**DO MORE MERGERS AND ACQUISITIONS CREATE VALUE
FOR THE FIRM?**

A thesis submitted for the degree of Doctor of Philosophy

by

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Abstract

This thesis is aimed to empirically investigate the performance impact of frequent acquisitions as an aggressive merger and acquisition (M&A) strategy for an acquiring firm. In literature related to the study of M&A, a common question is whether acquisitions improve the performance of acquirers. Neither theoretical nor empirical studies have a clear view on the performance effect of M&A. Some argue positively and some are opposite. Although existing research are mixed for their arguments, a takeover is commonly perceived as a shock to the firm with a constant effect on changing business performance. This static perception of M&A creates a difficulty in explaining why firms acquire others when the performance effect is negative. To address the issue, this thesis examines the M&A effect dynamically with taking into account the role of merger frequency in affecting performance.

On the basis of a large sample that consists of about 14,000 acquisitions from more than 100 countries over last 12 years, the thesis finds that the investors perceive a lower value if the acquiring firm is involved in frequent mergers. This is because more mergers are expected to attract considerable amount of management attention away from profitable activities in order to digest the challenges of new business integration at least in the short run. This "digesting constraint" argument is evident by our estimations. Firm becomes less profitable in the short run after a merger shock, and this adverse effect can be more severe if the firm is involved in more frequent mergers.

Evidence of the thesis further show that, the effect of merger shocks is not static and persistent, and it changes with time. The shock affects adversely profitability in the short run, usually lasting a couple of years, and then the negative effect on performance could be turned either oppositely if the firm digests the shock successfully, or otherwise, continuously but diminishing over time if the digestion takes longer such as for frequent acquisition. This finding implies that the pace of firm resilience to a merger shock can be affected by its merger strategies. The pace can be slow if the firm pursues frequent mergers aggressively.

The performance effect of a merger shock is dynamic and changes with time. The dynamic view for merger shocks from this study opens a new vision for literature in merger studies. Overall the market expectation to a merger effect on changing firm performance is quite consistently related to what has actually happened to the firm after the merger shock.

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1.   Introduction

1.1.   General concept of merger and acquisition

The compacting globally drives companies to grow rapidly, to act efficiently and effectively, to be profitable and to develop a competitively dominant position in the world. As a result, the mergers and acquisitions are inevitable for corporations to pursue in order to restructure a more competitive business for growth.

1.1.1. The type of M&As

Merger and acquisitions (M&As) are often classified as horizontal, vertical and conglomerate mergers. A horizontal merger and acquisition occurs when two corporations in similar lines of business or competitors combine. In general, horizontal merger causes the combined firm to obtain synergy and increases the market power by merging and acquiring related business. Apart from this, firms can also benefit both economies of scale and diversification by providing different products or services for risk reduction.

Vertical mergers are a combination of companies involved in different levels of production or business for producing a good. Combined companies usually have a buyer-seller relationship. The main reason for vertical merger, by directly merging with suppliers, is to increase synergies, decrease reliance and increase profitability. In general, vertical M&As can be classified into two types. Firstly, a backward vertical merger, which usually refers to the purchase of suppliers of the raw material in the chain of production and attempts to achieve production cost-saving and efficiency improvement. Secondly, a forward acquisition, which is usually a takeover of the acquirer's consumer and attempts to reduce marketing and delivering costs.

Conglomerate acquisition will create a combination of companies that have different or unrelated fields of business, which extends and diversifies an acquiring firm's product mixes (Mueller, 1977). In addition, Brealey et al. (2006) suggest that this type of M&A is the least popular one. The main motive for conglomerate M&A is efficient capital allocation and to enter a new emerging market to seek diversification of risks (Marks and Mirvis, 1998).

1.1.2. Development of M&A

There are six periods of intense merger activity, which are often called merger waves, driven by prevailing business growth imperatives since 1893 (e.g., Mitchell and Mulherin , 1996; Brealey and Myers, 2003).

The First Wave (1893-1904) included many horizontal mergers, creating many giants of the manufacturing and transportation industries in the US. Stigler (1950) described this as a wave of *monopoly and oligopoly by merger.* The wave stopped due to World War I. The Second Wave (1919-1929), was a wave of vertical merger and further consolidation in the principal industries formed by the First Wave, which was triggered by the application of radio technology and the development of automotive manufacturers. The Third Wave (1955-1970) was a wave of diversified conglomerate mergers, which mainly occurred between US firms and helped firms to enter a new market. This wave is ended because of the stock market crash in the early 1970's. The Fourth Wave (1974-1989) was an era of co-generic mergers, hostile takeovers and corporate raiders, which is also named the "highly leveraged takeovers" era. This era ended with the collapse of banks. The Fifth Wave (1993-2000) was the era of cross-border mergers. The rise of globalization has exponentially increased the competition, therefore, this era emphasized larger economies of scale and global economics to achieve competitive advantage in the global market. The fifth wave came to an end with

the bursting of the "Millennium Bubble". The Sixth Wave (2003-2008) was the era of globalization, private equity and shareholder activism.

1.2. Research context

1.2.1. Background

Several decades ago, mergers and acquisitions[1] seldom dominated the headlines as much as at present. It has been widely documented that nowadays many economies (e.g. USA) have witnessed a dramatic increase in merger activities. This is because of M&As, as an important strategy for business growth, are increasingly influential for corporations. A glance at existing literature indicates substantial mergers and acquisitions in a wide range of sectors, such as finance, steel, pharmaceuticals and gas.

An increase in M&A activity is often referred to either a wave of merger or merger clustering in the literature. Several waves of M&As have led to substantial industrial restructuring in different parts of the world. According to data from Thomson One Banker, aggregate transaction value has sharply increased from £1.95 billion in 1968 to £2,354 billion in 2013. Over the past decades the USA, UK and Continental Europe have made their FDI predominantly through cross-border M&As rather than greenfield investment. In addition, emerging countries, such as China and India, have witnessed a rapid growth of market for corporate control, taking up roughly 30% of overall global M&As in 2013.

Mergers and acquisitions decisions are critical to the success of corporations. In a dynamic economic environment, acquiring firms are often faced with strategic decisions concerning growth by acquisitions, or by internal investment. After all,

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[1] Mergers and acquisitions are both aspects of strategic management, corporate finance and management dealing with the buying, selling, dividing and combining of different companies and similar entities that can help an enterprise grow rapidly in its sector or location of origin, or a new field or new location, without creating a subsidiary, other child entity or using a joint venture. Mergers and acquisitions activity can be defined as a type of restructuring in that they result in some entity reorganization with the aim to provide growth or positive value.

through those takeovers, a decision maker is able to develop a competitive advantage and ultimately increase and maximize (at least in theory) the *actual benefits* generated by takeovers to improve company fundamentals. Many acquiring firms realize that M&As could be an efficient way to expand ownership boundaries, create corporate synergies, gain economies of scale, expand operations and reduce production costs. In theory, the effects of M&A are controversial for changing firm performance. In practice also, experiences are unclear. Literature suggests that many of mergers were disappointing since the motivations behind the takeover were probably flawed, and efficiency and synergy gains from economics of scale were somewhat ambiguous.

Empirical evidence has provided many possible M&A motivations, which can be briefly summarized as follows: resource-seeking, technology-seeking, market-seeking, diversification-seeking and asset-seeking (Andrade et al., 2001; Deng, 2004). Even though different companies have various reasons for engaging in mergers and acquisitions, the main purpose is to improve shareholders' value or firm fundamentals over and above that of the sum of two companies (Sudarsanam, 1995). Therefore, finance scholars have primarily focused on study of the issue of whether acquisitions are wealth creating or wealth reducing events for the acquiring firm.

The predominant focus of literature has focused on individual acquisitions and their performance implications. Many studies just simply and deliberately eliminate firms that undertook frequent acquisitions which may confoundingly occur during the pre- or post-acquisition window of a focal takeover. However, this would be problematic. Extensive empirical studies (e.g. Fuller et al., 2002; Conn et al. 2004; Ismail, 2008), which attempt to explain the causes and effects of takeovers on performance of acquiring firms, suggest that a large share of global acquirers has carried out multiple acquisitions during a specific short period, some of them even within the same year. When an acquirer performs frequent acquisitions, the overall impact of those

takeovers on its performance could not be attributed to the characteristics of individual/single merger case.

Although frequent mergers have become an increasingly important strategy widely adopted by firms, there is little evidence reported on how a frequent-merger strategy affects firm performance. For instance, from the short-run perspective, Conn et al. (2004) found a negative impact when the acquiring firms pursue frequent acquisitions. In contrast, Fowler and Schmidt (1989) suggest that frequent acquisition could enhance acquirer's expertise in M&As, which improves merger performance. From a long-run perspective, it is found that most of the existing work is either theoretical, based on game theory models (e.g., Nilssen and Sorgard, 1998; Fumagalli and Vasconcelos, 2009), or just pursuing simple statistical tests, except for a few papers that have explored this issue theoretically from the empirical corporate finance perspective. For, instance, Capron (1999) suggests a positive relationship between merger frequency and acquirer's performance in the long-run, in contrast to the prevalent view of the negative relationship (See for example, Bertrand and Betschinger, 2012).

In the existing studies, there are many limitations. For instance, Kusewitt (1985), Fowler and Schmidt (1989), Conn et al.(2004), Billett and Qian (2008) and Laamanen and Keil (2008) show some limitations in their studies, such as geographically biased samples, missing account of the effect of a time interval between takeovers or merger shocks in the estimation, only focusing on the market reaction; failure to find out the actual benefit of frequent acquisition and the link between it and investor expectation; and at least in the case of Conn et al. (2004) an inappropriate model specified for estimation. Overall, these limitations call for further research.

1.2.2. Motivation and aims

The main focus of the thesis is on the theme of "does an aggressive merger strategy with frequent acquisitions outperform the infrequent strategy for acquiring firms". In particular, it aims to examine a) how the different acquisition frequency patterns of acquirers affect their performance; b) whether the time interval between mergers or merger shocks can affect the relation between merger shocks and the post-merger performance; c) whether acquisitions by frequent acquirers have more favorable impacts on the performance of acquiring firms than do single takeovers.

There are three reasons for this choice of topic. Firstly, to gain a thorough understanding of frequently acquisitive behaviour and its impact on company performance. This understanding will help firms to develop either a short-run or a long-run acquisition strategy for growth, and also help investors to re-evaluate companies that become addicted to acquisition.

Secondly, although the effect of mergers on firm's performance has drawn a large amount of attention, relatively few published studies that associated with frequent acquisition could be found. So far, there is a lack of empirical research in the nexus between a frequently acquisitive strategy and acquirer's performance: this thesis aims to fill in the gap.

Thirdly, scholars in financial studies have a high concentration of interest in the USA, UK or any other single market (Cartwright, 2005), while few studies use worldwide sample of data for M&A studies.

1.3. Research method

1.3.1. Event-study approach

The thesis starts with an event-study chapter which explores the effect of merger frequency on performance by looking at the announcement effect of M&A on investors' perception on acquiring firm's value. The methodology of event study is widely applied to pursue this investigation. Generally, this methodology assumes that the market is informatively efficient, and price changes could effectively reflect new information. In merger and acquisition research, the events are assessed by a change in stock price during the period in which the event occurs.

The thesis follows the mainstream studies (e.g. Fuller et al., 2002; Conn et al, 2004) and takes the simplified method to evaluate impact of a merger announcement. The cumulative abnormal return (CAR) cumulates abnormal returns (ARs) over a "window" period or days around the event date which is set to be the date of announcement of an M&A event. The CAR is calculated as follows:

$$CAR_{i(T1-T2)} = \sum_{T1}^{T2} AR_{it} = \sum_{t=T1}^{t=T2} (R_{it} - R_{mt})$$

To investigate the sensitivity of the empirical results to different lengths of event window, this study first employed a 5-day event window which is commonly applied by existing studies (e.g. Faccio et al., 2006; Boubakri et al., 2012; Gaur, et al., 2013). To reduce the probability of capturing confounding events in CAR calculations, the event window was reduced from five days to three days to conduct the robustness checks.

1.3.2. Panel data estimation

The panel data estimation is applied to examine the static relation between announcement returns and merger frequency and the dynamic effect of merger shocks on firm fundamentals. With a panel estimation, econometric issues relating to the specific effect such as unobserved heterogeneity and endogeneity, which may arise from the estimation of the relation between merger frequency and firm performance, have been thoroughly explored in various chapters.

To make potential econometric concerns less severe and full use of the available rich dataset, the Least Square Dummy Variable (LSDV) and the system generalized method of moments (GMM) panel estimators are applied. These techniques are further complemented by various robustness checks to ensure that the empirical results of the respective approaches are consistently estimated.

1.3.3. Data

Compared to the existing studies, the dataset used in this thesis are substantially larger than those found in published M&A studies, and are more internationally representative. This allows a detailed analysis of the role that merger strategy or merger frequency plays. The dataset includes the most up to date and comprehensive worldwide firm-level data, which consists of two parts.

Firstly, the acquisition data used for both univariate and multivariate analysis are collected from the Securities Data Corporation (SDC)'s Global Mergers & Acquisitions database. All sample acquisitions are announced and completed during the period from January 1, 2000 to December 31, 2010. The dataset covers a larger amount successful acquisitions and tender offers of public, private and subsidiary target firms. All

acquiring firms included in the dataset are public companies. After a filtering process, the acquisition dataset ends up with more than 6,800 unique firms undertaking over 14,000 takeover transactions throughout 117 countries with a total transaction value of $4.49 trillion. Secondly, an accounting and a stock dataset of acquirers based on the merger dataset discussed above are used. The accounting information was retrieved from the Thomson Financials and Worldscope database. The stock data were obtained from Datastream,

1.4. Major contributions

The section is a brief summary of the major contributions in the thesis.

1.4.1. Chapter 2

The contribution of this chapter to the existing literature is threefold. Firstly, this chapter examines the impact of the merger frequency on the acquirer's performance by using a large and diverse sample of 14,103 takeover deals worldwide. Secondly, it contributes to the existing literature on corporate finance by distinguishing the creation of synergy, and division of gains between acquirers with different merger frequencies. Thirdly, it extends M&A literature by recording that the greater negative effect on the announcement returns usually appears in subsequent deals for acquirers associated with higher merger frequency. Significantly, it shows that the negative effect of a merger on performance becomes lower when the time intervals between subsequent deals are longer.

1.4.2. Chapter 3

This chapter makes four significant contributions to the existing literature on corporate merger strategy. Firstly, the study develops a new method of defining the merger frequency that interacts the number of mergers with the time that a merger effect may last after the event occurrence. Secondly, this study adds to the literature on how acquisitions affect the acquiring firm's stock performance in both the temporal and quantitative perspectives. Thirdly, it builds upon studies about the different implications to relationship between the aggressiveness of merger strategy and market expectation. Fourthly, a new argument is posited that the larger deal size produces a more positive impact on performance improvement for the acquiring firms due to the risk pressure on management.

1.4.3. Chapter 4

The research design developed in this chapter enables four new contributions to the literature. Firstly, this chapter is innovative because it systematically analyzes the operational performance implications of the frequent acquisition by employing a large global sample of acquiring companies. Secondly, this chapter introduces a new argument that the number and time of a merger shock matter simultaneously for the fundamental performance of the acquiring firm. Thirdly, it contributes to the literature by distinguishing effects between frequent acquirers and single acquirers: an area neglected in the literature. Fourthly, it extends the existing digesting theory (McCarthy, 1963) and the chewing theory (Kusewitt, 1985) into a dynamic context. It argues that the effect of merger shocks or frequency changes with time. As a result, the existing process of "Need to Chew" needs to be followed by a new process "Chew to Change".

McCarthy (1963) suggests that the presence of the clash of cultures and conflicts of objectives between the acquirer and the acquire leads to inefficiency in digestion and

absorption of the "nutrition". Kusewitt (1985) refers to this indigestion issue as "biting off more than you can chew". Both of these arguments suggest that the negative effect of merger frequency is attributable to the number of acquisitions. However, when time is taken into account in the process of digestion, the longer process helps the firm to gradually absorb the shocks of frequent acquisition, and then allows it to gain more corporate synergies for business operation.

1.5. Thesis structure and highlights

This thesis consists of five chapters as shown below.

1.5.1. Introduction (Chapter 1)

This chapter includes the background, research motivation and aims, research methods, major contributions and arguments and outlines the structure of the research thesis.

1.5.2. Short-term univariate analysis (Chapter 2)

Chapter 2 seeks to examine the effect of merger frequencies on the expectation of investors to the integration of new business for their performance in the future. Given this objective, the chapter focuses on performance assessment from an investment perspective.

By using a sample of 14,103 acquisitions collected from different countries over 11 years from 2000 to 2010, a univariate analysis is delivered to explore the effects of

frequent acquisition on announcement returns for three groups of acquirers: infrequent, frequent and highly frequent acquirers. The comparative results of announcements show that the low frequent acquirers outperform the highly frequent ones, in which this finding is consistent and robust across different time lengths, different regions, different time periods, different ownerships of target firms, different size of deals and different payment methods made by acquirers.

The significant findings of this chapter provide clear evidence on which the acquiring managements or firms have developed the hubris from their previously successful experiences on mergers and acquisitions. The development of hubris with more mergers drives down the expectation of investors for better performing in the future of the new integration and so lowering the value of the firm. Although the acquiring managements are expected to have declined performance after their first deal or second deals of mergers due to growing hubris in M&A, this does not mean that the management learning effect will be rejected. The chapter shows evidence about the learning effect that drives up the market expectation for the future improvement of new integration if the time interval between the two mergers pursued by the acquiring firm is longer.

1.5.3. Short-term multivariate analysis (Chapter 3)

This chapter aims to extend the existing studies of the frequent acquisition by using a more internationally representative sample with control of firm specific fixed effects, but also by defining merger frequency in terms of how merger effect can last, in the short-term, medium-term or long-term. Splitting frequency into these three terms enables interaction between time interval and frequency as a joint effect for estimations of how frequency affects stock performance in two dimensions: number and time.

Based on multivariate approach, it is found that if the number of merger repetitions presents "hubris", then it is expected that the frequency is negatively related to the market performance of acquiring firms. For a given number of mergers, if the length of time after the event occurrence reflects the amount of learning time which the management needs to digest opportunities and changes from new integrated business for more learning, then the longer time of an event repeating is expected to be positively related to performance. However, the estimation in this chapter of the interaction of frequency with time shows that the two managerial behaviours co-exist and offset each other.

In addition, the study shows that the larger size of a merger has a positive effect on performance. This supports the argument about "risk pressure" on the management of the acquiring firm. The estimation results are robust in two senses: firstly, controlled firm fixed effects in estimation, and secondly, a larger sample provides the consistency of estimation across different economies.

1.5.4. Long-run empirical analysis (Chapter 4)

The final empirical chapter starts with a question: Can market expectation of merger events on the announcement time be consistent with what would happen to a firm's operational performance in a later period? This chapter focuses on how the operational performance changes as an acquirer makes a different frequency of acquisition in a different time interval. If the acquiring firm can properly digest acquired assets and absorb "nutrition" from those assets, then the profitability of the acquiring firm will be improved, or at least, not damaged.

In Chapter 3, it is found that the investors perceive a lower value if the acquiring firm is involved in frequent mergers. This is because more mergers are expected to attract a considerable amount of management attention away from profitable activities in order to digest the challenges of new business integration at least in the short run. This "digesting constraint" argument is evident in the estimations reported in this chapter. Firms becomes less profitable in the short run after a merger shock, and this adverse effect can be more severe if a firm is involved in more frequent mergers.

Evidence in this chapter also shows that the effect of merger shocks is not static and persistent, and it changes with time. The shock adversely affects profitability in the short run, usually lasting a couple of years, and then the negative effect on performance could be turned either oppositely, if the firm digests the shock successfully, or continuously but diminishing over time if the digestion takes longer such as for frequent acquisition. In sum these findings imply that the pace of firm resilience to a merger shock can be affected by its merger strategies. The pace can be slow if the firm pursues frequent mergers aggressively.

1.5.5. Conclusion (Chapter 5)

The last chapter summarizes the major findings and contributions of the thesis, its limitations, and provides recommendations for future research. Having presented the structure of the thesis, the next chapter will provide an event study on the impact of merger frequency through a univariate analysis.

2. Do more mergers and acquisitions create value for shareholders? A univariate analysis

2.1. Introduction

Merger and acquisitions (M&A) are strategically important for firms to grow. Some firms engage in frequent merger and acquisition and some do not. From the perspective of performance improvement, it is important to consider if growth by merger and acquisition outperforms growth without M&A activities or if more acquisitions produce better performance. Existing literature can be summarized, firstly, according to the impact of M&A on announcement returns, and secondly, on changing the fundamentals of an acquiring firm. For the first school of studies about the impact of M&A on announcement returns, it is evident that the market responds to the merger announcement positively (Fowler & Schmidt, 1989; Mulherin and Boone, 2000; Andrade et al. 2001; Moeller et al., 2004). These papers take an event study approach to examine a change in the market-perceived value of the acquiring firm from pre-announcement of the M&A to post-announcement of the event. These event-studies identify a positive change. Based on their evidence, can this study extends that the positive experience of M&As on improving performance of acquiring firms will result in higher announcement returns with more and more frequent M&As?

Fuller et al. (2002) note that frequent acquirers are able to release more information about their own characteristics to the public due to repetitive corporate activities in the market. The released information is helpful because it causes the stock market to perceive or expect the future stock returns that can be delivered or improved by acquiring firms. This suggests that stock market reaction to a frequent acquirer may be different from the stock market reaction to an infrequent acquirer. Indeed, following Fuller et al. (2002), Ismail (2008) analyses a sample of 16,221 US takeovers between 1985 and 2004 and finds that single acquirers outperform frequent acquirers. However, Ismail (2008) limited his research to the US market.

This chapter examines the effect of merger frequency on the expectation of investors about the integration of new business for their performance in the future. Given this objective, the chapter focuses performance assessment from an investment perspective. If acquisition announcements are positively perceived by investors, then the announcement returns for acquiring firms will rise, at least in the short run. In order to examine the of the relation between acquisitions and announcement returns in the worldwide context, a large sample is collected from different countries, which includes 6,836 acquirers and 14,103 takeovers during the period 1st January 2000 to 31st December 2010. Among 6,836 acquirers, 2,842 carried out more than one acquisition across the sample span. The sample used in this chapter consists of public acquirers that have acquired \$4.49 trillion worth of foreign and domestic companies over the sample period. It is worth noting that there are few existing studies, which use global data.

Following Fuller et al. (2002) and Billett and Qian (2008), merger frequency is defined as the number of acquisitions undertaken by an acquirer during a specific time horizon in this study. Given this definition, acquiring firms are classified according to infrequent, frequent and highly frequent M&A activities. Infrequent activity is defined as an acquiring firm that has acquired only one firm over the time period of an observed window. In contrast, frequent activity is defined as an acquirer that has pursued 2-4 M&As, and the highly frequent activity is defined as an acquirer that has pursued five or more than five M&As during the time period.

This study begins by comparing bidder's Cumulative Abnormal Returns (CARs) with the firm's acquisition frequency at one day surrounding the announcement time. Four distinct results are identified. Firstly, the merger frequency is negatively related to acquirer's stock performance. Secondly, the cumulative abnormal returns diminish in subsequent deals. More particularly, the diminishing pattern is more marked for bidders with a higher frequency of mergers. Thirdly, past takeovers affect CARs in a timely fashion because very short temporal intervals between mergers may not be long enough for acquirers to learn from the past experience and inferences. Fourthly, the size of acquisition or deal size matters for the cumulative abnormal returns. The infrequent and frequent acquirers gain higher CARs in the larger size than in the smaller size. These findings imply that the management of acquiring firms is perceived to develop their hubris from the previous success in M&As.

The contribution of the study to the existing literature is three fold. Firstly, this chapter makes a new attempt to examine the impact of the merger frequency on the

acquirer's performance by using a sample of 14,103 takeover deals worldwide. Secondly, it contributes to the existing literature of corporate finance by distinguishing the creation of synergy, and division of gains between acquirers with different merger frequencies. Thirdly, it extends M&A literature by recording that the greater negative effect on the announcement returns usually appears in subsequent deals for acquirers associated with higher merger frequency. However, this negative effect becomes lower when the time intervals between subsequent deals are longer.

The chapter is organized in four sections. Section 2.2 reviews the related empirical evidence and the theoretical literature on the performance of frequent acquirers. Section 2.3 and 2.4 state research setup and data. Section 2.5 presents the empirical results. Section 2.6 presents robustness checks. Section 2.7 concludes.

2.2. Literature review

2.2.1. Theory

Current literature explores how past deals influence current acquisition (Bower and Hilgard, 1981) and how the accumulated experience of firms on acquisition can enhance management's acquisition expertise (Kusewitt, 1985; Fowler and Schmidt, 1989; Bruton et al. 1994; Barkema et al. 1996; Ashkenas et al., 1998; Hitt et al., 1998). These studies find that an acquirer with a higher merger frequency will experience a positive impact on performance. Specifically, they argue that later acquisitions can generate higher cumulative abnormal returns than earlier acquisitions. Fowler and Schmidt (1989) and Bruton, Oviatt and White (1994) study the CARs associated with

acquisition announcements. They find that the acquiring firms' prior experience of mergers is a predictor of success in subsequent acquisitions. In summary, acquirers with a lot of experience are likely to succeed.

This finding can be linked with the *Organizational Learning Hypothesis.* Argyris and Schon (1978) were the first to develop the *Organizational Learning Hypothesis*. The argument is that the number of acquisitions positively influences performance and the returns will rise with the number of acquisitions over time. That is, an experienced acquirer would be more successful than the less experienced in M&As. The organizational learning theory also suggests that the learning impact of any takeovers on acquiring firm performance would be related to how many acquisitions that have been carried out previously, have the same characteristics as the current one. Conn et al. (2004) follow the argument and state that firms making multiple acquisitions are expected to improve their absorptive capacity for innovative change (Cohen and Levinthal, 1990) and to choose more efficient investment (Vermeulen and Barkema, 2001). In 2008, Laamanen and Keil (2008) further point out that frequent acquirers would potentially become superior performers because more acquisition experience can lead to more success in subsequent deals.

Fuller et al. (2002) give the empirical evidence in support of the organization learning argument. They find higher CARs for more frequent acquisitions of private target firms based on a sample of acquisition announcements between 1990 and 2000. An acquirer firm can learn valuable lessons from the repeated process of mergers and integration (Paine and Power, 1984; Amburger and Miner, 1992 and Pablo, 1994).

They gain increasingly market power from more acquisitions (Conn et al., 2004), and later or subsequent acquisitions will perform better than earlier ones (Vermeulen and Barkema, 2001). They argue for a correlation between the number of acquisitions and the success of the outcome. The later the occurrence in the deal order position in the sequence of acquisitions then the more successful the acquirers' performance. In a follow-up piece, Kamien and Zhang (1993) turn to the effect of endogenous mergers, defined as a merger and acquisition that occurs between identical firms selling a homogeneous product. They argue that, if a firm makes a series of endogenous mergers, the firm may monopolize the industry. As a result, the performance of an acquiring firm would be improved with the number of acquisitions due to the dominant market power.

The *Managerial Hubris Hypothesis,* proposed by Roll in 1986, argues that some *optimistic* managerial behaviour leads to corporate decisions that destroy the value of the firm. It suggests that the management may pay less attention to the current merger than to the previous ones because an overly optimistic confidence develops. In addition, the overconfidence would cause overpayment for the targets or higher leverage being taken on to pay for subsequent acquisitions (Moeller et al., 2004; Malmendier and Tate, 2008). Billett and Qian (2008) test the managerial hubris hypothesis. They look at whether a self-attribution bias (Daniel et al., 1998; Gervais and Odean, 2001) leads to overconfidence by the acquirers' decision makers over the sequence of acquisitions. Billett and Qian (2008) indicate that managerial overconfidence may distort managerial decisions so that "the subsequent acquisitions may tend to be value destructive*"* (Conn et al. 2004). A number of articles also find evidence in support of the hubris argument, which generally involves data from, for instance,the U.S.: Billett and Qian(2008), Bruner (2002), Hietala et al. (2003), Malmendier and Tate (2003); and the U.K.: Doukas and Petmezas (2007). However, overconfidence proxies used in those earlier studies, such as frequent acquisition or multiple acquisition are subject to criticism.

