three-, five-, and 11-day CARs as the dependent variable, respectively. The variable *Successful Deal* plays a significantly negative role in the three- and five-day CARs, while it does not have a significant effect on any of the three-, five-, and 11-day CARs when acquirer firm characteristics are included. The *Mega * Success* interaction indicator has a negative effect on the three-, five, and 11-day CARs at the 10% significance level. Tender offers and hostile deals are two other important indicators of short-term performance, both of which have effects at the 10% significance level. Tender offers play a positive role, while hostile deals play negative role in post-merger market performance. In addition, public targets, diversification, cross-border deals, and stock payments all have a negative effect on the three-, five-, and 11-day CARs at the 10% significance level. As for acquirer firm characteristics, the return to total assets has negative effects on the three-, five-, and 11-day CARs at a significance level of 1%; the acquirer leverage ratio has a positive effect on the five- and 11-day CARs at a significance level of 10%; and Tobin's Q has a negative effect on the five- and 11-day CARs at a significance level of 10%.

Table 4.10 presents the OLS regression estimates of acquirer value-related measures on the measure of experience and other deal, firm, and market characteristics. The model's dependent variable is the acquirer's long-run buy-and-hold abnormal market

returns. The models all use the 12-, 24-, and 36-month BHAR as the dependent variable. Unlike in the short-term performance results, the *Mega * Success* interaction indicator has a positive effect on long-term performance, with significant coefficients of 2.539 and 3.606 for the 24-month BHAR, respectively. The effects on the 36-month BHAR are even larger and more pronounced, with significant coefficients of 6.145 and 5.924 at a significance level of 10%, respectively. Furthermore, the *Success* dummy also has significant and positive effects on the 12- and 24-month BHARs. In addition, public targets play a significantly role in all the 12-, 24-, and 36-month BHARs, while they have a significantly negative effect on short-term performance in all cases. Diversification, hostile attitude, and stock payment methods all have significant and negative effects on long-term performance, the same as their roles in short-term performance. The time needed to complete the deal also plays a significantly positive role on 12- and 24-month BHARs, but its effect is weakened over time and disappears for the 36-month BHAR. As for acquirer firm characteristics, leverage and free cash to total assets both have significant and positive effects, while acquirer firms' return on total assets and Tobin's Q both have significant and negative effects on long-term performance.

4.5 Discussions

4.5.1 Are mega-deals more likely to be withdrawn?

Table 4.11 reports the regression results for the completion rates. Two models are shown, one without acquirer firm characteristics and the other with. The coefficient on the *Mega* dummy is negative in both models, suggesting that mega-deals decrease the probability of deal completion. In the first model, the magnitude of the coefficient on the *Mega* dummy indicates that mega-deals have a 4.4% lower likelihood of completion. When acquirer firm characteristics are included, this magnitude reduces to 3.5%. Our results are consistent with our first hypothesis (H1), that is, mega-deals have a lower likelihood of completion. This can be explained by the more serious

agency problems and greater scrutiny and media attention of mega-deals (Alexandridis et al., 2017).

In terms of the control variables, the most important indicator is the hostile offer indicator (*Hostile*), with a significant and negative coefficient of -0.551 at the 10% significance level. This result indicates that the probability of deal completion drops when the deal attitude is hostile, which is expected, because the opposition from the target's management in hostile deals increases the difficulty of acquisition. Public targets and the time needed to complete the deal (*Time To Resolution*) also have a negative effect on the probability of completing deals, which in not surprising either. In contrast, tender offers play a positive role in the likelihood of completing deals, at the 10% significance level, which may be because the management boards of target firms are more likely to accept deals with a tender offer, thus increasing the likelihood of completing the deal.

4.5.2 Do successful deals outperform failed ones?

For mega-deals, whether the deal is withdrawn or completed has no significant effects on the mean value of CARs (either three, five, or 11 day), namely, on short-term post-merger market performance. However, for the full sample, the mean 11-day CAR is significantly lower in withdrawn deals than in completed deals. In other words, unsuccessful deals underperform the merger market in the short term; however, this is not true if only mega-deals are considered. This means H1 is not true for the short term, at least for the mega-deals sample. This conclusion is also supported by the results of the regression analyses, since neither the *Successful Deal* indicator nor the *Mega * Success* interaction indicator has a positive effect on short-term performance. Both of these have a significantly negative effect on short-term performance, which suggests that successful deals underperform failed ones around deal announcements. Since a deal's short-term performance reflects the stock market's response to it, this may indicate that deals are more likely to complete when the market's expectation of them is low, and successful deals thus have a lower CAR around their announcement.

As for long-term post-merger market performance, the results show that, for mega-deals, the 24- and 36-month BHARs are significantly lower in withdrawn deals compared to completed deals, whereas, for the full sample, only the 36-month BHAR is significantly lower in withdrawn deals. Therefore, successful deals significantly outperform the merger market in the long run, especially among mega-deals. Thus, H1 is true for long-term performance. This conclusion is strongly supported by the regression results in Table 4.10, which show that both the *Successful Deal* indicator and the *Mega * Success* interaction indicator have a significantly positive effect on the 36-month BHAR.

4.6 Conclusions

In this paper, I analyse the correlation between deal status and deal size by analysing the performance of withdrawn and completed deals and their relationships with mega-deals and payment methods. The sample includes 17,946 acquisitions, downloaded from the Thomson One Banker SDC database. The deal characteristics and acquirer and target firm characteristics among withdrawn and completed deals are analysed, as well as their relationships with short- and long-run post-merger stock market performance. Our results show that mega-deals have a lower likelihood of completion than non–mega-deals. Furthermore, successful deals positively affect long-run post-merger performance, especially for mega-deals. However, successful deals underperform failed deals in the short run, which may indicate that deals with a lower market expectation are more likely to successfully complete.

It should be noted that hostile and the all-stock payment method have distinctly negative influences on both short- and long-term post-merger stock market performance. These results are also supported by the relationships between the characteristics of the sample. The mean ratio of hostile takeovers is significantly higher

in withdrawn mega-deals, which may suggest that hostile takeovers have a higher chance of being rejected in mega-deals than in the non–mega-deals. In addition, the mean ratio of all-stock payments is significantly lower in withdrawn mega-deals; however, it is significantly higher in withdrawn deals for the full sample.

Figure 4.1. Year Distribution

The figure presents year distribution of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Volume indicates the number of deals for the certain year (referring to y-axis on the left), and value indicates the sum of deal value for the certain year (referring to y-axis on the left).

Figure 4.2.1 Industry Distribution of Acquirer Firms

The figure presents year distribution of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Each unique firm is categorized into 12 Fama and French industry according to their Standard Industry Classification (SIC) code.

Each unique firm is categorized into 12 Fama and French industry according to their Standard Industry Classification (SIC) code according to their website. The first category is consumer non-durable items, including food, tobacco, textiles, apparel, leather, toys, noted as 'NoDur'. The second category is consumer durable products, such as cars, furniture, and household appliances, noted as 'Durbl'. The third category, denoted as 'Manuf', is, includes machinery, planes, trucks, paper, printing and other manufacturing products. The fourth category covers oil, gas and coal extraction and products, labeled 'Enrgy'. The fifth category includes chemicals and allied products, noted as 'Chems'. The sixth category labelled 'BusEq', constructs business equipments, for example computer, software, and electronic equipment. The seventh group is telephone and television transmission industry, denoted as 'Telcm'. The eighth, 'Utils' stands for utilities. The ninth category 'Shops' represents wholesale, retail, and other services such as laundries, repair shops, etc. The tenth category 'Hlth' describes healthcare department, including medical equipment, medicine and drugs. The label 'Money' represents financial department, and the last category 'Other' includes other industries not described in the previous eleven groups, for instance mines, entertainment, construction, transportation, hotels, etc.

Industry Distribution of Acquirer Firms
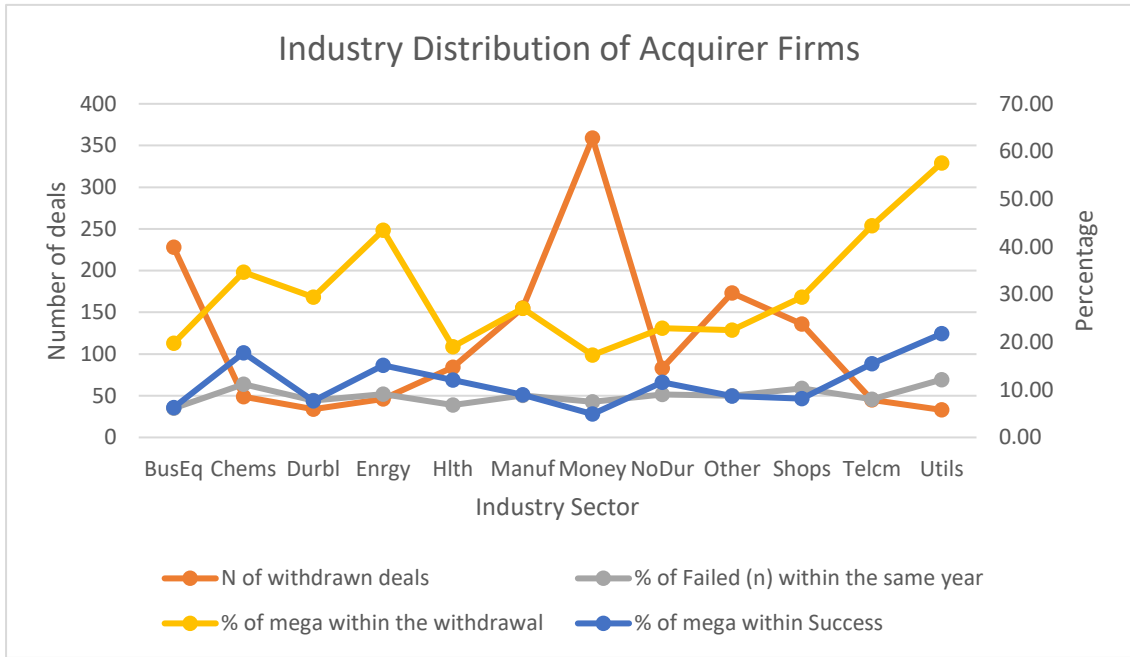
Figure 4.2.2. Industry Distribution of Target Firms

Industry Distribution of Target Firms

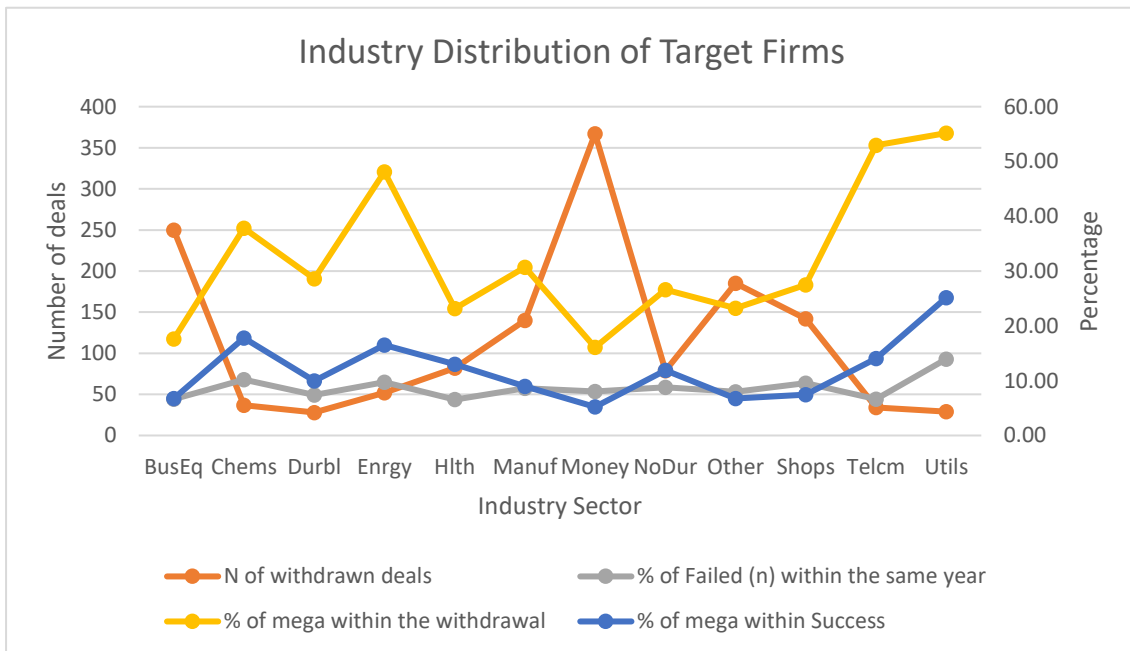**Table 4.1 Full Sample Year Descriptive Statistics**

The table presents year descriptive statistics of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Yearly number of deals, and their mean, median, and standard deviation are listed in the table.

| Year | Number | | | | | | | Mean | | | | | | | | |
| | All | Success | | | Withdrawn | | | All | | | Success | | | Withdrawn | | |
			mega	Nonmega		mega	nonmega		mega	nonmega		mega	nonmega		mega	nonmega
1980	31	26	2	24	5	1	4	503.71	2887.38	248.32	338.90	1839.86	213.82	1360.74	4982.40	455.33
1981	204	177	6	171	27	4	23	344.77	5482.47	79.94	186.94	3659.66	65.09	1379.46	8216.68	190.38
1982	267	229	3	226	38	4	34	107.32	2208.30	50.76	85.41	3066.85	45.84	239.34	1564.39	83.45
1983	371	339	4	335	32	2	30	137.84	4494.20	66.23	70.94	1254.20	56.81	846.59	10974.21	171.42
1984	595	535	15	520	60	8	52	129.29	1916.86	57.41	98.41	1633.44	54.13	404.58	2448.29	90.16
1985	239	203	23	180	36	10	26	414.57	2157.80	135.31	364.55	2193.78	130.82	696.61	2075.05	166.44
1986	321	291	28	263	30	7	23	278.04	1697.53	104.33	211.99	1275.64	98.75	918.73	3385.09	168.10
1987	370	319	22	297	51	13	38	343.30	2661.89	101.06	251.20	2315.10	98.32	919.39	3248.76	122.51
1988	342	278	27	251	64	15	49	340.98	2108.77	93.49	232.52	1620.99	83.16	812.12	2986.78	146.41
1989	416	364	23	341	52	10	42	271.19	2606.64	69.96	197.24	2078.95	70.32	788.86	3820.34	67.08
1990	380	347	8	339	33	3	30	116.29	2623.52	41.55	87.64	2142.77	39.14	417.49	3905.50	68.69
1991	316	277	7	270	39	3	36	78.43	1042.61	46.92	70.07	1021.61	45.40	137.78	1091.60	58.30

Year																
1992	465	427	8	419	38	5	33	117.58	2519.34	48.50	108.29	3232.81	48.63	222.00	1377.78	46.88
1993	578	533	11	522	45	7	38	103.34	1749.16	50.44	67.57	956.29	48.85	526.97	2995.10	72.32
1994	819	758	28	730	61	13	48	138.99	1807.81	51.04	104.65	1575.12	48.25	565.71	2308.98	93.57
1995	799	750	35	715	49	5	44	204.64	3043.60	55.03	195.90	3138.46	51.86	338.48	2379.62	106.53
1996	994	934	54	880	60	20	40	205.82	2084.95	54.67	142.53	1604.38	52.83	1191.03	3382.48	95.30
1997	1202	1129	74	1055	73	13	60	228.93	2294.62	67.75	160.06	1496.61	66.31	1294.13	6837.13	93.15
1998	1261	1197	84	1113	64	9	55	235.84	2446.05	59.86	229.02	2479.35	59.18	363.51	2135.28	73.58
1999	1025	957	85	872	68	22	46	547.59	4607.19	74.42	455.81	4377.49	73.53	1839.36	5494.66	91.17
2000	872	761	78	683	111	19	92	410.97	3082.81	76.56	356.56	2818.21	75.43	784.05	4169.09	84.96
2001	467	432	40	392	35	5	30	298.13	2397.75	74.24	245.67	1983.83	68.31	945.64	5709.09	151.73
2002	395	374	22	352	21	6	15	354.86	4163.62	64.27	351.47	4961.69	63.33	415.25	1237.37	86.40
2003	443	428	40	388	15	4	11	264.53	2030.82	69.75	255.57	2067.99	68.72	520.29	1659.13	106.16
2004	491	476	58	418	15	5	10	511.55	3448.33	79.27	470.73	3298.81	78.32	1806.96	5182.85	119.02
2005	516	495	53	442	21	5	16	430.35	3258.74	72.17	410.19	3232.15	71.81	905.52	3540.59	82.06
2006	497	477	65	412	20	11	9	490.28	2801.62	73.03	411.43	2568.64	71.09	2370.88	4178.32	161.79
2007	477	455	74	381	22	8	14	394.31	1950.66	71.22	364.61	1879.13	70.45	1008.57	2612.35	92.13
2008	347	322	33	289	25	11	14	539.06	3795.38	66.19	406.37	3401.21	64.40	2248.08	4977.90	103.22
2009	225	211	32	179	14	5	9	556.62	3012.35	73.31	524.20	3062.70	70.38	1045.23	2690.08	131.42
2010	300	275	43	232	25	7	18	522.13	2726.50	81.26	468.38	2556.65	81.33	1113.41	3769.84	80.36
2011	289	265	35	230	24	7	17	454.21	2592.85	90.55	407.61	2533.79	84.06	968.68	2888.15	178.31
2012	351	322	57	265	29	13	16	334.14	1395.03	69.86	294.22	1346.27	67.93	777.40	1608.80	101.88
2013	307	287	56	231	20	11	9	610.27	2532.69	73.59	525.79	2389.24	74.05	1822.49	3262.95	61.92
2014	372	332	51	281	40	18	22	692.40	3378.54	80.70	336.82	1762.93	77.99	3643.68	7956.12	115.33

2015	353	312	59	253	41	25	16	1305.76	5209.81	86.66	769.61	3711.96	83.45	5385.78	8744.74	137.41
2016	249	227	47	180	22	9	13	1018.79	4238.88	84.47	578.20	2472.48	83.58	5564.97	13463.44	96.79
Total	17946	16521	1390	15131	1425	343	1082	341.22	2892.83	68.48	271.63	2510.53	65.95	1148.06	4442.09	103.84

Table 4.2 Full Sample Year Descriptive Statistics (continued)

The table presents year descriptive statistics of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Yearly number of deals, and their mean, median, and standard deviation are listed in the table.

Year	Median									Standard Deviation								
	All			Success			Withdrawn			All			Success			Withdrawn		
		mega	non-mega		mega	non-mega		mega	non-mega		mega	non-mega		mega	non-mega		mega	non-mega
1980	172.36	1957.46	134.17	107.06	1839.86	75.14	426.10	4982.40	422.60	957.89	1818.15	275.09	517.19	166.31	278.06	2028.57	.	147.11
1981	34.79	1189.48	31.55	30.27	1096.43	27.92	79.80	6799.43	57.36	1897.42	7066.66	141.01	1219.38	6081.42	105.02	4094.26	8459.35	273.39
1982	21.23	1440.01	20.26	19.86	1440.01	19.70	38.14	1555.61	35.67	461.53	1952.63	89.05	446.82	2918.07	80.79	529.39	811.71	128.32
1983	18.48	1483.62	18.05	16.52	1300.08	16.06	62.71	10974.21	57.36	1069.55	7770.22	124.46	170.16	357.18	105.77	3573.56	13248.67	230.41
1984	17.23	1476.10	15.62	15.50	1451.00	14.76	54.10	1889.40	47.27	445.41	1267.34	103.01	309.32	823.18	100.50	1022.58	1788.22	121.70
1985	82.56	1373.56	61.85	75.47	969.79	61.45	206.11	1706.22	121.32	1010.85	1944.35	169.23	983.66	2168.93	169.90	1125.91	1389.83	164.33
1986	69.28	1096.74	53.64	63.53	1026.34	53.01	208.69	3595.54	118.65	671.60	1335.15	126.64	427.32	720.94	121.53	1637.88	1899.89	165.04
1987	47.77	1512.46	39.74	43.12	1368.74	36.27	128.66	1642.49	57.57	1170.21	2925.16	140.25	852.65	2437.31	139.78	2256.03	3640.62	143.95
1988	51.43	1256.03	41.32	42.46	964.10	33.05	137.50	2055.92	92.22	1231.47	2973.75	128.40	675.25	1581.29	120.65	2434.38	4468.71	153.22
1989	27.76	1171.67	23.09	25.59	1034.28	20.86	44.02	2048.84	30.79	1064.43	2903.67	113.19	677.09	1845.98	115.30	2375.74	4393.16	95.46
1990	12.60	1849.07	12.26	12.26	1379.45	12.26	14.71	2560.25	12.87	598.46	2492.61	80.72	462.97	2322.00	73.65	1349.76	2967.33	136.50
1991	13.05	1001.99	12.56	11.86	794.71	11.51	44.95	1053.17	41.99	206.44	404.19	87.85	191.03	491.00	88.85	289.98	82.34	80.19

Year																		
1992	15.66	981.49	14.72	15.66	955.36	15.07	18.15	1407.92	11.60	806.09	4294.83	81.60	826.11	5456.90	80.23	528.08	760.68	98.82
1993	16.99	1034.80	15.39	15.48	785.08	15.27	44.52	1914.55	30.73	537.10	2567.07	85.67	161.01	359.86	83.41	1808.47	3935.96	111.25
1994	16.76	1478.79	14.92	15.60	1127.50	14.63	84.28	1818.98	42.25	524.16	1574.31	83.36	399.85	1407.67	79.95	1236.32	1845.14	117.40
1995	20.22	1905.86	18.12	19.12	1771.74	16.51	54.54	2310.56	43.15	1034.73	3611.21	92.00	1045.70	3818.06	87.69	846.96	1615.07	136.44
1996	24.43	1084.61	20.49	23.15	965.67	20.24	80.63	2300.84	43.18	819.04	2270.92	89.39	539.24	1638.23	86.48	2375.21	3146.28	133.92
1997	25.90	1203.55	21.65	23.60	1063.22	20.98	73.97	2293.36	42.86	1194.19	3888.49	104.55	477.35	1194.31	104.17	4358.13	8567.63	108.86
1998	27.56	1118.00	23.85	26.69	1104.80	23.39	57.40	1507.41	40.92	991.24	2833.65	86.94	994.07	2936.92	87.22	934.94	1652.32	80.69
1999	35.78	1587.28	29.65	33.74	1642.87	28.81	134.59	1341.58	46.50	4093.94	11968.36	104.45	3724.89	11862.39	104.22	7507.91	12614.51	108.59
2000	36.58	1194.69	27.00	35.00	1151.16	26.22	53.28	1390.00	30.50	2034.42	5416.79	107.92	1397.17	3510.88	107.13	4373.11	10109.93	113.86
2001	39.40	1691.65	32.59	35.81	1657.21	29.31	187.49	3913.95	153.27	1070.24	2654.47	99.87	802.09	1898.70	94.68	2660.27	5190.34	131.24
2002	35.03	1214.99	30.82	34.70	1214.99	30.94	78.67	1232.21	28.90	3027.15	10836.51	85.58	3107.84	12156.53	83.74	620.47	601.83	122.80
2003	38.79	1305.19	29.98	38.37	1225.34	29.33	94.22	1655.89	87.29	1012.09	2628.13	91.57	1017.14	2743.78	91.23	843.75	964.54	100.75
2004	46.05	1607.37	37.60	46.05	1636.17	37.13	230.24	516.14	65.25	2508.47	6293.92	95.84	2349.86	6056.56	94.74	5570.72	9338.41	134.51
2005	44.66	1211.09	34.26	44.66	1205.73	34.26	66.99	2947.35	33.50	2625.84	7284.16	91.58	2647.50	7578.11	91.20	2042.23	3069.33	104.38
2006	43.60	1054.20	34.67	43.34	963.48	33.94	838.26	1594.71	122.01	2292.18	5320.64	91.61	2147.69	5364.91	89.65	4209.99	5067.05	136.80
2007	47.70	1047.30	32.80	46.89	982.22	31.72	182.80	1232.50	45.00	1069.94	1930.66	89.12	998.45	1838.96	89.04	1995.45	2703.78	92.08
2008	38.92	1425.81	26.50	34.36	1283.90	24.43	206.18	1607.34	90.36	2800.39	7115.23	84.25	2094.79	5800.73	84.76	7147.59	10390.77	64.52
2009	51.77	821.80	32.87	46.02	816.96	32.87	213.21	1979.72	131.49	3765.10	8985.64	94.59	3848.67	9615.14	92.53	2171.25	3167.25	121.05
2010	61.01	934.84	34.93	56.87	860.11	34.77	138.99	3126.67	60.07	1812.15	3747.12	96.68	1712.18	3712.02	98.68	2654.44	4091.08	67.71
2011	71.62	1008.94	47.74	59.68	825.52	43.77	238.72	3302.28	196.98	1637.76	3647.09	98.21	1632.19	3906.87	94.49	1645.18	2067.77	108.37
2012	56.02	780.74	38.57	50.94	805.56	37.53	234.22	772.47	83.47	834.56	1441.62	83.71	704.08	1200.04	83.19	1673.64	2273.50	88.56
2013	60.45	893.44	32.61	54.86	866.82	32.23	407.73	1304.40	67.08	2330.71	4512.05	87.88	2246.88	4671.85	89.09	3136.80	3690.67	48.58
2014	75.97	753.37	46.18	68.01	753.37	45.20	269.11	753.37	88.77	4958.51	11185.90	81.92	1393.52	3220.06	79.71	14401.37	20975.79	102.12

2015	93.28	1433.32	53.38	74.62	1407.40	51.93	746.24	1478.64	115.02	6718.39	13082.62	90.76	3262.80	6796.29	88.48	17179.27	21488.48	112.73
2016	75.72	1000.50	44.31	73.85	930.51	44.31	195.79	1107.75	73.85	5129.00	10245.42	91.93	2072.72	4055.94	91.91	15513.98	22649.67	95.10
Total	32.23	1188.12	26.09	29.87	1094.40	25.00	94.22	1594.71	47.79	2184.93	6492.73	100.93	1649.29	5174.03	97.86	5281.61	10087.73	131.99

Table 4.3. Summary Statistics of deal characteristics

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Deal characteristics includes deal value ($mil), paid by fully stock or fully cash or mixed payment, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Cross-border* takes the value of one if the deal's acquirer and target are from different countries, otherwise equals zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full Sample	Failed			Completed			Differences (1)-(4)	Differences (2)-(5)
			All (1)	Mega (2)	Non-mega (3)	All (4)	Mega (5)	Non-mega (6)		
					Deal Characteristics					
Deal Value($mil)	*mean*	341.22	1,148.06	4385.71	97.93	271.63	2,548.47	65.75	876.431***	1837.24***
	median	32.23	94.22	1531.60	47.64	29.87	1,115.29	25.04		
	n	17,946	1,425	349	1,076	16,521	1,370	15,151		
All Stock %	*mean*	17.25	20.49	15.19	22.21	16.97	20.00	16.70	3.519***	-4.814**

	n	3,096	292	53	239	2,804	274	2,530		
All Cash %	mean	33.63	41.47	45.27	40.24	32.96	37.52	32.55	8.516***	7.754***
	n	6,036	591	158	433	5,445	514	4,931		
Mixed %	mean	49.11	38.04	39.54	37.55	50.07	42.48	50.76	-12.035***	-2.940
	n	8,814	542	27	60	8,272	80	438		
Diversification %	mean	35.08	30.04	24.36	31.88	35.51	27.01	36.28	-5.477***	-2.65
	n	6,295	428	85	343	5,867	370	5,497		
Tender %	mean	8.32	12.00	19.77	9.48	8.01	21.24	6.81	3.992***	-1.470
	n	1,494	171	69	102	1,323	291	1,032		
Target Public %	Mean	45.00	79.93	96.28	31.88	41.98	84.38	38.15	37.947***	11.896***
	n	8,075	1,139	336	803	6,936	1,156	5,780		
Cross Border %	Mean	10.60	6.32	8.88	5.48	10.97	10.07	11.05	-4.652***	-1.190
	n	1,902	90	31	59	1,812	138	1,674		
Hostile %	Mean	1.21	10.11	19.20	7.16	0.44	2.12	0.29	9.663	17.081***
	n	217	144	67	77	73	29	44		
Time to Resolution	Mean	120.87	320.64	373.31	303.46	103.81	188.59	96.14	216.832***	184.724***
	n	17,946	1,425	141	1,064	16,521	15,151	1,370		

Table 4.4. Summary Statistics of acquirer characteristics

The table presents summary Statistics of acquirer characteristics of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Target characteristics includes free cash flow to total asset, market-to-book ratio, leverage ratio, return on asset, and Tobin's Q. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full Sample	Failed			Completed			Differences	Differences
			All (1)	Mega (2)	Non-mega (3)	All (4)	Mega (5)	Non-mega (6)	(1)-(4)	(2)-(5)
					Acquirer Firm Characteristics					
Market-to-Book Ratio	*Mean*	3.70	3.019	2.816	3.16	3.348	5.77	3.57	-0.681	-2.959
	n	13,412	1,030	259	771	12,382	11,329	1,053		
Return on Asset	*Mean*	0.033	0.031	0.060	0.012	0.038	0.068	0.031	-0.009*	-0.007
	n	13,813	1,046	261	785	12,767	1,062	11,705		
Cash Flow to Total Asset	*Mean*	0.056	0.048	0.076	0.388	0.057	0.084	0.054	-0.008*	-0.008
	n	14,037	1,065	264	801	12,972	11,893	1,079		
Leverage	*Mean*	0.345	0.377	0.407	0.376	0.334	0.384	0.338	0.042	0.024
	n	15,338	1,162	281	881	14,176	1,138	13,038		
Tobin's Q	*Mean*	3.058	2.368	2.731	2.246	3.115	3.369	3.092	-0.748	-0.639**
	n	13,331	1,022	257	765	12,309	1,052	11,257		