In M&A, the *Agency Problem Hypothesis* occurs when there is conflict between management and shareholders. Management may maximize their own interests at the expense of shareholders' wealth (Jensen, 1986). The agency view divides the firm's directors into two groups: insider and outsider. Many articles employ an empirical test on the agency theory (e.g. Harris and Raviv, 1978), but results are mixed (e.g. Hoskisson et al., 1993; Wright et al., 1996; Sanders, 2001; Rajgopal and Shevlin, 2002; Wright et al. 2002; Wright et al., 2007). From the perspective of managerial decision-making, agency issues (Eisenhardt, 1989) might cause the size effect (Moeller et al., 2004). Using a sample of US listed frequent acquirers over the 1990-2002, Croci (2005) investigates why managers make serial acquisitions. His empirical test on building empire cooperation suggests the motivation for conducting multiple acquisitions is that the management serves its reputation and interests and sidelines the shareholders' value.

Apart from the above arguments, the *Diminishing Returns Theory* predicts the diminishing efficiency of investment for frequently acquisitive firms. In the M&A literature, Schipper and Thompson (1983) first introduce the argument. They argue that the best investment opportunities are taken first. The latest acquisition, by contrast, will be the worst. The decreasing attractiveness of an investment opportunity set, therefore, means that subsequent takeovers are bound to decrease in value over time. It may not have to predict a negative CAR but does predict a lower return in subsequent acquisitions. Using a sample of US listed firms between 1982 and 1999, Klasa and Stegemoller (2007) explore the relationship of acquisition sequences and acquisition performance. They find that the attractiveness of the investment opportunity decreases when sequence increases. Consequently, the higher sequence of acquisitions would more negatively affect the acquisition performance (Conn et al., 2004).

The *Capitalization Hypothesis* of Schipper and Thompson (1983) suggests that cumulative abnormal returns at a merger programme to an acquirer performing serial takeovers should be capitalized at or prior to the announcement of the program. This means the market views most favourably the first announcement of a merger programme, and a zero effect on share returns of later acquisitions or, at least, their magnitude, will be relatively small because subsequent takeovers are now events known by the market. Both Schipper and Thompson (1983) and Loderer and Martin (1990) provide evidence in support of this hypothesis. Schipper and Thompson (1983) examined 55 US firms that engaged in acquisition programs during the period 1952-1968. They find that stock prices react positively to the announcement of the acquisition for up to 12 months. However, they find little market reaction to the later acquisition announcements. In addition, Loderer and Martin (1990) find a significantly larger return in the first announcement of the program than in the later acquisitions. In contrast, other authors reject the hypothesis (Asquith et al., 1983; Croci, 2005; Ismail, 2008). For instance, Asquith et al. (1983) found that cumulative abnormal returns of roughly comparable size are observed for the bidding firms' first through fourth merger bids.

The *valuation hypothesis* indicates that if an acquiring firm's stock were overvalued, the firm would make an acquisition (Shleifer and Vishny, 2003). Shleifer and Vishny also point out that the periods of high market valuations would cause merger waves. Based on the hypothesis, Ismail (2008) uses P/E ratio to examine the

difference between single and multiple acquirers' return. He finds that the valuation of frequent acquirers is significantly higher than that of single acquirers.

Apart from the above argument hypothesises, there are some other researches document that the *timing of acquisitions* or *temporal intervals* as an extension to the organizational learning theory is also one factor for investor's returns (Hayward, 2002). Appropriate temporal intervals could benefit the acquiring firms because an appropriate time interval provides sufficient time to allow the building processes of inference and experience from previous acquisitions to take place. However, very short or very long temporal intervals are all have negative influence for investors' returns due to insufficient time of learning or ineffectiveness of inference and experience (Hayward, 2002).

In summary, evidence about the impacts of frequent acquisition on announcement returns is mixed. Some are positive with frequency and some are opposite in stock markets. The two opposite arguments call for further research on the issues related to merger frequency effects on stock performance.

2.2.2. *Empirical evidence of frequent acquisition*

Research with discussion of an immediate effect by an M&A event on company performance is called a short-run study on M&A. Most of the existing short-

run studies (For example Fuller et al., 2002; Billett and Qian, 2008) found a negative impact of takeovers on the announcement returns of acquiring firms on stock markets if acquiring firms pursue more acquisitions. This suggests that the first or single acquisition creates the highest announcement returns, but two or more acquisitions deteriorate the returns. A few studies argue oppositely about the negative relationship between merger frequency and stock performance of acquiring firms in the short run (For example, Rovit and Lemire, 2003).

Asquith et al. (1983) is the very first study to identify that many acquiring firms, accounted 45% of their sample, are highly frequent acquirers, performing four or more subsequent takeovers from 1963 to 1979. Following Asquith et al (1983), Fuller et al. (2002) first examine the pattern of announcement returns for frequent acquirers based on a sample of 3,135 acquisitions by 539 US acquirers from 1990 to 2000. They define a frequent acquirer as a firm that acquires at least five target firms during the sample period. They found that the acquirers' announcement returns are negatively related to the frequency. Additionally, their study suggests that the announcement returns are improved when privately held targets are acquired. As a limitation, the study did not investigate differences in announcement returns between acquirers with different merger frequencies.

By using a UK sample of acquiring firms, Conn et al. (2004) examine the impact of merger frequency on acquirers' performance. They found that infrequent acquirers gain higher announcement returns than the highly frequent ones. Ismail (2008) extends Conn et al.'s study by examining a U.S. sample over the period between

1985 and 2004. He classified 5,655 unique U.S. acquiring firms according to single acquirers and multiple acquirers who acquire two or more target firms during the sample period. Ismail shows that the announcement returns of single acquirers outperform multiple ones. Additionally, he found that the privately held targets generate higher returns for the single acquirers than the multiple acquirers.

Billett and Qian (2008) is the first study that investigates both the effects of individual CEOs and firms' acquisition decisions on announcement returns. They define a frequent acquirer as a firm that acquires at least two target firms within a five-year period. Based on a sample of 3,795 US acquisitions, they found that a negative announcement effect was concentrated in subsequent acquisitions of public targets. Billett and Qian argue that a CEO who is subject to self-attribution is more likely to overestimate their managerial ability. This suggests that a CEO tends to make more value-destroying takeovers if the CEO develops his hubris from previous successful acquisition experience.

From an organizational learning perspective, Haleblian and Finkelstein (1999) define a merger frequency as the experience of organizational acquisition by counting the number of deals that a sample acquirer made prior to current event year. They found both positive and negative impacts of merger experience based on a sample of 449 US large takeovers[2]. They argued that a dissimilar prior merger experience leads to a negative effect on performance of the current acquisition. In contrast, a similar prior acquisition makes positive influences on the current acquisition.

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[2] They defined large acquisitions that have an excess value greater than $10 million.

For the study of subsequent acquisitions, Schipper and Thompson (1983) investigate announcement returns by using a sample of 55 firms in the period from 1952 to 1968. They found that cumulative abnormal returns for the first mergers of acquiring firms are much higher than subsequent acquisitions, supporting both the capitalization hypothesis[3] and the diminishing returns hypothesis[4].

Furthermore, Loderer and Martin (1990) explore acquisition series[5] by using a sample of 5,172 M&A deals occurred between 1966 and 1984. They found that the first takeover creates the highest cumulative abnormal returns to acquirer shareholders. In addition, the study found a significant declining trend in abnormal returns of subsequent takeovers for acquiring firms. For a high frequency, recent literature suggest a strong declining trend in cumulative abnormal returns which decrease from -0.045% to -1.96 % (Firth, 1980; Dodd, 1980; Bradley et al., 1983; Lang et al., 1989; Mitchell and Lehn, 1990; Smith and Kim, 1994; Holl and Kyriazis, 1997; Higson and Elliot, 1998; Walker, 2000; Sud Gupta and Misra upta and Misraarsanam and Mahate, 2003; Gupta and Misra, 2007; Song and Walking, 2004; Campa and Hernando, 2004).

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[3] The capitalization hypothesis suggests that the first acquisition yields positive returns and then no returns for later acquisitions since the gain of the second acquisition is partly discounted in the share price.
[4] The diminishing returns hypothesis suggests that the acquiring firm always choose the best investment opportunity first, and the latest investment will be the worst.
[5] An acquisition series starts after a two-year or more non-acquisition hiatus and ends with an analogous 2-year or more no-acquisition hiatus.

Overall, all the above cited studies either gave a definition of the frequent acquirers or distinguished between frequent and infrequent acquirers. Most of the studies emphasized the effects of merger activities on the performance of acquiring firms; however, they ignored the direct effect of merger frequency on the performance of acquiring firms. More specifically, merger is a process of accumulating; it also needs to consider the timing of acquisitions as a significant factor.

2.2.3. *Empirical evidence of other determinates on merger impact*

There are also many other factors that can influence the outcome of an acquisition for an acquirer, such as the order of a merger in a series, in addition to the number of acquisitions. For instance, the corporate status of the target (e.g. Officer et al., 2009), the payment method used (e.g. Healy et al., 1992) and the degree of relatedness between acquirers and targets (e.g. Palich et al., 2000), can also affect the performance of announcement returns.

2.2.3.1. *Target type*

A large body of existing studies investigates the post-merger performance of acquiring firms who take both publicly and privately held targets. Most of these studies reveal that acquisitions of non-public firms significantly improve bidders' value. (Chang, 1998; Koeplin et al., 2000; Andrade et al., 2001; Fuller et al., 2002; Kooli et al., 2003; Moeller et al., 2004; Shen and Reuer, 2005; Faccio et al., 2006; and Officer et al., 2009).

Using a sample of 3,135 U.S domestic takeovers during the period 1980 to 2001, Fuller et al. (2002) examine 539 frequent acquirers and a -1.02% of significant negative change in abnormal returns on average for firms that acquired public held targets. In addition, John et al. (2010) found that returns for bidders in the announcement period (-1 to 1) are significantly positive for the sample of acquisitions of public traded firms with low-shareholder protection, but returns are significantly negative for takeovers of public targets in high-shareholder protection countries. Bargerona et al. (2008) found that publicly held acquirers pay 63% higher premium to shareholders of public targets than to shareholders of private targets.

One explanation for positive market reaction to the acquisitions of non-public firms is that bidders purchase at a substantially discounted price when acquiring non-public companies because the illiquidity nature of non-public targets. Koeplin et al. (2000) state that private targets are purchased at, on average, 18% (by using earnings multiples) or 20% to 30% (by using book multiples) discount in comparison to public firms. In studies about subsequent acquisitions of non-public targets, they reported 20% (by using cash flow multiples) and 34% (by using earnings multiples) median discount. Officer (2007) suggests that private targets are sold at an average discount from 15% to 30%.

Alternatively, the transparency of information explains differences in performance of acquisitions between publicly and privately held targets. Based on the monitoring hypothesis, the lack of information on non-public firms leads to a difficulty for the acquirers to evaluating targets (Reuer and Ragozzino, 2008). However,

acquirers would receive more opportunities to gain significant abnormal returns from the takeovers of non-public firms by exploiting private information situations. The asymmetry of information causes private companies to suffer low market liquidity. In contrast, public targets are more visible and transparent to investors, in which this is positively perceived by investors (Deeds et al. 1999). Hence, the classic reaction to the risk of adverse selection for bidders is to reduce the offer price (Akerlof, 1970). Moreover, there is a possibility that the target will turn out to be a lemon and this may lead to a reduction of value on its offer, even though the bidder has private information on a specific target.

2.2.3.2. *Payment method*

The literature in the study of the M&A performance suggest that the selection of payment method is also a factor which affects acquirer's abnormal returns (e.g. Fuller et al., 2002).

Myers and Majluf (1984) indicate that the presence of asymmetric information between acquirers and targets allows bidders who believe that their shares are overvalued to use stock as a medium of exchange. Within the context of managerial control, the use of stocks payment method can dilute the existing shareholders' control power over the company. Faccio and Lang (2002) suggest that an acquirer will choose cash payment rather than stock payment if retaining control of target firms in post-merger is more important. However, without sufficient size and concentration of ownership, the acquiring firm is likely to be less apprehensive about the stock offer. There are some studies which support the managerial control argument, for instance,

Harris and Raviv (1988), Eckbo et al. (1990), Travlos et al. (1990), Cornu and Isakov (2000) and Faccio and Masulis (2005).

Alternatively, an acquiring firm inclines to finance an acquisition by cash in which the acquirer's shares are undervalued and thus will overpay the deal (Myers and Majluf, 1984; Fishman, 1989; Linn and Switzer, 2001; Fuller et al., 2002). Travlos (1987) suggests that acquirers always finance an acquisition in the most profitable way. He found that acquiring firms experience significant losses when making pure stock offers, but gain regular rates of returns for pure cash bids. In addition, scholars suggest that the effects of payment method on abnormal returns are independent of the type of acquisitions. For instance, Ghosh (2001) and Carline et al. (2002) suggest a consistent result that the all-cash offer leads to a significant improvement in the post-merger performance. In contrast, the tax-based hypothesis is often cited in favour of stock offers, which suggests that shareholders of target firms will immediately experience a tax loss if bidders pay them with cash, but tax implications are deferred (Fuller et al., 2002). This taxation hypothesis or argument is supported and evident by studies, such as Yang et al. (1983), Fuller et al. (2002), Ismail and Krause (2010) and Ayers et al. (2004).

The use of all-cash or higher proportion of a cash offer may send a positive signal of a bidder's value to the market. If the acquiring firm is uncertain about the real value of a target firm, the acquiring firm is more likely to make a stock offer since the target only accepts cash offers with the value, at least, as much as its true value. The issue of this uncertainty in target valuation indicates that bidders force target firms to

share the financing risk of overpaying. Therefore, the higher the uncertainty on an acquirer's own firm value is, the more the preference for a cash offer to be made; the higher the uncertainty on the target's firm value is, the more the preference for a stock offer value (Martin, 1996)). Hansen (1987) defines this as a contingency pricing effect. A number of studies show that the contingency pricing effect plays a role in determining payment method. These studies suggest that acquirers who make cash offers gain higher abnormal returns than those who make stock offers within the announcement period (e.g. Brown and Ryngaert, 1991; Martin, 1996).

Furthermore, a number of empirical studies demonstrate that the mix of cash and stock as a medium of exchange in merger and acquisition activities between large firms is increasingly selected (Betton et al., 2008). For example, Faccio and Masulis (2005) collect a larger sample of 3,667 deals occurred between European firms during the 1990s. They found that only 414 takeovers are paid by the mixed method of payment, accounting for 11.3% of the whole sample. Among those deals, an average proportion of 57% in cash and 43% in stock. However, transaction value of takeovers paid by the mixed-payment is five times higher than all-cash offers. In addition, all of these studies found that acquirers are more likely to take relatively smaller firms with cash rather than stock.

2.3. Research setup

2.3.1.   Define performance measurement: Abnormal Returns

To investigate market reactions to the announcement of M&A deals, the methodology of event study is widely applied. Event studies can evaluate the effect of

merger announcements on shareholder value from both sides: the target firm and the bidder. The evaluation is made by comparing the stock value of a firm during the specific period before and after the announcement of a merger. The event study methodology assumes that the market is informatively efficient, and price changes reflect new information. Indeed, Haleblian et al. (1999) suggest that the event study methodology is related to the market efficiency assumption. In addition, evidence from Elton and Gruber (1987) shows that the market does react to the new information rapidly.

Beginning with Dolley (1933), event study was firstly used to investigate the relationship between stock splits and stock price. Ball and Brown (1968) and Fama et al. (1969) then introduced modern methodology of event studies in their studies, which is essentially the same as today. They made two major improvements by considering the information content of earnings announcements (Ball and Brown, 1968) and the split of effects of stock after eliminating the effects of increasingly simultaneous dividend (Fama et al., 1968). In 1980, Brown and Warner further developed a simple event study methodology based on the market model, which performs well under a wide variety of conditions. The main purposes of this methodology are: firstly to capture 'abnormal returns' attributed to the event from the difference between the 'actual returns' and 'normal returns', secondly to test the existence of information effect, and thirdly to detect the factors that can explain changes in firm value at the event date (Prabhala, 1997).

In merger and acquisition research, the events are assessed by a change in stock price during the period in which the event occurs. The price change is called

"abnormal returns" and is calculated as the difference between the observed returns and the returns that would be predicted for given the performance of the market. Healy et al. (1992), Kapland and Weisbach (1992) and Harrison and Godfrey (1997) show supportive evidence of predictive validity, which justifies the study to apply abnormal returns to measure acquisition performance. The abnormal returns are defined as follows:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \tag{1}$$

where t is the time, $i = 1, 2, ..., n$ stands for a stock; R_{it} is the observed returns on stock i for day t; $\alpha_i =$ Intercept; $\beta_i =$ Beta of stock i (measure of non-diversifiable risk); $R_{mt} =$ Returns on the market portfolio at day t. α is a measure of the amount of return produced by a stock's inherent factors rather than market sensitivity factors. The calculation of β is improved by Kroll and Caples (1987) and may be expressed as the covariance of stock returns and market returns, divided by the variance of market return, which can be defined as follows:

$$\beta_i = \frac{COV(R_i, R_m)}{\sigma_m^2}. \tag{2}$$

As document in Haleblian and Finkelstein (1999), the abnormal returns equation above is adjusted for both market performance and individual stock risk. Healy et al. (1992), Kaplan and Weisbach (1992), Sirower (1997), Harrison & Godfrey (1997) and Haleblian & Finkelstein (1999) find that market beta is related to security returns.

On the contrary, Brown and Warner (1985) developed another standard event study methodology by comparing the market model with the market-and-risk-adjusted model in their previous study (Brown and Warner 1980). It has been verified that market returns based on the beta, does not significantly improve estimation in the short-window event study. Based on Brown and Warner's (1980 & 1985) studies, Fama and French (1992) conduct their own analyses and find the relation between firm beta and stock returns is flat, which further supports Brown and Warner's argument.

However, Beta estimation is possibly less meaningful since: firstly, previous takeover attempts would be more likely to be included in the estimation period (Fuller, Netter and Stegemoller, 2002); and secondly, according to Haleblian and Finkelstein (1999) the abnormal returns equation presented above assumes that abnormal returns are adjusted by both market performance and individual stock risk. However, Fama and Frech (1992) suggest that this is not a case. A preferable method of measuring the stock market reaction to M&A announcements, as argued by Brown and Warner's (1985), is applied to compute abnormal returns (AR) and the model is stated as follows:

$$AR_{it} = R_{it} - R_{mt} \qquad (3)$$

where t is the time of an acquisition and i stands for a firm or stock; R_{it} is acquiring firm's daily stock returns on security i for day t; R_{mt} is daily stock market returns (for the market on which the acquiring firm is listed) on security i for day t.

This study follows Brown and Warner's (1985) measurement of abnormal returns and further accumulates the daily abnormal returns to measure cumulative

abnormal returns (CARs) which is a measurement of the total abnormal returns during the event window:

$$CAR_{i(T1-T2)} = \sum_{T1}^{T2} AR_{it} \qquad (4)$$

where the *T1* is the start date of the event window, *T2* is the end date of the event window.

Average cumulative returns of *N* firms for the period from *T1* to *T2* days can be expressed as follows:

$$\overline{CAR}_{(T1-T2)} = \sum_{i=1}^{N} CAR_{i(T1-T2)}/N \qquad (5)$$

Finally, the *t*-statistics of $CAR_{(T1-T2)}$ is calculated by

$$t(CAR_{(T1-T2)}) = CAR_{i(T1-T2)}/S[CAR_{i(T1-T2)})) \qquad (6)$$

where $S(CAR_{i(T1-T2)})$ is the standard deviation.

The event day (day 0) is defined as the announcement day of an event. Predictive power will decrease when more days are added into the event window in the short-term research (MacKinlay, 1997), due to the likelihood of confounding effects from other events. A number of authors conduct a 3 days event window (-1, +1) and explain that one day after the event day (day +1) can reflect the market reaction when event occurs after trading hours (Ma, Pagan and Chu, 2009). If information leaked

before the announcement date of the official deal, it can capture the market reaction in day -1 (one day before the event day).

However, a longer window can capture more economic impact of the acquisition since the initial stock market reaction, to the announcement of an acquisition, is often incomplete or biased (Harrison, Oler, and Allen, 2008). To investigate the sensitivity of the empirical results to different lengths of an event window, a five-day event window (-2, +2) around the announcement day (day 0) is used, which is consistent with prior studies (Cox and Portes, 1998; Fuller, Netter and Stegemolloer, 2002; Faccio et al., 2006; Boubakri, Chan and Kooli, 2012; Gaur, Malhotra and Zhu, 2013). To reduce the probability of capturing confounding events in CAR calculations, the event window is reduced from five days to three days to conduct the robustness checks (See Appendix A).

2.3.2.   *Define merger frequency for acquiring firms*

How to define merger frequency in event study is a common concern for the research of impact of frequent acquisition. Existing studies count a number of mergers emerged during a specific period as "frequency", and some split or classify acquiring firm according to the single acquirer for the firm that acquired only one target during the sample period, and the frequent acquirer that severed multiple acquisitions in the sample period. Fuller et al. (2002) studied the performance of firms involved in mergers by defining a firm performed at least five acquisitions as a frequent acquirer. The definition of frequent acquirers by Fuller et al. (2002) has been widely cited by existing studies for merger frequency studies. For instance, Ismail (2008) broadly groups US acquisitions according to single and multiple (at least two acquisitions)

acquirers. Similarly, Billett and Qian (2008) define a firm as a frequent acquirer if the firm acquired at least two public targets during the sample period. Additionally, Combined their approach, Conn et al. (2004) further separate their sample and group UK acquisitions according to single acquirers, moderately (2-3 acquisitions) and highly (at least four acquisitions) acquisitive over the sample period.

To follow the studies above, in this chapter, the merger frequency is defined as the number of acquisitions that occurred during the sample span. Then acquiring firms are further classified according to infrequent, frequent and highly frequent acquirers over a specific time period. Infrequent merger means that a firm that has acquired only one target firm over this period. In contrast, the frequent means the firm that has pursued two to four M&As during the period, and the highly frequent have five M&As or more over the same span as infrequent and frequent ones.

According to Equation (4) that defines cumulative abnormal returns to an announcement of takeover over a specified window, calculation of the CARs for an acquiring firm with f frequency can be specified as follows.

$$CAR_{it}^{f} = \frac{\sum_{m=i}^{f} CAR_{itm}}{f} \tag{7}$$

where, CAR is cumulative abnormal returns defined by (4), f is a merger frequency that counts a number of mergers made by i^{th} acquiring firm during the time period t; m indicates the mth merger of ith firm during the same period of time t. Apparently, CAR_{it}^{f} is the ith acquirer's average returns earned from its f number or frequency of the mergers and acquisitions over the period from the sample starting year to year t.

2.3.3.   Empirical predictions

The section 2.2.1 surveys several theories in relation to frequent acquisition. It is found that merger motives have attracted far less theoretical attention than merger consequences or effects themselves. At the most general level, those theories are considered as merger motives which is the moving cause behind merger impacts. However, the research settings of the chapter aim to give an exploration of potential impacts that are born or developed from repetitive and frequent acquisitions. It may not be appropriate to use some of these theories to explain the impacts of frequent acquisition. For example, *diminishing returns theory* and *valuation theory* may not be relevant.

In addition, *capitalization theory* is considered inappropriate. Because there is a big uncertainty concerning the magnitude, success, timing of a merger program and whether a series of mergers is a merger program. This is not done to refute or prove a single theory. Most scholars agree that merger and acquisitions are a complex process and that there may not be a single approach that could offer a full explanation (e,g. Steiner, 1975; Ravenscraft and Scherer, 1987; Trautwein, 1990).

Therefore, by comparing CAR_i^f with different f, this chapter will test several arguments that are more likely to be associated with frequent acquisition:

Firstly, the organizational learning hypothesis (OLH) (Argyris and Schon, 1978) that expects higher CAR_{it}^f with increasing f, which means

$$CAR_{it}^f\big|_{infrequent\ merger}^{f=1} < CAR_{it}^f\big|_{frequent\ merger}^{2\leq f\leq 4} < CAR_{it}^f\big|_{highly\ frequent\ merger}^{f\geq 5}\text{[rank one]}$$

and the opposite arguments of the Managerial Hubris Hypothesis (MHH) (Roll, 1986) or Agency Theory (Jensen, 1986) that expects lower CAR_{it}^f with increasing f:

$$CAR_{it}^f\big|_{infrequent\ merger}^{f=1} > CAR_{it}^f\big|_{frequent\ merger}^{2\leq f\leq 4} > CAR_{it}^f\big|_{highly\ frequent\ merger}^{f\geq 5}\text{[rank two]}$$

Secondly, CAR_{it}^f can be specified as CAR_{it}^F with F indicating F^{th} merger made by the acquiring firm i. By ranking CAR_{it}^F with different F, a stronger claim against each hypothesis can be obtained if

$$CAR_{it}^F\big|_{F=1} < CAR_{it}^F\big|_{F=2} < \dots < CAR_{it}^F\big|_{F=n}\dots\dots\dots\dots\dots\dots\dots\dots\text{[rank three]}$$

in support of the OLH, otherwise, if

$$CAR_{it}^F\big|_{F=1} > CAR_{it}^F\big|_{F=2} > \dots > CAR_{it}^F\big|_{F=n}\dots\dots\dots\dots\dots\dots\dots\dots\text{[rank four]}$$

in support of the Managerial Hubris or Agency Theory.

This is because when the management of the acquirer undertakes its first bid, they will be more careful in choosing a target and investing in the business of the target, thus making a successful decision for the acquisition. However, according to the hubris theory, once the management develops hubris from initially successful merger experience, the management of the acquiring firm will be less careful about target selection and risk assessment of an acquisition. This could result in paying excessive takeover premiums and thus leading to the value losses for subsequent deals.

Thirdly, *timing of acquisitions* or *temporal intervals theory* predicts that if an acquirer performs frequent acquisition within a longer time period, the acquirer is expected to have higher CARs than the one undertaking frequent acquisition within a shorter time period. Further it can be expected that the former has a longer average time interval between mergers that the latter. The longer break between deals will benefit acquirers since learning depends on the time between two acquisitions. Short periods do not allow acquiring firms to draw inferences and experience from past takeovers (Hayward, 2002).

2.4. Data

The sample used for this study includes all completed M&As and tender offers to public, private and subsidiary target firms completed by worldwide public companies over 11 years from January 1, 2000 to December 31, 2010. During the

sample period, acquiring firms are classified as follows: infrequent acquirers acquired only one firm, frequent acquirers acquired two to four firms, and highly frequent acquirers acquired five firms or more. The M&A data is collected from the Thomson Financial Securities Data Corporation (SDC) Database and stock and other financial data related to acquiring firms are collected from DataStream. In line with existing studies (Fuller et al., 2002; Billett and Qian, 2008; Ismail, 2008; Boubakri et al., 2012; Rahahleh and Wei, 2012), the sample takeovers are selected based on the following conditions.

1. The acquisition has been completed between the sample spans.

2. Deals completed longer than 1,000 days after the announcement date are removed.

3. An acquiring firm is publicly traded on either a domestic or a foreign stock exchange, which has three days $(-1, +1)$[6] and five days $(-2, +2)$ of return data around the announcement of a takeover held on the DataStream database.

4. The target firm is one of these three: public, private or subsidiary.

5. The target is purchased at a disclosed dollar value for at least $1 million.

6. The bidder owns either nothing or less than 50% percent of the target's voting rights before the acquisition. Then transfer of the control rights to the acquirer to at least 50% of shares or ownership after takeover.

7. Utilities (with a primary SIC code between 4900 and 4999) and financial institutions (with a primary SIC code between 6000 and 6999) are not included.

8. Acquiring two or more than two targets during the event window period is regarded as an extreme case for exclusion from the sample.

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[6] Within empirical studies related to merger and acquisitions, a period measures the impact of takeover activities on a firm's performance over time is defined as event window.

Furthermore, in line with Martin (1996) and Fuller et al. (2002), methods of payment used in transactions are categorized into three groups: (1) transactions made by pure cash from the firm's own earning, borrowing or from mixed earning and borrowing; (2) transactions made by pure stock in a form of common or ordinary shares (for public targets), options, warrants or stock (for private targets); and (3) transactions made by a mixture of cash and stock.

After filtering from the initial set of 339,640 acquisitions, a final sample is yielded, consisting of 14,103 acquisitions by 6,836 acquirers across 117 countries. The full sample is then divided into sub-samples according to methods of payment, ownership status of target firms, geography and industry, respectively. In Table 2-1, acquiring firms are classified by the number of acquisitions over the sample span. Acquiring firms which acquired single, two to four, and at least five acquisition(s) during 2000 to 2010 are classified as an infrequent acquirer, a frequent acquirer and a highly frequent acquirer, respectively.