Table 4.5. Summary Statistics of target characteristics

The table presents summary Statistics of acquirer characteristics of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Target characteristics includes free cash flow to total asset, market-to-book ratio, leverage ratio, return on asset, and Tobin's Q. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full Sample	Failed			Completed			Differences	Differences
			All (1)	Mega (2)	Non-mega (3)	All (4)	Mega (5)	Non-mega (6)	(1)-(4)	(2)-(5)
					Target Firm Characteristics					
Market-to-Book Ratio	*Mean*	2.781	2.466	4.167	1.760	2.832	4.232	2.483	-0.365	-0.065
	n	4,853	675	198	477	4,178	832	3,346		
Return on Asset	*Mean*	0.002	0.020	0.452	0.010	0.036	-0.010	0.036	0.021**	0.009
	n	4,947	684	199	485	840	3,423	840		
Cash Flow to Total Asset	*Mean*	0.029	0.048	0.061	0.042	0.026	0.059	0.018	0.022***	0.002
	n	5,242	716	201	515	4,526	837	3,689		
Leverage	*Mean*	0.354	0.368	0.375	0.365	0.352	0.412	0.338	0.016	-0.036
	n	5,484	741	216	525	4,743	892	3,851		
Tobin's Q	*Mean*	2.043	2.115	2.401	1.996	2.031	2.728	1.857	0.084	-0.327
	n	4,823	670	197	473	4,153	830	3,323		

Table 4.6. Descriptive of short-term post-merger market performance

The table presents summary Statistics of short-run post-merger market performance of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. 3-day, 5-day, 11-day, and twenty-one-day cumulative abnormal return (*CAR*) are used to evaluate the short-run post-acquisition performance. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full Sample	Failed			Completed			Differences (1)-(4)	Differences (2)-(5)
			All (1)	Mega (2)	Non-mega (3)	All (4)	Mega (5)	Non-mega (6)		
		Acquirer Post-merger Market Performance (%)								
CAR(-1,+1)	*mean*	0.101	0.846	-0.236	1.1197	1.025	-0.370	1.151	-1.793	0.134
	median	0.005	0.346	-0.198	0.422	0.478	-0.162	0.524		
	n	17,946	1,425	349	1,076	16,521	1,370	15,151		
CAR(-2,+2)	*mean*	0.012	1.078	-0.281	1.519	1.195	-0.256	1.326	-0.117	-0.024
	median	0.005	0.368	0.033	0.425	0.529	-0.188	0.603		
	n	17,944	1,425	349	1,076	16,519	1,370	15,149		
CAR(-5,+5)	*mean*	0.013	0.711	-0.331	1.051	1.378	0.050	1.499	-0.667***	-0.381
	median	0.007	0.297	-0.202	0.379	0.715	-0.220	0.788		
	n	17,823	1,413	347	1,066	16,410	1,367	15,043		

Table 4.7. Descriptive of long-term post-merger market performance

The table presents summary Statistics of long-run post-merger market performance of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. 12-month, 24-month, and 36-month buy and hold abnormal return (*BHAR*) are used to present the long-run acquisition performance. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full Sample	Failed			Completed			Differences (1)-(4)	Differences (2)-(5)
			All (1)	Mega (2)	Non-mega (3)	All (4)	Mega (5)	Non-mega (6)		
		Acquirer Post-merger Market Performance (%)								
BHAR(0,+12)	*mean*	-0.020	-1.913	-3.459	-1.404	-0.601	-0.867	-0.576	-1.374	-2.203
	median	-0.048	-4.705	-3.430	-5.213	-4.802	-2.214	-5.127		
	n	17,038	1,277	316	961	15,761	1,322	14,439		
BHAR(0,+24)	*mean*	-0.150	-15.010	-15.937	-14.706	-13.585	-10.754	-13.844	-1.616	-4.753**
	median	-0.196	-21.548	-18.144	-23.472	-19.455	-14.866	-20.008		
	n	17,038	1,277	316	961	15,761	1,322	14,439		
BHAR(0,+36)	*mean*	-0.264	-27.554	-27.206	-27.669	-24.958	-19.913	-25.420	-2.710*	-6.660***
	median	-0.313	-33.750	-30.288	-35.531	-31.149	-25.067	-31.793		
	n	17,038	1,277	316	961	15,761	1,322	14,439		

Table 4.8. Mega deals and non-mega deals post-acquisition bidder performance comparison.

The table presents the post-merger bidder market performance comparison of withdrawn and successful takeovers respectively, between mega deals and non-mega deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. 3-day, 5-day and 11-day cumulative abnormal return (CAR) are used to evaluate the short-run acquisition performance, and 12-month, 24-month, and 36-month buy and hold abnormal return (BHAR) are used to present the long-run acquisition performance. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

Deal Status:		Failed Deals			Completed Deals				
Deal Type:		Mega	Non-mega	Difference	Mega	Non-mega	Difference	Difference	Difference
		(1)	(2)	(2)-(1)	(3)	(4)	(4)-(3)	(1)-(3)	(2)-(4)
CAR(-1,+1)	mean	-0.236	1.1197	1.432***	-0.370	1.151	1.521***	0.134	0.045
	median	-0.198	0.422		-0.162	0.524			
	n	349	1,076		1,370	15,151			
CAR(-2,+2)	mean	-0.281	1.519	1.799***	-0.256	1.326	1.583***	-0.024	0.192
	median	0.033	0.425		-0.188	0.603			
	n	349	1,076		1,370	15,149			
CAR(-5,+5)	mean	-0.331	1.051	1.382**	0.050	1.499	1.449***	-0.381	-0.448
	median	-0.202	0.379		-0.220	0.788			
	n	347	1,066		1,367	15,043			
BHAR(0,+12)	mean	-3.459	-1.404	0.261	-0.867	-0.576	-0.691	-2.203	-1.251

	median	-3.430	-5.213		-2.214	-5.127			
	n	316	961		1,322	14,439			
BHAR(0,+24)	*mean*	-15.937	-14.706	-0.809	-10.754	-13.844	-4.088***	-4.753**	-1.473
	median	-18.144	-23.472		-14.866	-20.008			
	n	316	961		1,322	14,439			
BHAR(0,+36)	*mean*	-27.206	-27.669	-2.567	-19.913	-25.420	-6.421***	-6.660***	-2.807*
	median	-30.288	-35.531		-25.067	-31.793			
	n	316	961		1,322	14,439			

Table 4.9. OLS regressions of acquirer short-term stock performance

The table OLS regression model of acquirer short-run post-acquisition market performance of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer's 3-day, 5-day, 11-day cumulative abnormal return (*CAR*) are used to evaluate the short-run post-acquisition performance, which are used as the dependent variable of the models. Independent variables include deal characteristics, deal value ($mil), paid by fully stock or fully cash or mixed payment, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Cross-border* takes the value of one if the deal's acquirer and target are from different countries, otherwise equals zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective.. Acquirer characteristics includes free cash flow to total asset (*A_CF2TA*), market-to-book ratio (*A_M2B*), leverage ratio (*A_leverage*), return on asset (*A_ROA*), and Tobin's Q (*A_TobinQ*). Target characteristics includes free cash flow to total asset (*T_CF2TA*), market-to-book ratio (*T_M2B*), leverage ratio (*T_leverage*), return on asset (*T_ROA*), and Tobin's Q (*T_TobinQ*).

Independent Variable	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-2,+2]	CAR[-2,+2]	CAR[-2,+2]	CAR[-2,+2]	CAR[-5,+5]	CAR[-5,+5]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Successful Deal	-0.281*	-0.085			-0.465**	-0.046				
Mega	-1.570***	-1.611***			-1.629***	-1.643***				
Mega*Success			-1.571***	-1.665***			-1.592***	-1.642***	-1.335***	-1.320***
Public Target	-0.955***	-0.987***	-0.983***	-1.037***	-1.044***	-1.034***	-1.060***	-1.095***	-1.242***	-1.216***
Diversification	-0.605***	-0.677***	-0.597***	-0.671***	-0.566***	-0.597***	-0.555***	-0.591***	-0.719***	-0.729***

Tender	2.153***	2.254***	2.164***	2.296***	2.225***	2.220***	2.218***	2.263***	2.414***	2.544***
Hostile	-1.607***	-2.320***	-1.889***	-2.663***	-1.908***	-2.373***	-2.101***	-2.742***	-2.507***	-3.289***
Cross Border	-0.773***	-0.922***	-0.774***	-0.923***	-0.956***	-0.954***	-0.960***	-0.953***	-0.967***	-1.041***
Stock	-0.984***	-1.022***	-0.986***	-1.029***	-0.945***	-0.783***	-0.946***	-0.796***	-0.739***	-0.475*
Log(TimeToResolution)	0.015	0.054	0.014	0.050	-0.020	-0.003	-0.018	-0.009	-0.102	-0.114
A_M2B		0.003		0.003		0.002		0.002		0.004
A_Leverage		0.100		0.093		0.602***		0.594***		0.908***
A_CF2TA		-0.356		-0.295		0.216		0.284		0.913
A_ROA		-2.321*		-2.401*		-3.275**		-3.367**		-4.101**
A_TobinQ		-0.002		-0.002		-0.023**		-0.023**		-0.448***
Constant	0.834	1.270	0.569	1.124		2.063	-0.698	1.960	-1.270	1.790
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,946	17,946	17,946	17,946	17,946	17,946	17,946	17,946	17,946	17,946
Adjusted R2 (%)	4.04	4.03	3.96	4.01	3.32	4.59	3.22	4.53	2.93	2.14

Table 4.10. OLS regressions of acquirer long-term stock performance

The table OLS regression model of acquirer long-run post-acquisition market performance of full sample deals. The sample consists of 17,946 deals announced between January 1, 1980 and December 31, 2016. In order to be considered into our sample, the deal must be at least $1 million transaction value. Acquirers are public U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. Targets can be either public or private firm. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer's 12-month, 24-month, and 36-month buy and hold abnormal return (*BHAR*) are used to present the long-run acquisition performance, which are used as the dependent variable of the models. Independent variables include deal characteristics, deal value ($mil), paid by fully stock or fully cash or mixed payment, diversification dummy, target publicity (public dummy), deal attitude (hostile dummy), tender offer dummy, cross-border dummy, and time to completion. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Public* takes the value of one if target is a public firm, otherwise takes the value of zero. *Cross-border* takes the value of one if the deal's acquirer and target are from different countries, otherwise equals zero. *Hostile* takes the value of one if the deal is a hostile acquisition, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective.. Acquirer characteristics includes free cash flow to total asset (*A_CF2TA*), market-to-book ratio (*A_M2B*), leverage ratio (*A_leverage*), return on asset (*A_ROA*), and Tobin's Q (*A_TobinQ*). Target characteristics includes free cash flow to total asset (*T_CF2TA*), market-to-book ratio (*T_M2B*), leverage ratio (*T_leverage*), return on asset (*T_ROA*), and Tobin's Q (*T_TobinQ*).

Independent Variable	BHAR(0,+12)	BHAR(0,+12)	BHAR(0,+12)	BHAR(0,+24)	BHAR(0,+24)	BHAR(0+24)	BHAR(0,+36)	BHAR(0,+36)	BHAR(0,+36)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Success dummy	3.577**				3.071*			2.704	
Mega dummy	-1.721				2.785*			5.572***	
Mega*Success		-1.373	-1.5264			2.539*	3.406**		6.145***	5.924***
Public Target	2.757**	3.040***	2.248**	3.226***	4.009***	2.932**	3.531***	4.675***	3.416***
Diversification	-2.918***	-2.763***	-2.943***	-2.221*	-2.213**	-2.252**	-1.831	-2.185**	-1.865

Tender	2.365	1.840	2.748*	2.681	2.128	2.864*	2.949	2.266	3.022
Hostile	-8.316**	-7.65***	-10.557***	-13.731***	-13.018***	-14.604***	-17.843***	-16.174***	-17.858***
Cross Border	-2.430	-2.945**	-2.369	-0.836	-1.272	-0.779	-0.145	-0.132	-0.092*
Stock	-5.145***	-6.957***	-5.188***	-6.635***	-7.162***	-6.665***	-7.130***	-6.448***	-7.138***
Log(TimeToResolution)	1.486***	1.313***	1.369***	0.889*	0.711*	0.810*	-0.068	-0.249	-0.118
A_M2B	-0.003		-0.003	0.008		0.008	0.020		0.019
A_Leverage	5.486***		5.385***	3.947***		3.885***	2.496		2.461
A_CF2TA	23.765***		23.810***	21.632**		21.491**	21.785**		21.471**
A_ROA	-9.201		-9.139	-15.176		-14.942	-21.730**		-21.278**
A_TobinQ	-0.285***		-0.281***	-0.189***		-0.186***	-0.112		-0.110
Constant	-33.438*	-14.727	-29.394	-54.099**	-33.780	-50.712		-44.377***	-61.049***
Year fixed effects	No	No	No	No	No	No	No	No	No
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,038	17,038	17,038	17,038	17,038	17,038	17,038	17,038	17,038
Adjusted R2 (%)	2.02	2.42	2.91	2.59	2.30	2.57	2.63	2.37	2.61

Table 4.11. OLS regressions of deal completion rate

Independent Variable	Success	Success
	(1)	(2)
Mega	-0.044***	-0.035***
Public Target	-0.094***	-0.108***
Diversification	-0.011*	-0.006
zzTender	0.093***	0.102***
Hostile	-0.551***	-0.501***
Cross Border	0.013	0.012
Stock	-0.010	-0.011
Log(TimeToResolution)	-0.023***	-0.026***
A_M2B		0.000
A_Leverage		-0.025***
A_CF2TA		-0.060
A_ROA		0.177***
A_TobinQ		0.001***
Constant	0.974***	1.039***
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Observations	17,946	17,946
Adjusted R2 (%)	11.21	11.67

5 How merger activity affects firm capital structure

5.1 Introduction

Usually, appropriate debt issuances are timed to occur after high-return periods and ahead of low-return periods. Merger and acquisition (M&A) activities can change this timing, however. Due to the limited liability of debt-financed projects, the penalties of failed investment are inflicted on debtholders alone, but the benefits of the above debt's face value are reaped primarily by shareholders. This may lead to a situation in which shareholders sometimes participate in these negative result projects. Moreover, as advocated by Myera (1977), if a corporate is going to go bankrupt soon, instead of investing in value-creating projects, shareholders tend to do nothing, since gains from the project will compensate debtholders, whereas the investment fees are paid by the shareholders. Debt issuance, according to Narayanan (1988), is evaluated by the market as a good signal, causing the firm's share price to increase, and this opinion is supported by Poitevin (1989). By studying three sets of samples (428 mergers between 1962 and 1982, 389 takeovers between 1982 and 1986, and 173 takeovers between 1978 and 1990), Maloney et al. (1993) show that the leverage of acquirers increases with announcement abnormal returns. Furthermore, bidder leverage and the market's assessment of the managerial decision to acquire are positively related. All the above shows that agency costs exist and that capital structure adapts in order to account for agency costs.

Nielsen and Melicher (1973) find that, when the acquiring party has a great deal of cash and the acquired party has little cash, the M&A premium is high. This shows that the capital or cash flow is reallocated between the acquiring and acquired firms' industries. This means that the internal cash flow level tends to be an important factor affecting the company's investment rate. Therefore, when investment opportunities in a growth industry are discovered, the volume of investment in the industry by a

company is likely to be related to its internal cash flow. Also supported by Harford et al. (2009), targets tend to borrow money and issue debt before acquisitions, to gain a higher premium and gain greater bargaining power during the deal, costing bidders more.