Table 2-1 presents the sample statistics of 14,103 acquisitions which occurred during the period 2000 to 2010. 3,994 sample acquisitions were made by infrequent acquirers, 5,820 deals were made by frequent acquirers, and the rest of the 4,289 deals were made by highly frequent acquirers. Over the time, the total number of acquisitions increased from 825 in 2000 to 1,483 in 2010. However, the increasing trend is not monotonically up over these years. For instance, merger activities decreased in 2008. The median values of transactions were almost stable at around $23 million over an 11-year period. The huge difference between the mean and the median

averages of acquisition values suggest that some outliers exist in the sample of transaction values. Interestingly, the total value of transactions is only around $2 trillion in 2002 and 2003, which is much lower than the rest of the years.

Table 2-1. Sample statistics of 14,103 takeovers from 2000 to 2010.

Year	Number of Deals	Number of Acquirers	Deals by infrequent acquirer	Deals by frequent acquirer	Deals by High frequent acquirer	Mean Value of Transactions ($Million)	Median value of Transactions ($Million)	Total Value of Transactions ($Million)
2000	825	640	192	339	294	676.73	23.18	558303.00
2001	616	382	143	236	237	500.89	31.23	308549.15
2002	765	476	173	315	277	243.45	23.18	186235.71
2003	914	516	199	380	335	223.27	24.56	204065.70
2004	1259	612	290	533	436	235.04	20.11	295910.79
2005	1629	755	374	699	556	295.03	21.4	480602.28
2006	1770	771	473	780	517	318.82	22.69	564316.63
2007	2010	849	589	826	595	278.14	23.1	559051.67
2008	1564	672	536	629	399	298.84	20.83	467387.72
2009	1268	562	462	527	279	344.93	17	437375.48
2010	1483	601	563	556	364	290.88	25.67	431376.16
Total	14103	6836	3994	5820	4289	322.87	23.36	4493175.42

Table 2-2 presents the sample distribution by payment methods, ownership status of targets, geography and industry. In the table, Panel A shows the number of acquisitions in terms of target ownership status. The publicly owned target firms take 20% of the total sample deals and this group of deals has the highest mean value of transactions, although it show the lowest number of takeovers. In contrast, acquisitions of privately owned targets account for 49%, the highest proportion, of the full sample but the lowest deal value. This pattern is consistent in sub-samples of infrequent, frequent and highly frequent acquirers. In other words, non-public traded targets are more attractive to the bidders than public targets. Previous literature (Fuller et al., 2002; Moeller et al., 2004) explains that acquirers will get more opportunities to gain significant abnormal returns from takeovers of privately owned firms from exploiting private information.

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The Panel B of the table provides details on payment methods. Overwhelmingly, there are 7,772 transactions accounting for 55% of the total deals made by pure cash. In contrast, the stock financing only accounts for 19%. Apparently, the cash offers are popular in acquiring small targets. Acquisitions financed by combination of stock and cash are often used to acquire large corporations. It is found that the infrequent bidders are more likely to use equity as the method of payment in acquiring targets. Although stock takeovers have a lower proportion than cash ones, the mean value of transactions financed by stock is higher than deals financed by cash for frequent and highly frequent acquirers.

Panel C reports that 73% of targets are domestic companies and only 27% of targets are foreign firms, which suggests that domestic targets are more favourable to acquirers than cross-border targets. This is possibly due to the information asymmetry between acquirers and foreign target firms. Panel D reveals that 64% of total deals are stretched out beyond acquirers' core business, and the rest of 36% deals originate in bidders' own industry. However, the mean value of transactions for related acquisitions is much greater than for conglomerates even after controlling for the number of mergers. This suggests that the acquiring firms are more confident in pursuing horizontal mergers due to the advantage of information and controlling capability.

Table 2-2. Sample statistics for payment method, target ownership and types of acquiring firms

	All			Infrequent			Frequent			Highly frequent		
	Deals	%	Mean Value of deals ($Million)	Deals	%	Mean Value of deals ($Million)	Deals	%	Mean Value of deals ($Million)	Deals	%	Mean Value of deals ($Million)
Full Sample	14103		318.6	3994	28%	164.01	5820	41%	291.9	4289	30%	512.84
Panel A: Target listing status												
Public	2799	20%	1092.34	1177	8%	669.12	919	7%	1097.37	703	5%	1794.34
Private	6842	49%	64.28	3133	22%	45.4	2047	15%	64.71	1662	12%	99.33
Subsidiary	4462	32%	223.2	2346	17%	159.59	1262	9%	322.53	854	6%	251.19
Panel B: Payment method												
Cash	7772	55%	239.47	3147	22%	163.45	2440	17%	250.63	2185	15%	336.5
Stock	2738	19%	308.55	1698	12%	134.07	671	5%	491.99	369	3%	777.86
Mixed	3593	25%	497.41	1811	13%	310.42	1117	8%	542.79	665	5%	930.43
Panel C: Cross-border												
Domestic	10302	73%	297.55	4847	34%	172.19	3146	22%	337.54	2309	16%	506.22
Foreign	3801	27%	375.64	1809	13%	259.59	1082	8%	449.22	910	6%	518.84
Panel D: Industry Relatedness												
Related	5018	36%	411.53	2458	17%	243.01	1527	11%	443.42	1033	7%	765.37
Conglomerate	9085	64%	267.27	4198	30%	168.38	2701	19%	322.43	2186	16%	389.15

2.5. Empirical results

In this section, two questions are addressed: the first is about how merger frequency affects cumulative abnormal returns for shareholders of the acquiring firm; and the second is how CARs differ between the first and subsequent acquisitions. Then the section explores whether these differences can be explained by the hubris or the organization theory.

2.5.1.   *The impact of frequency on announcement returns*

Table 2-3 reports univariate analysis of the five-day cumulative returns of acquisitions made for different merger frequencies. In the row "within sample span" of Table 2-3, the overall CARs for three subsamples are all significantly positive at the 1% level: a 3.97% CAR for infrequent bidders, a 2.12% CARs for frequent acquisitions and a 0.79% CAR for highly frequent bidders, respectively. It is found that the infrequent acquirers outperform frequent acquirers[7], clearly suggesting that the CARs decline as the merger frequency increases.

As stated in Huber (1991), there invariably exists a temporal interval between two acquisitions. During this interval, an acquirer is able to facilitate organizational learning in integrating new business with existing one for more efficient utilization of new acquisitions through sufficient digestion of acquisition assets and integration of cost and risk. To take into account the performance effect of time interval between

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[7] For robustness, infrequent, frequent and highly frequent bidder are re-defined as a firm undertaking one to two, three to five and greater than five acquisitions during 2000-2010. The results remain qualitatively unchanged (See Appendix A).

acquisitions pursued by the acquiring firm, acquisitions are grouped according to one-year interval and four-year interval and the sample span in which an acquirer performs frequent acquisitions. In this context, a frequent acquirer with one-year interval means that the acquirer completes two to four acquisitions within one year, or the firm completes two to four acquisitions within four years if it has four-year interval. Based on the argument of the learning effect (OLH), the market expects a better performance for the longer interval.

As reported in Table 2-3, there is a clearly increasing trend in CARs as time interval becomes longer, which ranges from 2.25% to 3.97% for infrequent acquirers, 0.91% to 2.12% for frequent acquirers and 0.17% to 0.79% (insignificant) for high-frequent acquirers, respectively. The results suggest that CARs are higher when acquirers take longer time to break from the last acquisition to next one. One explanation for this finding is that acquirers need time to learn from previous acquisition experience and to digest newly acquired business. This shows clear evidence in support of OLH as the longer interval helps the acquiring firm with more time to learn and improve integration of new business to the existing one. Time for learning matters for improvement of acquisition quantity (Hayward, 2002).

In short, Table 2-3 provides a clear ranking of CARs that decrease with the increasing number of acquisitions, supporting the hubris or agency argument. However, the hubris effect can be mitigated or weakened by the learning effect when the frequency appears slowly, such as increasing time-break length between mergers. Further, a variety of robustness checks were introduced, including the analysis was

repeated by splitting the full sample by different regions and economies and redefining the length of time intervals (See, Appendix B). These results were also robust and consistent

Table 2-3. Cumulative abnormal returns for infrequent, frequent and highly frequent across different time interval

Temporal interval	Infrequent		Frequent		Highly frequent	
	CAR(+2,-2)	N#	CAR(+2,-2)	N#	CAR(+2,-2)	N#
within one year	2.25%***	10009	0.91%***	3818	0.17%	276
	(23.36)		(7.96)		(0.40)	
within Four years	2.81%***	6831	1.10%***	5685	0.39%***	1587
	(22.18)		(10.97)		(2.64)	
within sample span	3.97%***	3994	2.12%***	5820	0.79%***	4289
	(18.63)		(17.50)		(7.43)	

Note: This table reports five-day (-2,+2) Cumulative Abnormal Returns (CARs) for infrequent, frequent and high frequency acquirers across different time interval. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one, two to four and more than four acquisition(s), respectively. To take into account the performance effect of time interval between acquisitions pursued by the acquiring firm, acquisitions are grouped according to one-year interval and four-year interval, and the sample span in which an acquirer performs frequent acquisitions. The t-statistic is in bracket. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

2.5.2. *The impact of frequency on subsequent acquisition performance*

To further check the finding shown in Table 2-3, CARs are ranked according to the occurrence orders of acquisitions. The full sample is divided into two subsamples: single acquirers and frequent acquirers. This will lead us to see if the Rank Four can be established empirically. Table 2-4 presents evidence on CARs of acquiring firms declining after the first deal, indicating that the market reacts more strongly to the first deal. The results are consistent with Conn et al. (2002) who find that the announcement return decline rather than improve in subsequent acquisition, using a sample of 4,344

UK acquisitions during 1984-1998. The Rank Four is clearly evident in Table 2-4. Further, the evidence is consistent with the notion that acquirers with no acquisition history show no evidence of hubris or learning impacts.

The Panel A and B of Table 2-4 explore whether the merger impacts of first takeovers differ between frequent acquirers and infrequent acquirers. It is found that for the 3,994 of 6,836 first acquisitions made by infrequent acquirers, the average CAR is 2.53%, statistically distinguishable from zero. For frequent and highly frequent acquirers, the average of first deal abnormal return is 2.41%, also statistically significant. The difference between the first takeover CARs for is also insignificantly different from zero. It appears that the negative effects of mergers only found in high-order deals (see Panel A), where previous merger experience may lead to the development of hubris.

The Panel C of Table 2-4 compares CARs with different time intervals between one and another. The results still strongly suggest that CARs increase with slower pace of merger, which is consistent across different intervals in support of the learning hypothesis. CARs for a shorter interval are lower than one with a longer interval. For instance, the CAR increases from 1.15% with a one-year interval to 2.08% with a two-year interval for the overall subsample, 2.07% with a one-year interval to 3.38% with a two-year interval for the first deal, and 1.31% to 1.75% for the second to third deal. These results are consistent with Hayward (2002) which argues that acquirers need more time to draw adaptive inference from prior experience on subsequent deals.

In sum, findings in Table 2-4 provides further evidence on which increasing merger frequency decreases CARs returns, but the decrease can be mitigated if the acquiring firm slows its pace of merger frequency. The evidence of Table 2-4 to support this argument is consistent with the evidence of Table 2-3. In addition, a positive relationship between CARs and the time interval is highlighted in Figure 2-1 which illustrates CARs against time intervals from completion of the 1st deal to start 2nd deal (TI between 2nd and 3rd). Overall, the findings of value destructive subsequent acquisitions are robustly shown to support the hubris hypothesis. In addition, it is found that managerial hubris (negative effect) and organizational learning (positive effect) coexist in frequent acquisition, but among the contrasting effects, the latter is much dominated by the former.

Table 2-4. Cumulative abnormal returns by the deal order and different average temporal intervals between deals

Panel A: Subsample of frequent and highly frequent acquirers

	Overall		1st		2nd -3rd		>=4th	
	CAR[+2,-2]	N#	CAR[+2,-2]	N#	CAR[+2,-2]	N#	CAR[+2,-2]	N#
	1.24%***	10109	2.41%***	2842	1.23%***	4353	0.29%**	2914
	(16.17)		(13.35)		(10.83)		(2.54)	

Panel B::merger effects of first acquisitions between frequent and infrequent acquirers

	Infrequent		Frequent and Highly frequent			Difference	
Deal order	CAR[+2,-2]	N#	CAR[+2,-2]	N#		CAR[+2,-2]	
1st deal	2.53%***	3994	2.41%***	2842		0.12%	
	(18.25)		(13.35)			(-0.53)	

Panel C: avg. of temporal intervals between deals

	Overall		1st		2nd -3rd		>=4th	
Temporal interval	CAR[+2,-2]	N#	CAR[+2,-2]	N#	CAR[+2,-2]	N#	CAR[+2,-2]	N#
< one year	1.15%***	6545	2.07%***	1684	1.31%***	2565	0.28%**	2296
	(12.67)		(10.33)		(8.78)		(2.21)	
one to two year(s)	2.08%*	2726	3.38%***	813	1.75%***	1325	0.49%*	588
	(1.78)		(8.25)		(5.03)		(1.72)	
> two years	2.78%***	742	4.94%***	297	2.13%***	415	-0.63%	30
	(7.17)		(5.54)		(4.80)		(-0.55)	

Note: This table reports five-day (-2,+2) Cumulative Abnormal Returns (CARs) for subsample consisting of frequent and highly frequent acquirers across different average temporal intervals between deals and deal order. Frequent and highly frequent bidders are defined as an acquirer undertaking two to four and more than four acquisition(s), respectively. The t-statistic is in bracket. N# reports the number of takeovers.***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

Figure 2-1. The relationship between CARs and the time interval
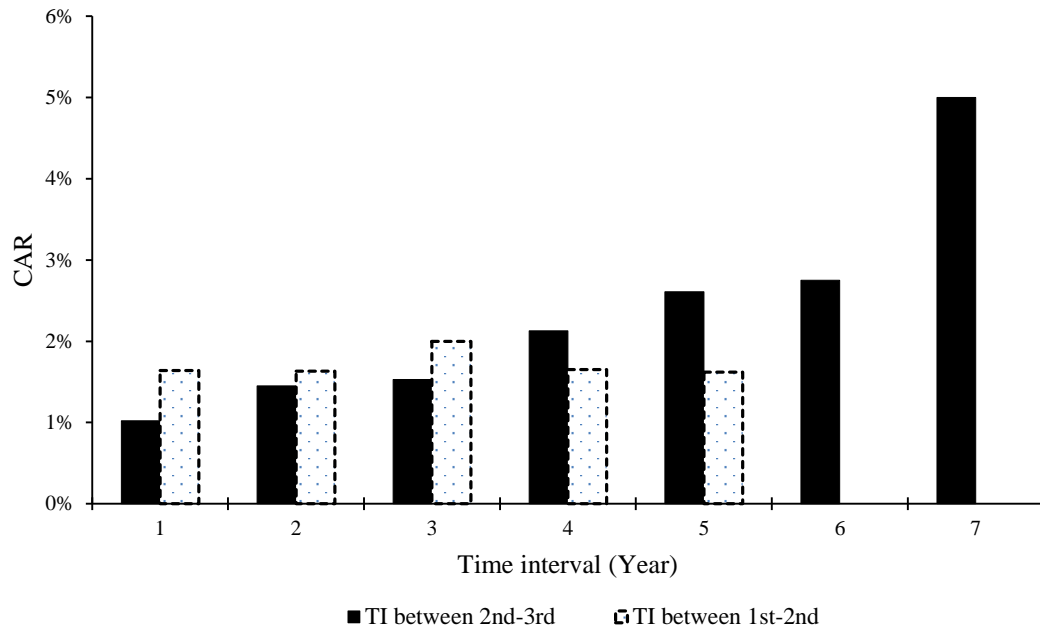
2.6. Robustness check

2.6.1.   Robustness tests for merger frequency by deal-characteristics

A large body of early research documented the importance of the deal characteristics, especially in determining the probability of a merger or acquisition (Kuehn, 1975; Singh, 1975; Dietrich and Sorensen, 1984; Palepu, 1986; Chatterjee, 2000; Alcade and Espitia, 2003; Siriopoulos et al., 2006). Thus, in this section, target type and the method of payment are employed as comparative controls.

2.6.1.1. CARs by frequency for public, private and subsidiary targets

Panel A of Table 2-5 reports that after controlling the effect of target ownership on analysis, the CARs are still higher for infrequent acquirers than frequent acquirers. (0.67% vs. -1.03% CAR for public targets, 4.74% vs. 0.55% CAR for private targets and 4.51% vs. 0.56% CAR for subsidiaries respectively) [8]. When focusing on public targets, the evidence on infrequent acquisitions outperforming highly frequent ones is more obvious: the CARs change from positive to negative with increasing the merger frequency, see row "Public" in Table 2-5.

Unlike prior evidence by Ismail (2008), it is found that firms are break even when moderately acquiring public held targets. The finding that the high-frequency yields lower returns, particularly for public acquisitions is consistent with Fuller et al. (2002). In addition, acquisitions of private targets are found to generate superior performance, which is possibly attributed to the fact that the acquirer takes over a privately held target at a discounted price due to illiquidity nature of private targets.

2.6.1.2. CARs by frequency for cash, stock and mixed payment deals

Panel B of Table 2-5 presents that when the full sample is further classified according to the method of payment, the results still show that the higher merger frequency leads to more negative effects on CARs. For instance, for using stock payment, it is found that the returns drop from the positive to the negative with

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[8] The mean CAR of infrequent bidder of public targets is significant at the 10% level. All other results are significant at the 1% level.

increasing frequency, see row "Pure stock" in Table 2-5. Findings in other rows in Table 2-5 show a similar pattern: the infrequent outperforms the highly frequent across different methods of payment. Furthermore, by control of frequency, it is found that stock offers outperform cash offers for infrequent and frequent acquirers. Also, unlike the previous research[9], this study shows that stock offers generate highest CARs for a group of the infrequent bidders.

Table 2-5. Cumulative abnormal returns sorted by infrequent, frequent and highly frequent acquirers based on the target ownership (Panel A) and payment method (Panel B).

	Infrequent		Frequent		Highly frequent	
	CAR[+2,-2]	N#	CAR[+2,-2]	N#	CAR[+2,-2]	N#
Deal-Specification						
Panel A: By target ownership						
Public	0.67%*	673	0.04%	2792	-1.03%***	963
	(1.69)		(0.15)		(-5.18)	
Private	4.74%***	1890	2.65%***	1163	0.55%***	2160
	(13.77)		(14.43)		(4.52)	
Subsidiary	4.51%***	1431	2.64%***	1865	0.56%***	1166
	(13.72)		(12.67)		(3.50)	
Panel B: By payment method						
Pure cash	2.10%***	1778	1.65%***	3148	0.47%***	2846
	(9.69)		(12.34)		(5.19)	
Pure stock	5.84%***	1158	2.41%***	1047	-1.03%***	533
	(11.48)		(6.84)		(-3.08)	
Combination	5.07%***	1058	2.86%***	1625	0.07%	910
	(11.50)		(10.83)		(0.29)	

Note: This table presents five-day (-2,+2) CARs sorted across target ownership status and payment method. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one, two to four and more than four acquisition(s), respectively. The target public status is public, private or subsidiary of a public firm. The method of payment is pure cash, pure equity or mixed. The t-statistic is in bracket. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

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[9] See for example, Travlos (1987)and Change (1998).

2.6.2. *Robustness tests for merger frequency by firm-characteristics*

In this section, P/E ratio and relative size are employed as firm-specified controls to examine the sensitivity of the results in section 2.5.

2.6.2.1. *CARs by frequency for valuations*

Fama and French (1992) tested the relationship between stock returns and P/E ratio and point out firms with low P/E ratios outperform those with high P/E ratios. This is possibly due to the fact that firms with higher value may develop more hubristic behaviours in acquisition (Rau and Vermaelen, 1998). Following their arguments, CARs with different levels of P/E ratios for each group of acquirers are compared and the results are reported in Table 2-6. It is found that the frequent and highly frequent acquirers exhibit the higher average P/E ratio and lower CARs than infrequent acquirers. The results consistently suggest that the infection of hubris could be a main driver that explains the findings that the higher the merger frequency the lower the CAR.

2.6.2.1. *CARs by frequency for relative acquisition size*

Table 2-7 presents CARs sorted by infrequent, frequent and highly frequent acquirers across the relative acquisition size which is calculated as the deal value divided by the acquirer's total assets. Robustly, Table 2-7 provides clear evidence in support of the argument that acquirers with lower merger frequency outperform ones with higher merger frequency. In addition, Table 2-7 provides clear evidence in support of Moller's theory: CARs are larger for the higher relative size. Moeller et al.

(2004) addressed the question from the point of view of acquiring firms and find that the smaller the acquirer size relatively to deal size generates a higher return. They offer an explanation that the larger size of acquirer relatively to the target firm leads to e managerial hubris which reduces announcement returns.

Table 2-6. Cumulative abnormal returns sorted by infrequent, frequent and highly frequent acquirers based on P/E ratios

Panel A	Infrequent			*Panel B*	Frequent		
	Avg. P/E	CAR[-2,+2]	*N#*		Avg. P/E	CAR[-2,+2]	*N#*
Low P/E 0-10	6.45	3.47%[***]	474		7.04	2.99%[***]	576
		(7.27)				(7.43)	
Mid P/E 10-17	13.51	2.19%[***]	560		13.53	2.06%[***]	1040
		(6.28)				(8.80)	
High P/E 17-25	20.55	2.07%[***]	462		20.50	1.45%[***]	895
		(5.79)				(6.30)	
P/E 25+	75.44	1.66%[***]	1251		80.31	0.86%[***]	1801
		(7.41)				(4.99)	
Panel C	Highly frequent			*Panel D*	All		
	Avg. P/E	CAR[-2,+2]	*N#*		Avg. P/E	CAR[-2,+2]	*N#*
Low P/E 0-10	7.34	0.99%[**]	254		6.89	2.25%[***]	1304
		(2.50)				(10.85)	
Mid P/E 10-17	13.96	0.99%[***]	794		13.67	1.58%[***]	2394
		(5.06)				(11.98)	
High P/E 17-25	20.47	0.57%[***]	985		20.5	1.12%[***]	2342
		(3.54)				(9.02)	
P/E 25+	91.84	0.40%[**]	1564		87.87	0.92%[***]	4616
		(2.40)				(8.61)	

Note: This table presents five-day (-2,+2) CARs sorted across P/E ratios. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one, two to four and more than four acquisition(s), respectively. The t-statistic is in parentheses. N# reports the number of takeovers.[***]Denotes significance at the 1% level. [**]Denotes significance at the 5% level. [*]Denotes significance at the 10% level.

Table 2-7. Cumulative abnormal returns sorted by infrequent, frequent and highly frequent acquirers based on the relative acquisition size

Relative Size(R.S)	Overall			Infrequent			Frequent			Highly frequent		
	Avg. of R.S	CAR[-2,+2]	N#	Avg. of R.S	CAR[-2,+2]	N#	Avg. of R.S	CAR[-2,+2]	N#	Avg. of R.S	CAR[-2,+2]	N#
<5%	1.83%	0.54%***	5832	2.20%	0.51%**	986	1.99%	0.47%***	2142	1.57%	0.30%***	2704
		(6.22)			(2.19)			(3.16)			(2.83)	
5% to 15%	9.14%	1.98%***	3379	9.26%	2.27%***	944	9.19%	2.09%***	1532	8.94%	1.50%***	903
		(12.60)			(6.51)			(9.03)			(6.18)	
15% to 25%	19.54%	2.49%***	1350	19.66%	3.40%***	476	19.49%	2.25%***	635	19.41%	1.29%**	239
		(8.38)			(5.48)			(5.94)			(2.55)	
> 25%	124.11%	7.10%***	3542	184.60%	10.00%***	1588	127.06%	5.84%***	1511	86.74%	2.01%*	443
		(20.63)			(15.53)			(14.76)			(1.96)	

Note: This table presents five-day (-2,+2) CARs sorted by infrequent, frequent and highly frequent acquirers across the relative acquisition size. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one, two to four and more than four acquisition(s), respectively. The relative acquisition size is calculated as the deal value divided by the acquirer's total assets. The t-statistic is in bracket. N# reports the number of takeovers.***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

2.6.3.   Robustness test for merger frequency by economic concerns

Furthermore, by controlling regional and macro effects a various robustness tests are conducted. Alexandridis et al. (2010) suggest that acquirers come from the most competitive M&A markets (U.S. and E.U.), realizing higher gains. Since the greater degree of competition for corporate control could make acquisitions costly. To test this argument in the context of different frequencies, the full sample thus split into three regional subsamples: Asia, Europe and U.S. (Panel B of Table 2-8), and further break down the sample for developing or developed countries in order to see how the hubris effect is dominant on merger consistently across different regions over the world. The results of Table 2-8 suggest that the results of section 2.5 are unchanged and robust: the market perceives the low frequent better than the highly frequent. This finding is also consistent for pre-crisis and crisis period, respectively.

Table 2-8. Cumulative abnormal returns sorted by infrequent, frequent and highly frequent acquirers based on economic concerns

Merger frequency	Infrequent		Frequent		Highly frequent	
	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*
Timing-specification						
Panel A: By time period						
2000-2005	2.97%***	2149	1.40%***	2604	0.41%**	1255
	(12.87)		(8.71)		(2.12)	
2006-2010	3.02%***	3377	1.28%***	3470	0.53%***	1248
	(16.34)		(9.92)		(3.63)	
Economic-specification						
Panel B: By regions						
Asia	2.11%***	1260	1.37%***	1074	-0.10%	348
	(8.78)		(5.95)		(-0.28)	
Europe	2.14%***	561	1.62%***	1180	1.24%***	974
	(6.96)		(7.80)		(7.00)	
U.S.	2.55%***	1573	1.84%***	2419	0.78%***	2035
	(10.40)		(10.15)		(4.98)	
Panel C: By economic development						
Developing economies	2.57%***	540	2.26%***	314	1.29%	39
	(6.81)		(5.26)		(1.19)	
Developed economies	2.58%***	3441	1.83%***	5490	0.72%***	4237
	(15.34)		(15.50)		(6.61)	

Note: This table presents five-day (-2,+2) CARs sorted by infrequent, frequent and highly frequent acquirers and by the relative acquisition size. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one, two to four and more than four acquisition(s), respectively. The t-statistic is in parentheses. N# reports the number of takeovers.***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

2.6.4.   Robustness test for subsequent acquisitions

Following Conn et al. (2004) and Billett and Qian (2008), an initial successful acquisition is defined as a first deal exhibiting positive abnormal return. Table 2-9 reports the CARs for initially successful deal (CARs>0) and subsequent deals according to frequency. The results are consistent with the findings of Table 2-4 that CARs are higher for the first deal than subsequent deals or high-order deals, suggesting that bidders could develop' hubris after making the first successful acquisition, explains lower returns for subsequent acquisitions. Overall, the hubris phenomenon is consistent across three merger-frequency groups of firms.

In table 2-10, the performance of subsequent deals is further tested against different regional samples, target ownerships, pre-crisis and the crisis period, respectively. The results remain consistently robust: the management develops hubris significantly for subsequent acquisitions after the first deal.