Alexandridis et al. (2013) study mega-deals acquiring public targets from 1990 to 2007 in the United States and show that the market-to-book ratios of both parties are higher in large deals, meaning that firms involved in mega-deals are more highly valued. This result further supports the valuation hypothesis of Jensen (2005) and Moeller et al. (2005). Consistent with Gorton et al. (2009), the competition conjecture is demonstrated, where the transactions of large targets are less competitive. The authors suggest that offer premiums and overpayment potential are negatively affected by the logarithm of target size. Specifically, acquirers have a tendency to pay less for larger deals, though they still suffer losses around the announcement date. The authors find that the logarithm of market-relative acquirer size has a positive effect on the offer premium, but the absolute value of the coefficient is merely one-third that for the market-relative target size, demonstrating the more dominant the role target size plays in the offer premium.

The 20 largest deals are used as a subsample, 18 of which have a lower premium than the average industry adjusted premium. Throughout the sample period of 17 years, the annual mean of the offer premium of small deals all surpass that of large deals. This result demonstrates the benefits mega-deals experience. Though large deals are associated with a lower offer premium and a lower likelihood of overpayment, this cannot ease the fact that such deals with a high transaction price destroy value. Large deals are associated with greater complexity, reflecting the reality that assured gains are harder to obtain.

By analysing China's M&A deals between 2000 and 2015, Tao et al. (2017) show that acquirers use M&As to reduce deviations from the optimal level before deals. The authors suggest that, subsequent to acquisitions, acquirers change their leverage ratios to achieve an optimal level with equal debt costs and benefits in the long run.

Jandik and Lallemand (2017) investigate the impact of target firms' change in capital structure on acquisition gains by considering the debt issuance by target companies around takeover announcements. The authors show that the targets' debt issuance tends to result in positive adjustments to the acquisition premiums offered by acquirers.

Given the research on debt level changes during the takeover process, this chapter aims to examine changes in acquirer debt levels in mega-deals. The first question is whether mega-deals are more likely to change their debt level in the takeover process. I compare acquirer and target firm characteristics in terms of capital structure and debt level for mega-deals and non–mega-deals, as well as their change during the takeover process. Regression is used to analyse the role of mega-deals in the change of acquirer firm leverage and the change in the ratio of debt to total assets. Another contribution is that I further consider the effect of the interaction indicator between mega-deals and higher leverage changes on both short- and long-term performance. Furthermore, mega-deals are divided into a higher leverage change group and a lower leverage change group. I then compare their (three-day, five-day, and 11-day) cumulative abnormal returns (CARs) and (12-month, 24-month, and 36-month) buy-and-hold abnormal returns (BHARs).

The remainder of the chapter is organized as follows. Section 5.2 develops the three hypotheses. Section 5.3 describes the data set, sample criteria, and empirical methodology. Section 5.4 presents the univariate and multivariate results. Section 5.5 discusses the empirical results. Section 5.6 presents the conclusions of the paper.

5.2 Hypothesis development

Harford et al. (2009) analyse the determining factors of acquisition-induced change in a bidder's leverage. They record that a bidder's pre-merger year tax costs are positively related to both whether cash payment is adopted for a high-value deal and the deal-induced change in acquirer leverage. This finding indicates the likelihood of the acquirer to gain higher leverage by larger acquisitions that increase with the importance of interest tax shields. Harris and Raviv (1990) find that the leverage level and firm value are positively related. This situation, according to Stulz (1991), is triggered by the fact that targets, compared to acquirers, are associated with higher debt levels, ceteris paribus. Meanwhile, firms with anti-takeover measures are less willing to hold large amounts of debt. I thus propose the first hypothesis as follows.

H1: Mega-mergers tend to improve their debt level in the takeover process.

Agliardi, Amel-Zadeh, and Koussis (2016) analyse the leverage changes in M&As. They find that acquiring firms tend to finance diversifying acquisitions with debt, because equity holders try to improve their debt capacity by increasing leverage, resulting in total merger gains. The authors further show, both theoretically and empirically, that the growth options first decrease and then increase with leverage changes. Jandik, Lallemand, and McCumber (2017) investigate the incremental leverage changes of the targets of ultimately withdrawn takeover attempts. Analysing a sample of 700 international takeover targets, they find that targets in countries with a high takeover index have substantially increase their leverage ratio through both debt issuance and equity repurchase. They report a remarkably negative relationship between debt issuance by firms in high takeover index countries and returns to target shareholders around issuance, while these do not negatively affect equity value if alternatively made by high-performance managers. Murray, Svec, and Wright (2017) analyse the wealth transfer, signalling, and leverage in M&As and investigate the impact of acquisition-driven changes in firm leverage on equity returns and credit default swap

spreads. They show that the gains to bidder shareholders and losses to bidder bondholders result from the change in leverage, but not from the form of payment or its signalling effect. I thus propose the second hypothesis as follows.

H2: Mega-deals with a higher change in leverage outperform those with a lower change in leverage.

5.3 Data and methodology

5.3.1 Sample selection

The primary data set is obtained from the Thomson One Banker SDC database, with historical merger information on the financial statistics of targets and bidders. Firm accounting information, such as stock prices, is downloaded from Compustat (via Wharton Research Data Services). The acquirer country is set to be the United States only, with no restrictions on the countries of target firms. The sample period spans from January 1, 1990, and December 31, 2016. Following Fuller et al. (2002), the following criteria are set:

1. The acquirer is a U.S. firm listed on the New York Stock Exchange, American Stock Exchange, or NASDAQ with valid data available from the Center for Research in Security Prices, to evaluate bidder market performance in the short and long term.

2. The deal must have been announced between January 1, 1990, and December 31, 2016.

3. The acquirer owned no more than 20% of the target firm before the merger and ended up with no less than half of the target firm afterwards.

The proceeds measured by in constant 2010 dollars are the nominal proceeds adjusted by the U.S. monthly gross domestic product, to reduce the impact of inflation and economic growth. Following Alexandridis, Antypas, and Travlos (2017), acquisitions with transaction value over $500 million are labelled as mega-mergers.

I use each firm's primary Standard Industry Classification (SIC) code to define the merger types. If the acquirer and target have the same two-digit SIC codes, I call them horizontal mergers; and otherwise they are diversified mergers, denoted by the variable *Diversification* taking the value of one.

To evaluate deal payment methods, I follow Ang and Cheng (2006), such that acquisitions completed with 100% cash are classified as cash deals, denoted by the variable *CASH*; acquisitions transferred with 100% equity are classified as stock deals, denoted by the variable *STOCK*; and mergers are otherwise denoted by the variable *MIX*, referring to mixed payments.

To evaluate overpayments, I follow Alexandridis et al. (2013) and calculate the offer premium (*PREM*) using the ratio of the offer price to the target's share price one month prior to the deal announcement.

Acquirer and target financial characteristics are evaluated. A firm's market value, or market capitalization, equals the total number of the firm's outstanding shares multiplied by the market price per share. I use the variable *Market Cap* to represent this measure. To evaluate a firm's debt level, the leverage ratio, debt-to-equity ratio, and debt-to-assets ratio are applied. The leverage ratios are denoted *A_leverage* and *T_leverage* for acquirers and targets respectively. I use book leverage, calculated as $\frac{Long-termDebt}{BookEquity}$. The debt-to-equity ratio takes short-term debt into consideration and is calculated as $\frac{TotalDebt}{BookEquity}$, denoted *D2E* in this paper. The debt-to-assets ratio equals $\frac{TotalDebt}{TotalEquity}$ and is denoted as *D2TA*. For firms' profiting ability, the return on

assets and return on equity are used, denoted as *roa* and *roe*, respectively. To determine whether the firm's share price accurately represents the projected earnings per share, I use the price-to-earnings ratio, which equals $\frac{MarketValuePerShare}{EarningsPerShare}$, denoted as *PE*. The market-to-book ratio is calculated as $\frac{MarketValue}{CommonEquityValue}$ and denoted as *M2B*. This ratio determines the market value of a company relative to its actual worth, indicating whether the firm is overvalued or undervalued by the market. To consider a firm's liquidity, the free cash flow to assets ($\frac{FreeCashFlow}{TotalAsset}$) and free cash flow to equity ($\frac{FreeCashFlow}{Equity}$) are applied, denoted as *CF2E* and *CF2TA*, respectively.

5.3.2 Short-run analysis

For each subsample, I compute the deals' short- and long-term abnormal return (*AR*) to study post-merger market performance. The CAR, *CAR,* that is, total abnormal returns, is applied to evaluate short-term performance, which is given by

$$R_e = \ln(\frac{P_j}{P_{j-1}}) \tag{5.1}$$

$$AR_e = R_e - R_m \tag{5.2}$$

$$CAR_e = \sum_{k-l}^{k+l} AR_e \tag{5.3}$$

where R_e is the daily return of firm e on day j, and R_m is the value-weighted market return on day j. To obtain the CARs, I add up l days of abnormal returns around the deal announcement date k, where $l = 1, 2,$ or 5 for three-, five-, and 11-day CARs, respectively.

5.3.3 Long-run analysis

I adopt 12-, 24-, and 36-month buy-and-hold abnormal returns (BHARs) to analyse long-term performance. A reference portfolio is first constructed, and its returns ($R_{ref,T}$) are calculated. Then, I have

$$R_{ref,T} = \sum_{i=1}^{n} \frac{\prod_{t=0}^{T}(1+R_{i,t})-1}{n} \tag{5.4}$$

$$BHAR_i = \prod_{t=0}^{T}(1 + R_{i,t}) - R_{ref,T} - 1 \tag{5.5}$$

where $R_{i,t}$ is the return of firm i in month t (the month of the deal announcement), n is the number of firms at $t = 0$, and T is the length of the holding period. Here I take $T = 12, 24,$ or 36 for 12-, 24-, or 36-month BHARs, respectively.

5.3.4 Univariate tests

I use a series of univariate tests to find the key differences between how mega-deal and non–mega-deal acquirers change their capital structure and perform distinctively from the perspective of acquirer performance and target firm characteristics. Common variables from previous studies are included. The following deal characteristic variables have been taken into account: the deal transaction value, the payment type, the deal type, whether the target is a public firm, time to completion, and the deal premium. For acquirer and target firm characteristics, I include the market-to-book ratio, the return on assets, the return on equity, the price-to-earnings ratio, cash flow to total assets, debt to total assets, the leverage ratio, and the firm's Tobin's Q. Student's *t*-test is used to test for statistical significance, and I additionally conduct bootstrap tests to eliminate sample distribution problems. The results are presented in Section 5.4.

5.3.5 Multivariate analysis

An OLS regression is adopted after obtaining the CARs and BHARs, which is given by

$$CAR_e = \alpha + \gamma \times \text{Mega} + \sum_{v=1}^{N} \beta_u \times X_v + \varepsilon_u, \ e = 3, 5, 11 \tag{5.6}$$

$$BHAR_i = \vartheta + \mu \times \text{Mega} + \sum_{v=1}^{N} \beta_\delta \times X_v + \varepsilon_i, \quad i = 12, 24, 36 \tag{5.7}$$

where X_v comprises the control variables, such as deal characteristics and acquirer firm characteristics. The deal characteristic variables include *Mega, Stock, Diversification, Offer Premium,* and the logarithm of *Time to Completion* as dummy variables. The market-to-book ratio, the leverage ratio, free cash flow to total assets,

the return on assets, and debt to total assets are considered for acquirer and target firm characteristics. I thus obtain

$$\triangle \text{A\_leverage}_F = \alpha + \gamma \times \text{Mega} + \sum_{v=1}^{N} \beta_u \times X_v + \varepsilon_u \qquad (5.8)$$

$$\triangle \text{A\_D2TA}_F = \vartheta + \mu \times \text{Mega} + \sum_{v=1}^{N} \beta_\delta \times X_v + \varepsilon_i \qquad (5.9)$$

where $\triangle A\_leverage$ represents the change in the acquirer's leverage ratio from the announcement to the effective date, and $\triangle A\_D2TA$ represents the change in the acquirer's debt to total assets from the announcement to the effective date.

5.4 Empirical results

5.4.1 Yearly distribution of M&A deals

Figure 5.1 reports the yearly numbers and values of mega-mergers and non–mega-mergers over the 36-year sample period, and Table 5.1 gives the descriptive statistics for the full sample year. Overall, the volumes of both mega-deals and non–mega-deals appear to have an upward trend followed by an obvious decline, reaching a peak around 1999. This is also true for the values of both mega-deals and non–mega-deals, which also first increase and then decrease. This phenomenon can be explained by the fifth merger wave during 1993–2000. Generally speaking, the yearly volume of non–mega-deals is much higher than that of mega-deals, while the yearly value of mega-deals is much higher than that of non–mega-deals, both of which are as expected.

In the first decade, although both are at a low level, the volume of non–mega-deals is much higher than that of mega-deals, while the values of transactions are very low for both types of deals. M&A activity is very slow in 1991 and 1992. Both the volume and the value of transactions are low for both mega-deals and non–mega-deals. After that, the increase in volume of non–mega-deals in 1993 is the first sign of the fifth merger wave. Both the volume and values of transactions dramatically increase in the following few years. While the volume of non–mega-deals increases a great deal, the value of the transactions does not change much, which may suggest that the deals

involved are almost all of low value. In contrast, the increase in value of mega-deals is very large, which suggests that the value of mega-deals increases even more in the fifth merger wave. A minor peak arises for mega-deals between 2003 and 2007, which coincides with the sixth merger wave. Both the volume and value of transactions increase. Afterwards, both remain at low levels until 2014. In the last few years of the sample period, they again reach relatively high levels.

The difference in volume between non–mega-deals and mega-deals has a similar trend as the change in volume, which reaches a maximum in 1997 and declines quickly after that. From 2006 on, the difference in volume between non–mega-deals and mega-deals becomes very small and is almost zero in the last four years. This suggests that, although the volume of M&A deals remains low after the fifth merger wave, the share of mega-deals is much higher than in earlier years. While the share of mega-deals in terms of volume is no more than one-third from 1986 until 2004, it accounts for almost one-half of all M&A deals in the last few years. In contrast, the difference in value between non–mega-deals and mega-deals is very small in the first few years and even becomes negative in 1994. It increases dramatically in the following years and reaches a maximum in 1999. After that, it declines, but it maintains a relatively high level. This is because, although the values of mega-deals decrease greatly after the fifth merger wave, they are still much higher than before. In contrast, the change in value of non–mega-deals is very small over the whole sample period, which results in a relatively large difference in value between mega-deals and non–mega-deals in the last few years.

In summary, the volumes of both mega-deals and non–mega-deals vary sharply during the whole sample period, especially during the fifth merger wave. There is also a minor peak afterwards, and the volumes then remain at relatively low levels. The volume share of mega-deals increases a great deal but is less than one-third at the beginning

of the sample period and almost a half by the end of the sample period. In contrast, the value of mega-deals increases a great deal during the whole sample period, but the value of non–mega-deals does not change much over the whole sample period. The difference in the value of transactions between mega-deals and non–mega-deals at the beginning the sample period is not very large, but it is very large at the end of the sample period, which suggests that, not only does the volume share of mega-deals increase, but so does the scale of the mega-deals.

5.4.2 Characteristics of deals, acquirer firms, and target firms

A comparison of the summary statistics of the key characteristics of mega-deals and non–mega-deals is reported in Tables 5.2 to Table 5.4. The characteristics of deals (Table 5.2), acquirer firms (Table 5.3), and target firms (Table 5.4) are all included. Panel A presents the deal characteristics, and the other panels report the mean values of the corresponding characteristics in the full sample and among mega-deals non–mega-deals, and the differences in mean value between non–mega-deals and mega-deals. There are 1,719 deals, 570 (33.2%) of which are mega-deals and 1,149 (66.8%) of which are non–mega-deals.