Table 2-9. Cumulative abnormal returns for infrequent, frequent and highly frequent acquirers firms associated with the initial success across deal order

Deal Order	Infrequent		Frequent		Highly Frequent	
	CAR[-2,+2]	N#	CAR[-2,+2]	N#	CAR[-2,+2]	N#
1st	8.29%***	2338	7.87%***	1365	8.63%***	333
	(55.55)		(43.04)		(15.54)	
2nd-3th			1.57%***	2124	1.15%***	999
			(8.93)		(4.85)	
>=4th					0.54%***	1154
					(2.94)	
Overall	8.29%***	2338	4.03%***	3489	1.87%***	2486
	(55.55)		(29.08)		(11.86)	

Note: This table reports five-day (-2,+2) Cumulative Abnormal Returns (CARs) associated with the initial success across deal order. The initial success is defined as the first acquisition generates CAR greater than zero. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one, two to four and more than four acquisition(s), respectively. The t-statistic is in parentheses. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

Table 2-10. Robustness checks for cumulative abnormal returns based on deal order across different comparative controls

Deal order	Overall		1st		2nd -3rd		>=4th	
	CAR[+2,-2]	N#	CAR[+2,-2]	N#	CAR[+2,-2]	N#	CAR[+2,-2]	N#
Timing-specification								
Panel A:By time period								
2000-2005	1.67%***	4637	2.43%***	2010	1.41%***	1802	0.25%	531
	(15.91)		(13.93)		(8.81)		(1.11)	
2006-2010	1.34%***	5472	1.63%***	1513	0.59%**	1166	0.46%*	391
	(15.09)		(6.30)		(2.51)		(1.80)	
Economic-specification								
Panel B: By regions								
Asia	0.90%***	1422	1.68%***	488	1.01%***	694	-1.03%**	240
	(4.82)		(5.09)		(3.87)		(-2.45)	
Europe	1.38%***	2154	2.22%***	580	1.16%***	906	0.95%***	668
	(10.26)		(7.18)		(5.67)		(4.87)	
U.S.	1.19%***	4454	1.99%***	1212	1.17%***	1876	0.50%***	1366
	(10.46)		7.95)		(6.61)		(3.01)	
Panel C: By economic development								
Developing economies	2.12%***	353	2.04%***	139	2.02%***	179	-0.15%	35
	(5.36)		(2.80)		(4.73)		(-0.18)	
Developed economies	1.27%***	9727	2.72%***	2695	1.13%***	4161	0.11%***	2871
	(15.94)		(14.36)		(9.75)		(1.00)	
Deal-specification								
Panel D: By target ownership								
Public	-0.33%**	2126	-0.12%	610	-0.14%	908	-0.98%***	398
	(-2.03)		(-0.33)		(-0.15)		(-3.14)	
Private	2.01%***	4952	4.24%***	1344	1.67%***	2099	0.46%***	1052
	(16.13)		(13.27)		(9.53)		(2.63)	
Subsidiary	2.00%***	3031	3.33%***	888	1.94%***	1346	0.48%**	539
	(13.52)		(10.04)		(9.17)		(1.99)	
Panel E: By payment method								
Pure cash	1.23%***	5994	2.33%***	1413	1.27%***	2499	0.47%***	1452
	(14.29)		(10.31)		(9.75)		(3.80)	
Pure stock	1.59%***	1580	3.28%***	602	1.27%***	705	-1.45%**	169
	(5.72)		(6.30)		(3.31)		(-2.33)	
Combination	2.13%***	2535	4.02%***	827	1.75%***	1149	-0.26%	368
	(10.75)		(9.45)		(6.63)		(-0.64)	

Note: This table shows robustness checks for cumulative abnormal returns by different comparative controls. The t-statistic is in parentheses. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

2.7. Conclusions

By using a sample of 14,103 acquisitions collected from different countries over 11 years from 2000 to 2010, this study examines the effect of merger frequency on the expectation of investors to the integration of new business for their performance in the future. A univariate analysis is taken to explore the effects of merger frequency on cumulative abnormal returns for three groups of acquirers, respectively, the infrequent, the frequent and the highly frequent.

The comparative results of CARs show that the low frequent acquirers outperform the highly frequent ones, in which this finding is consistent and robust across different time length, different regions, different time periods, different ownerships of target firms, different size of deals and different payment methods made by acquirers.

The significant findings above provide clear evidence on which the acquiring managements or firms have developed the hubris from their previously successful experiences on mergers and acquisitions. The development of hubris with more mergers drives down the expectation of investors for better performing in the future of the new integration and so lowering the value of the firm. Although the managements of acquiring firms are expected to have worse performance after their first deal or second deals of mergers due to growing hubris in M&A, this does not mean that the management learning effect shall be rejected. The study does show evidence on the learning effect that drives up the market expectation for the future improvement of new integration if the time interval between the two mergers pursued by the firm is longer.

The short break between the two mergers cannot provide the new integration with sufficient time to digest new opportunities and challenges raised from the acquisition before a new one starts. The results are consistent and robust across different frequencies of mergers: the firm with a longer break for next merger after its last one drives up market expectation for the future performance and so the higher value of the firm. For a given frequency, the management learning plays a role in performance improvement. In other words, the effect of management hubris or agency issue brought by more mergers can be mitigated or offset by more learning allowed by the longer break between the mergers. In sum, an increase in acquisitions develops more negative impact of hubris or agency issue, but the adverse effects of them on performance can be offset or weakened by increasing time interval between mergers.

Finally, this study also identifies that the hubris effect on performance can be offset or weakened by increasing the size of acquisition. The large size exposes the acquiring firm to a high risk for devastating business of the acquisition fails. This risk pressure leads the firm to be more careful in handling the large deals.

Appendix A

Table A1. Robustness checks on 3-day cumulative abnormal returns sorted by infrequent, frequent and highly frequent acquirers across different comparative controls

	Infrequent		Frequent		Highly frequent	
	CAR[+1,-1]	N#	CAR[+1,-1]	N#	CAR[+1,-1]	N#
Panel A: By temporal interval						
within sample span	3.59%***	3994	1.73%***	5820	0.57%***	4289
	(19.38)		(17.07)		(6.49)	
within four years	2.34%***	6831	0.87%***	5685	0.26%**	1587
	(22.17)		(10.12)		(2.25)	
within one year	1.85%***	10009	0.73%***	3818	0.28%	276
	(22.98)		(7.50)		(0.67)	
Timing-specification						
Panel A: By time period						
2000-2005	2.56%***	2149	1.49%***	2604	0.61%***	1255
	(16.06)		(11.12)		(3.51)	
2006-2010	1.53%***	754	0.83%***	1621	0.55%***	919
	(6.66)		(6.32)		(4.09)	
Economic-specification						
Panel B: By regions						
Asia	2.20%***	1260	1.44%***	1074	0.28%	348
	(9.83)		(6.54)		(0.96)	
Europe	2.58%***	561	1.69%***	1180	1.01%***	974
	(8.05)		(8.54)		(6.73)	
U.S.	2.83%***	1573	1.96%***	2419	0.54%***	2035
	(11.27)		(11.41)		(3.96)	
Panel C: By economic development						
Developing economies	2.29%***	540	1.96%***	314	0.85%	39
	(6.95)		(5.40)		(1.14)	
Developed economies	3.08%***	3441	1.95%***	5490	0.60%***	4237
	(17.50)		(16.98)		(6.47)	
Deal-specification						
Panel D: By target ownership						
Public	0.65%*	673	0.02%	1163	-1.02%***	963
	(1.88)		(0.10)		(-5.79)	
Private	4.42%***	1890	2.18%***	2792	0.62%***	2160
	(14.82)		(14.51)		(5.95)	
Subsidiary	3.88%***	1431	2.13%***	1865	0.68%***	1166
	(13.51)		(12.23)		(4.92)	
Panel E: By payment method						
Pure cash	1.83%***	1778	1.38%***	3148	0.48%***	2846
	(9.65)		(12.31)		(6.11)	
Pure stock	5.12%***	1158	1.93%***	1047	-0.82%***	533
	(11.81)		(6.47)		(-2.82)	
Combination	4.88%***	1058	2.29%***	1625	0.24%	910
	(12.42)		(10.48)		(1.20)	

Note: This table reports three-day (-1,+1) Cumulative Abnormal Returns (CARs) for infrequent, frequent and highly frequent acquirers across different comparative controls. The t-statistic is in parentheses. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

Table A2. Robustness checks on 3-day cumulative abnormal returns sorted by infrequent, frequent and highly frequent acquirers across deal order

Deal order	Overall		1st		2nd-3rd		>4th	
	CAR[+1,-1]	N#	CAR[+1,-1]	N#	CAR[+1,-1]	N#	CAR[+1,-1]	N#
Full sample	1.40%***	10109	1.78%***	2842	0.94%***	4353	0.24%**	2914
	(18.67)		(13.55)		(9.60)		(2.48)	
By avg. temporal intervals between deals								
< one year	0.87%***	6545	1.68%***	1684	0.97%***	2565	0.18%*	2296
	(11.61)		(10.24)		(7.56)		(1.77)	
one to two years	2.08%*	2726	2.90%***	813	1.75%***	1325	0.53%**	588
	(1.78)		(8.77)		(5.03)		(2.16)	
> two years	2.18%***	742	2.92%***	297	1.78%***	415	0.35%	30
	(6.83)		(5.05)		(4.64)		(0.34)	
Timing-specification								
By time period								
2000-2005	1.30%***	4637	1.98%***	2010	1.06%***	1802	0.10%	531
	(14.88)		(13.59)		(7.82)		(0.55)	
2006-2010	1.13%***	5472	1.57%***	1513	0.62%***	1166	0.34%*	391
	(15.06)		(6.70)		(3.06)		(1.71)	
By regions								
Asia	0.82 %***	1422	1.27%***	488	1.00%***	694	-0.61%*	240
	(5.42)		(4.70)		(4.61)		(-1.96)	
Europe	1.18%***	2154	1.81%***	580	1.10%***	906	0.74%***	668
	(10.51)		(7.20)		(6.23)		(4.65)	
U.S.	0.91%***	4454	1.71%***	1212	0.85%***	1876	0.30%**	1366
	(9.66)		(8.26)		(5.66)		(2.18)	
By economic development								
Developing economies	1.81%***	353	1.51%***	139	1.82%***	179	-0.52%	35
	(5.52)		(2.59)		(5.53)		(-0.86)	
Developed economies	1.30%***	9727	2.73%***	2695	1.10%***	4161	0.24%**	2871
	(17.32)		(15.23)		(9.87)		(2.53)	
Deal-specification								
By target ownership								
Public	-0.40%**	2126	0.16%	610	-0.32%	908	-1.03%***	398
	(-2.70)		(0.52)		(-1.38)		(-4.10)	
Private	1.66%***	4952	3.49%***	1344	1.35%***	2099	0.45%***	1052
	(16.18)		(13.73)		(8.83)		(3.32)	
Subsidiary	1.65%***	3031	2.61%***	888	1.66%***	1346	0.35%*	539
	(8.97)		(9.68)		(8.97)		(1.81)	
By payment method								
Pure cash	1.02%***	5994	1.94%***	1413	1.05%***	2499	0.36%***	1452
	(14.11)		(10.50)		(9.40)		(3.56)	
Pure stock	1.23%***	1580	2.96%***	602	0.67%*	705	-0.93%*	169
	(5.19)		(6.91)		(1.94)		(-1.89)	
Combination	1.72%***	2535	3.14%***	827	1.45%***	1149	-0.29%	368
	(10.39)		(9.16)		(6.16)		(-0.93)	

Note: This table reports three-day (-1,+1) Cumulative Abnormal Returns (CARs) sorted by deal order across different comparative controls. The t-statistic is in parentheses. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

Appendix B

Table B1. Cumulative abnormal returns sorted by infrequent, frequent and highly frequent acquirers based time intervals across different regions and economies

Panel A:By regions

	Infrequent		Frequent		Highly frequent	
	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*
Asia						
within sample span	2.11%***	1260	1.37%***	1074	-0.10%	348
	(8.78)		(5.95)		(-0.28)	
within three years	2.07%***	1417	1.07%***	1098	-0.85%*	167
	(9.10)		(5.03)		(-1.68)	
within one year	1.87%***	2001	0.59%**	657	-2.84%*	24
	(10.26)		(2.12)		(-1.79)	
	Infrequent		Frequent		Highly frequent	
	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*
Europe						
within sample span	2.14%***	561	1.62%***	1180	1.24%***	974
	(6.96)		(7.80)		(7.00)	
within three years	1.97%***	651	1.66%***	1360	1.11%***	704
	(6.80)		(8.95)		(5.45)	
within one year	1.78%***	1331	1.47%***	1252	0.79%**	132
	(8.87)		(8.65)		(2.01)	
	Infrequent		Frequent		Highly frequent	
	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*
U.S.						
within sample span	2.55%***	1573	1.84%***	2419	0.78%***	2035
	(10.40)		(10.15)		(4.98)	
within three years	2.49%***	1872	1.52%***	2771	0.85%***	1384
	(11.19)		(9.38)		(4.48)	
within one year	2.17%***	3288	1.09%***	2491	0.86%*	248
	(13.49)		(6.97)		(1.84)	
	Infrequent		Frequent		Highly frequent	
	CAR[+2,-2]	N#	CAR[+2,-2]	N#	CAR[+2,-2]	N#
Panel B:By economies						
	Infrequent		Frequent		Highly frequent	
	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*
Developing economies						
within sample span	2.57%***	540	2.26%***	314	1.29%	39
	(6.81)		(5.26)		(1.19)	
within three years	2.67%***	586	1.97%***	288	0.98%	19
	(7.18)		(4.99)		(0.54)	
within one year	2.50%***	780	1.73%***	113	-	-
	(8.21)		(2.78)		-	
	Infrequent		Frequent		Highly frequent	
	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*	CAR[+2,-2]	*N#*
Developed economies						
within sample span	2.58%***	3441	1.83%***	5490	0.72%***	4237
	(15.34)		(15.50)		(6.61)	
within three years	2.56%***	4071	1.48%***	6209	0.81%***	2888
	(16.77)		(13.75)		(6.38)	
within one year	2.18%***	7288	1.09%***	5373	0.40%	507
	(20.14)		(10.35)		(1.26)	

Note: This table reports five-day (-2,+2) Cumulative Abnormal Returns (CARs) for infrequent, frequent and highly frequent acquirers by time intervals across different regions and economies. The t-statistic is in parentheses. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

Table B2. Cumulative abnormal returns sorted by infrequent, frequent and highly frequent acquirers across different time intervals

Temporal interval	Infrequent CAR[+2,-2]	Infrequent N#	Frequent CAR[+2,-2]	Frequent N#	Highly frequent CAR[+2,-2]	Highly frequent N#
within eight years	2.72%*** (19.00)	4066	1.92%*** (18.33)	6014	1.32%*** (2.64)	4023
within five years	2.52%*** (17.49)	4385	1.58%*** (15.12)	6342	0.81%*** (6.96)	3376
within two years	2.41%*** (19.73)	5806	1.28%*** (13.19)	6712	0.41%*** (4.45)	1585

Note: This table reports five-day (-2,+2) Cumulative Abnormal Returns (CARs) for infrequent, frequent and highly frequent acquirers by time intervals. The t-statistic is in parentheses. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

Appendix C

Table C1. Comparative sample statistics for different definitions of acquirer type sorted by payment method, target ownership status and interaction controls

Merger frequency	Infrequent			Frequent			Highly frequent	
	CAR[+2,-2]	N#		CAR[+2,-2]	N#		CAR[+2,-2]	N#
Panel A: Overall								
	3.84%***	6656		1.62%***	4228		0.27%***	3219
	(23.89)			(13.04)			(2.61)	
Panel B: By target ownership								
Public	0.78%***	1177		-0.41	919		-0.72%***	703
	(2.72)			(-1.60)			(-3.22)	
Private	4.73%***	3133		2.22%***	2047		0.51%***	1662
	(17.99)			(12.32)			(3.43)	
Subsidiary	4.17%***	2346		2.13%***	1262		0.64%***	854
	(16.89)			(9.49)			(3.28)	
Panel C: By payment method								
Pure cash	2.09%***	3147		1.46%***	2440		0.47***	2185
	(13.02)			(10.85)			(4.45)	
Pure stock	5.80%***	1698		1.54%***	671		-0.99%**	369
	(13.93)			(3.94)			(-2.27)	
Combination	5.04%***	1811		2.02%***	1117		0.32%	665
	(14.98)			(7.15)			(1.16)	

Note: This table reports five-day (-2,+2) Cumulative Abnormal Returns (CARs) for infrequent, frequent and highly frequent acquirers by target type and payment method. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one to two, three to five and more than five acquisitions during 2000-2010, respectively. The t-statistic is in parentheses. N# reports the number of takeovers. ***Denotes significance at the 1% level. **Denotes significance at the 5% level. *Denotes significance at the 10% level.

3.   How does frequent acquisition affect the market expectation of performance changes after acquisition? The role of merger quantity and time interval

3.1. Introduction

Previous research on merger and acquisition adopted a univariate approach which was widely applied in studies of merger frequency[10]. The second chapter, about univariate analysis, explored how not only Cumulative Abnormal Returns (CARs) decrease with more mergers, but also provided a little clue that how they increase with temporal intervals. In this chapter a multivariate analysis is employed to test the joint effects of merger frequency from the perspective of inferential statistics. As compared to univariate approach, the multivariate one enables a more effective exploration about the marginal effect of merger frequency on announcement returns when other effects are controlled or isolated in the estimation. Thus, the results of multivariate estimation can inform us about how merger frequency affects CARs particularly at the presence of other on stock value.

Based on a large global sample of 14,000 takeovers, this chapter shows that announcement returns are lower when an acquiring firm takes a more aggressive merger strategy. However, this negative impact may not always exist when the time interval is long. This suggests that among the managerial behaviours that develop in the course of repetitive merger activities, management hubris and, over time, management learning

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[10] Merger frequency is measured as the quantity of acquisition for a given period.

may co-exist. More specifically, if an acquiring firm develops "hubris" from frequent acquisitions, then a negative relation between frequency and CARs may be expected. If the time intervals between those acquisitions are longer, then there will be a greater opportunity for acquiring firms to learn experience from their takeovers. The positive impact of learning may reduce the negative effect of hubris and thus weakens the negative impact of merger frequency on announcement returns. Consistent with chapter 2, this study also found that for a given merger frequency the size of acquisition or merger is positively related to announcement returns. It can be explained by the effect of "risk pressure" on the managerial behaviour of acquiring firms.

This chapter makes three significant contributions to the existing literature on corporate merger strategy. Firstly, the study develops a new method of defining the merger frequency that interacts the number of mergers with the time that a merger effect may last after the event occurrence. Secondly, this study adds to the literature on how acquisitions affect the acquiring firm's stock performance in both the temporal and quantitative perspectives. Thirdly, it builds upon studies about the different implications to relationship between aggressiveness of merger strategy and market expectation. Fourthly, a new argument is posited that a larger deal size produces a more positive impact on performance improvement for the acquiring firms due to the risk pressure on management.

The rest of the chapter is structured as follows. Section 3.2 presents the testable arguments and surveys existing evidence. Section 3.3 gives a brief review of merger activities and stock returns in the past. Section 3.4 describes data and sample. Section 3.5 presents the estimation model and variables. In section 3.6, the possible

determinates of merger announcement returns are discussed. Finally, section 3.7 explains the conclusions of the discussion.

3.2. Literature review

3.2.1.   Theory

Consider an acquiring firm which starts performing acquisitions without any bias, but develops managerial hubris from its previous acquisition experience. When the firm undertakes the first acquisition it will not overpay because the value of the first acquisition and the expectation of the value created are not biased by hubris. Once managerial hubris is developed, the expectation of the firm about the benefit from subsequent takeovers become over optimistic and biased from the real outcomes. In this case, the subsequent acquisitions will destroy value for the acquirer. However, if the acquiring firm learns from past merger experience about its true ability, the impact of hubris may level off and eventually decline with additional experience.

The above arguments lead to the following testable hypotheses on impacts of frequent acquisition on announcement returns. Two theories are developed from opposite ends of a spectrum. At one end is *managerial hubris hypothesis* of acquisitions driven by managerial optimistic behaviour in corporate decisions. At the other end is *organizational learning hypthesis* that drives better outcomes for current acquisition than the prior ones, since firms accumulate experience on acquisition which can

enhance management's acquisition expertise (Kusewitt, 1985; Fowler and Schmidt, 1989; Bruton et al. 1994; Barkema et al. 1996; Ashkenas et al., 1998; Hitt et al., 1998).

If an acquirer's acquisitive decisions develop hubris, it is expected that the management of the acquiring firm will be as equally likely to make frequent acquisitions that exceed their acquisitive capability, and thus destroy shareholder's value. It is also expected that the value-destruction would be more serious as acquirers are more aggressive in acquisition during a relatively shorter time period. This theory addresses the negative effects of over-confident issue with acquirers, yet there is also a mechanism for improving shareholders wealth based on the theory of organizational learning which is widely discussed by scholars, especially since Argyris and Schon (1978). *Organizational learning theory* emphasizes the role of prior acquisition experience in determining the positive outcomes of serial acquisitions. However, Hayward (2002) argues that learning does not necessarily benefit acquirers if there is a very short temporal interval between two acquisitions since acquirers may be unable to learn so meaningfully in such a short time period. From this point of view, an acquirer is more likely to generate better inferences suited for subsequent acquisitions from prior experience as such experience can take root more successfully in a relatively longer time period.

To sum up, from the point of view of shareholder valuation, it is expected that it may not be suitable for firms making a large quantity of acquisitions in the short term since frequent acquisition is harmful to shareholder wealth. Yet, acquirers may be feasible in mergers in the long-run as a long time period may result in improvements in the effect of learning and thus offset initial hubris.

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Table 3-1. Summary of early empirical research on merger frequency by using multivariate approach

STUDY	SAMPLE	KEY FINDING(S)
KUSEWITT (1985)	Acquisitions by 138 U.S. firms from 1967 to 1976	Negative relationship
FOWLER & SCHMIDT (1989)	Acquisitions by 42 manufacturing firms from 1975 to 1979	Positive relationship
HALEBLIAN & FINKELSTEIN(1999)	449 acquisitions from 1980 to 1992	U-shaped relationship between acquisition experience and performance
FINKELSTEIN & HALEBLIAN (2002)	192 acquisitions by 96 acquirers from 1970 to 1990	Second acquisition underperforms the first, especially when from a different industry
HAYWARD (2002)	214 acquisitions by 120 firms in six industries from 1990 to 1995	Inverted U-relationship between the similarity of prior acquisitions and the performance of the focal acquisition
LAAMANEN & KEIL (2008)	A sample of 5,518 U.S. acquisitions during the period between 1990 and 1999	They also find that the acquisition rate is negatively related to acquirer performance
BILLETT & QIAN (2008)	3,795 US acquisitions of 2,213 acquiring firms during the period between 1980 and 2002	The negative effect of CEO's merger frequency persists in a multivariate context after controlling the deal and firm specific characteristics
CONN ET AL. (2004)	A sample of 4,344 UK acquisitions during the period from 1984 to 1998.	Negative relationship

3.2.2.   Empirical evidence

Table 3-1 presents relatively recent research which took a multivariate approach for the impact of frequent acquisition. Kusewitt (1985) firstly raised the issue of merger frequency related to performance on the basis of investigating a sample of 3,500 acquisitions by 138 acquirers during the period 1967-1976. Kusewitt (1985) and a subsequent study by Conn et al., (2004) show that the merger frequency is negatively related to the performance of acquiring firms, which is consistent with the results in the previous chapter.

To test this argument, Conn et al. (2004) further examined the difference in merger performance among three frequencies: one acquisition, two to three acquisitions,

and more than three acquisitions, by using a sample of 4,344 UK acquisitions during the period from 1984 to 1998. In the multivariate analysis, Conn et al. (2004) defined a dummy variable to present multiple acquirers and found that both the dummy and the number of acquisitions are significantly negative in relation to the announcement returns after announcement. The finding made by Conn et al. (2004) supports the managerial hubris argument rather the managerial learning argument.

Consistent with Kusewitt and Conn's, Billett and Qian (2008) found similar results from individual CEOs' standpoint by using a sample of 3,795 US acquisitions of 2,213 acquiring firms during the period 1980 to 2002. Their study defines CEOs as infrequent acquirers if they make only one acquisition, and frequent acquirers if they make at least two acquisitions of public targets within a five-year period. They argue that the negative effect of the CEO's merger frequency persists in a multivariate context after controlling the deal and firm specific characteristics. They argue that CEOs become overconfident through prior acquisitions. As a result the CEOs destroy the shareholder value, which indicates that CEOs develop more hubris when a firm plans high-order deals.

Hayward (2002) [11] introduced another argument on frequency-performance issues but from the perspective of temporal interval. He introduced two interval measures to explore the effect of temporal interval between deals on investors' returns. Firstly, the average temporal interval between deals and secondly, the temporal interval between focal acquisition and prior acquisition. There are two major findings. Firstly,

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[11] Hayward (2002) focused his research on firms' learning from the acquisition experience by using a sample of 214 US acquisitions during the period between 1990 and 1995. The study measures the acquisition experience as the sum of recent acquisitions that conduct by acquiring firms, which is similar to Haleblian and Finkelstein (1999).

Hayward's results suggest that acquiring firms with a higher merger frequency perform worse for stock returns than those with a lower merger frequency. Secondly, the author finds that moderately temporal intervals between acquisitions could benefit the performance of acquiring firms. This may be because a very short interval between acquisitions may not allow enough time for the acquirers to digest prior experiences; and a very long interval means that the prior experiences may become unavailable, inaccessible, irrelevant or forgotten (Argote et al., 1990; Huber, 1991; Chang, 1998; Ginsberg and Baum, 1998).

Laamanen and Keil (2008) use an acquisition rate[12] in order to capture the effect of the temporal interval between acquisitions. On the basis of a sample of 5,518 U.S. acquisitions during the period between 1990 and 1999, they find that the time of two acquisitions is affected by the acquisition rate. They find that the acquisition rate is negatively related to acquirer performance. In their study the acquisition experience, measured as the number of acquisitions over the sample time, is significantly and negatively associated with performance. In contrast, they also find that the interaction of merger experiences and an acquisition rate is positively associated with performance, which alleviates the negative effects of the frequency on performance.

There also are some counter arguments about the negative relationship between merger frequency and investment returns. For example, Fowler and Schmidt (1989) extended Kusewitt's (1985) findings by exploring another set of variables, including a more valid measure of acquisition frequency which measures the number of other major acquisitions made by an acquiring firm in the 4-year period preceding the year of the

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[12] Acquisition rate is calculated as the average number of acquisitions over three years

tender offer, and they found a significant positive relationship between acquisition experience and market-based acquisition performance.

Most existing research predicts positive outcomes to experience (e.g. Lubatkin, 1983; Hitt et al., 1993). That is, the more the merger experience the better the performance for acquiring firms. Haleblian and Finkelstein (1999) argue that the Managerial Learning Theory has a wider variety of conditions than the Learning-curve Theory. The authors focus their research on the influence of organizational acquisition experience[13] on returns to investors in the time span of the merger announcement and limit their study to the quantity of acquisitions. Their evidence shows a U-shaped relationship between the acquisition experience and cumulative abnormal returns. A negative relationship when a firm's current acquisition is dissimilar to its prior acquisitions and the relationship can become positive if the focal acquisition is similar to prior ones. In addition, Haleblian and Finkelstein (1999) find that the acquiring firms with multiple acquisitions in the same industry outperform others. Their findings suggest that acquisition experiences are important for the performance of the new integration.

In sum, current studies on merger frequency and announcement returns leave unresolved issues. Research presented by Kusewitt (1985), Fowler and Schmidt (1989), Conn et al. (2004), Laamanen and Keil (2008), Billett and Qian (2008) and Hayward (2002) has three major limitations. Firstly, some samples are geographically biased. Secondly, they do not take into account the effect of a time interval in estimation (except Hayward (2002)). Thirdly, notably in the case of Conn et al. they employ an

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[13] The acquisition experience is defined as the total number of acquisitions that sample acquiring firms made from 1948 up to the acquisition of interest.

inappropriate model for estimation. These limitations call for further research on the effect of the frequent acquisition.

This chapter aims to extend the existing studies of the frequent acquisition by using a more internationally representative sample with control of firm specific fixed effects, but also by defining merger frequency in terms of how merger effect can last, in the short-term, medium-term or long-term. Splitting frequency into these three terms enables interaction between time interval and frequency as a joint effect for estimations of how frequency affects stock performance in two dimensions: number and time.

3.3. A brief review of merger activities and announcement returns for infrequent and frequent acquirers in the past

To elaborate the trend of mergers made by acquiring firms with different merger frequencies, the number of acquisitions for 6,836 acquirers[14] from 117 countries from 2000 to 2010 are plotted. Figure 3-1a demonstrates the number of takeovers undertaken by infrequent frequent and highly frequent acquirers during the period 2000-2010. It is found that all groups show a similar pattern of growth of acquisitions. The volume of acquisitions has a downward trend after the stock market crash of 2000 till 2001 reaching the first lowest point, gradually increased with the recovery of the stock market to a peak in 2007, declines again from 2007 to 2009 (reach the second lowest point) following the financial crisis and then grows up with global economic recovery. It is

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[14] See Section 4.3 for the sample selecting procedure.

found that infrequent acquirers have increased in both pre-crisis (2001-2007) period and post-crisis period (2007-2009).

Figure 3-1b presents the number of infrequent, frequent and highly frequent deals as percentage of total deals at a year. It shows clearly that there is a converging trend of merger deals for infrequent and highly frequent acquirers: the infrequent acquirers rose to almost 40% in 2010 when compared with the declining trend of the highly frequent deals dropping from 42% in 2000 to 25% in 2010.

Given a decline trend of the highly frequent deals, the cumulative abnormal returns for the highly frequent acquirers were lower when compared with the infrequent and frequent ones over the decade from 2000 to 2010, see Figure 3-2a. In Figure 3-2b, it also shows a clear pattern of decreasing investment returns with increasing the number of acquisitions over the sample period. This pattern is consistent with the findings the last chapter found.