The mean deal value for the full sample is $1.333 billion, which is about one-third that of mega-deals and nearly eight times that of non–mega-deals. The mean deal value of non–mega-deals is a mere $167.97 million, which is why the value of the transactions of non–mega-deals in Figure 5.1 is very flat compared to that of mega-deals. The differences in value between non–mega-deals and mega-deals are very large. As shown in Table 5.1, the values of mega-deals are much higher than those of non–mega-deals at the 1% significance level. The mean value of the offer premium for mega-deals is lower than that of non–mega-deals by about 17%, and the difference between them is significant. This result suggests that overpayment is less common among mega-deals than among non–mega-deals. The number of deals transferred with 100% equity is 636, which is about 37% of the full sample, and the number of

deals completed with 100% cash is 570, which is about 34% of the full sample. The remainder of the deals are completed with both financing methods. Among the deals transferred with 100% equity, mega-deals account for less than one-third, which is lower than the share of mega-deals in the full sample. The percentage of mega-deals completed with 100% equity is about 33% of the full mega-deal sample, while it is more than 40% for non–mega-deals, and the difference between these two terms is significant. The share of mega-deals completed with 100% cash is even lower in the full mega-deal sample, which is less than one-third. While the share of non–mega-deals completed with 100% cash also decreases, it still accounts for about 37% of the full non–mega-deal sample. Therefore, about a half of mega-deals are paid with both equity and cash, while less than one-fourth of non–mega-deals are paid with both methods.

Regarding the industry diversification of the deals, diversified mergers account for about one-third of the full sample, while they account for a slightly lower share among mega-deals and a slightly higher share among non–mega-deals. The difference in diversification between non–mega-deals and mega-deals is also significant. As for the time needed to complete a deal, the mean value for the full sample is about 137 days. Mega-deals need more time while non–mega-deals need less time, and the difference between them is significant, which is not surprising.

For acquirer firms, characteristics such as market capitalization, the ratio of free cash flow to assets, the market-to-book ratio, the leverage ratio, the return on equity, the return on assets, the price-to-earnings ratio, the ratio of debt to total assets, and the ratio of debt to equity are considered. The mean value of market capitalization for the full sample is almost half that for mega-deals and twice that for non–mega-deals, which is as expected. The difference in market capitalization between non–mega-deals and mega-deals is significant and is nearly three times that of non–mega-deals. The

mean value of free cash flow to assets for mega-deals is also significantly higher than for non–mega-deals, which suggests that mega-deals have better liquidity; for the full sample, the value is 0.025, and the difference between mega-deals and non–mega-deals is 0.018, which is almost the same as for non–mega-deals. The mean market-to-book ratio of acquirers for the full sample is about 3.3, and this ratio is slightly lower for non–mega-deals. For mega-deals, the mean market-to-book ratio is much higher, about 4.0, and it is significantly different from that for non–mega-deals. This result indicates that mega-deals are more likely to be overvalued by the market, in contrast with non–mega-deals.

The mean leverage ratio of acquirers for the full sample is about 0.7, and the ratio for mega-deals is slightly higher, while the ratio for non–mega-deals is slightly lower. However, the difference in leverage ratio between mega-deals and non–mega-deals is not significant. The return on equity of acquirers for the full sample is around 0.16, and the value is slightly higher for mega-deals and slightly lower for non–mega-deals. However, the difference in return on equity between mega-deals and non–mega-deals is not significant either. In contrast, the difference in the return on assets between mega-deals and non–mega-deals is significant. The value of the mean return on assets for mega-deals is 0.15, and 0.112 for non–mega-deals, and there is a significant one-third difference between them, which indicates that mega-deals tend to have higher profiting ability.

Although mega-deals have a higher mean price-to-earnings ratio than non–mega-deals, the difference between them is not significant. Thus, no conclusions can be drawn regarding whether the share price of mega-deals can better represent projected earnings per share than non–mega-deals. The ratio of debt to total assets does show a significant difference between mega-deals and non–mega-deals, and the ratio of debt to total assets for the former is about one-fifth higher than that of the latter,

indicating that mega-deals tend to have a higher ratio of debt. Although the mean ratio of debt to equity of non–mega-deals is higher than that of mega-deals, they are not significantly different.

For target firms, characteristics such as the free cash flow to assets, market to book, leverage ratio, return on equity, return on assets, price-to-earnings ratio, and debt to total assets are considered. Compared to those of acquirer firms, target firms' free cash flow to assets, return on equity, return on assets, and price-to-earnings ratio are all much lower, while the target firms' leverage ratio is much higher. The mean free cash flow to assets of target firms for the full sample is only 0.01, while it is 0.025 for acquirer firms. For mega-deals, this value is far higher for target firms, at 0.026, while for non–mega-deals, it is a great deal lower. The difference in free cash flow to assets between mega-deals and non–mega-deals is significant, as is the difference in the market to book. The mean value for mega-deals is more than twice that for non–mega-deals. However, there is no big difference in the market-to-book values between target firms and acquirer firms for the full sample. The mean market-to-book value for the target firms of mega-deals is even higher than that of acquirer firms. The mean leverage ratio is high for the full sample, mega-deals, and non–mega-deals, which are all above unity, while that for acquirer firms is around 0.7. However, there is no significant difference in leverage ratio between mega-deals and non–mega-deals, the same as for acquirer firms.

The mean return on equity for the full sample of target firms is negative, which is also the case for non–mega-deals. While mega-deals have a positive mean return on equity, the value is much lower than that of acquirer firms. There is no significant difference in the return on equity between mega-deals and non–mega-deals either. The mean return on assets of target firms is positive for the full sample, mega-deals, and non–mega-deals. However, their values are much lower than those of acquirer firms.

Further, there is a significant difference in the return on assets between mega-deals and non–mega-deals, where the value of the former is almost twice that of the latter. The mean price-to-earnings ratio for the full sample of target firms is much lower than that of acquirer firms, but the difference is not large. The difference in the price-to-earnings ratio of target firms between mega-deals and non–mega-deals is not significant either. This result is consistent with that of acquirer firms. The value of debt to total assets for the full sample of target firms is around 0.2, which is similar to that of acquirer firms; however, the significant difference in debt to total assets between mega-deals and non–mega-deals is much larger than that of acquirer firms.

In summary, mega-deals tend to have lower offer premiums in contrast with non–mega-deals. The main payment method for mega-deals is mixed payments of both stock and cash, accounting for half of all mega-deals, while mixed payments comprise less than one-fourth of all non–mega-deals. This may be because the deal value is usually too large to be completed by a single payment method. The diversification of mega-deals is also significantly lower than for non–mega-deals, which suggests that horizontal mergers account for the main portion of mega-deals, rather than vertical mergers across industries. Furthermore, mega-deals usually need more time to complete than non–mega-deals do, which is expected.

As for acquirer firms' financial characteristics, the market values of mega-deals are more likely to be overestimated by the market, as reflected by their mean market-to-book ratio, which may be due to their large market value. Mega-deals also tend to have better liquidity, that is, their mean ratio of free cash flow to total assets is much higher than for non–mega-deals. As for debt levels, only the ratio of debt to total assets is significantly higher for mega-deals than for non–mega-deals. There are no significant differences between the leverage ratio and the ratio of debt to equity. In terms of firms' profiting ability, mega-deals have a significantly higher mean ratio of return on asset

than non–mega-deals, but there is no significant difference in the ratio of return on equity between mega-deals and non–mega-deals.

About target firms' financial characteristics, mega-deals have a higher ratio of free cash flow to assets and a higher market to book, which are the same as for acquirer firms. However, both differences are larger than those for acquirer firms. As for debt levels, the ratio of debt to total assets is significantly higher for mega-deals than for non–mega-deals, and there is no significant difference in leverage ratio between mega-deals and non–mega-deals. However, the ratio of debt to equity for mega-deals is far lower than for non–mega-deals, which is different from that for acquirer firms. In terms of firms' profiting ability, mega-deals have a significantly higher mean ratio of return on assets than non–mega-deals, while no significant difference is found in the ratio of return on equity, which is the same as for acquirer firms.

5.4.3 Post-merger market performance

Table 5.5 presents the descriptive results of post-merger market performance. Three-, five-day, 11-day, and 21-day CARs are used to evaluate short-run post-acquisition performance, while 12-, 24-, and 36-month BHARs are used to examine long-run acquisition performance.

Table 5.5 shows that the mean three-, five-, 11-, and 21-day CARs are all negative for the full sample, mega-deals, and non–mega-deals. For the full sample, the mean three-day CAR has the highest value. The three-day CAR for mega-deals is lower and the value for non–mega-deals is higher. The difference between these two terms is significant, and the difference accounts for almost twice of the absolute value of non–mega-deals. The mean five-day CAR is slightly lower than the mean three-day CAR for both the full sample and non–mega-deals. In contrast, the mean five-day CAR is higher than the mean three-day CAR for mega-deals. As a result, the significant difference in the five-day CAR between mega-deals and non–mega-deals is smaller compared to that of the three-day CAR. The mean 11-day CAR further decreases for both the full

sample and non–mega-deals. The difference in the 11-day CAR between mega-deals and non–mega-deals is still significant, and its value increases slightly in contrast with that of the five-day CAR. In conclusion, mega-deals do play a significantly important role in short-term post-merger market performance, and they usually have a far lower mean CAR compared to that of non–mega-deals.

As for long-term post-merger market performance, the 12-month BHAR is positive for the full sample, mega-deals, and non–mega-deals. Non–mega-deals have the highest 12-month BHAR, which is more than twice that for mega-deals. However, the difference in the 12-month BHAR between mega-deals and non–mega-deals is not significant. Compared to the 12-month BHAR, the 24-month BHAR declines a great deal, and the values are negative for the full sample, mega-deals, and non–mega-deals. The 24-month BHAR for non–mega-deals is lowest. However, the difference in the 24-month BHAR between mega-deals and non–mega-deals is not significant, either. The 36-month BHAR further decreases for the full sample, mega-deals, and non–mega-deals. The 36-month BHAR for non–mega-deals declines the most, which results in a significant difference with that of mega-deals. In conclusion, the impact of mega-deals on long-term post-merger market performance is only significant for the 36-month BHAR, and no significant difference exists for shorter periods.

In summary, non–mega-deals tend to have better short-term post-merger market performance than that of mega-deals, since non–mega-deals' three-, five-, and 11-day CARs are all significantly higher than those of mega-deals. As for long-term post-merger market performance, there are no significant differences between mega-deals and non–mega-deals in terms of 12- and 24-month BHARs. However, the 36-month BHAR of mega-deals is significantly higher than that of non–mega-deals, and the difference between them is quite large. Therefore, although mega-deals' short-term

post-merger market performance is worse than that of non–mega-deals, they tend to have much better performance if the period is long enough.

5.4.4 Acquirer firm capital structure changes during the takeover process

Table 5.6 presents the financial changes during the takeover process for acquirer firms, which includes variables such as the leverage ratio, market-to-book ratio, the ratio of debt to total assets, and the ratio of debt to equity. During the takeover process, the market-to-book ratio increases a great deal. The mean value of the market-to-book ratio grows by 3.446 from the announcement to the effective date for the full sample, and the growth is even larger for mega-deals. Compared to that of target firms at the announcement of the deal, the market-to-book ratio also increases by more than 100% for the full sample at the time the deal is completed. There is a significant difference in the change of the market-to-book ratio between mega-deals and non–mega-deals, and that in mega-deals more than one-third higher than in non–mega-deals. Given that the mean market-to-book ratio for mega-deals is higher than that for non–mega-deals at the announcement of deals, a comparison between the growth rate for mega-deals and for non–mega-deals is also necessary. From Table 5.3, the former can be found to be about 107%, while the latter is about 101%. Thus, one can conclude that mega-deals tend to have a larger increase in the market-to-book ratio in the takeover process than that of non–mega-deals, which may suggest that acquirer firms of mega-deals can benefit more in the sense of overestimated market value.

The leverage ratio of acquirer firms also increases during the takeover process. The change in the leverage ratio from the announcement to the effective date is 0.767 for the full sample, and that of mega-deals is higher while that of non–mega-deals is lower. Considering that the mean leverage ratio of acquirer firms is merely 0.715 (see Table 5.3) upon announcement, it increases by more than 100% for the full sample after the whole takeover process. The growth rate of the leverage ratio for mega-deals is even higher, about 117%. The difference in the change of leverage ratio between mega-deals and non–mega-deals is significant, where the change in the former is almost 20%

higher than in the latter. The growth rate of leverage for non–mega-deals is about 101%, which is also far lower than that for mega-deals. This result indicates that mega-deals tend to produce larger changes in leverage ratio and may thus suggest that mega-deals tend to exhibit a larger change in the capital structure of the firm.

To determine whether this is true, I further analyse the change in the ratio of debt to total assets and the ratio of debt to equity. In Table 5.3, the ratio of debt to total assets increases by 104%, 96.4%, and 111% during the takeover process for the full sample, mega-deals, and non–mega-deals, respectively. Therefore, the increase in the rate of the debt-to-total assets ratio for mega-deals is smaller than that for non–mega-deals. However, the change in the debt-to-total assets ratio for mega-deals is nearly one-third greater than that for non–mega-deals, and the difference between these two terms are significant. This is because, upon announcement, the debt to total assets for mega-deals is a great deal higher than for non–mega-deals. Thus, although the scale of increase in the takeover process for mega-deals is far greater than that for non–mega-deals, the growth rate is not as high as for non–mega-deals.

As for the debt-to-equity ratio, it increases by about 4.2 for the full sample. Different from the other characteristics, the change in the ratio of debt to equity is larger for non–mega-deals than for mega-deals, where it is about 0.6 higher in the former than in the latter, with a significant gap between these two terms. This finding is consistent with the comparison in debt to equity between mega-deals and non–mega-deals at the announcement of deals (see Table 5.3), where non–mega-deals also have a higher mean debt-to-equity than that for mega-deals. The growth rate of the debt-to-equity ratio is similar to the increase in scale, which is 95.4% for mega-deals and 102% for non–mega-deals. Therefore, the increase in the debt to total assets of mega-deals is larger than that of non–mega-deals, although the growth rate of the former is lower than that of the latter. Given that the ratio of debt to total assets of mega-deals is

already far higher than that of non–mega-deals, this result is not surprising. However, both the increase in scale and the increase in the rate of the debt-to-equity ratio of mega-deals are lower than for non–mega-deals.

Table 5.6 also presents the changes in the leverage rate of acquirer firms for different time spans. The leverage rate of acquirer firms does not increase in the month after the announcement of deals. Instead, it even decreases slightly for the full sample and mega-deals. However, the difference in the change of leverage rate for mega-deals and non–mega-deals is not significant. The leverage rate of target firms for mega-deals also decreases and at a larger scale, while that for non–mega-deals increases slightly. Therefore, the difference in the change of leverage rate between mega-deals and non–mega-deals is significant for target firms. In the six months after the announcement of deals, the leverage ratio does increase for the full sample, mega-deals, and non–mega-deals. The increase for mega-deals is largest, with an increase in scale of 0.541. The increase for non–mega-deals is quite small, only 0.056. However, the difference in the change in the leverage rate is not significant between mega-deals and non–mega-deals either. In 12 months after the announcement of deals, the leverage ratio further increases by 0.111, 0.106, and 0.114 for the full sample, mega-deals, and non–mega-deals, respectively. Still, there is no significant difference in the change of leverage between mega-deals and non–mega-deals. In the next 12 months, the leverage ratio of the three cases continues to increase, with the largest increase for non–mega-deals. However, the difference in the increase for mega-deals and non–mega-deals is not significant either. In conclusion, for acquirer firms, the leverage ratio generally increases after the announcement of deals. For mega-deals, there is a slight decrease for a short time after the announcement, and then the leverage ratio undergoes a fast increase in the six months after the announcement. The rates of increase are relatively low in the following months. In contrast, for non–mega-deals, the growth of the leverage ratio continues to increase and is largest between 12 and 24 months after the announcement of deals.