As shown in Figure 3-2b, the cumulative abnormal returns on average decreased with the number of deals completed by an acquiring firm over the sample period. This pattern is consistent with the results found in Chapter 2. This comparative evidence provides a motivation to investigate the merger frequency nexus with bidder's stock performance through a multivariate analysis.

Figure 3-1. Comparison of the number of acquisitions: infrequent, frequent and highly frequent acquirers

(a)
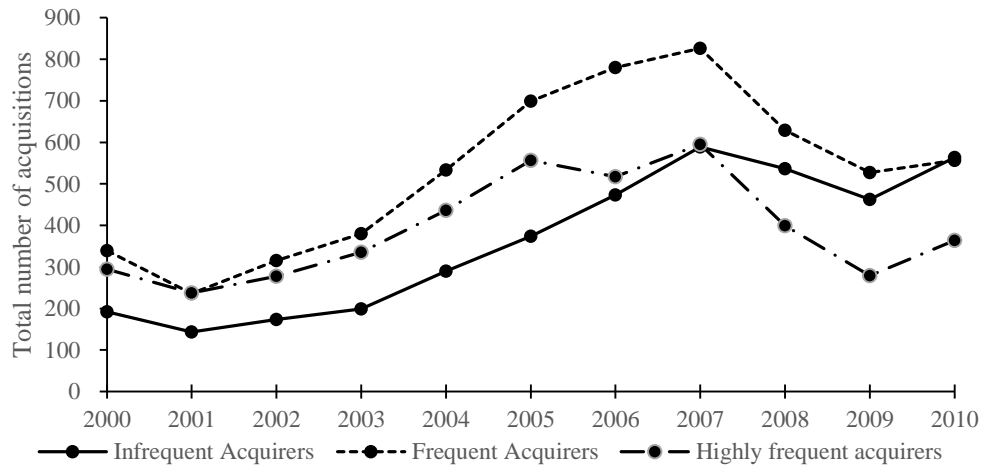
(b)
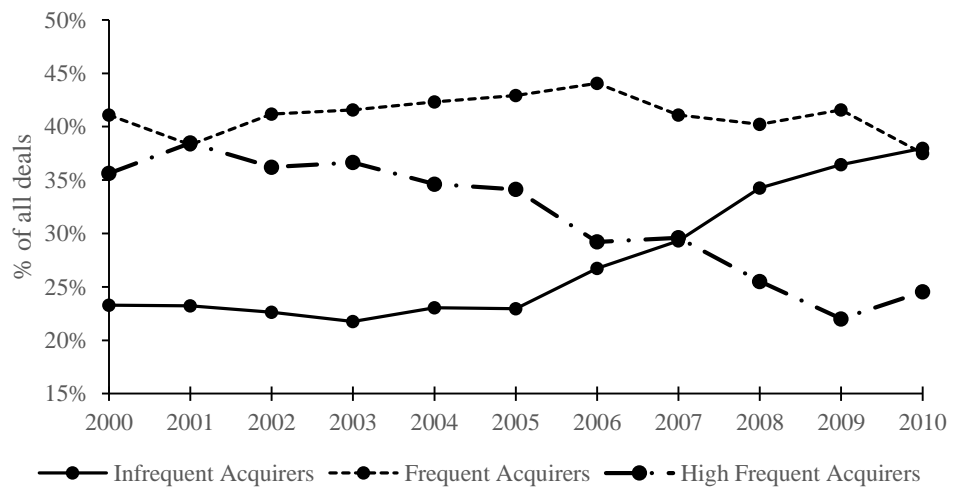
Note: This figure shows graphical illustration of the number of acquisitions for infrequent and frequent bidders from January 1, 2000 to December 31, 2010. Figure (a) and (c) reports the comparison of the number of deals made by infrequent, frequent and highly frequent bidders: the absolute value and as % of year-total acquisitions, respectively. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one, two to four and more than four acquisition(s), respectively.

Source: Authors' calculation based on data from SDC, Datastream and Thomson Financial.

Figure 3-2. Cumulative abnormal returns (CAR) across acquirers and number of mergers

(a)

Infrequent Acquirers --●-- Frequent Acquirers --●-- High frequent acquirers

(b)

Total number of deals
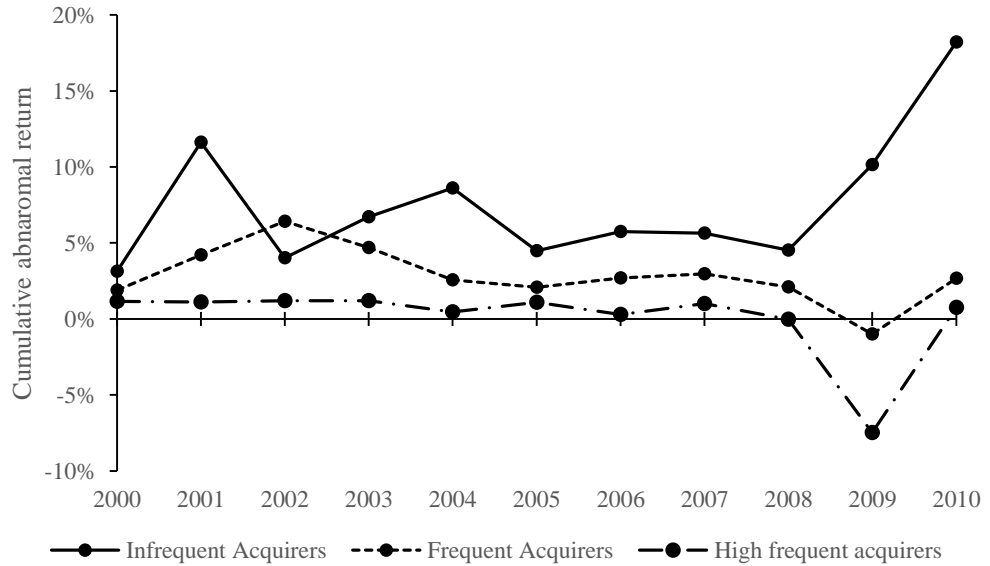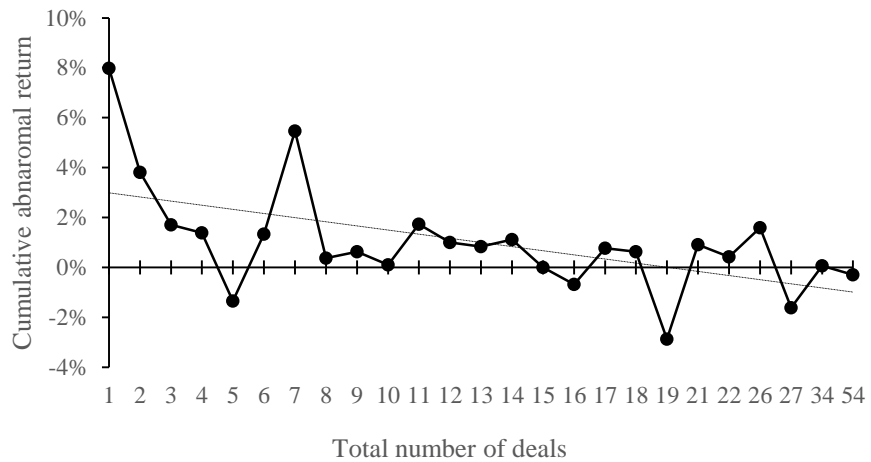
Note: This figure plots distribution of abnormal returns to the shareholders of acquiring firms based on the full sample of 14,103 takeovers from January 1, 2000 to December 31, 2010. Figure (a) reports the comparison of cumulative abnormal returns between infrequent frequent and highly frequent acquirers. Figure (b) presents distribution of CARs against the number of acquisitions. Infrequent, frequent and highly frequent bidder is defined as an acquirer undertaking one, two to four and more than four acquisition(s), respectively.

Source: Authors' calculation based on data from SDC, Datastream and Thomson Financial. Sample period 2000-2010.

3.4. Model specification and variables

3.4.1.   Specification of model

Modeling the relation between merger frequency and investment returns helps understand a question "Are the busiest the best?". Most of the existing studies[15] on the question are based on pooled OLS estimation. However, the pooled regression model has a disadvantage in that it omits the unobserved heterogeneity across individual firms and assumes that the coefficients are the same for all individuals. Consider the pooled OLS estimator:

$$y_{it} = \alpha + \beta x_{it} + \varepsilon_{it}, \tag{1}$$

where ε_{it} represents the random error term.

The above pooled OLS estimator will be problematic if the true mode is the fixed effects model. To explore that, rewrite the model as

$$y_{it} = \alpha + \beta x_{it} + (c_i - \alpha + \varepsilon_{it}) \tag{2}$$

where c_i represents the unobserved heterogeneity or firm specific effects. In the pooled OLS regression, all unique impacts are subsumed in the error term. Yet, there is a fact that each individual has time invariant but unique unobserved effects on the dependent variable. If it is the case, the pooled OLS regression will lead to biased and inconsistent estimates since the explanatory variables are no longer uncorrelated with the error terms (Wooldridge, 2002). Econometrically, unobservable heterogeneity exists in Eq. (2) if

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15 See for example, Fuller et al.(2002), Moller et al. (2004) and Billet and Qian (2008).

$E(\varepsilon_i | x_{it}, c) \neq 0$[16]. Then the pooled OLS regression of y_{it} on x_{it} can produce a biased estimation of β.

In studies of M&A, the integration of new business changes the firm specific effects, such as corporate management style, culture and brand image et cetera. For instance, Tischer and Hildebrandt (2013) suggest that changes in corporate image after acquisition significantly and positively affect shareholder value. The pooled OLS estimation of announcement returns on merger frequency without controlling firm specific effects can be biased due to correlation between the firm specific effects and frequency.

As a result, to control firm specific effects, the Least Square Dummy Variable (LSDV) estimator is applied to estimate the relation of investment returns with merger frequency, in which the estimation model is specified as follows:

$$Y_{it} = \alpha_0 + \alpha_1 freq + \sum_{j=1}^{n} \beta_j M_{j,it} + \sum_{k=1}^{m} \gamma_k F_{k,it} + T_t + c_i + \varepsilon_{it} \qquad (3)$$

where Y_{it} is investment returns value measured by CARs over a 5 days window of the merger announcement. Here, *freq* captures the impact of merger frequencies on investor's value of stocks. T_t as a time dummy controls macroeconomic shocks. Then c_i captures firm specific effects. M_j captures deal characteristics' effects and F_k captures the time variant effects of the acquiring firms. Lastly, ε_{it} denotes the error term in estimation.

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16 The correlation implies that the combined error term$(c_i - \alpha + \varepsilon_{it})$ is correlated with the x_{it}.

3.5. Specification of variables

Further detailed specifications of variables for model (3) are discussed below.

3.5.1.   Announcement returns

Andrade et al. (2001) suggest that the most reliable evidence on impact of merger and acquisition on shareholder wealth creation for acquiring firm draw on short-term event studies. The main purpose of the event study is to test the existence of information effect and to detect the factors that can explain changes in shareholder value around the event date (Prabhala, 1997). Following existing literature, this chapter thus estimates cumulative abnormal returns[17] (CARs) as the measure of the acquiring shareholder valuation on the basis of the event study methodology[18].

The last chapter has detailed discussion on specifying this variable. There are two elements in evaluating CARs empirically. One is about how to calculate abnormal returns after announcement of a merger event and another is about how to specify a period of the impact of the merger announcement or "window". According to Dolley (1933), Ball and Brown (1968) and Fama et al. (1969), a change in a stock price after the announcement of an event is called "return" and the expected returns generated from

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[17] King (2002) provides evidence that CAR is commonly used as a measure of stock performance in M&A research. Since the CAR reflects well on the information regarding the change of stock price for acquiring firm around the acquisition announcement to a benchmark index.

[18] Healy et al.(1992), Kapland and Weisbach (1992) and Harrison and Godfrey(1997) show significant evidence of predictive validity, which increases the confidence in using abnormal returns to measure acquisition performance.

a market portfolio with an adjustment for a risk in investing in the stock are "abnormal returns".

Later, Brown & Warner (1985) and Fama &French (1992) have simplified the calculation of the abnormal returns as the difference between the returns of a stock and the returns of the market portfolio or the market average at a same day. This chapter follows the mainstream studies and takes the simplified method to evaluate impact of a merger announcement. The CAR cumulates the abnormal returns over a "window" period or days, which is specified as follows:

$$CAR_{i(T1-T2)} = \sum_{T1}^{T2} AR_{it} = \sum_{t=T1}^{t=T2}(R_{it} - R_{mt}) \tag{4}$$

where T1 is the start date of the event window, T2 is the end date of the event window. R_{it} represents the observed returns on stock i for day t. R_{mt} represents returns on the market portfolio for day t.

Choosing a window of an event for equation (4), always raises an issue about how to balance between the short window which is usually 3 days and the longer window, such as 5 days or 7 days or even longer. The short window may not be able to capture complete information on market response to a merger announcement. However, the longer window may cause a confounding effect on the evaluation of an event, which can reduce predictive power of the stock price change (Mackinlay, 1997). As a result, to balance the two counter effects, this study defines 5-day as the event window (-2, +2) for empirical estimation of CARs in (4), which is consistent with existing studies (Cox

and Portes, 1998; Fuller, Netter and Stegemolloer, 2002; Faccio et al., 2006; Boubakri, Chan and Kooli, 2012; Gaur, Malhotra and Zhu, 2013). By considering the probability of capturing confounding events in CAR calculations, the study also applies the 3-day window for robustness checks of the estimations (See Appendix A).

3.5.2.   Merger frequency

Kusewitt (1985) is the very first study to measures merger frequency as the number of acquisitions that the sample firms made in a given year. Following Kusewitt, a number of subsequent studies define merger frequency in this way, despite the fact that Kusewitt might not intend to interpret the variable as the measure of the merger frequency. In recent research[19], most of studies attempt to capture the impact of merger frequency by counting the number of takeovers the sample acquirers made over a specific time period.

However, how long shall a specific time period be defined to count a number of mergers, one year, three years or five years? It can be argued that investors or stock markets respond to a new merger announcement by taking into account the short history of merger made by the acquirer. This is because very old mergers in past do not have much effect on the new integration of business. To test this argument, this chapter defines three types of merger frequency according to the temporal business effect of a merger:

- To assume that the business effect lasts longer: *Freq1*, the cumulative number of

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[19] See for example, Croci and Petmezas (2009), Rahahleh and Wei (2012) and Boubakri et al. (2012).

acquisitions for an acquiring firm is over the sample span;

- To assume that the business effect lasts a few years: *Freq2*, the number of acquisitions for an acquiring firm is in a given year plus the three preceding years.

- To assume that the business effect lasts just over one year: *Freq3*, the number of acquisitions for an acquiring firm is in a given year.

Table 3-2 shows the example of coding the different merger frequencies at each year for firm *i*. If the business effect lasts longer, for instance, from 2000 to 2006, then merger frequency (*Freq1*) is accumulatively higher and higher over time. In contrast, if the effect lasts only a year, then the frequency variable measures for 1-year accumulative effects (*Freq3*). Effects of Frequencies which last longer than a year but less than the sample span are also defined. Following the existing studies (e.g. Healy, 1992; Hitt et al., 1998), they are assumed to accumulate a 4-year business effect (*Freq2*). For any given merger earlier or later than the 4-year mark, it is considered to have zero accumulative effects.

Table 3-2. Example of serially coding for the three measures of merger frequency

Year	2000	2001	2002	2003	2004	2005	2006
Number of mergers	•••	••		••	•	•	••
Freq1	1 2 3	4 5		6 7	8	9	10 11
Freq2$_{00\text{-}03}$	1 2 3	4 5		6 7	0	0	0 0
Freq2$_{01\text{-}04}$	0 0 0	1 2		3 4	5	0	0 0
Freq2$_{02\text{-}05}$	0 0 0	0 0		1 2	3	4	0 0
Freq2$_{03\text{-}06}$	0 0 0	0 0		1 2	3	4	5 6
Freq3	1 2 3	1 2		1 2	1	1	1 2

Note: One dot presents one acquisition completed during one year.

3.5.3.   Control variables

According to Jensen (1986), Haleblian and Finkelstein (1999), Fuller et al. (2002), Moeller et al. (2004), Billet and Qian (2008) and Gaur et al. (2013), it can be expected that CARs after a merger announcement will be affected by the ownership status of target firms, the method of payment for acquisition, takeover attitude, the relatedness of acquirers to targets' business or industry, the relative acquisition size, acquirer international scope, and acquirer slack. Note that all monetary data are expressed in US dollars in value of a given year. More specifically, each of the variables is defined as follows:

i.   *Deal-Specific Variables*

- Method of payment: *Cash* and *Stock*, binary variables, where *Cash* (*Stock*) equals one if target is acquired with 100% cash (stock), zero otherwise.

- Ownership of target: *Public* and *Private* binary variables, where *Public* (*Private*) equals one if target is publicly (privately) held, zero otherwise.

- Attitude: *Attitude*, binary variable, where *Attitude* equals one if the takeover is classified as hostile (friendly) by SDC, zero otherwise.

- Acquirer to target industrial relatedness: *Relatedness,* binary variables, where *Relatedness* equals one if target is sharing the same two-digit SIC code as acquirer, zero otherwise. This is obtained as the traditional SIC code-based measure of relatedness following the same approach as Servaes (1996).

- Acquirer international scope: *Cross border*, binary variables, where *Cross border* equals one if the target is a foreign company, otherwise it is zero.

- Relative acquisition size: *Relative size*, the ratio of the deal transaction value to acquirer's market value it 4 weeks prior to the announcement.

- Acquirer slack: *Leverage*, the ratio of acquiring firm's total debt to total assets. *FCF*, the ratio of acquiring firm's free cash flow to total assets.

3.6. Data

The acquisition data used for this study are collected from Securities Data Corporation (SDC)'s Global Mergers & Acquisitions database which includes deals announced and completed from January 1, 2000 to December 31, 2010. The SDC Global Mergers & Acquisitions database is a comprehensive database of over 1.9 million transactions by either public or private acquirers throughout their lifespan starting in 1992. This study focusses on transactions with an explicit transfer of control that the acquirer must own none or less than 50% of the target's voting shares prior to the merger announcement and yield at least 50% or more of the ownership position of the target in post-merger.[20]

To be included in the sample, takeover deals must further match the following criteria. The transaction value of a deal exceeds one million dollars. Acquisitions must be completed, and have both announcement date and effective date[21] and disclosed dollar deal value. The time between announcement date and completion date must be at

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[20] This research is designed to examine acquisitions where the transaction is a significant change of ownership from the target to the bidder. For instance, an acquisition where an acquirer owns 49% nor 2% of target's voting rights is not be included.

[21] SDC database defines the Effective Date as a date when the entire transaction is completed and effective.

least zero or less than 1,000 days. Target firms are required to be a public firm, a private firm or a subsidiary. Consideration of payment method classified by SDC of a deal is one of the four: cash only, stock only, combination of cash and stock and others[22]. Neither the target nor the acquirer is in the financial or utilities industry.[23] Acquirers must not purchase more than two targets within ten trading days. Acquisitions are not buyback offers, repurchases, or self-tender offers.

The sample includes a number of deal characteristic items from SDC, such as the announcement and completion dates, the acquirer and the target's name, nation and primary SIC code, target listing status, deal value, deal attitude and consideration structure (payment method made by the acquirer). Due to the availability of financial data for privately owned acquiring firms, the sample is restricted to public acquirers. After the filtering process of the data, it ends up with a sample of more than 6,800 unique firms undertaking over 14,000 takeover transactions throughout 117 countries with a total transaction value of $4.49 trillion. Among these acquisitions, 3,994 and 10,109 deals are made by infrequent and frequent acquirers, respectively. Then the financial and stock data of sample acquirers are obtained from Thomson Financial[24] and Datastream[25].

Table 3-3 reports the summary statistics of frequency and other related variables for period between 2000 and 2010. To avoid sample selection issues, a balanced panel is not required; thus, the number of acquisitions differs each year. The sample includes both large and small firms.

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[22] The "Other" category describes a mixture of payment methods including cash, bonds, preferred stock, earn outs, assumption of liabilities and the other consideration offered is a form of stock.

[23] firms with a primary SIC code between 4900 and 4999(utilities) or 6000 and 6999 (financial institutions) are excluded.

24 Thomson Financial provides broadest coverage of 51,900 active global companies, representing 99% of the global market capitalization.

25 Datastream offers daily stock prices, trading volumes, and return indices, updated at the end of every trading day, for over 100,000 equities in nearly 200 countries around the world.

Table 3-3. Summary statistics of merger frequency and firm characteristics

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Panel A: Mean (median) [standard deviation] of merger frequency variables											
Freq1	1.46	1.72	1.82	2.03	2.51	2.71	2.68	3.04	3.01	3.06	3.39
	(1.00)	(1.00)	(1.00)	(1.00)	(2.00)	(2.00)	(2.00)	(2.00)	(2.00)	(2.00)	(2.00)
	[1.33]	[1.39]	[1.66]	[1.95]	[3.05]	[3.45]	[3.16]	[3.65]	[3.15]	[4.26]	[3.95]
Freq2	1.92	1.95	2.00	2.22	2.42	2.59	2.43	2.73	2.50	2.22	2.35
	(1.00)	(1.00)	(1.00)	(1.00)	(2.00)	(2.00)	(2.00)	(2.00)	(2.00)	(2.00)	(2.00)
	[2.16]	[1.58]	[1.85]	[2.13]	[2.47]	[2.84]	[2.31]	[2.86]	[2.43]	[2.00]	[2.02]
Freq3	1.92	1.44	1.36	1.39	1.54	1.58	1.44	1.58	1.39	1.30	1.42
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
	[2.16]	[0.89]	[0.79]	[0.74]	[1.13]	[1.17]	[0.84]	[1.17]	[0.92]	[0.67]	[0.88]
Panel B: Mean (median) [standard deviation] of firm characteristics											
Relative size	37.40%	36.80%	35.40%	45.30%	33.20%	36.30%	32.10%	32.00%	35.10%	44.70%	35.00%
	(6.36%)	(7.08%)	(6.92%)	(7.09%)	(6.95%)	(7.28%)	(7.57%)	(6.92%)	(7.37%)	(10.10%)	(8.53%)
	[1.10]	[0.98]	[1.03]	[1.30]	[0.92]	[1.07]	[0.94]	[0.93]	[1.00]	[1.18]	[0.99]
Leverage	19.80%	21.80%	22.80%	21.20%	21.50%	20.00%	18.30%	20.10%	19.10%	19.40%	22.00%
	(10.80%)	(16.30%)	(16.60%)	(18.20%)	(17.00%)	(15.50%)	(13.70%)	(15.40%)	(14.40%)	(12.10%)	(16.00%)
	[0.28]	[0.26]	[0.28]	[0.24]	[0.25]	[0.24]	[0.22]	[0.25]	[0.21]	[0.27]	[0.30]
Free cash/total assets	-0.49%	-0.33%	1.56%	2.31%	2.88%	2.73%	2.25%	1.76%	1.05%	-0.38%	2.65%
	(0.53%)	(1.00%)	(1.99%)	(2.69%)	(2.87%)	(2.61%)	(2.59%)	(1.66%)	(1.32%)	(0.91%)	(3.03%)
	[0.10]	[0.10]	[0.09]	[0.09]	[0.07]	[0.08]	[0.09]	[0.08]	[0.09]	[0.11]	[0.08]
CAR[-2,+2]	2.43%	3.12%	2.48%	3.69%	2.34%	2.19%	2.19%	2.50%	2.36%	3.35%	3.11%
	(0.09%)	(1.35%)	(1.32%)	(1.56%)	(0.89%)	(0.85%)	(0.81%)	(0.91%)	(0.70%)	(1.00%)	(0.81%)
	[0.14]	[0.13]	[0.10]	[0.12]	[0.10]	[0.09]	[0.10]	[0.10]	[0.12]	[0.13]	[0.11]
CAR[-1,+1]	2.08%	2.19%	2.08%	2.81%	1.95%	1.94%	1.77%	2.08%	1.85%	2.70%	2.45%
	(0.14%)	(1.19%)	(1.03%)	(0.98%)	(0.73%)	(0.71%)	(0.52%)	(0.76%)	(0.67%)	(0.69%)	(0.81%)
	[0.12]	[0.10]	[0.09]	[0.10]	[0.08]	[0.08]	[0.08]	[0.08]	[0.10]	[0.11]	[0.09]
Number of observations	825	616	765	914	1,259	1,629	1,770	2,010	1,564	1,268	1,483

Note: The table reports the sample characteristics of merger frequency and firm characteristics regressed and analyzed in the study. The results are tabulated based on a sample of 14103 acquisitions made by 6836 unique bidders from January 1, 2000 to December 31, 2010. *Freq1* is the cumulative number of acquisitions for an acquiring firm over the sample span. *Freq2* is the number of acquisitions for an acquiring firm in a given year. *Freq3* is the number of acquisitions for an acquiring firm in a given year plus the three preceding years. *Relative size* is the ratio of the deal transaction value to acquirer's market value 4 weeks prior to the announcement. *Leverage* is the ratio of acquiring firm's total debt to total assets. *FCF* is the ratio of acquiring firm's free cash flow to total assets. Median values are shown in parentheses; standard deviations are shown in brackets.

3.7. Empirical evidence and discussions

The model (4) is estimated by using Least Square Dummy Variable (LSDV) in order to control firm fixed effects on investment returns at presence of unobserved heterogeneity. Instead of Hausman Statistic, Breusch-Pagan (BP) statistic is employed to test a presence of heterogeneity in estimation under the expectation of which the heteroscedasticity is correlated with explanatory variables. The significance of BP statistic implies biased estimates if the firm fixed effects are not controlled. Therefore, in following estimations, LSDV is applied when BP statistic is significant. The results of estimation are reported on the basis of clustered standard error in the fixed-effects to account for heteroscedasticity and auto-correlation at the firm level[26].

3.7.1. The impact of merger frequency

As the first step of empirical estimation, it starts by examining the degree of correlation among dependent and independent variables in Table 3-4. Within the independent variables, two highest correlations are at -0.54 and -0.48 found between the variables of *Cash* (5) and *Stock* (6); *Public* (7) and *Private* (8). Therefore, these four dummies are replaced by four interaction variables which are interacted the cash and share dummies with the target ownership dummies in robustness checks, in order to reduce the effect of the potential multicollinearity problem on estimation. In additional, Table 3-4 shows a point worth nothing that the correlation between all of merger frequency [27] variables and acquisition performance are negative, which suggests preliminarily a negative linear link between frequency and CARs.

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[27] For brevity, the results of Freq2 are not presented here, but are available from the author upon request. For freq2, it does not appear then potential multicollinearity problem on estimation.

Table 3-4. Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1)	CAR[-2,+2]	1															
(2)	Freq1	-0.09***	1														
(4)	Freq3	-0.06***	0.50***	1													
(5)	Cash	-0.11***	0.14***	0.04***	1												
(6)	Stock	0.08***	-0.12***	-0.03***	-0.54***	1											
(7)	Public	-0.11***	0.01	-0.04***	-0.10***	0.18***	1										
(8)	Private	0.06***	0.05***	0.10***	-0.07***	-0.06***	-0.48***	1									
(9)	Cash*public	-0.05***	0.06***	0.00	0.28***	-0.15***	0.63***	-0.31***	1								
(10)	Stock*public	-0.06***	0.12***	0.07***	0.52***	-0.28***	-0.29***	0.59***	-0.18***	1							
(11)	Cash*private	-0.06***	-0.06***	-0.04***	-0.30***	0.55***	0.54***	-0.26***	-0.08***	-0.16***	1						
(12)	Stock*private	0.13***	-0.07***	0.04***	-0.33***	0.61***	-0.15***	0.31***	-0.09***	-0.17***	-0.08***	1					
(13)	Attitude	-0.02*	-0.01	-0.01	0.01	-0.01	0.09***	-0.04***	0.08***	-0.02***	0	-0.01	1				
(14)	Relatedness	0.00	-0.05***	-0.03***	-0.05***	0.00	0.03***	-0.03***	-0.02*	-0.03***	0.03***	-0.02**	-0.01	1			
(15)	Cross border	0.01	0.02**	-0.01	0.11***	-0.09***	-0.02**	-0.01	0.07***	0.04***	-0.08***	-0.04***	0.03***	-0.01	1		
(16)	Relative size	0.24***	-0.11***	-0.11***	-0.19***	0.15***	-0.01	0.02**	-0.05***	-0.11***	0.02**	0.16***	0.01	0.03***	0.00	1	
(17)	Leverage	0.05***	-0.03***	-0.03***	-0.01	0.03***	0.01	-0.04***	0.01	-0.04***	0.00	0.03***	0.00	0.01	-0.04***	0.10***	1
(18)	FCF	-0.15***	0.12***	0.08***	0.20***	-0.18***	0.04***	-0.04***	0.07***	0.10***	-0.03***	-0.18***	0.01	-0.04***	0.02*	-0.25***	-0.24***

Table 3-5 and 3-6[28] report the results of estimation of model (4) using the full sample of 12 thousands observations. The coefficient of merger frequency is significantly negative in explaining announcement returns. This finding is consistent with Kusewitt (1985) who also finds a significantly negative relation between merger frequency and performance using a sample of 155 U.S. companies which had made two or more large acquisitions during the 1967 – 1976 period. By comparing with Kusewitt (1985), the estimation is further broken down according to the long lasting effects of M&A on performance, the medium-term lasting effects of M&A, and the short-term lasting effects of M&A.

In table 3-5, it is found that the acquisition frequency is significantly and negatively strong in affecting the market expectation to the new integration for its short-term impacts on business. Furthermore, Panel A of Table 3-6 shows that 62.5% of coefficients for *Freq2* are significant and all of them are lower than short-term one. This suggests that the market expects that the impact of the new integration will last a few years longer, resulting in two or three year old frequent acquisitions that are still playing a significant role in affecting announcement returns negatively, although the effects are getting weaker when compared with the short-term ones.

In column (1) and (3) of Table 3-5, the frequency counted over a sample span does not show its significant effect on CARs. There are two possible explanations to this finding. One is that the business effect of new integration is not permanent. Acquisitions made in 7 or 11 years ago will not be perceived by investors or market for their impacts on business improvement that can drive up the value of firm. Another explanation is the mixed effects of management hubris developed with frequency and the management learning from repeated activities over a certain length of time. The longer time helps the growth of the learning effects that allow corporation to digest new opportunities on improving business. As shown in the last chapter, the two effects are

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[28] For full estimation results, see Appendix B.

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opposite for business improvement after new integration and so the expectation of firm's value. The learning takes time to come effective, which can offset the disadvantage brought by managerial hubris. Therefore, in the long run, the M&A frequency can be unclear for its overall significant effects on performance when neither the hubris nor the learning becomes dominant over each other. This argument is consistent with the finding of the last chapter.

3.7.2. *The impact of control variables*

It is found that the relative size of acquisition matters for performance in the last chapter. The findings from the multivariate analysis are consistent with the findings from the univariate analysis shown in Tables 3-5 and 3-6. The variable of relative acquisition size, measured as the ratio of the deal transaction value to acquirer's market value 4 weeks prior to the announcement, appears significantly positive in affecting announcement returns. This finding is consistent with Asquith et al. (1983) who were the first researchers to incorporate relative size effects, stating that the larger the size of acquisition relatively to acquiring firm in an acquisition results in the greater cumulative abnormal returns for acquirer's shareholders.

One explanation is that acquirers will be more careful about dealing with a large acquisition as they can expose the firm to a high risk of devastating the business if the integration fails, which creates a risk pressure on management.Increasing acquisitions size can increase "the risk-driven pressure" on the acquiring firm's management or decision makers. If the size of a merger deal is large relative to the scale of the acquiring firm's business, the acquiring firm will be more exposed to the risk of the acquisition. Any failure of the large acquisition may cause a difficulty for the acquiring firms in using its existing resources to absorb or digest the large acquisition.

If the difficulty is beyond the capability of the acquiring firm to overcome, it can result in the ruination of the existing business of the firm. In considering potential risks, any decision maker or shareholder of the firm will be much more cautious and careful in pursuing large acquisitions than the small ones, as the risk of the small size of the deal could be relatively easier for the acquiring firm to control or absorb. Therefore, this study argues that the pressure of the high risk drives the firm to perform better in large-size acquisitions. This is different from the argument by Moeller et al. (2004) who explain the size effect from the point of view of acquirer size.

Turning to other controlling variables, the coefficient on the public target dummy is significantly negative, indicating that the market views acquisitions of private targets is more favorable than of public ones. This is possibly due to which private firms could have more value added up than public targets in the market. By contrast, the shareholders of a public firm can be traded with for their shares at a premium price in a stock market rather than selling their shares to a potential bidder. In order to make the investment opportunity more attractive and more valuable to potential acquirers, private firms are generally sold at a price with liquidity discount (Fuller et al., 2002).

Similar result regarding the higher value creation of acquiring non-public targets have been found by Moller et al. (2004). Moreover, the interaction variable of public targets with the payment method of stock, also, enters with a significantly positive coefficient. The results suggest that using equity as the method of payment to acquire public targets generates lower returns for shareholders of acquiring firm as compared to cash financing. This is possibly due to the dilution of ownership caused by acquisitions of large public targets.

With respect to internationalization, the *cross border* variable shows how economic fit between countries of acquiring firm and target firm can determine investor's returns in terms of internationalization. With a significantly positive result in each estimation, it suggests that international diversification tends to be value destructive. Morck and Yeung (1992) suggest that the positive relation between cross-border acquisition and investor's returns could be possibly due to that act of cross-border takeovers enhances the managerial ability of using the firm's intangible assets and thus benefits investors.

The free cash flow (FCF) as another variable to control financial slack is found to be significantly and negatively related to investor's returns, which is consistent with Jensen (1986). This indicates that the increase in free cash flow may result in an acquirer making unprofitable acquisitions as the managers of an acquiring firm are likely to spend free cash flow for deals which increase their personal utility. Turning to the other slack variable, given an insignificant coefficient of leverage, it is found that, in line with Laamanen and Keil (2008), financing an acquisition through raising debt does not seem to be factor determining the announcement returns for shareholders of an acquiring firm.

Table 3-5. The effect of merger frequency on stock performance of acquirers

Dependent variable: CAR[-2,+2]	Panel A:Full sample		Panel B:Full sample with interaction variable	
	(1)	(2)	(3)	(4)
Merger Frequency				
Freq1	-0.0003		-0.0003	
	(-0.59)		(-0.55)	
Freq3		-0.0022*		-0.0021*
		(-1.85)		(-1.79)
Deal-specific variables				
Cash	0.0004	0.0004		
	(0.14)	(0.14)		
Stock	-0.0035	-0.0030		
	(-0.86)	(-0.75)		
Public	-0.0187***	-0.0189***		
	(-5.64)	(-5.72)		
Private	-0.0016	-0.0014		
	(-0.59)	(-0.54)		
Cash*public			0.0004	0.0003
			(0.12)	(0.08)
Stock*public			-0.0231***	-0.0230***
			(-4.68)	(-4.67)
Cash*private			-0.0021	-0.0020
			(-0.78)	(-0.76)
Stock*private			0.0068	0.0076
			(1.28)	(1.45)
Attitude	-0.0225	-0.0233	-0.0321	-0.0329
	(-1.06)	(-1.09)	(-1.53)	(-1.57)
Relatedness	-0.0024	-0.0023	-0.0023	-0.0023
	(-0.89)	(-0.87)	(-0.87)	(-0.85)
Cross border	0.0049*	0.0050*	0.0055*	0.0056*
	(1.66)	(1.68)	(1.89)	(1.91)
Firm-specific variables				
Relative size	0.0160***	0.0159***	0.0154***	0.0153***
	(9.00)	(8.94)	(8.84)	(8.77)
Leverage	0.0139	0.0131	0.0145	0.0137
	(1.56)	(1.46)	(1.63)	(1.55)
FCF	-0.0360***	-0.0359***	-0.0359***	-0.0358***
	(-5.43)	(-5.41)	(-5.49)	(-5.48)
Constant	0.0259***	0.0309***	0.0217***	0.0264***
	(4.38)	(4.92)	(4.09)	(4.63)
R^2-adjusted	32.69%	32.72%	33.07%	33.09%
Heterogeneity	1.811***	1.816***	1.828***	1.833***
Firm Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES
F-statistic	11.07	11.22	10.71	10.85
No. of pooled observations	12968	12968	12968	12968
No. of firms	6098	6098	6098	6098

Note: t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **, *** represent significance at the 1%, 5% and 10% level, respectively.

Table 3-6. The effect of 4-year merger frequency on stock performance of acquirers

Panel A:Full sample				
	(1) 2000-2003	(2) 2001-2004	(3) 2002-2005	(4) 2003-2006	
β_j of Freq2	-0.0014**	-0.0023***	-0.0018***	-0.0015***	
	(-2.52)	(-2.90)	(-2.91)	(-2.80)	
	(5) 2004-2007	(6) 2005-2008	(7) 2006-2009	(8) 2007-2010	% of significant β
β_j of Freq2	-0.0009*	-0.0006	-0.0005	-0.0003	62.5%
	(-1.83)	(-1.06)	(-0.80)	(-0.62)	

Panel B:Full sample with interaction variables				
	(1) 2000-2003	(2) 2001-2004	(3) 2002-2005	(4) 2003-2006	
β_j of Freq2	-0.0014**	-0.0024***	-0.0018***	-0.0016***	
	(-2.44)	(-3.09)	(-3.01)	(-2.89)	
	(5) 2004-2007	(6) 2005-2008	(7) 2006-2009	(8) 2007-2010	% of significant β
β_j of Freq2	-0.0009*	-0.0006	-0.0005	-0.0003	62.5%
	(-1.87)	(-1.10)	(-0.81)	(-0.64)	

Note: t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **, *** represent significance at the 1%, 5% and 10% level, respectively.

3.8. Robustness checks

In order to see how the findings from estimation of the full sample are robust across different economies, the full sample is grouped into four subsamples: (1) developed countries, (2) OECD economies, (3) US and (4) EU economies. For developing economics, the sample used only consists of 500 firms from the developing world, and these firms have pursued 680 international acquisitions over the sample period. Apparently, due to the data constraint, on one hand, it will not be efficient from an econometric perspective for using LSDV to estimate the developing-sample firms. On the other hand, estimation is not very representative since 500 firms with 680 deals will not provide much information on merger frequency due to relatively short history of M&A in developing economies.

To further examine frequent acquisition effects, economic co-operation and

development (OECD) [29]countries are extracted from the full sample for a variety of reasons. Firstly, at the firm-level, the acquirers from developed and developing economies belonging to OECD could be relatively more capable in terms of firm operations, corporate governance and structures than others in the world. Secondly, in terms of M&A activity, acquirers of OECD members play a pivotal role in the global M&A market by performing 12,815 acquisitions during the period 2000-2010, accounting for 92.65% of the total deals.

The researches of M&A effects in US and EU are well documented in previous studies. With respect to merger activity, the US has been historically the most active country in M&A activity in the world. Among OECD countries the U.S. and EU stand in the top two position. The US had 5,619 acquisitions and the EU had 2,552 acquisitions, which accounted for 46.77% and 21.24% of OECD acquisitions, respectively. In terms of regulation, the merger regulation of the European Commission[30] is relatively lenient, and tolerates acquisitions that would be unlawful in the United States (Kauper, 2000). According to anti-trust law, the EU rarely brings actions against mergers that tend to create or enhance oligopolies, while the US actively enforced against oligopolies (Bergman et al., 2010). Also, for illustrative purposes that provide a better comparison with prior literature, the US and the EU acquirers are therefore separately tested in this section.

Table 3-7 shows estimation results for developed countries and OECD economies, which is consistent with findings in Table 3-5. Frequency counted for a year interval and frequency counted for a 4-year interval are negatively and significantly related to announcement returns. This finding is also shown in the estimation of firms

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[29] The OECD was established in 1948, including 34 member countries, contributing 80% of trade and investment to world economy. In the study, acquirers from 33 OECD countries except those from Mexico are included.
[30] The European Commission is the EU agency charged with enforcing antitrust regulations.

from EU economies (see Table 3-8). Moreover, the US sample also shows a consistent result for the 4-year or medium-term lasting effect of frequency on CARs that is negative and significant. Interestingly, the longer lasting effect of new integration seems stronger in the US evidenced by the significant negative relationship between CARs and the long-term frequency (see Table 3-8). The result for the US implies that managerial hubris grows with merger frequency and it dominates other effects, particularly, the learning effects.

The US finding is consistent with Boubakri et al. (2012) who find that acquirers experience significant loss from frequent acquisition, using a sample of 4,215 acquisitions by 397 US acquirers from 1999 to 2010. The EU results are in line with Martynova and Renneboog (2006) who examine 2,419 EU acquisitions made across 28 EU countries and document that the wealth of acquirer's shareholders reduces as merger frequency increases. However, these studies have not looked at the different lasting effects of merger frequency, and the unobserved heterogeneity of acquirers is not controlled in the estimation. Given insignificant coefficient, the variable of short-term measure of frequency is not related to announcement returns in the US sample. In contrast to the EU sample, the estimating results indicate that acquirers take much stronger negative effects from frequent acquisition in the short-run, suggesting that the European acquirers may suffer from more serious corporate indigestion of past merger experience in the short-run. Further, the results of medium-term frequency measures show that more than 65% of coefficients are significantly negative for US and EU.

Overall, both results for the US and the EU robustly exhibit that frequent acquisition is value-destructive regardless of the differences in culture, anti-trust law, investor protection, competition of the M&A market and economic system. The different lasting effects of mergers is also re-examined in the EU and US samples. For

the EU, the key mechanism allowing an acquiring firm to be able to create acquisitive capabilities in frequent acquisitions may need more time to enhance learning effects, such as drawing adaptive inference from prior experience on subsequent acquisitions. Yet, for the U.S., the negative effect of frequent acquisition could possibly be attributed to agency issues due to the significant long-lasting effect of the frequency.

Among the controls, the effect of deal size is robustly consistent across different samples for its positive relation to announcement returns. Also the estimated effects of acquiring public targets and free cash flow are robustly and significantly negative. It is noticed that for US acquirers, there is no significant difference in CARs when acquiring foreign or domestic targets. This finding is in line with that of Hayward (2002) who finds that acquisitions of foreign target are not prone to be different to domestic targets for over 100 US domiciled companies during 1985-1995. Although the effect of cross-border acquisition is insignificant, the experience gained through foreign acquisitions or the complementarities of resources and capabilities of the foreign target firms still make these transactions at least partially worth the effort (Bertrand and Betschinger, 2012).

Table 3-7. The effect of merger frequency on acquirer stock performance across different economies

Dependent variable: CAR[-2,+2]	Panel A:Developed economies		Panel B:OECD economies	
	(1)	(2)	(3)	(4)
Merger Frequency				
Freq1	-0.0002		-0.0004	
	(-0.42)		(-0.72)	
Freq3		-0.0021*		-0.0020*
		(-1.83)		(-1.68)
Deal-specific variables				
Cash	0.0004	0.0004	0.0007	0.0007
	(0.12)	(0.13)	(0.22)	(0.22)
Stock	-0.0045	-0.0041	-0.0055	-0.0050
	(-1.16)	(-1.05)	(-1.32)	(-1.20)
Public	-0.0181***	-0.0183***	-0.0201***	-0.0203***
	(-5.61)	(-5.68)	(-5.80)	(-5.87)
Private	-0.0018	-0.0016	-0.0014	-0.0013
	(-0.68)	(-0.64)	(-0.51)	(-0.47)
Attitude	-0.0216	-0.0225	-0.0180	-0.0190
	(-1.03)	(-1.08)	(-0.81)	(-0.85)
Relatedness	-0.0021	-0.0021	-0.0020	-0.0019
	(-0.83)	(-0.81)	(-0.71)	(-0.70)
Cross border	0.0051*	0.0052*	0.0061**	0.0062**
	(1.78)	(1.80)	(1.98)	(2.00)
Firm-specific variables				
Relative size	0.0177***	0.0176***	0.0174***	0.0173***
	(9.85)	(9.79)	(8.85)	(8.79)
Leverage	0.0093	0.0086	0.0148	0.0140
	(1.08)	(1.00)	(1.61)	(1.52)
FCF	-0.0366***	-0.0365***	-0.0365***	-0.0363***
	(-5.72)	(-5.71)	(-5.31)	(-5.30)
Constant	0.0326***	0.0372***	0.0214***	0.0263***
	(5.76)	(6.18)	(3.53)	(4.07)
R-squared	35.71%	35.74%	32.89%	32.91%
Heterogeneity	1.945***	1.950***	1.876***	1.880***
Firm Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES
F-stat	12.52	12.67	10.96	11.07
No. of pooled observations	12246	12246	12015	12015
No. of firms	5584	5584	5407	5407

Note:t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **,

*** represents the significance at the 1%, 5% and 10% level..

Table 3-7. The effect of merger frequency on acquirer stock performance across different economies - Continued

Panel C: Medium-term frequency for developed economies

	(1) 2000-2003 CAR[-2,+2]	(2) 2001-2004 CAR[-2,+2]	(3) 2002-2005 CAR[-2,+2]	(4) 2003-2006 CAR[-2,+2]	(5) 2004-2007 CAR[-2,+2]	(6) 2005-2008 CAR[-2,+2]	(7) 2006-2009 CAR[-2,+2]	(8) 2007-2010 CAR[-2,+2]
Freq2	-0.0015***	-0.0025***	-0.0019***	-0.0016***	-0.0009*	-0.0006	-0.0006	-0.0003
	(-2.61)	(-3.20)	(-3.11)	(-2.98)	(-1.86)	(-1.03)	(-0.83)	(-0.57)
Deal-specific variables								
Cash	0.0001	0.0035*	-0.0006	-0.0007	-0.0008	-0.0008	-0.0008	0.0005
	(0.10)	(1.94)	(-0.35)	(-0.37)	(-0.44)	(-0.44)	(-0.43)	(0.38)
Stock	-0.0030	-0.0052**	-0.0033	-0.0034	-0.0034	-0.0033	-0.0033	-0.0029*
	(-1.53)	(-2.11)	(-1.36)	(-1.38)	(-1.41)	(-1.37)	(-1.36)	(-1.66)
Public	-0.0082***	-0.0114***	-0.0104***	-0.0103***	-0.0103***	-0.0104***	-0.0104***	-0.0075***
	(-5.15)	(-5.62)	(-5.14)	(-5.12)	(-5.12)	(-5.14)	(-5.14)	(-5.20)
Private	-0.0004	0.0009	-0.0009	-0.0008	-0.0009	-0.0009	-0.0009	-0.0005
	(-0.35)	(0.56)	(-0.55)	(-0.52)	(-0.57)	(-0.56)	(-0.54)	(-0.43)
Attitude	-0.0119	-0.0091	-0.0166	-0.0168	-0.0165	-0.0164	-0.0163	-0.0109
	(-1.15)	(-0.69)	(-1.27)	(-1.28)	(-1.26)	(-1.25)	(-1.24)	(-1.17)
Relatedness	0.0004	0.0002	-0.0004	-0.0004	-0.0003	-0.0004	-0.0004	0.0005
	(0.33)	(0.12)	(-0.24)	(-0.22)	(-0.21)	(-0.23)	(-0.23)	(0.46)
Cross border	0.0020	0.0030	0.0024	0.0024	0.0025	0.0025	0.0025	0.0017
	(1.37)	(1.64)	(1.35)	(1.35)	(1.38)	(1.38)	(1.40)	(1.34)
Firm-specific variables								
Relative size	0.0029***	-0.0001	0.0061***	0.0061***	0.0061***	0.0061***	0.0061***	0.0020**
	(3.18)	(-0.10)	(5.35)	(5.38)	(5.36)	(5.35)	(5.35)	(2.48)
Leverage	0.0056	0.0109**	0.0085	0.0085	0.0087	0.0087	0.0087	0.0048
	(1.31)	(2.03)	(1.59)	(1.59)	(1.63)	(1.63)	(1.63)	(1.26)
FCF	-0.0081***	-0.0086**	-0.0129***	-0.0130***	-0.0129***	-0.0130***	-0.0130***	-0.0072**
	(-2.60)	(-2.18)	(-3.27)	(-3.30)	(-3.29)	(-3.29)	(-3.30)	(-2.56)
Constant	0.0124***	-0.0221***	0.0237***	0.0236***	0.0239***	0.0241***	0.0241***	0.0057**
	(4.34)	(-6.27)	(6.76)	(6.75)	(6.81)	(6.89)	(6.89)	(2.27)
R^2-adjusted	31.84%	32.86%	32.44%	32.43%	32.35%	32.32%	32.31%	31.65%
Heterogeneity	1.206***	1.266***	1.333***	1.331***	1.330***	1.330***	1.332***	1.172***
Firm Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	5.91	9.29	7.92	7.88	7.61	7.49	7.48	5.30
Observations	12246	12246	12246	12246	12246	12246	12246	12246
No. of firms	5584	5584	5584	5584	5584	5584	5584	5584

Note: t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **, *** represents significance at the 1%, 5% and 10% level.

Table 3-7. The effect of merger frequency on acquirer stock performance across different economies - Continued

Panel D: Medium-term frequency for OECD countries

	(1) 2000-2003 CAR[-2,+2]	(2) 2001-2004 CAR[-2,+2]	(3) 2002-2005 CAR[-2,+2]	(4) 2003-2006 CAR[-2,+2]	(5) 2004-2007 CAR[-2,+2]	(6) 2005-2008 CAR[-2,+2]	(7) 2006-2009 CAR[-2,+2]	(8) 2007-2010 CAR[-2,+2]
Freq2	-0.0014**	-0.0026***	-0.0019***	-0.0017***	-0.0009*	-0.0006	-0.0006	-0.0003
	(-2.45)	(-3.23)	(-3.16)	(-3.05)	(-1.91)	(-1.01)	(-0.88)	(-0.63)
Deal-specific variables								
Cash	0.0001	0.0032*	-0.0007	-0.0007	-0.0008	-0.0008	-0.0008	0.0004
	(0.07)	(1.78)	(-0.37)	(-0.38)	(-0.46)	(-0.45)	(-0.44)	(0.34)
Stock	-0.0028	-0.0050**	-0.0031	-0.0031	-0.0032	-0.0031	-0.0031	-0.0028
	(-1.46)	(-2.02)	(-1.26)	(-1.29)	(-1.32)	(-1.27)	(-1.26)	(-1.58)
Public	-0.0083***	-0.0117***	-0.0105***	-0.0105***	-0.0104***	-0.0105***	-0.0105***	-0.0076***
	(-5.20)	(-5.75)	(-5.20)	(-5.19)	(-5.18)	(-5.20)	(-5.21)	(-5.25)
Private	-0.0005	0.0006	-0.0009	-0.0008	-0.0009	-0.0009	-0.0008	-0.0005
	(-0.36)	(0.39)	(-0.53)	(-0.51)	(-0.55)	(-0.53)	(-0.52)	(-0.44)
Attitude	-0.0117	-0.0088	-0.0164	-0.0165	-0.0163	-0.0161	-0.0160	-0.0107
	(-1.13)	(-0.67)	(-1.26)	(-1.27)	(-1.25)	(-1.24)	(-1.23)	(-1.15)
Relatedness	0.0007	0.0004	0.0000	0.0000	0.0001	0.0000	0.0000	0.0008
	(0.55)	(0.23)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.66)
Cross border	0.0023	0.0033*	0.0027	0.0027	0.0027	0.0027	0.0028	0.0020
	(1.57)	(1.81)	(1.48)	(1.49)	(1.51)	(1.52)	(1.53)	(1.55)
Firm-specific variables								
Relative size	0.0031***	-0.0003	0.0066***	0.0066***	0.0066***	0.0066***	0.0066***	0.0022***
	(3.30)	(-0.21)	(5.50)	(5.52)	(5.51)	(5.51)	(5.51)	(2.58)
Leverage	0.0064	0.0121**	0.0095*	0.0095*	0.0097*	0.0096*	0.0097*	0.0056
	(1.52)	(2.25)	(1.79)	(1.79)	(1.83)	(1.82)	(1.82)	(1.47)
FCF	-0.0079**	-0.0088**	-0.0123***	-0.0124***	-0.0124***	-0.0124***	-0.0124***	-0.0071**
	(-2.54)	(-2.23)	(-3.15)	(-3.18)	(-3.17)	(-3.17)	(-3.17)	(-2.51)
Constant	0.0113***	-0.0226***	0.0222***	0.0221***	0.0223***	0.0226***	0.0226***	0.0049*
	(3.99)	(-6.41)	(6.36)	(6.35)	(6.41)	(6.48)	(6.48)	(1.96)
R^2-adjusted	31.80%	32.88%	32.43%	32.41%	32.33%	32.29%	32.29%	31.63%
Heterogeneity	1.204***	1.267***	1.324***	1.323***	1.322***	1.322***	1.323***	1.171***
Firm Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	5.75	9.29	7.79	7.76	7.48	7.35	7.34	5.20
Observations	12015	12015	12015	12015	12015	12015	12015	12015
No. of firms	5407	5407	5407	5407	5407	5407	5407	5407

Note: t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **, *** represents significance at the 1%, 5% and 10% level.

Table 3-8. Empirical results across US and EU countries

Dependent variable: CAR[-2,+2]	Panel A:USA		Panel B:EU countries	
	(1)	(2)	(3)	(4)
Merger Frequency				
Freq1	-0.0049**		-0.0026	
	(-2.46)		(-1.29)	
Freq3		-0.0001		-0.0085*
		(-0.04)		(-1.95)
Deal-specific variables				
Cash	0.0044	0.0042	-0.0037	-0.0036
	(0.79)	(0.75)	(-0.75)	(-0.74)
Stock	-0.0013	-0.0017	0.0034	0.0035
	(-0.17)	(-0.22)	(0.38)	(0.39)
Public	-0.0279***	-0.0277***	-0.0116*	-0.0115*
	(-4.51)	(-4.48)	(-1.88)	(-1.86)
Private	0.0074	0.0073	-0.0026	-0.0025
	(1.55)	(1.52)	(-0.59)	(-0.57)
Attitude	-0.0312	-0.0349	-0.0317	-0.0344
	(-0.72)	(-0.80)	(-0.98)	(-1.07)
Relatedness	-0.0049	-0.0047	0.0039	0.0037
	(-1.01)	(-0.96)	(0.91)	(0.88)
Cross border	0.0044	0.0037	0.0086*	0.0083*
	(0.84)	(0.71)	(1.90)	(1.83)
Firm-specific variables				
Relative size	0.0634***	0.0634***	0.0078***	0.0075***
	(7.14)	(7.12)	(2.94)	(2.80)
Leverage	0.0248	0.0241	-0.0177	-0.0192
	(1.26)	(1.22)	(-1.17)	(-1.27)
FCF	-0.0543***	-0.0546***	-0.0346**	-0.0334**
	(-4.84)	(-4.86)	(-2.46)	(-2.37)
Constant	-0.0039	-0.0019	-0.0332**	-0.0233
	(-0.38)	(-0.17)	(-2.07)	(-1.40)
R-squared	43.63%	43.48%	28.01%	28.11%
Heterogeneity	2.028***	2.025***	1.814***	1.825***
Firm Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES
F-stat	7.18	6.87	4.04	4.14
No. of pooled observations	5619	5619	2552	2552
No. of firms	3377	3377	1065	1065

Note:t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **,

*** represents significance at the 1%, 5% and 10% level.

Table 3-8. Empirical results across US and EU countries - Continued

Panel C: Medium-term frequency for US

	(1) 2000-2003 CAR[-2,+2]	(2) 2001-2004 CAR[-2,+2]	(3) 2002-2005 CAR[-2,+2]	(4) 2003-2006 CAR[-2,+2]	(5) 2004-2007 CAR[-2,+2]	(6) 2005-2008 CAR[-2,+2]	(7) 2006-2009 CAR[-2,+2]	(8) 2007-2010 CAR[-2,+2]
Freq2	-0.0019**	-0.0019**	-0.0014***	-0.0008*	-0.0001	-0.0016***	0.0002	-0.0008
	(-2.04)	(-2.38)	(-2.83)	(-1.79)	(-0.15)	(-3.21)	(0.26)	(-0.96)
Deal-specific variables								
Cash	0.0013	-0.0005	-0.0007	-0.0008	-0.0009	-0.0008	-0.0006	-0.0003
	(0.45)	(-0.24)	(-0.40)	(-0.45)	(-0.48)	(-0.47)	(-0.24)	(-0.15)
Stock	-0.0023	0.0006	0.0016	0.0016	0.0018	0.0020	-0.0001	-0.0008
	(-0.57)	(0.18)	(0.64)	(0.63)	(0.71)	(0.79)	(-0.02)	(-0.25)
Public	-0.0149***	-0.0093***	-0.0064***	-0.0065***	-0.0066***	-0.0066***	-0.0110***	-0.0103***
	(-4.73)	(-3.79)	(-3.27)	(-3.29)	(-3.31)	(-3.35)	(-4.08)	(-4.22)
Private	0.0021	-0.0001	-0.0004	-0.0003	-0.0003	-0.0003	-0.0001	-0.0004
	(0.83)	(-0.06)	(-0.23)	(-0.20)	(-0.20)	(-0.21)	(-0.03)	(-0.21)
Attitude	-0.0021	-0.0167	-0.0167	-0.0170	-0.0172	-0.0173	-0.0144	-0.0114
	(-0.10)	(-0.95)	(-1.19)	(-1.21)	(-1.23)	(-1.23)	(-0.75)	(-0.66)
Relatedness	-0.0002	0.0005	0.0002	0.0003	0.0003	0.0003	0.0006	0.0008
	(-0.09)	(0.27)	(0.12)	(0.18)	(0.18)	(0.17)	(0.27)	(0.40)
Cross border	0.0009	0.0013	0.0010	0.0010	0.0012	0.0011	0.0012	0.0009
	(0.31)	(0.62)	(0.61)	(0.60)	(0.68)	(0.67)	(0.51)	(0.41)
Firm-specific variables								
Relative size	-0.0018	0.0024	0.0030**	0.0030**	0.0030**	0.0030**	0.0019	0.0007
	(-0.91)	(1.59)	(2.49)	(2.48)	(2.49)	(2.51)	(1.17)	(0.46)
Leverage	-0.0084	-0.0027	-0.0012	-0.0013	-0.0012	-0.0012	-0.0036	-0.0032
	(-1.40)	(-0.57)	(-0.33)	(-0.36)	(-0.32)	(-0.32)	(-0.71)	(-0.69)
FCF	-0.0325***	-0.0214***	-0.0135**	-0.0137**	-0.0139**	-0.0136**	-0.0258***	-0.0242***
	(-3.56)	(-3.01)	(-2.37)	(-2.40)	(-2.43)	(-2.37)	(-3.31)	(-3.44)
Constant	-0.0244***	0.0046	0.0164***	0.0166***	0.0169***	0.0172***	-0.0001	-0.0037
	(-4.43)	(1.10)	(4.89)	(4.95)	(5.03)	(5.12)	(-0.02)	(-0.89)
R^2-adjusted	35.24%	32.90%	32.90%	32.69%	32.55%	32.61%	32.93%	33.04%
Heterogeneity	1.292***	1.252***	1.277***	1.273***	1.272***	1.275***	1.250***	1.207***
Firm Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	5.84	3.16	3.15	2.92	2.76	2.83	3.19	3.31
Observations	5619	5619	5619	5619	5619	5619	5619	5619
No. of firms	3377	3377	3377	3377	3377	3377	3377	3377

Note: t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **, *** represents significance at the 1%, 5% and 10% level.