In summary, the leverage ratio, market-to-book ratio, the ratio of debt to total assets, and the ratio of debt to equity of acquirer firms all roughly double during the takeover process. Mega-deals tend to have a higher increase in leverage ratio, market to book, and debt to total assets, while non–mega-deals tend to have a higher increase in the ratio of debt to equity. This means acquirer firms of mega-deals tend to change the capital structure of the firm in the long run and may try to benefit from a high leverage ratio and by expanding the scale of the enterprise. This finding is consistent with the results in Table 5.3, where mega-deals tend to have a higher leverage ratio, market to book, and ratio of debt to total assets, while non–mega-deals tend to have higher ratio of debt to equity. This result may suggest that acquirer firms of mega-deals pay more attention to the capital structure of the firm in the long run, while acquirer firms of non–mega-deals try to improve their debt-paying ability in the short term. Regarding the changing process of the leverage ratio, I find that, for mega-deals, it slightly decreases in the first month after the announcement of deals and undergoes the largest increase from the first month to the sixth months after the announcement of deals, while non–mega-deals undergo the largest increase in the latter stage of the takeover. Mega-deals' worse performance in the short term and better performance in the long run could imply that the acquirer firms of mega-deals place a higher value on market performance and capital structure in the long term than in the short term.

5.4.5 Target firms' financial changes during the takeover process

In this section, I investigate whether the difference in leverage level affects the financial situation of target firms and the role mega-deals play in it. Based on the leverage ratio of acquirer firms, both mega-deals and non–mega-deals are classified into two types, one with a relatively larger change in the acquirer leverage ratio and the other with a relatively smaller change. The comparisons in the leverage ratio, the ratio of debt to total assets, the market-to-book ratio, and the ratio of cash flow to total assets for target firms are presented in Table 5.7.

For mega-deals, target firms' mean leverage ratio in deals with a larger acquirer leverage ratio change is far higher than that in deals with a smaller acquirer leverage ratio change, and the difference between these two terms is significant at the 5% level. For non–mega-deals, the difference in target firms' mean leverage ratio between deals with a larger and a smaller acquirer leverage ratio change, respectively, is even greater. However, it is not significant. Based on the above comparisons, for mega-deals, acquirers with a larger leverage ratio change are more likely to acquirer target firms with a higher leverage ratio than acquirers with a smaller leverage ratio change. This result suggests that acquirer firms of mega-deals are more likely to choose target firms with a high leverage ratio, and target firms' high leverage ratio is one of the reasons that acquirer firms encounter a large leverage ratio change in the takeover process. This may explain why the change in acquirer firms' leverage ratio for mega-deals in the takeover process is far larger than that for non–mega-deals. Regarding target firms' ratio of debt to total assets, the value for mega-deals with a larger acquirer leverage ratio change is higher than that for mega-deals with a smaller acquirer leverage ratio change, and the difference between them is significant at the 1% level. Non–mega-deals with a larger acquirer leverage ratio change also have a higher debt to total assets ratio than those with a smaller acquirer leverage ratio change, and the difference between them is significant at the 1% level, too. However, the difference in target firms' ratio of debt to total assets for mega-deals is larger than that for non–mega-deals. The results for target firm leverage ratios discussed above, may indicate that acquirer firms of mega-deals tend to choose target firms with high debt levels in order to change their own structure.

In contrast, target firms' mean market-to-book for mega-deals with a larger acquirer leverage ratio change is lower than that for mega-deals with a smaller acquirer leverage ratio change. This is also true for the case of non–mega-deals. Compared to that in non–mega-deals, the difference in target firms' market to book in mega-deals is much larger, which suggests that acquirer firms of mega-deals are more likely to

choose target firms with an overestimated market value. However, the significance level is 10% for mega-deals, while it is 5% for non–mega-deals. In terms of target firms' ratio of cash flow to total assets, mega-deals with a larger acquirer leverage ratio change have a higher ratio than mega-deals with a smaller acquirer leverage ratio change, and the difference is significant at the 1% level. This difference is even larger for non–mega-deals, also at the 1% significance level. This finding indicates that, for both mega-deals and non–mega-deals, acquirer firms with a larger change in leverage ratio tend to choose target firms with high liquidity, and this tendency for acquirer firms in non–mega-deals is even stronger than for acquirer firms in mega-deals.

In summary, deals with a greater change in acquirer leverage ratio tend to have a higher target firm leverage ratio, ratio of debt to total assets, and ratio of cash flow to total assets, whereas deals with a smaller change in acquirer leverage ratio tend to have a higher target firm market-to-book ratio. This result may suggest that target firms' higher leverage ratio, debt to total assets, and cash flow to total assets may be the reason for the large change in the leverage ratio of acquirer firms, and target firms' higher market to book may be the reason for the small change in the leverage ratio of acquirer firms. As for the role of mega-deals, the differences in the ratio of debt to total assets and in the market-to book ratio are larger for mega-deals, and the difference in cash flow to total assets is smaller for mega-deals. This result may indicate that acquirer firms of mega-deals are more likely to choose target firms with a higher debt level and with an overestimated market value, while acquirer firms of non–mega-deals are more likely to choose target firms with high liquidity. In other words, acquirer firms of mega-deals tend to pay more attention to improving their debt level and estimated market value in M&A activities, while acquirer firms of non–mega-deals may pay more attention to improving liquidity through M&A activities. Furthermore, whether the deal is a mega-deal also affects the significance levels of the differences. The difference in target firms' leverage ratio is significant at the 5% level for mega-deals, while it is not significant for non–mega-deals. In contrast, the difference in the

market-to-book ratio is significant at the 10% level for mega-deals and at the 5% level for non–mega-deals.

5.4.6 OLS regression on changes in acquirers' leverage and debt to equity

Table 5.9 presents the OLS regression estimations of acquirers' leverage ratio and debt-to-equity ratio. The dependent variables are the change in acquirers' leverage ratio and the change in acquirers' debt-to-equity ratio.

Regarding the change in acquirers' leverage ratio, whether the deal is a mega-deal plays a positive role at the 10% significance level, which is consistent with the conclusion that acquirer firms of mega-deals pay more attention to improving their leverage ratio. The leverage ratio of target firms also has a slightly positive effect on that of acquirers, which is consistent with the conclusions in the previous section. In contrast, the offer premium has a slightly negative effect on the leverage ratio, which suggests that the offer premium decreases the improvement of acquirer firms' debt levels. Considering that the mean offer premium of mega-deals is much lower than that of non–mega-deals (see Table 5.1), this may imply that acquirer firms of mega-deals attach less importance to the instant benefits than to change in capital structure. None of the other characteristics of the deal, such as the payment method, diversification, time to completion, and deal value, produce any significant effect on the change in acquirers' leverage ratio. Characteristics of the acquirer firm, such as the market-to-book value, leverage ratio, cash flow to total assets, return on equity, and debt to total assets, are not significant factors in the change in acquirers' leverage ratio either. When target firms' characteristics are included, the ratio of free cash flow to total assets has a significantly positive role in the change of the leverage rate of acquirer firms. However, mega-deals and the ratio of free cash flow to total assets are no longer significant when deal characteristics are further included, while the all-stock payment method has a significantly positive effect.

For the change in acquirers' ratio of debt to total assets, I first consider three variables for mega-deals, offer premiums, and target firms' debt to total assets, respectively. Mega-deals and target firms' debt to total assets are both significantly positive factors, while the effect of the latter is much larger than that of the former. The offer premium has a significantly negative effect, but a very small one. When deal characteristics are included, there are more significant factors. Whether the deal is a mega-deal still plays a positive role at a significance level of 10%, indicating that acquirer firms of mega-deals tend to experience a larger change in debt level and, thus, in capital structure. However, the effect is not as large as that on the change of acquirers' leverage ratio. The leverage ratio of target firms is still a significantly positive factor in the change in acquirers' ratio of debt to total assets, but its effect is much smaller than that for acquirers' leverage, too. The offer premium does not have a significant effect on the change in acquirers' ratio of debt to total assets, which is different from that in acquirers' leverage. However, some deal characteristics, such as the payment method, time to completion, and deal value, have significant effects on the change in acquirers' ratio of debt to total assets. Regarding payment methods, all-stock payments have a significantly negative effect on the change in acquirers' ratio of debt to total assets. On the other hand, time to completion and deal value both have significantly positive effects on the change in acquirers' ratio of debt to total assets. None of the characteristics of acquirer firms have a significant effect on post-merger stock performance, nor on the change in acquirers' leverage. When target firm characteristics are included, the all-stock payment method is no longer significant, while the market-to-book ratio, free cash flow to total assets, and debt to total assets become significant.

5.5 Discussion

5.5.1 Do mega-deals undergo a larger capital structure change?

The results in Table 5.6 shows that acquirer firms of mega-deals tend to experience greater improvements in their leverage ratio, market to book, and debt to total assets

than those of non–mega-deals, while acquirer firms of non–mega-deals tend to have a higher debt-to-equity ratio. The leverage ratio and debt to total assets of target firms for deals with a larger change in acquirer firms' leverage ratio are higher than those for deals with a smaller change in acquirer firms' leverage ratio. This is especially true for mega-deals. In contrast, the market-to book ratio of target firms with a larger change in acquirer firms' leverage ratio is lower than for deals with a smaller change in acquirer firms' leverage ratio. In addition, deals with a larger change in acquirer firms' leverage ratio tend to have a higher free cash flow to total assets.

The regression results in Table 5.9 show that mega-deals play a significantly positive role in both the change in acquirer firms' leverage ratio and the change in acquirer firms' debt to total assets. This is also true for target firms' leverage ratio. The offer premium has a significantly negative effect on the change of acquirer firms' leverage ratio, and all-stock payments have a significantly negative effect on the change of acquirer firms' debt to total assets. The time needed to complete the deal and the deal value both have significantly positive effects on the change of acquirer firms' debt to total assets. Considering that mega-deals usually have a longer completion time and large deal value, this suggests that acquirer firms of mega-deals are more likely to have a higher debt-to-total assets ratio.

5.5.2 Do mega-deals with a larger leverage change perform better?

From the results of Table 3.8, mega-deals with a larger change in leverage have significantly higher three-, five-, and 11-day CARs than those with a smaller change in leverage, which suggests that mega-deals with a larger leverage change do perform better in the short term. However, no significant difference exists in any of the 12-, 24-, and 36-month BHARs between the higher leverage change group and the lower leverage change group. In other words, mega-deals with a larger leverage change do not perform better in the long term.

The regression results in Table 5.10 also confirm the above conclusions. The *Mega * Higher* leverage change interaction indicator has a significant and positive effect on the three-day CAR, but it does not have a significant effect on either the 12- or 36-month BHAR. As for the controlling variables, the stock payment method and time to complete the deal are the most important indicators for both short- and long-term performance. Stock payments have significant and negative effects on the three-day CAR and the 12- and 36-month BHARs, while the time to complete the deal has a significantly negative effect on the three-day CAR and a positive effect on the 12- and 36-month BHARs. In addition, the acquirer firms' return to total assets and debt to total assets are important indicators of short-term performance, with significantly positive effects.

5.6 Conclusion

In this paper, I examine the change of acquirer firms' capital structure in the takeover process and the impact of mega-deals on it. I adopt a sample with 1,719 M&A deals and analyse targets' and bidders' financial changes during the takeover process. The merger data and information are downloaded from the Thomson One Banker SDC database, and the acquirer country is the United States, with no restrictions on the target firm nation. I find that, compared to non–mega-deals, both the acquirer and target firms of mega-deals tend to have a higher debt to total assets, free cash flow to assets, market to book, and return on assets. However, there is no obvious difference in the leverage ratio between mega-deals and non–mega-deals. Furthermore, target firms' mean debt to equity of non–mega-deals is distinctly higher than that of mega-deals. In terms of deal characteristics, mega-deals have a lower mean offer premium than non–mega-deals do, and they tend to choose mixed payments of both cash and stock, whereas non–mega-deals prefer a single payment method, either all stock or all cash. Non–mega-deals also exhibit greater diversification in M&A activity, while most mega-deals are within the same industry.

I find that acquirer firms of mega-deals are more likely to improve their debt levels in terms of their leverage ratio and debt to total assets. This may imply that mega-deals attach more importance to the improvement of debt levels, rather short-term market performance. However, acquirer firms in mega-deals are less likely to improve their debt-to-equity ratio, in contrast with those in non–mega-deals. Acquirers with a larger change in leverage ratio during the takeover process seems to prefer target firms with a higher leverage ratio, debt to total assets, and free cash flow to total assets. This is especially true for mega-deals. On the other hand, although mega-deals tend to show a larger change in acquirer firms' market-to-book ratio, those with a large change in acquirer firms' leverage ratio seem to prefer to choose target firms with a lower market-to-book ratio.

The regression results show that the deal value does play a significantly positive role in improving acquirer firms' leverage ratio and debt to total assets. Target firms' leverage ratio also has a significantly positive effect on these two terms. However, its effect is not as strong as those of mega-deals. The offer premium has a significantly negative effect on the improvement of acquirer firms' leverage ratio. Although its effect is not large, it is consistent with the low mean offer premium and the large change in acquirer firms' debt level in mega-deals. While the all-stock payment method has a significantly negative effect on acquirer firms' debt to total assets, the time to completion and deal values both have significantly positive effects. Given that the share of all-stock payments is low in mega-deals and mega-deals usually involve much longer takeover times and far larger deal values, it seems reasonable that, compared to acquirer firms of non–mega-deals, acquirer firms of mega-deals tend to experience a larger improvement in debt to total assets during the takeover process. However, these three factors are no longer significant when target firm characteristics are included. Instead, target firms' ratio of free cash flow to total assets and debt to
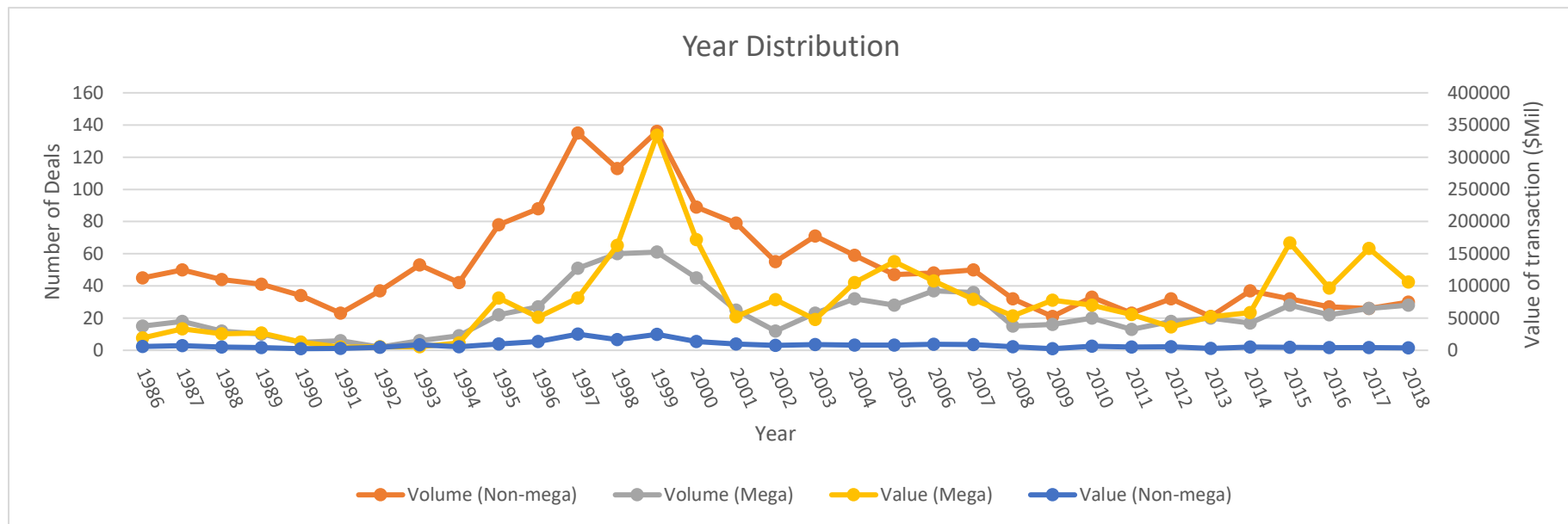
total assets become significantly positive factors, while target firms' market-to-book ratio has significantly negative effect.