Table 3-8. Empirical results across US and EU countries - Continued

Panel D: Medium-term frequency for EU

	(1) 2000-2003 CAR[-2,+2]	(2) 2001-2004 CAR[-2,+2]	(3) 2002-2005 CAR[-2,+2]	(4) 2003-2006 CAR[-2,+2]	(5) 2004-2007 CAR[-2,+2]	(6) 2005-2008 CAR[-2,+2]	(7) 2006-2009 CAR[-2,+2]	(8) 2007-2010 CAR[-2,+2]
Freq2	-0.0030**	-0.0025*	-0.0021***	-0.0013**	-0.0001	-0.0017**	0.0000	0.0001
	(-2.14)	(-1.94)	(-2.99)	(-2.04)	(-0.21)	(-2.17)	(0.05)	(0.15)
Deal-specific variables								
Cash	-0.0036	-0.0036	-0.0035*	-0.0036*	-0.0035*	-0.0035*	-0.0033	-0.0025
	(-1.56)	(-1.57)	(-1.84)	(-1.87)	(-1.86)	(-1.84)	(-1.35)	(-1.13)
Stock	-0.0012	-0.0013	-0.0000	0.0001	0.0001	0.0001	-0.0012	-0.0012
	(-0.30)	(-0.31)	(-0.01)	(0.03)	(0.03)	(0.04)	(-0.28)	(-0.31)
Public	-0.0053*	-0.0055*	-0.0042*	-0.0040*	-0.0040*	-0.0041*	-0.0064**	-0.0059**
	(-1.85)	(-1.91)	(-1.77)	(-1.72)	(-1.72)	(-1.75)	(-2.06)	(-2.12)
Private	-0.0019	-0.0019	-0.0019	-0.0019	-0.0020	-0.0020	-0.0020	-0.0015
	(-0.95)	(-0.94)	(-1.16)	(-1.15)	(-1.22)	(-1.23)	(-0.95)	(-0.78)
Attitude	-0.0227	-0.0234	-0.0181	-0.0176	-0.0168	-0.0166	-0.0260	-0.0256*
	(-1.51)	(-1.56)	(-1.47)	(-1.43)	(-1.36)	(-1.35)	(-1.61)	(-1.76)
Relatedness	0.0020	0.0019	0.0015	0.0015	0.0017	0.0017	0.0021	0.0021
	(1.00)	(0.95)	(0.90)	(0.93)	(1.03)	(1.02)	(1.01)	(1.12)
Cross border	0.0027**	0.0028**	0.0025**	0.0025**	0.0027	0.0028	0.0028	0.0023
	(2.16)	(2.11)	(2.14)	(2.17)	(1.55)	(1.59)	(1.22)	(1.11)
Firm-specific variables								
Relative size	0.0025*	0.0026*	0.0023*	0.0024*	0.0024*	0.0024**	0.0027*	0.0020
	(1.66)	(1.72)	(1.92)	(1.94)	(1.96)	(1.99)	(1.71)	(1.40)
Leverage	-0.0158	-0.0153	-0.0099	-0.0104	-0.0110	-0.0109	-0.0186	-0.0176*
	(-1.44)	(-1.40)	(-1.10)	(-1.15)	(-1.22)	(-1.22)	(-1.58)	(-1.66)
FCF	-0.0005	-0.0013	0.0007	-0.0002	0.0002	0.0008	-0.0025	-0.0038
	(-0.05)	(-0.12)	(0.08)	(-0.03)	(0.03)	(0.10)	(-0.23)	(-0.39)
Constant	-0.0125	0.0005	0.0109*	0.0107*	0.0108*	0.0109*	-0.0035	-0.0061
	(-0.99)	(0.07)	(1.72)	(1.70)	(1.71)	(1.73)	(-0.42)	(-0.81)
R^2-adjusted	34.15%	33.93%	34.34%	34.03%	33.76%	33.85%	33.72%	33.61%
Heterogeneity	1.315***	1.231***	1.247***	1.241***	1.240***	1.252***	1.231***	1.201***
Firm Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	3.02	2.85	3.17	2.93	2.73	2.79	2.70	2.61
Observations	2552	2552	2552	2552	2552	2552	2552	2552
No. of firms	1065	1065	1065	1065	1065	1065	1065	1065

Note: t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **, *** represents significance at the 1%, 5% and 10% level,.

3.9. Conclusions

Does merger frequency affect stock performance? It is evident from this study that short-term frequency and medium-term frequency are negatively related to CARs. However, long-term frequency is not significantly related to the market expectation of performance improvement. This suggests that the effect of merger frequency does not last permanently. A distinctive contribution to the literature made by this study is to examine the merger frequency impacts on market expectation in both the temporal and the quantitative dimensions.

This chapter examines the interaction of the number of takeover events with the time of their lasting effect after the event occurrence in order to explore the impact of merger frequency on market expectation about the future performance of an acquiring firm. The interaction provides the advantage of assessing an argument about which kind of managerial behaviour caused by repeated events such as merger frequency are stronger or dominant in affecting performance: management hubris or management learning?

Firstly, if the number of merger repetitions presents "hubris", then it is expected that the frequency is negatively related to the market performance of acquiring firms. Secondly for a given number of mergers, if the length of time after the event occurrence reflects the amount of learning time which the management needs to digest opportunities and changes from new integrated business for more learning, then the longer time of an event repeating is expected to be positively related to performance. However, the estimation in this chapter of the interaction of frequency with time shows

that the two managerial behaviours co-exist. It is evident that the negative effect of the short term and medium term merger frequency decreases over time and may become insignificant.

In addition, the study shows that the larger size of a merger has a positive effect on performance. This supports the argument about "risk pressure" on management of the acquiring firm. The estimation results are robust in two senses: firstly, controlled firm fixed effects in estimation, and secondly, a larger sample provides the consistency of estimation across different economies.

Appendix A

Table A1. The effect of merger frequency on acquirer stock performance based on 3-day CARs

Dependent variable: CAR[-1+1]	Panel A: Full sample		Panel B: Full sample with interaction variable	
	(1)	(2)	(3)	(4)
Merger Frequency				
Freq1	-0.0002		-0.0002	
	(-0.42)		(-0.41)	
Freq3		-0.0017*		-0.0016*
		(-1.74)		(-1.65)
Deal-specific variables				
Cash	0.0015	0.0016		
	-0.63	-0.63		
Stock	-0.0017	-0.0014		
	(-0.52)	(-0.42)		
Public	-0.0165***	-0.0167***		
	(-6.00)	(-6.06)		
Private	-0.0014	-0.0013		
	(-0.65)	(-0.60)		
Cash*public			0.0004	0.0003
			-0.11	-0.09
Stock*public			-0.0211***	-0.0211***
			(-5.16)	(-5.15)
Cash*private			-0.0008	-0.0007
			(-0.35)	(-0.33)
Stock*private			0.006	0.0066
			-1.37	-1.52
Attitude	-0.0310*	-0.0316*	-0.0397**	-0.0403**
	(-1.75)	(-1.79)	(-2.28)	(-2.31)
Relatedness	-0.0032	-0.0031	-0.0031	-0.0031
	(-1.42)	(-1.40)	(-1.41)	(-1.39)
Cross border	0.0039	0.004	0.0045*	0.0045*
	-1.58	-1.6	-1.85	-1.87
Firm-specific variables				
Relative size	0.0107***	0.0106***	0.0102***	0.0101***
	-7.22	-7.16	-7.07	-7.01
Leverage	0.0035	0.0029	0.0042	0.0036
	-0.47	-0.39	-0.57	-0.5
FCF	-0.0257***	-0.0256***	-0.0260***	-0.0259***
	(-4.66)	(-4.65)	(-4.79)	(-4.78)
Constant	0.0232***	0.0270***	0.0203***	0.0238***
	-4.73	-5.18	-4.6	-5.02
R^2-adjusted	33.15%	33.17%	33.61%	33.63%
Heterogeneity	1.85***	1.85***	1.87***	1.87***
Firm Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES
F-statistic	8.22	8.36	7.89	8.02
No. of pooled observations	12968	12968	12968	12968
No. of firms	6098	6098	6098	6098

Note: Cumulative abnormal returns are calculated for the 3-day (−1, +1) around the acquisition announcement (day 0). A modified market-adjusted model: $AR_{it} = R_{it} - R_{mt}$ is obtained to estimate the abnormal returns.. Statistical significance is marked at 1% (***), 5% (**) and 10 (%) levels, based on robust standard errors.

Table A2. The effect of medium-term merger frequency on acquirer stock performance based on 3-day CARs

VARIABLES	(1) 2000-2003 CAR[-1,+1]	(2) 2001-2004 CAR[-1,+1]	(3) 2002-2005 CAR[-1,+1]	(4) 2003-2006 CAR[-1,+1]	(5) 2004-2007 CAR[-1,+1]	(6) 2005-2008 CAR[-1,+1]	(7) 2006-2009 CAR[-1,+1]	(8) 2007-2010 CAR[-1,+1]
Freq2	-0.0012***	-0.0018***	-0.0011**	-0.0009*	-0.0008*	-0.0009*	-0.0010*	-0.0003
	(-2.60)	(-2.81)	(-2.30)	(-1.94)	(-1.87)	(-1.89)	(-1.81)	(-0.74)
Deal-specific variables								
Cash	0.0015	0.0044***	0.0006	0.0006	0.0005	0.0005	0.0005	0.0018*
	(1.31)	(3.02)	(0.41)	(0.39)	(0.34)	(0.34)	(0.36)	(1.72)
Stock	-0.0007	-0.0034*	-0.0009	-0.0009	-0.0010	-0.0009	-0.0009	-0.0008
	(-0.44)	(-1.74)	(-0.45)	(-0.47)	(-0.50)	(-0.48)	(-0.46)	(-0.61)
Public	-0.0062***	-0.0107***	-0.0079***	-0.0079***	-0.0079***	-0.0079***	-0.0079***	-0.0054***
	(-4.85)	(-6.54)	(-4.86)	(-4.84)	(-4.83)	(-4.84)	(-4.85)	(-4.73)
Private	-0.0004	0.0017	-0.0014	-0.0014	-0.0015	-0.0014	-0.0014	-0.0001
	(-0.41)	(1.28)	(-1.10)	(-1.08)	(-1.11)	(-1.10)	(-1.07)	(-0.16)
Attitude	-0.0197**	-0.0203*	-0.0229**	-0.0230**	-0.0229**	-0.0229**	-0.0227**	-0.0184**
	(-2.42)	(-1.92)	(-2.19)	(-2.19)	(-2.18)	(-2.18)	(-2.17)	(-2.51)
Relatedness	0.0002	-0.0008	-0.0006	-0.0005	-0.0005	-0.0006	-0.0006	0.0002
	(0.17)	(-0.57)	(-0.43)	(-0.42)	(-0.41)	(-0.43)	(-0.44)	(0.23)
Cross border	0.0011	0.0021	0.0014	0.0015	0.0015	0.0015	0.0016	0.0010
	(0.93)	(1.44)	(0.99)	(0.99)	(1.01)	(1.03)	(1.06)	(1.00)
Firm-specific variables								
Relative size	0.0019***	-0.0008	0.0042***	0.0042***	0.0042***	0.0042***	0.0042***	0.0013**
	(2.72)	(-0.87)	(4.77)	(4.78)	(4.78)	(4.77)	(4.76)	(2.05)
Leverage	0.0025	0.0066	0.0041	0.0041	0.0043	0.0044	0.0044	0.0021
	(0.73)	(1.49)	(0.93)	(0.93)	(0.98)	(0.99)	(1.00)	(0.69)
FCF	-0.0053**	-0.0047	-0.0097***	-0.0098***	-0.0098***	-0.0098***	-0.0098***	-0.0043*
	(-2.09)	(-1.43)	(-2.98)	(-3.00)	(-3.00)	(-3.00)	(-3.01)	(-1.87)
Constant	0.0086***	-0.0177***	0.0190***	0.0191***	0.0191***	0.0192***	0.0192***	0.0029
	(3.75)	(-6.14)	(6.64)	(6.64)	(6.65)	(6.69)	(6.68)	(1.45)
R^2-adjusted	31.46%	33.01%	31.72%	31.70%	31.69%	31.69%	31.69%	31.40%
Heterogeneity	1.227***	1.250***	1.372***	1.375***	1.321***	1.341***	1.373***	1.183***
Firm Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	4.84	10.12	5.70	5.63	5.61	5.62	5.60	4.63
No. of pooled observations	12968	12968	12968	12968	12968	12968	12968	12968
No. of firms	6098	6098	6098	6098	6098	6098	6098	6098

Note: Cumulative abnormal returns are calculated for the 3-day (−1, +1) around the acquisition announcement (day 0). A modified market-adjusted model: $AR_{it} = R_{it} − R_{mt}$ is obtained to estimate the abnormal returns. Statistical significance is marked at 1% (***), 5% (**) and 10 (%) levels, based on robust standard errors.

Table A3. The effect of medium-term merger frequency on acquirer stock performance based on 3-day CARs (with interaction variables)

VARIABLES	(1) 2000-2003 CAR[-1,+1]	(2) 2001-2004 CAR[-1,+1]	(3) 2002-2005 CAR[-1,+1]	(4) 2003-2006 CAR[-1,+1]	(5) 2004-2007 CAR[-1,+1]	(6) 2005-2008 CAR[-1,+1]	(7) 2006-2009 CAR[-1,+1]	(8) 2007-2010 CAR[-1,+1]
Merger Frequency								
Freq2	-0.0012***	-0.0018***	-0.0011**	-0.0009*	-0.0008*	-0.0009*	-0.0010*	-0.0003
	(-2.60)	(-2.81)	(-2.30)	(-1.94)	(-1.87)	(-1.89)	(-1.81)	(-0.74)
Deal-specific variables								
Cash*public	0.0019	0.0019	0.0016	0.0016	0.0016	0.0015	0.0016	0.0020
	(1.33)	(0.99)	(0.85)	(0.85)	(0.85)	(0.82)	(0.83)	(1.56)
Stock*public	-0.0097***	-0.0181***	-0.0111***	-0.0111***	-0.0111***	-0.0111***	-0.0112***	-0.0088***
	(-5.08)	(-7.32)	(-4.51)	(-4.52)	(-4.52)	(-4.52)	(-4.54)	(-5.14)
Cash*private	0.0002	0.0034**	-0.0008	-0.0007	-0.0008	-0.0008	-0.0008	0.0006
	(0.22)	(2.54)	(-0.58)	(-0.56)	(-0.61)	(-0.61)	(-0.59)	(0.68)
Stock*private	0.0007	-0.0006	0.0004	0.0004	0.0003	0.0004	0.0006	-0.0000
	(0.36)	(-0.23)	(0.17)	(0.15)	(0.11)	(0.16)	(0.23)	(-0.00)
Attitude	-0.0235***	-0.0266**	-0.0273***	-0.0274***	-0.0273***	-0.0272***	-0.0271***	-0.0218***
	(-2.88)	(-2.52)	(-2.61)	(-2.61)	(-2.60)	(-2.60)	(-2.59)	(-2.98)
Relatedness	0.0002	-0.0009	-0.0006	-0.0006	-0.0005	-0.0006	-0.0006	0.0002
	(0.16)	(-0.66)	(-0.43)	(-0.42)	(-0.41)	(-0.43)	(-0.44)	(0.20)
Cross border	0.0013	0.0027*	0.0017	0.0017	0.0017	0.0017	0.0018	0.0012
	(1.12)	(1.81)	(1.15)	(1.15)	(1.17)	(1.18)	(1.22)	(1.21)
Firm-specific variables								
Relative size	0.0016**	-0.0013	0.0039***	0.0039***	0.0039***	0.0039***	0.0039***	0.0010
	(2.34)	(-1.52)	(4.46)	(4.47)	(4.48)	(4.47)	(4.46)	(1.64)
Leverage	0.0029	0.0071	0.0047	0.0047	0.0048	0.0049	0.0050	0.0025
	(0.85)	(1.61)	(1.06)	(1.06)	(1.10)	(1.11)	(1.13)	(0.80)
FCF	-0.0055**	-0.0050	-0.0100***	-0.0100***	-0.0100***	-0.0100***	-0.0100***	-0.0044*
	(-2.15)	(-1.52)	(-3.05)	(-3.07)	(-3.06)	(-3.06)	(-3.07)	(-1.94)
Constant	0.0078***	-0.0179***	0.0172***	0.0172***	0.0172***	0.0173***	0.0173***	0.0024
	(3.72)	(-6.83)	(6.60)	(6.61)	(6.59)	(6.64)	(6.63)	(1.33)
R^2-adjusted	31.43%	32.60%	31.66%	31.62%	31.61%	31.64%	31.34%	31.35%
Heterogeneity	1.238***	1.250***	1.389***	1.338***	1.318***	1.389***	1.390***	1.192***
Firm Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	4.72	8.71	5.50	5.45	5.74	5.44	5.43	4.47
No. of pooled observations	12968	12968	12968	12968	12968	12968	12968	12968
No. of firms	6098	6098	6098	6098	6098	6098	6098	6098

Note: Cumulative abnormal returns are calculated for the 3-day $(-1, +1)$ around the acquisition announcement (day 0). A modified market-adjusted model:$AR_{it} = R_{it} - R_{mt}$ is obtained to estimate the abnormal returns. Statistical significance is marked at 1% (***), 5% (**) and 10 (%) levels, based on robust standard errors.

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Appendix B

Table B1. The effect of medium-term merger frequency on acquirer stock performance based on 5-day CARs

	(1) 2000-2003 CAR[-2,+2]	(2) 2001-2004 CAR[-2,+2]	(3) 2002-2005 CAR[-2,+2]	(4) 2003-2006 CAR[-2,+2]	(5) 2004-2007 CAR[-2,+2]	(6) 2005-2008 CAR[-2,+2]	(7) 2006-2009 CAR[-2,+2]	(8) 2007-2010 CAR[-2,+2]
Freq2	-0.0014**	-0.0024***	-0.0018***	-0.0016***	-0.0009*	-0.0006	-0.0005	-0.0003
	(-2.44)	(-3.09)	(-3.01)	(-2.89)	(-1.87)	(-1.10)	(-0.81)	(-0.64)
Deal-specific variables								
Cash	-0.0001	0.0034*	-0.0010	-0.0010	-0.0011	-0.0011	-0.0011	0.0003
	(-0.08)	(1.89)	(-0.56)	(-0.58)	(-0.65)	(-0.64)	(-0.63)	(0.22)
Stock	-0.0025	-0.0045*	-0.0025	-0.0026	-0.0027	-0.0026	-0.0025	-0.0025
	(-1.30)	(-1.89)	(-1.05)	(-1.08)	(-1.10)	(-1.07)	(-1.05)	(-1.44)
Public	-0.0078***	-0.0107***	-0.0100***	-0.0099***	-0.0099***	-0.0100***	-0.0100***	-0.0071***
	(-4.95)	(-5.40)	(-5.03)	(-5.01)	(-5.01)	(-5.03)	(-5.03)	(-4.96)
Private	-0.0005	0.0012	-0.0011	-0.0010	-0.0011	-0.0011	-0.0011	-0.0004
	(-0.36)	(0.78)	(-0.69)	(-0.66)	(-0.69)	(-0.68)	(-0.67)	(-0.38)
Attitude	-0.0141	-0.0128	-0.0183	-0.0184	-0.0182	-0.0181	-0.0180	-0.0132
	(-1.39)	(-1.00)	(-1.44)	(-1.44)	(-1.43)	(-1.42)	(-1.41)	(-1.44)
Relatedness	0.0004	0.0001	-0.0004	-0.0004	-0.0004	-0.0004	-0.0004	0.0005
	(0.30)	(0.07)	(-0.28)	(-0.26)	(-0.25)	(-0.27)	(-0.27)	(0.45)
Cross border	0.0016	0.0025	0.0021	0.0021	0.0021	0.0021	0.0021	0.0014
	(1.13)	(1.38)	(1.16)	(1.17)	(1.19)	(1.20)	(1.21)	(1.07)
Firm-specific variables								
Relative size	0.0022***	-0.0005	0.0052***	0.0052***	0.0052***	0.0052***	0.0052***	0.0015*
	(2.64)	(-0.50)	(4.91)	(4.92)	(4.92)	(4.92)	(4.92)	(1.94)
Leverage	0.0064	0.0114**	0.0095*	0.0095*	0.0098*	0.0097*	0.0097*	0.0055
	(1.51)	(2.12)	(1.77)	(1.78)	(1.82)	(1.81)	(1.81)	(1.44)
FCF	-0.0080**	-0.0086**	-0.0126***	-0.0127***	-0.0127***	-0.0127***	-0.0127***	-0.0071**
	(-2.53)	(-2.16)	(-3.18)	(-3.21)	(-3.20)	(-3.20)	(-3.21)	(-2.49)
Constant	0.0125***	-0.0221***	0.0239***	0.0239***	0.0241***	0.0243***	0.0243***	0.0059**
	(4.40)	(-6.32)	(6.86)	(6.84)	(6.90)	(6.97)	(6.97)	(2.36)
R^2-adjusted	33.12%	32.52%	30.19%	31.32%	34.29%	33.12%	32.09%	31.47%
Heterogeneity	1.197***	1.242***	1.319***	1.317***	1.316***	1.316***	1.318***	1.163***
Firm Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	5.38	8.95	7.35	7.32	7.08	6.97	6.94	4.85
Observations	12968	12968	12968	12968	12968	12968	12968	12968
No. of firms	6098	6098	6098	6098	6098	6098	6098	6098

Note: t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **, *** represents significance at the 1%, 5% and 10% level.

Table B2. The effect of medium-term merger frequency on acquirer stock performance based on 5-day CARs (with interaction variables)

VARIABLES	(1) 2000-2003 CAR[-2,+2]	(2) 2001-2004 CAR[-2,+2]	(3) 2002-2005 CAR[-2,+2]	(4) 2003-2006 CAR[-2,+2]	(5) 2004-2007 CAR[-2,+2]	(6) 2005-2008 CAR[-2,+2]	(7) 2006-2009 CAR[-2,+2]	(8) 2007-2010 CAR[-2,+2]
Freq2	-0.0014**	-0.0023***	-0.0018***	-0.0015***	-0.0009*	-0.0006	-0.0005	-0.0003
	(-2.52)	(-2.90)	(-2.91)	(-2.80)	(-1.83)	(-1.06)	(-0.80)	(-0.62)
Deal-specific variables								
Cash*public	0.0013	0.0025	0.0010	0.0011	0.0010	0.0010	0.0010	0.0013
	(0.70)	(1.10)	(0.46)	(0.47)	(0.45)	(0.43)	(0.43)	(0.77)
Stock*public	-0.0104***	-0.0157***	-0.0129***	-0.0129***	-0.0129***	-0.0130***	-0.0130***	-0.0093***
	(-4.37)	(-5.23)	(-4.31)	(-4.31)	(-4.32)	(-4.33)	(-4.34)	(-4.36)
Cash*private	-0.0009	0.0023	-0.0019	-0.0019	-0.0020	-0.0020	-0.0020	-0.0007
	(-0.75)	(1.41)	(-1.21)	(-1.17)	(-1.25)	(-1.25)	(-1.25)	(-0.58)
Stock*private	0.0001	-0.0019	0.0012	0.0010	0.0011	0.0013	0.0014	-0.0008
	(0.03)	(-0.59)	(0.36)	(0.33)	(0.33)	(0.41)	(0.45)	(-0.34)
Attitude	-0.0184*	-0.0193	-0.0235*	-0.0236*	-0.0234*	-0.0233*	-0.0232*	-0.0172*
	(-1.82)	(-1.51)	(-1.85)	(-1.85)	(-1.83)	(-1.82)	(-1.82)	(-1.88)
Relatedness	0.0003	-0.0000	-0.0005	-0.0004	-0.0004	-0.0004	-0.0004	0.0005
	(0.27)	(-0.02)	(-0.28)	(-0.27)	(-0.26)	(-0.27)	(-0.27)	(0.41)
Cross border	0.0019	0.0031*	0.0024	0.0024	0.0024	0.0025	0.0025	0.0017
	(1.36)	(1.74)	(1.36)	(1.36)	(1.38)	(1.39)	(1.40)	(1.33)
Firm-specific variables								
Relative size	0.0019**	-0.0011	0.0049***	0.0049***	0.0049***	0.0049***	0.0049***	0.0012
	(2.27)	(-1.06)	(4.59)	(4.60)	(4.61)	(4.60)	(4.60)	(1.54)
Leverage	0.0070	0.0119**	0.0103*	0.0103*	0.0106**	0.0105**	0.0105**	0.0060
	(1.64)	(2.22)	(1.92)	(1.92)	(1.97)	(1.96)	(1.96)	(1.56)
FCF	-0.0080**	-0.0088**	-0.0127***	-0.0128***	-0.0128***	-0.0128***	-0.0128***	-0.0072**
	(-2.55)	(-2.22)	(-3.21)	(-3.23)	(-3.22)	(-3.22)	(-3.23)	(-2.52)
Constant	0.0103***	-0.0232***	0.0207***	0.0207***	0.0208***	0.0210***	0.0210***	0.0041*
	(4.00)	(-7.32)	(6.52)	(6.52)	(6.55)	(6.62)	(6.62)	(1.81)
R^2-adjusted	31.46%	32.27%	32.08%	32.07%	32.00%	31.97%	31.96%	31.27%
Heterogeneity	1.205***	1.244***	1.332***	1.330***	1.329***	1.329***	1.331***	1.169***
Firm Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	4.82	7.58	6.91	6.88	6.66	6.55	6.53	4.19
Observations	12968	12968	12968	12968	12968	12968	12968	12968
No. of firms	6098	6098	6098	6098	6098	6098	6098	6098

Note: t-statistics are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. *, **, *** represents significance at the 1%, 5% and 10% level..