5.6 Tables for Empirical Chapter 3

Figure 5.1 Year Distribution Figure

The figure presents year distribution of full sample deals. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Volume indicates the number of deals for the certain year (referring to y-axis on the left), and value indicates the sum of deal value for the certain year (referring to y-axis on the left).

Table 5.1 Full Sample Year Descriptive Statistics

The table presents year descriptive statistics of full sample deals. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Yearly number of deals, and their mean, median, and standard deviation are listed in the table.

Year	Number			Mean			Median			Standard Deviation		
	All	Mega	Non-mega	All	Mega	Non-mega	All	Mega	Non-mega	All	Mega	Non-mega
1986	40	13	27	547.57	1401.30	136.51	171.94	1063.08	133.94	775.13	873.21	97.11
1987	52	16	36	712.67	1948.59	163.37	235.20	1010.68	89.28	1551.60	2403.94	150.57
1988	42	12	30	680.40	2129.88	100.61	120.38	1089.37	66.24	1486.10	2235.82	95.47
1989	34	9	25	827.12	2802.00	116.16	131.90	2158.88	99.87	1741.35	2550.69	108.01
1990	28	4	24	457.96	2669.21	89.41	73.66	1194.29	64.20	1447.26	3346.06	79.76
1991	19	5	14	324.07	784.64	159.58	235.49	664.95	162.92	331.12	293.45	120.79
1992	19	2	17	429.55	2791.08	151.73	139.40	2791.08	128.35	1033.65	2559.16	116.36
1993	47	4	43	240.13	1003.47	169.12	172.20	1095.88	150.67	278.35	352.70	123.75
1994	40	8	32	365.05	1360.16	116.27	99.87	1188.51	85.24	566.31	569.18	104.30
1995	81	19	62	892.52	3398.87	124.45	148.37	2039.97	79.47	2598.45	4616.03	106.12
1996	96	24	72	635.00	2042.15	165.95	179.90	1208.51	119.71	1372.16	2228.84	132.64
1997	136	34	102	522.52	1489.28	200.27	247.77	1040.67	167.27	862.00	1303.20	137.09
1998	128	46	82	1102.48	2781.36	160.66	265.89	1398.77	124.04	2199.09	3020.08	128.66
1999	143	51	92	2101.95	5530.12	201.55	322.92	1587.28	169.73	9209.63	14906.79	140.38

2000	105	40	65	1647.77	4045.12	172.48	352.84	2231.68	151.45	3257.86	4329.38	151.05
2001	76	17	59	562.96	2059.94	131.62	156.59	1629.64	112.61	1369.45	2384.45	102.73
2002	40	6	34	1913.02	11876.42	154.77	154.76	2635.04	125.98	9059.06	22358.18	114.34
2003	64	16	48	577.02	1855.21	150.95	136.42	1375.55	111.25	1151.68	1785.25	138.46
2004	62	25	37	1596.53	3708.50	169.52	341.58	1607.37	142.05	4872.42	7247.74	129.47
2005	50	20	30	2562.11	6136.80	178.98	361.67	1495.66	152.42	7927.01	11815.52	139.46
2006	57	27	30	1656.83	3240.11	231.88	466.82	1205.14	187.61	4172.96	5703.84	153.72
2007	55	26	29	1256.95	2393.57	237.91	479.51	1761.22	206.50	1656.69	1832.53	140.32
2008	29	9	20	1542.90	4529.06	199.12	300.62	2496.05	156.06	3017.35	4155.75	143.53
2009	25	12	13	2989.89	6096.45	122.30	442.91	1469.76	90.97	10943.23	15524.83	118.19
2010	34	13	21	1530.03	3618.07	237.43	354.99	1750.65	238.49	3333.63	4783.58	136.57
2011	20	9	11	1883.50	3861.73	264.95	490.31	2457.39	270.92	3392.14	4391.64	172.18
2012	26	8	18	876.83	2372.62	212.04	353.16	1992.85	181.47	1375.73	1728.66	178.89
2013	26	14	12	1608.61	2848.61	161.93	593.25	1330.18	108.17	2883.41	3519.64	123.95
2014	29	11	18	1563.71	3866.84	156.24	239.62	1540.28	141.25	3984.66	5919.37	101.27
2015	32	16	16	4097.56	8005.94	189.17	485.67	4393.37	143.16	8763.77	11230.51	125.42
2016	31	17	14	2282.39	4031.02	159.05	686.58	2536.05	149.04	4019.27	4805.15	89.89
2017	28	20	8	5222.79	7216.26	239.14	656.10	1041.12	196.64	14314.56	16629.29	157.53
2018	25	17	8	3579.95	5173.59	193.48	935.98	2555.49	217.33	5853.00	6553.11	155.52
Total	1719	570	1149	1332.97	3681.38	167.97	247.65	1459.19	133.69	4782.00	7793.82	132.67

Table 5.2 Summary Statistics of deal characteristics

The table presents summary Statistics of deal characteristics of full sample deals. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Deal characteristics includes deal value ($mil), offer premium (%), paid by fully stock or fully cash (%), diversification (%), and time to completion. *Offer premium* equals the ratio of the offer price to the target's share price one month prior to the deal announcement. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Cash* takes the value of one if the deal is fully financed by cash, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Mega (1)	Non-mega (2)	Difference (2)-(1)
		Deal characteristics			
Deal value ($mil)	mean	1,332.97	3,681.38	167.97	-3,513.42***
	n	1,719	570	1,149	
Offer Premium	mean	45.74	40.17	48.51	8.344***
	n	1,719	570	1,149	
Stock	mean	37.86	32.51	40.57	8.066***
	n	636	177	459	
Cash	mean	33.93	27.56	37.16	9.602***
	n	570	173	397	
Diversification	mean	31.06	27.37	32.9	5.530***
	n	534	156	378	
Time to Completion	mean	137.36	152.3	129.95	-22.347***
	n	1,719	570	1,149	

Table 5.3 Summary Statistics of acquirer characteristics

The table presents summary Statistics of acquirer characteristics of full sample deals. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer characteristics includes market capitalization ($mil), free cash flow to total asset, market-to-book ratio, leverage ratio, return on equity, return on asset, price-earning ratio, debt to total asset ratio, and debt to equity ratio. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Mega (1)	Non-mega (2)	Difference (2)-(1)
			Acquirer characteristics		
Market Cap ($mil)	mean	14,420	28,017.63	7,848.68	-20,168.95***
	n	1,719	570	1,149	
FCF-to-asset	mean	0.025	0.036	0.02	-0.018***
	n	1,719	570	1,149	
Market-to-book	mean	3.334	4.009	3.003	-1.006***
	n	1,719	570	1,149	
Leverage	mean	0.715	0.757	0.694	-0.062
	n	1,719	570	1,149	
Return on Equity	mean	0.155	0.161	0.152	-0.009
	n	1,719	570	1,149	
Return on Asset	mean	0.125	0.150	0.112	-0.038***
	n	1,719	570	1,149	
Price-Earning Ratio	mean	16.416	17.628	15.812	-1.816
	n	1,719	570	1,149	
Debt-to-total asset	mean	0.205	0.241	0.188	-0.054***
	n	1,719	570	1,149	
Debt-to-equity	mean	4.257	4.056	4.357	0.301
	n	1,719	570	1,149	

Table 5.4 Summary Statistics of target characteristics

The table presents y summary Statistics of target characteristics of full sample deals. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Target characteristics includes market capitalization ($mil), free cash flow to total asset, market-to-book ratio, leverage ratio, return on equity, return on asset, price-earning ratio, debt to total asset ratio, and debt to equity ratio. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full sample	Mega	Non-mega	Difference
			(1)	(2)	(2)-(1)
Target characteristics					
FCF-to-asset	mean	0.01	0.026	0.002	-0.024***
	n	1,719	570	1,149	
Market-to-book	mean	3.302	5.111	2.392	-2.719***
	n	1,719	570	1,149	
Leverage	mean	1.065	1.033	1.081	0.048
	n	1,719	570	1,149	
Return on Equity	mean	-0.059	0.014	-0.097	-0.111
	n	1,719	570	1,149	
Return on Asset	mean	0.061	0.099	0.041	-0.057***
	n	1,719	570	1,149	
Price-Earning Ratio	mean	12.183	14.839	10.758	-4.081
	n	1,719	570	1,149	
Debt-to-total asset	mean	0.197	0.250	0.170	-0.080***
	n	1,719	570	1,149	
Debt-to-equity	mean	4.235	2.994	4.870	1.816*
	n	1,719	570	1,149	

Table 5.5 Descriptive of short-term and long-term post-acquisition market performance

The table presents year descriptive statistics of short-term and long-term post-acquisition market performance. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. 3-day, 5-day, 11-day, and twenty-one-day cumulative abnormal return (*CAR*) are used to evaluate the short-run post-acquisition performance, and 12-month, 24-month, and 36-month buy and hold abnormal return (*BHAR*) are used to present the long-run acquisition performance. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full Sample	Mega	Non-mega	Differences
		Short-term market performance			
CAR(-1,+1)	mean	-0.96	-1.76	-0.56	1.200***
	n	1,719	570	1,149	
CAR(-2,+2)	mean	-1.07	-1.59	-0.81	0.781**
	n	1,719	570	1,149	
CAR(-5,+5)	mean	-1.22	-1.86	-0.91	0.951**
	n	1,719	570	1,149	
CAR(-10,+10)	mean	-1.22	-1.86	-0.91	0.951**
	n	1,719	570	1,149	
		Long-term market performance			
BHAR(0,+12)	mean	1.72	0.97	2.1	1.122
	n	1,719	570	1,149	
BHAR(0,+24)	mean	-8.33	-6.68	-9.16	-2.472
	n	1,719	570	1,149	
BHAR(0,+36)	mean	-17.44	-12.82	-19.78	-6.956***
	n	1,719	570	1,149	

Table 5.6 Acquirer and target financial changes during takeover process

The table presents acquirer and target financial changes during takeover process of full sample deals. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer's leverage change ($\triangle A_leverage$), market-to-book ratio change ($\triangle A_M2B$), debt-to-total asset ratio($\triangle A_D2TA$), and debt-to-equity ratio ($\triangle A_D2E$) from announcement to effective are listed. One-month, six-month, 12-month, and 24-month change of acquirer leverage ($\triangle A_leverage$) from announcement, and one-month change of target leverage($\triangle T_leverage$) are listed. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Full Sample	Mega (1)	Non-mega (2)	Difference (2)-(1)
△A_leverage from announcement to effective	mean	0.767	0.889	0.707	-0.181**
	n	1,687	558	1,129	
△A_M2B from announcement to effective	mean	3.446	4.283	3.034	-1.249***
	n	1,687	558	1,129	
△A_D2TA from announcement to effective	mean	0.205	0.241	0.188	-0.054***
	n	1,687	558	1,129	
△A_D2E from announcement to effective	mean	4.262	3.87	4.455	0.586**
	n	1,687	558	1,129	
△ A_leverage(0,+24)	mean	0.152	0.145	0.156	0.011
△ A_leverage(0,+12)	mean	0.111	0.106	0.114	0.008
△ A_leverage(0,+6)	mean	0.217	0.541	0.056	-0.485
△ A_leverage(0,+1)	mean	-0.002	-0.005	0.000	0.006
△ T_leverage(0,+1)	mean	0	-0.025	0.005	0.031***
	n	1,543	521	1,022	

Table 5.7 Target financial differences and comparisons

The table presents target financial differences and comparisons of full sample deals. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer's leverage change ($\triangle A_leverage$) from announcement to effective is divided into two groups (*higher* and *lower* groups) according to value. Target's financial characteristics: free cash flow to total asset(T_CF2TA), market-to-book ratio (T_M2B), leverage ratio ($T_leverage$), debt to total asset ratio (T_D2TA) are used to analyzed the different preferences of two groups. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Mega			Non-mega			Difference	Difference
		All	higher △A_leverage_ef (1)	lower △A_leverage_ef (2)	All	higher △A_leverage_ef (3)	lower △A_leverage_ef (4)	(2)-(1)	(4)-(3)
T_leverage	mean	1.032	1.26	0.769	1.082	1.825	0.363	-0.491**	-1.462
	n	566	304	262	1086	534	552		
T_D2TA	mean	0.247	0.301	0.181	0.171	0.207	0.136	-0.121***	-0.072***
	n	580	317	263	1,095	538	557		
T_M2B	mean	5.093	3.605	6.836	2.37	2.044	2.685	3.231*	0.640**
	n	567	306	261	1,089	536	553		
T_CF2TA	mean	0.025	262	0.019	0.002	0.011	-0.007	-0.012***	-0.018***
	n	558	314	262	1,073	523	550		

Table 5.8 The post-merge performance of mega deals and non-mega deals

The table presents the short-term and long-term post-acquisition market performance. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. 3-day, 5-day, 11-day, and twenty-one-day cumulative abnormal return (*CAR*) are used to evaluate the short-run post-acquisition performance, and 12-month, 24-month, and 36-month buy and hold abnormal return (*BHAR*) are used to present the long-run acquisition performance. In this thesis, all continuous variables are winsorized at the 1% and 99% levels, the Student's t-test is used to test for statistical significance, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

		Mega			Non-mega			Difference	Difference
		All	higher △A_leverage_ef	lower △A_leverage_ef	All	higher △A_leverage_ef	lower △A_leverage_ef		
			(1)	(2)		(3)	(4)	(2)-(1)	(4)-(3)
CAR(-1,+1)	mean	-1.762	-1.185	-2.490	-0.562	-0.326	-0.784	-1.305**	-0.458
	N	570	318	252	1,149	557	592		
CAR(-2,+2)	mean	-1.591	-0.962	-2.386	-0.810	-0.532	-1.072	-1.424***	-0.540
	N	570	318	252	1,149	557	592		
CAR(-5,+5)	mean	-1.859	-1.292	-2.575	-0.908	-0.695	-1.109	-1.283*	-0.414
	N	570	318	252	1,149	557	592		
BHAR(0,+12)	mean	0.974	0.825	1.159	2.096	0.324	3.739	0.334	3.415
	N	570	318	252	1,149	557	592		
BHAR(0,+24)	mean	-6.684	-6.512	-6.897	-9.156	-9.756	-8.599	-0.384	1.157
	N	570	318	252	1,149	557	592		
BHAR(0,+36)	mean	-12.822	-13.056	-12.530	-19.778	-19.600	-19.944	0.527	-0.344
	N	570	318	252	1,149	557	592		

Table 5.9 OLS regression model of acquirer leverage and debt-to-equity ratio change from announcement to effective

The table presents OLS regression model of acquirer leverage and debt-to-equity ratio change from announcement to effective of full sample deals. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer's leverage change ($\triangle$ A_leverage_ef) and debt-to-total asset ratio($\triangle$A_D2TA_ef) from announcement to effective are used as the dependent variable of the models. Independent variables include deal characteristics and target characteristics. Deal characteristics includes mega dummy (*Mega*), offer premium (%), fully paid by stock (%), diversification (%), the logarithm of time to completion, and the logarithm of deal value. *Offer premium* equals the ratio of the offer price to the target's share price one month prior to the deal announcement. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. Target characteristics includes free cash flow to total asset (*T_CF2TA*), market-to-book ratio (*T_M2B*), leverage ratio (*T_leverage*), return on asset (*T_ROA*), and debt to total asset ratio (*T_D2TA*). In this thesis, all continuous variables are winsorized at the 1% and 99% levels, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

Independent Variable	△A_leverage_ef	△A_leverage_ef	△A_leverage_ef	△A_D2TA_ef	△A_D2TA_ef	△A_D2TA_ef
	(1)	(2)	(3)	(4)	(5)	(6)
Mega	0.158*	0.141*	0.167	0.030***	0.021*	0.025***
T_Leverage	0.009***	0.010***	0.010***		0.001***	0.001*
Offer Premium	-0.002**	-0.002*	-0.001	0.000*	-0.000	
Stock			0.113**		-0.044***	
Diversification			-0.113		0.006	
log(Time toCompletion)			0.102		0.011*	
log(DealValue)			-0.019		0.009**	

T_M2B		-0.001	-0.002			-0.001**
T_CF2TA		1.340*	1.0002			0.184***
T_ROA		-0.070	-0.116			-0.021
T_D2TA				0.286***		0.359***
Constant	0.781***	0.780***	0.207	0.146***	0.110***	0.129***
Year fixed effects	No	No	No	No	No	No
Industry fixed effects	No	No	No	No	No	No
Observations	1,719	1,719	1,719	1,719	1,719	1,719
Adjusted R2 (%)	0.71	0.75	1.63	16.58	5.79	20.54

Table 5.10 OLS regressions of acquirer short- and long-term market performance with interaction coefficient of mega deal and higher-level acquirer's leverage change

The table OLS regression model of acquirer short- and long-term market performance with interaction coefficient of mega deal and higher-level acquirer's leverage change. The sample consists of 1,719 deals announced between January 1, 1986 and December 31, 2018. In order to be considered into our sample, the deal must be completed, domestic U.S. mergers and acquisitions with at least $1 million transaction value. Acquirers are U.S. firm listed in NYSE, AMEX or NASDAQ with valid data on CRSP, in order to evaluate bidder's short-run and long-run market performance. After eliminating outliers, target firms are public corporates. Deal value is reassessed by constant dollars of 2010 as the nominal proceeds adjusted by the U.S. monthly Gross Domestic Product to eliminate for the influence of inflation and economic growth. Acquisitions with transaction value over $500 million are labeled as mega mergers, otherwise non-mega mergers. Acquirer's 3-day cumulative abnormal return (*CAR[-1,+1]*) is used to evaluate the short-run post-acquisition performance, and 12-month, and 36-month buy and hold abnormal return (*BHAR[0,12], BHAR[0,36]*) are used to present the long-run acquisition performance. These are used as the dependent variable of the models. Independent variables include deal characteristics, acquirer and target characteristics, and interaction coefficient of mega deal and higher-level acquirer's leverage change. Interaction coefficient of mega deal and higher-level acquirer's leverage change (*Mega*High △A_leverage_ef*) equals *Mega* times △*A_leverage_ef*. Deal characteristics includes offer premium (%), fully paid by stock (%), diversification (%), the logarithm of time to completion, and the logarithm of deal value. *Offer premium* equals the ratio of the offer price to the target's share price one month prior to the deal announcement. *Stock* takes the value of one if the deal is fully financed by stock, otherwise takes the value of zero. *Diversification* takes the value of one if target and acquirer are in different industry, otherwise takes the value of zero. *Time to completion* equals the number of days count from announcement to effective. Acquirer characteristics includes free cash flow to total asset (*A_CF2TA*), market-to-book ratio (*A_M2B*), leverage ratio (*A_leverage*), return on asset (*A_ROA*), and debt to total asset ratio (*A_D2TA*). Target characteristics includes free cash flow to total asset (*T_CF2TA*), market-to-book ratio (*T_M2B*), leverage ratio (*T_leverage*), return on asset (*T_ROA*), and debt to total asset ratio (*T_D2TA*). In this thesis, all continuous variables are winsorized at the 1% and 99% levels, and significance at the 1%, 5% and 10% levels is denoted by ***, ** and * respectively.

	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	BHAR[0,12]	BHAR[0,36]
Independent Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Mega* High △A_leverage_ef	1.142***	0.922*	0.875*	-0.302	1.698
Offer Premium	-0.001	0.000	0.000	0.032	0.011
Stock	-1.723***	-1.765***	-1.658***	-3.287*	-4.003*

Diversification	-0.444	-0.504	-0.480	-2.540*	-2.869
log(Time to Completion)	-0.730**	-0.722***	-0.800***	4.327***	5.370***
log(DealValue)	-0.843***	-0.870***	-0.923***	-0.851	-0.563
A_M2B		0.018	0.273		
A_CF2TA		-1.494	0.310		
A_ROA		4.091**	3.585**		
A_D2TA		2.436**	2.404*		
T_M2B			0.006		
T_Leverage			-0.026		
T_CF2TA			-4.097		
T_ROA			1.471		
T_D2TA			-0.270		
Constant	7.565**	6.481**	8.660***	-13.43	-55.951
Year fixed effects	Yes	Yes	Yes	No	No
Industry fixed effects	Yes	Yes	Yes	No	No
Observations	1,719	1,719	1,719	1,719	1,719
Adjusted R2 (%)	8.39	8.63	8.69	0.41	32.90

6 General conclusions

6.1 Conclusions

This thesis investigates the impacts of mega-deals on post-merger market performance, deal status, and debt levels. The literature covers a large number of studies on the impacts and mechanisms of political, economic, cultural, and other factors on the performance of cross-border mega-mergers and acquisitions (mega-M&As). Their main focus is on the completion of cross-border M&As, the stock market response, and long-term post-merger performance. However, investigations on the different impacts of deal characteristics between mega-deals and non–mega-deals are rare. Chapter 3 investigates the post-merger market performance differences between mega-deals and non–mega-deals, as well as the roles of the characteristics of deals, acquirer firms, and target firms. Chapter 4 explores the impacts of mega-deals on the success or failure of deals and post-merger stock market performance. Chapter 5 examines the change in acquirer firms' debt levels in the takeover process and the impact of deal characteristics.

Chapter 3 compares how mega-deals and non–mega-deals perform differently when other factors are controlled for. By analysing nearly 6,000 deals from 1990 to 2016, I find that mega-merger deals, namely, acquisitions with a transaction value over $500 million, gain around announcements but suffer from market loss in the long run. Ceteris paribus, though mergers experience negative market feedback, on average, mega-deals outperform non–mega-deals significantly at both 24 and 36 months, but this pattern reverses in the short run. This result is inconsistent with past papers that argue that massive acquisitions destroy value to some extent. In addition, many control variables seem to contribute to this sequence, especially the payment method, target publicity, and acquirer characteristics.

Mega-deals seem to be more profitable than non-mega-deals, in that they tend to lose less in the long run. Not only do firm and deal characteristics matter, but also acquirer industry structure can explain this issue to some extent. While non–mega-deals tend to have better short-term performance, mega-deals are more likely to have better long-term performance. Further, cash deals tend to have better performance than stock deals, while deals with a non-public target tend to have better performance than deals with a public target. In addition, mega-deals tend to have higher values than non–mega-deals in acquirer characteristics such as the market cap, market to book, free cash flow to total assets, and leverage ratio. Mega-deals are more likely to have higher values in deal characteristics such as deal value, relative size, and time to completion. Acquirers' leverage ratio, relative size, and Herfindahl–Hirschman index all have significantly positive effects on short-term performance, while a public target has significantly negative effects on short-term performance. Cash payments have significantly positive effects on short-term performance for all deals, while tender offers have significantly positive effects on long-term performance for all deals. In addition, acquirers' market-to-book ratio has significantly negative effects on the short-term performance of mega-deals.

Whether unsuccessful M&A deals destroy value is a matter of debate. Chapter 4 tries to answer this question by investigating the relationship between deal status and post-merger stock market performance and how these are affected by mega-deals and payment methods. The results suggest that successful deals significantly affect long-term post-merger stock market performance in a positive way, while mega-deals and all-stock payments both significantly affect it in a negative way. In addition, the mean ratio of deals with all-stock payments is significantly lower among withdrawn mega-deals, while it is significantly higher in withdrawn deals in the full sample.

The relationship between deal status and deal size is investigated by analysing the performance of withdrawn and completed deals and their relationships with mega-deals and the payment method. The results show that successful deals have a significantly positive effect on long-term post-merger stock market performance, while mega-deals and all-stock payments both have significantly negative effects. However, these effects may disappear when the characteristics of acquirer firms and target firms are included in the analysis. Instead, the interaction between successful deals and mega-deals becomes a significant factor, as well as acquirer firms' and target firms' cash flow to total assets and return on assets. As for short-term post-merger stock market performance, deal characteristics such as deal value, diversification, tender offers, hostile takeovers, and all-stock payments are the most significant factors. It should be noted that hostile takeovers and all-stock payments have significantly negative effects on both short- and long-term post-merger stock market performance. These results are also supported by the relationships between the characteristics of the sample. The mean ratio of hostile takeovers is significantly higher among withdrawn mega-deals, which may suggest that hostile takeovers have a higher chance of being rejected in mega-deals than in non–mega-deals. In addition, the mean ratio of deals with all-stock payments is significantly lower among withdrawn mega-deals, however, it is significantly higher in the withdrawn deals for the full sample.

Chapter 5 investigates the change in acquirer firms' debt levels in the takeover process and the role of mega-deals. Compared to those of non–mega-deals, both the acquirer firms and target firms of mega-deals tend to have higher debt to total assets, free cash flow to assets, market to book, and return on assets. However, there is no significant difference in the leverage ratio between mega-deals and non–mega-deals. Furthermore, target firms' mean debt-to-equity ratio for non–mega-deals is significantly higher than that for mega-deals. Regarding deal characteristics, mega-deals have a lower mean offer premium than non–mega-deals and they tend to choose mixed payments, with both cash and stock, while non–mega-deals prefer single

payment methods, either all stock or all cash. Non–mega-deals also have greater diversification in terms of M&A activity, while most mega-deals are between firms in the same industry. Non–mega-deals tend to have better short-term post-merger market performance than mega-deals, while mega-deals can experience much better post-merger market performance in the long run. It seems acquirer firms of mega-deals are more likely to improve their debt levels in terms of their leverage ratio and debt to total assets. This may imply that mega-deals attach more importance to the improvement of debt levels rather than short-term market performance. However, acquirer firms of mega-deals are less likely to improve their debt-to-equity ratio, in contrast with non–mega-deals. Those with a larger change in leverage ratio during the takeover process seems to prefer target firms with a higher leverage ratio, debt to total assets, and free cash flow to total assets. This is especially true for mega-deals. On the other hand, although mega-deals tend to induce a larger change in acquirer firms' market-to-book ratio, it seems that mega-deals with a large change in acquirer firms' leverage ratio prefer target firms with a lower market-to-book ratio.

Mega-deals do play a significantly positive role in improving acquirer firms' leverage ratio and debt to total assets. Target firms' leverage ratio also has significantly positive effects on these two terms; however, its effect is not as strong as that of mega-deals. The offer premium has a significantly negative effect on the improvement of acquirer firms' leverage ratio. Although the effect is not large, it is consistent with the low mean of the offer premium and the large change in acquirer firms' debt level in mega-deals. While the all-stock payment method has a significantly negative effect on acquirer firms' debt to total assets, time to completion and deal values both have significantly positive effects. Given that the share of deals with all-stock payments is low among mega-deals, and mega-deals usually involve much longer takeover times and far larger deal values, it seems reasonable that, compared to non–mega-deals, the acquirer firms of mega-deals tend to experience larger improvements in debt to total assets during the takeover process.

However, these three factors are no longer significant when target firm characteristics are included. Instead, target firms' ratio of free cash flow to total assets and debt to total assets become significantly positive factors, while target firms' market-to-book ratio has a significantly negative effect. All-stock payments, time to completion, and deal value all have significantly negative effects on short-term post-merger market performance, which, to some extent, explains why mega-deals tend to have poor short-term post-merger market performance. In contrast, mega-deals and acquirer firms' return on assets have significantly positive effects on short-term post-merger market performance. Furthermore, both time to completion and acquirer firms' return on assets have significantly positive effects on the long-term post-merger market performance.

6.2 Future study

This thesis only investigates the problem from an overall and macro perspective, and many detailed questions remain unanswered. While industry structure can affect merger deals, huge deals can affect competition in the entire industry as well. How huge deals affect the industry and how diversification and policy restrictions affect acquisition performance can be directions for future research. Further, industry concentration can take into account antitrust law, as well as policy tightness. Analysing these factors together can provide deeper understanding towards the topic.

In addition, the roles of the CEO and the management board in mega-deal completion and performance need further study. Martin and McConnell (1991) find that the turnover rate of top managers increases significantly after disciplinary takeovers, and there is a strong link between top executive turnover and the pre-takeover performance of target firms. Both results suggest that takeovers play an important role in disciplining top executives. This paper also suggests that the rate of turnover of top

executives does not differ significantly between friendly and hostile takeovers. In addition, regardless of the motivation, tender offer takeovers create value for the shareholders of the involved firms. According to Fu et al. (2013), the failure of stock-paying overvalued bidders is due to large governance problems. Alexandridis et al. (2017) also suggest that smoothed agency conflicts lead to the performance improvement of mega-deals since the 2009 financial crisis. After changing CEOs, previous failed deals may achieve later success.

Furthermore, it is interesting to investigate the impacts of the pandemic on M&As. Hu and Zhang (2021) demonstrate the tendency to favour cross-border M&As during the COVID-19 pandemic and their performance. Qin et al. (2021) examine firm-level cash holdings under COVID-19 and the moderating effects on firm's risk level of goodwill and goodwill impairment. As more data become available with the development of the COVID-19 pandemic, further investigation into how the pandemic shapes firms' investment decisions in terms of mega-deals, as well as their responses, would be a fruitful avenue of research.

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