4. The effect of merger shocks on firm fundamentals: a dynamic estimation

4.1. Introduction

Chapters 2 and 3 discussed how a greater merger frequency for an acquiring firm results in lower stock returns for investors. However, the announcement returns may tell us more about how the stock market or investors reassess the acquiring firm than it does about the actual influence on the operation of bidder's business (Grinblatt and Titman, 2002). This raises a question: Is there any consistency between the market reaction to an announcement of takeover and how the takeover affects an acquirer's fundamentals afterwards? This chapter seeks the answer to this question.

Existing research is limited because much of it focuses on the effects of acquisitions on the shareholders of acquiring firms (e.g. Haleblian and Finkelstein, 1999; Fuller et al., 2002; Billett and Qian, 2008). Other extensive empirical studies (e.g. Healy et al., 1992; Clark and Ofek, 1994) attempted to explain the causes and effects of takeovers on the fundamentals of acquiring firms. They often ignored a fact that a large body of acquirers performs frequent acquisitions during a specific period, some of them even within the same year. Consequently, scholars know much less about the effect of the frequent acquisition activity on the operational performance of acquiring firm. Also, the distinction of effects on operational performance between infrequent and frequent acquisition has been under-examined in the existing empirical research.

This chapter responds to the limitations in the existing research from an operational perspective in a specific research setting: the relation between merger frequency or shock, and operational performance. It focuses on how the operational performance changes as an acquirer makes a different frequency of acquisition in a different time interval. If the acquiring firm can properly digest acquired assets and absorb "nutrition" from those assets, then the profitability of the acquiring firm will be improved, or at least, not damaged.

Generalized method of moments (GMM) estimator is applied to the dynamic panel data in order to deal with endogeneity (Arellano and Bover, 1995, and Blundell and Bond, 1998). By controlling for the firm time-invariant specific effects and general market conditions, a large dataset which consists of 2,172 unique worldwide acquiring firms undertaking 3,488 acquisitions during a 10-year period from 1st January 2000 to 31st December 2009, is analyzed. Among 2,172 acquirers, 887 carried out more than one acquisition across the sample span. The study then includes accounting data from 2000 to 2012 to ensure the availability of accounting information about acquiring firms for at least three years after acquisition.

Five main findings stand out from estimations. Firstly, the merger frequency is significantly and negatively related to acquirer's operational performance. Secondly, the strength of the negative effect is reduced with time. Thirdly, single acquirers outperform frequent acquirers. More specifically, the effect of merger frequency on a firm's fundamentals becomes positive in a long-term process: improving profitability of single acquiring firms. However, for multi-acquirers, it appears that the performance effect of merger frequency becomes weaker over time. Fourthly, the effect of a merger shock generally lasts a couple of years after acquisition and therefore the effect of a merger

shock is not permanent. Fifthly, Jenson's agent hypothesis, which predicts a negative change that can last in the long run after the merger, is rejected.

The research design developed in this chapter enables four new contributions to the literature. Firstly, this chapter is innovative because it systematically analyzes the operational performance implications of the frequent acquisition by employing a large global sample of acquiring companies. Secondly, this chapter introduces a new argument that the number and time of merger shock matter simultaneously for the performance effects of merger shocks or frequency. Thirdly, it contributes to the literature by distinguishing effects between frequent acquirers and single acquirers – an area neglected in the literature. Fourthly, it extends the existing digesting theory (McCarthy, 1963) and the chewing theory (Kusewitt, 1985) into a dynamic context. It argues that the effect of merger shocks or frequency changes with time.

As a result the existing process "Need to Chew" needs to be followed by a new process "Chew to Change". McCarthy suggests that the presence of the clash of cultures and conflicts of objectives between the acquirer and the acquire leads to inefficiency in digestion and absorption of the "nutrition". Kusewitt refers to this indigestion issue as "biting off more than you can chew". Both of these arguments suggest that the negative effect of merger frequency is attributable to the number of acquisitions. However, when time is taken into account in the process of digestion, the longer process helps the firm to gradually absorb the shocks of frequent acquisition, and then allows it to gain more corporate synergies for business operation.

The rest of the paper is organized as follows. Section 4.2, discusses related literature and develops hypotheses. Section 4.3 builds estimation model and lays out the

theoretical basis for the biases that may arise in commonly used techniques for estimating the relation between merger strategy and performance. The data for empirical applications is described in Section 4.4. Section 3.5 provides an empirical analysis of the relation between merger frequency and firm performance. Section 3.6 discusses robustness checks. Section 3.7concludes.

4.2. Literature review

4.2.1.   Theoretical background

There is much discussion in economics and finance studies about the driver behind the positive economic impact of takeovers on acquirer's operating performance. Generally it has concerned the creation of synergy. For example, the empirical results of Bradley et al. (1983) suggest the positive effects of the synergy motive on the acquiring firms' operating performance. Based on positive findings drawn from M&A literature, scholars developed synergy theory to explain the enhanced performance of acquirers after acquisitions. In general, synergy exists when the newly consolidated firm runs more efficiently and more effectively than two separate firms that are combined (Lubatkin, 1983; Seth et al., 2000). If this was the case, then the entirely new integrated firm would be more profitable than the sum of two individual entities (Gaughan, 2005).

The existing literature suggests that takeovers are able to improve the operating performance of the acquiring firm through various sources of synergy. One major source of acquisition synergy is cost saving (Berger and Ofeck, 1995; Gaughan, 2010) which results from economies of scale and scope (Brealey et al., 2006). Economies of scale arise for the acquiring firm if the quantity of production increases with reduction

in average unit fixed-cost (Seth, 1990). Conceptually similar to the economies of scale, the economies of scope arise when the acquiring firm is able to produce various goods at a lower cost than if production are spread across multiple firms (Severiens, 1991). Generally, the production-linked economies of scale and scope are considered to be the major rationale for cost saving. However, Shepherd (1979) suggests that the benefits of economies of scale are not only related to production, but the economies of scale can also occur in several areas within a business, such as R&D personnel and facilities, distribution, sales, or administrative activities, as fixed costs are spread out over higher total output.

Market power is known as another source of synergy (Lubatkin, 1983). Gaughan (2005) suggests that the positive impact of acquisition on a firm's performance can occur when firms strengthen their financial position by increasing market power. Generally, market power refers to gain of economic profits when the market price of a good or service exceeds marginal cost and long-term average cost. However, firms may perform serial acquisitions to achieve significant market power that is likely to result in monopoly and/or monopsony. This allows an acquiring firm to force buyers to accept a higher price and/or suppliers to sell at a discounted price. Then the acquiring firm is able to gain a higher monopolistic profit (Porter, 1980; Mueller, 1985; Andrade at al., 2001).

In line with this notion, Kamien and Zang (1993) suggest that acquirers can rapidly expand the range of production and geographical penetration through sequential acquisitions and then monopolize an industry or a market to enhance synergy gain. More recently, Gugler et al. (2003) state that serial acquirers are able to capture more consumer surplus, and be more competitive than rival firms. Furthermore, Chatterjee

(1986) points out that such advantage in the form of collusive synergies are much higher than production one.

Alternatively, merger-related gains may stem from learning economies that lead to a fall in cost since the new consolidated firm has "a sufficiently high level of cumulative volume of production to exploit learning curve economies" which may give an advantage over independent firms (Capron, 1999). The cost reduction through learning economy, which results in higher efficiency and growth in productivity is, on the one hand, conducted by reducing the amount of production wasted and increasing the synergies from research and development (R&D). On the other hand, cost saving may also be achieved when the managers of an acquiring firm become more skilled at cost saving through learning as the management of the acquiring firm has developed the skills to hold down the expenses of the 'target part' of a new consolidation.

On the contrary, the merger activities may lead to value reduction in an acquiring firm's performance. Fowler and Schmidt (1989) find that the number of previous takeovers is negatively related to the performance of an acquiring firm and attribute this result to corporate indigestion. Later, Caves (1989) suggests that ineffective solutions for post-merger integration issues can lead to an increase in integration costs and loss of competitive edge, and the ineffective solutions then cause a reduction in the profitability of the acquiring firm. Conn et al. (2004) further state that this adverse relation may be even more pronounced for serial or frequent acquisitions, since the larger organizational challenges and financial constraints need to be faced when absorbing or integrating multiple target firms (Kamien and Zang, 1993).

Some of the existing literature considers integration deficiency, which is a major concern for frequent acquisition makers, to be attributable to indigestion theory (McCarthy, 1963; Terry, 1982; Shrivastava, 1986). The corporate indigestion theory predicts that in a short time period, a substantial number of targets are unable to be successfully integrated or digested by an acquiring firm and this ultimately brings a negative impact on the acquiring firm's operating performance.

Corporate indigestion may arise from three major sources. Firstly, the clash of cultures between the acquiree and the acquirer will be stronger as the number of target firms increases. Jemison and Sitkin (1986) suggest that culture is an integral part of the merger process. Further, other authors state that a bigger culture gap would result in lower commitment to the job for acquired employees (Sales & Mirvis, 1984; Buono et al,. 1985), and greater diminishment of relative standing among the acquired executives (Hambrick and Cannella, 1993; Lubatkin et al., 1998). This implies that the effectiveness of the integration would be reduced when integrating a great number of subordinate cultures.

Secondly, the contradiction of strategic objectives among different businesses will be intensified when the acquiring firm absorbs and integrates multiple target firms. It causes more difficulties in the decision-making for business operation, and finally leads to a decrease in the acquirer's operational performance. Some researchers argue that the activities of strategic integration are more long-term in different aspects: relationship building, joint development activities, and sharing of cost and capability information (Narasimhan and Kim, 2002; Swink et al., 2007).

Thirdly, the multiple dealmakers need to spend more time on the adjustment of corporate organizational structure than a single acquirer does. Therefore, the large organizational challenges that multiple dealmakers face will lead to inefficiency in post-merger operating and resource allocation (Bertrand and Betschinger, 2012).

Alternatively, the agency theory posits that serial acquisitions may cause great agency costs for the acquiring firm. Jensen (1986) indicates that empire-building managers tend to acquire firms for their own benefit rather than maximizing company wealth, since acquisitions can reduce the likelihood of their own replacement. When the agency motive, which is an impure initial motive, is the main motive behind M&As, the profit of acquirers would be destroyed. In addition, during the decision-making process, irrational decision-makers (hubristic managers) would also reduce the value of an acquiring firm since they frequently overestimate the ability to exploit synergies (Roll, 1986) and thus overpay the target (Hitt et al., 2001).

In summary, operating performance studies present conflicting arguments for the effect of takeovers on the performance of acquiring firms. More importantly, research of the impact of mergers on firm's fundamentals indicates that multiple deal makers or frequent acquirers are expected, or perceived, to create a more negative impact on improving post-merger performance (Conn et al., 2004). However, from an empirical perspective, most of acquisition/operating performance studies have failed to consider merger frequency sufficiently as an important factor in determining the post-merger performance of an acquirer. A failure in controlling merger frequency in estimation of post-merger performance can result in a biased result or analysis (e.g., Ahuja and Katila, 2001).

Further, as stated in Chapter 3 and 4, it has shown that single and multiple acquirers or infrequent and frequent acquirers differ in their announcement returns to the shareholders of acquiring firms. As a result, it is expected that fundamentals or operational performance may also differ between infrequent and frequent acquirers if the stock market is efficient in reflecting the firm's fundamentals. Therefore this chapter looks at the question: Can market expectation of merger events on the announcement date be consistent with what would happen to a firm's operational performance in a later period?

Overall, existing studies provide contradictory arguments about an acquiring firm's operating performance. Apparently, the distinction between infrequent and frequent acquirers has been under-investigated, in particular, from the perspective of a firm's operating performance. Therefore, this chapter will build on existing literature about the relationship between merger frequencies and operating performance.

4.2.2. *Empirical evidence*

What is the effect of M&A on the acquiring firm's operating performance? This has been a question for researchers over many years. There are three major perspectives on the question: significant deterioration, significant improvement, and insignificant changes in post-merger operating performance. Some scholars found that takeovers could lead to a significant decline in the post-acquisition operating performance. Hogarty (1970) employs earnings per share and capital gains as measures of a firms' profitability and is one of the earliest studies to document that takeovers have a negative impact on the post-acquisition profitability of acquiring firms based a sample of 43 US combined firms over the period 1953-1964. Also, Hogarty finds that the impact of

acquisitions on a firm's profitability becomes neutral when the target firms are included in the analysis.

Clark and Ofek (1994) examine the effect of acquisitions and mergers by comparing three years pre and post-merger performance. They find that the operating performance declines over following acquisitions during the period of 1981-1988 and explain that the declining trend is mainly caused by industry factors. They also give some other factors associated with poor post-merger performance: the overpayment of bidders and high levels of post-merger leverage. Furthermore, Clark and Ofek (1994) suggest that the acquiring firms of financially distressed targets are frequently in the same industry. Similarly, Kruse et al. (2002) document significant reduction in the post-acquisition operating performance of 46 combined firms, and Yeh and Hoshino (2002) in 86 combined firms. However, due to the limitation created by a small sample size, the finding cannot be generalized to the broader community.

By examining changes of return on assets (ROA) for a sample of 233 UK takeovers over the period 1964-1972, Meeks (1977) finds that the post-merger profitability of acquirers significantly deteriorates in the post-merger years. It is worth noting that in their sample, about two-thirds of acquirers' performances are lower than the industry average standard. Following Meek (1977), Dickerson et al. (1997) explore merger effects based on a larger sample of 4430 UK acquisitions over the period 1948-1977. Consistent with Meeks (1977), Dickerson et al. find significant deterioration in the operating performance in the five years following the focal merger, whilst the coefficient for acquisition growth is much lower than internal growth. This evidence shows that takeovers have a "systematically detrimental" effect on a firm's performance. In addition, they report that the performance of non-acquiring firms significantly outperform acquiring firms by 2.4% per annum.

In contrast, some researchers' findings suggest significant improvement in post-merger operating performance. Healy et al. published a study in 1992 which is considered to be one of the most influential empirical studies in the literature of operating performance. They examine the impact of takeovers on the operating performance of 50 largest U.S. acquisitions over the period 1979-1984. The study states that various sources can give rise to a 2.8% improvement in industry-adjusted cash flow returns on all tangible assets (IACRTA). For instance, the higher productivity of assets, and the lower cost of labour and operating margin are improved. They also disclose that there is no evidence for the linkage between cash flow performance and payment method, as well as a friendly or hostile deal atmosphere. Later, Healy et al. (1997) re-investigate the same sample of takeovers and find a significantly positive relation between takeovers and the asset productivity of acquiring firms. Healy et al. do not find significant improvement in industry-adjusted cash-flow return on all assets.

Using the same performance measure (IACRTA) and industry median control as in Healy et al. (1992), Ramaswamy and Waegelein (2003) investigate the relation between acquisition and post-acquisition performance based on 162 Hong Kong takeovers over the period 1975-1990. They find that mergers significantly improve the operating performance of acquiring firms, which is broadly consistent with both the expectation of efficient market theory and empirical evidence suggested by the findings of Healy et al. (1992). Further, the sample is divided into those acquisitions which occurred before and after 1982. This evidence shows that the improvement in operating performance is significant prior to 1982, but insignificant afterwards.

Ramaswamy and Waegelein (2003) argue that the findings of Healy et al (1992) are subject to the period selected. Another influential scholar in operating performance

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research, Switzer (1996) also argues that the findings of Healy et al (1992) are not sensitive to sample size and sample period. By examining 324 pairs of US target and acquiring firms over the period 1967-1987, Switzer suggests that the median industry adjusted operating performance improves over the five years following the merger, which is mainly due to the expected synergies of takeovers.

To avoid the impact of country factors, Gugler et al. (2003) analyse the effects of mergers by using a sample of 2,753 worldwide acquisitions over the period 1981-1998. Their results demonstrate that acquirer's profits increase significantly after the merger. However, it is found that sales significantly decline in the post-merger period. One possible explanation is that the increasing market power suggests the ability to raise the price of its products. Unlike the results for sales, they find that the increasing market power could result in the improvement of acquirer's profit. Overall, they find that the patterns of post-acquisitions are similar across countries. In addition, the study does not consider the effects of industry changes before merger.

Unlike the studies above, other authors do not find any significant change in post-merger operating performance. Ravenscraft & Scherer (1987) and Herman & Lowenstein (1988) are considered to be the first two papers reporting non-significant findings in early studies. However, the investigations of Ravenscraft & Scherer (1987) have been criticized for a fault in the research design. The merger period of twenty-seven years from 1950-1977, is not aligned with the investigation of performance change in a single three year period from 1974 to 1977. This results in the comparison of acquirers' performance focusing exclusively on the acquired firm's lines of business (Bruner, 2002). The empirical results found by Herman & Lowenstein (1988) have also been questioned. Healy et al. (1992) argue that a large portion of post-merger data is missing for acquisitions after 1979 (the sample period is 1975-1983) and the authors fail

to control the differences in industry shocks. Therefore, the limitations of these studies make their findings hard to interpret.

To address the limitations of existing studies, following Healy et al. (1992), Ghosh (2001) examines 315 worldwide acquisitions completed over the period 1981-1995. By comparing the realized performance following a takeover with benchmark performance of a sample of non-merging companies, Ghosh finds no evidence that a firm's operating performances are improved in following acquisitions. Using a sample of 36 Australian acquisitions over the period between 1986 and 1991, Sharma and Ho (2002) compare various accounting measures of acquirer's operating performance and do not to find consistent results: cash flow and profit margin show non-significant changes between pre- and post-acquisitions, yet return on assets and return on equity show a significant decline with following acquisitions.

Furthermore, scholars document that the firm and its deal characteristics have an important impact upon determination of merger outcomes (Capron, 1999; Ishii and Xuan, 2011; Bertrand and Betschinger, 2013). Switzer and Linn (2000) examine a sample of 413 takeovers over the period 1967-1987, and develop explanations for "why cash offers are sometimes selected over stock offers" instead of testing "why cash offers outperform stock offers" (Switzer, 2000, Pg 1134). The results suggest that the cash offers are significantly associated with the positive improvements in operating performance, while there are no significant changes for stock offers. Further, they find that changes made in the operating performance of target firms are significantly larger when the acquirer offers cash payment instead of stock offers.

Similarly, Ghosh (2001) finds that the operating cash flow significantly increases after the cash is made for paying acquisitions, but decreases after the stocks are used as payment. Sharma and Ho (2002) state that industry relatedness and size of firms are insignificantly related to acquirer's operating performance, and significantly related to the declining operating performance of target firms. Ramaswamy and Waegelein (2003) document that a smaller acquirer outperforms a bigger acquirer. Further, they report that payment method is not associated with changes in post-merger performance, and diversified takeovers exhibit more positive operating performance than industry-related acquisitions. In contrast, Powell and Stark (2005) report non-significant results in industry relatedness.

Disparities in the operating performance of acquirers may also show up via cross-border and domestic acquisitions. Some existing empirical studies, for example Markides and Ittner (1994) document that acquirers derive more benefits from acquiring domestic targets than foreign ones, but others find the opposite results, for example Morck and Yeung (1992). Other studies of firm and deal characteristics also show mixed results about their effects on the operating performance of acquirers, for instance, Moeller et al., 2004 about size, Linn and Switzer (2001) about leverage, Martynova et al, 2006) about industry relatedness, and Burkart and Panunzi (2006) about deal atmosphere.

4.3. Model specification

This section first demonstrates a theoretical basis relating to the specific effect of endogeneity which may arise from the estimation of the dynamic relation between merger frequency and firm performance when using OLS or fixed-effects estimator and

illustrate the need of appropriate econometric procedures. Then the system generalized method of moments (GMM) for a dynamic panel analysis which makes those biases less severe, is discussed.

4.3.1.   A dynamic panel model for firm operating performance

Theoretical argument made by Shaver (1998) and Bertrand and Betschinger (2013) models show that an acquisition strategy is a choice variable that arises from a process that firms systematically make a strategic choice of acquiring or not acquiring, where this choosing process is affected by past performance and their expectation on outcomes of the acquisitions. This means that if a firm strategically decides to undertake frequent acquisitions today, then the subsequently unanticipated shocks on future performance will be related to the historical realization of merger frequency or performance.

Therefore, in the examination of frequent acquisition effects on operating performance of an acquiring firm, an important factor has to be taken into account: an acquisition strategy. As similar as many aspects of a firm's corporate strategies, for instance the board size, the acquisition strategy is dynamically endogenous to firm's performance. A choice of a merger strategy depends on expectation of performance improvement brought by the intended mergers. Once the merger and merger strategy is successfully implemented, then this drives up performance. The interaction of merger strategy and performance implies that the strategy of mergers and performance are inter-related endogenously and dynamically.

On this basis, the inter-related performance and merger strategy are specified as follows:

$$x_{it} = \alpha + \beta y_{it} + \theta Z + \varepsilon_{it} \tag{1}$$

$$y_{it} = \lambda + \varphi x_{it} + \sigma Z + \rho y_{it-1} + \varepsilon_{it} \tag{2}$$

where, y_{it} is performance, x_{it} is a merger strategy that represents a choice of frequency in this study. Z is a vector of other variables than can affect performance and choice of frequency exogenously. In estimations of (1) and (2), the residual term is further broke down as

$$\varepsilon_{it} = c_i + \gamma T_t + V_{it} \tag{3}$$

where c_i is firm specific effects, T_t is a market condition at time t and V_{it} captures modern shocks with normal distribution and constant variance.

Apparently, estimation of (1) and (2) will be affected by the endogenous problem. To overcome the problem and obtain consistent and unbiased estimates, following Holtz-Eakin, Newey, and Rosen (1988), Arellano and Bond (1991) proposed the generalized method of moments (GMM) approach in the first-difference form for dynamic panel data, which removes the time-invariant unobservable heterogeneity in the following model:

$$\Delta y_{it} = \alpha \Delta y_{it-k} + \beta_1 \Delta X_{it} + \beta_2 \Delta Z_{it} + \gamma_t \Delta T_t + \Delta \varepsilon_{it}, \quad k > 0 \tag{4}$$

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Then to deal with endogeneity, the historical values of explanatory variables (levels), for instance, y_{it-p}, X_{it-p}, Z_{it-p}, where $p>k$, are employed as instruments to predict ΔX_{it} and Δy_{t-1} with holding strict orthogonality restrictions:

$$Cov(\,y_{it-p}\varepsilon_{it)} = Cov(\,X_{it-p}\varepsilon_{it)} = Cov(\,Z_{it-p}\varepsilon_{it)} = 0, \quad \forall\, p > k \tag{5}$$

However, in terms of transformation, Griliches and Hausman (1986) point out that estimations relying on first-differencing GMM estimator may magnify the errors of measurement on the dependent variables and thus lead to more serious bias. Alternatively, from the validity point of view for instruments, Arellano and Bover (1995) and Bond (2002) further point that using the lagged levels of endogenous variable as instruments for their first-differences may be problematic due to poor prediction power when the data closely follows a random-walk process.

To address these issues, Arellano and Bover (1995) proposed an extension to improve the estimating efficiency by including the additional equation in levels into the first-difference estimating system. In the equation, the explanatory variables in levels are instrumented by suitable lags (later than t-1) of their first-differences. Later, Blundell and Bond (1998) fully developed this augmented "System" GMM estimator by making an additional assumption that the first differences of instrumenting variables are uncorrelated with the unobserved heterogeneity.

In sum, the system GMM is applied in the analysis because of its higher efficiency when compared to previous version of GMM estimator, while controlling for

endogeneity arising from time-invariant unobservable heterogeneity, simultaneity and correlation between current values of the explanatory variables and the past realization of the dependent variable. As suggested in Roodman (2009), all possible lags later than t-2 of endogenous variable can be used as instruments for the estimation of model (2) where the highest lag of dependent variable is t-1.

Further, the key exogeneity assumption for approach in this study is that the firm's past performance and characteristics are exogenous to current shocks in performance. Two different tests are carred out for validity of instruments and the key assumption required. First, Arellano and Bond (1991) tests are applied to identify first - (AR (1)) and second-order (AR (2)) serial correlation of residuals. For GMM estimates, the valid instruments should theoretically be incorporated to the first-order autocorrelation and the absence of the second-order autocorrelation in the first-differenced idiosyncratic residuals. Second, the Hansen-J statistic is calculated which is distributed χ^2, for the validity of over-identifying restrictions for each regression under the null hypothesis of the validity of instruments. Failure to reject the null hypothesis suggests the invalidity of the instruments. With a two-step estimation of system GMM, the Windmeijer (2005) correction is applied to correct for downward bias of standard errors. Overall, application tests listed above, exhibit that the system-GMM method is an appropriate approach in estimating the effect of frequency as a merger strategy on post-merger performance in a dynamic context.

4.4. Variable construction, data source and sample

In this section, variables employed in the estimation of model (2) are discussed. Apart from the concerning variable of merger frequency, this study classifies other

explanatory variables according to deal-specific factors and firm-specific factors that are discussed below in turn.

4.4.1. *Merger frequency*

In previous studies, several measures have been considered to investigate the impact of merger frequency. Commonly, a simple dummy variable is employed, in which dummy equals one if an acquiring firm is experienced in M&A, otherwise zero (for instance, Ismail, 2008). Alternatively, the number of mergers occurred during a period of time are taken as a measure of frequency for study of performance-frequency nexus. One example is Haleblian and Finkelstein (1999) cumulated mergers performed over its sample time period. One limit of using sample span as the length of time to count mergers happened is unable for the study to compare merger intensities for their effects on performance and therefore a role of time in interacting with merger numbers can be omitted. For instance, two acquisitions pursued by a firm over a period of two years or over five years will make very different impacts on business in post-merger integration.

By considering this argument, merger frequency or numbers are counted relative to three different lengths of event shocking time: one year, four-year and the whole sample span. The three types of shock-lasting time imply three expectations for the lasting effects of a merger shock on changing firm performance after the event. How long the shock effect of a merger can last on new integration is a question related to the pace of a firm in digesting the merger shock. The shock can be positive or negative overall, depending on which factor dominates the process of new business integration, such as managerial hubris or learning impacts.

With the long span of sample, it enables the study to explore the pace of a merger-shock that can be digested by the acquiring firm. The pace can be estimated by examining the sample strength of performance-merger nexus for every possible length of time that a merger shock is expected to last: one year, two years, three years, four years, and consecutively continued to the sample span. The pattern of a change in these estimates can demonstrate how the effect of a merger shock on performance can last and diminish gradually over time.

The interaction of time and number decides frequency. In the context of discussion here, a frequency for each of sample firm is counted in terms of three expectations of merger shock-lasting time, respectively, as follows:

Frequency at time t with expectation of a merger shock lasting 1 year:

$$F_{it}^1 = m_{it}, \quad t = 1,2,3 \ldots T \tag{6}$$

Frequency at time t with expectation of shock lasting 4 years:

$$F_{it}^4 = \sum_{t=1}^{T} m_{it} - \sum_{t=5}^{T} m_{it-4}, T \geq 5 \quad t = 1,2,3 \ldots \tag{7}$$

and

$$F_{it}^4 = \sum_{t=1}^{T} m_{it} \ with \ 0 < T \leq 4 \tag{8}$$

Frequency at time t with expectation of a merger shock lasting 10 years:

$$F_{it}^{10} = \sum_{t=1}^{10} m_{it} \tag{9}$$

where, F_{it}^{N} is a merger frequency of firm i at time t with expectation that a merger shock can last N years on the firm's integration after the merger event. m_{it} is a number of mergers completed by the firm i at time t with a range of value from 0 without any merger activity to an indefinite number. Application of (6), (8) and (9) to compute F_{it}^{1}, F_{it}^{4} and F_{it}^{10} respectively can be illustrated in Table 4-1 below.

Table 4-1. Illustration of computing merger frequency under different shock-lasting time

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Number of mergers	⋮		•		⋮			•		
F_{it}^{1}(shock lasts a year)	2	0	1	0	2	0	0	1	0	0
F_{it}^{4}(shock lasts 4 years)	2	2	3	3	3	3	2	3	1	1
F_{it}^{10}(shock lasts 10 years)	2	2	3	3	5	5	5	6	6	6

Note: One dot presents one acquisition completed during one year.

Table 4-1 shows the frequency of merger shocks at each year for firm i. If the shock lasts longer, for instance 10 years, then the frequency of merger shocks is accumulatively higher and higher over time. In contrast, if the shock lasts only a year, then the frequency of merger shocks is lower and has no accumulative effects. Frequencies with any shock time longer than a year, but shorter than the sample span are dynamically defined. The different measures of frequency according to the time a merger shock lasts, enable the study to compare frequency impacts on firm performance and so find out a frequency at which its shock can last longest.

4.4.2. Dependent variable

For performance, *Return on Assets (ROA)* is used as a measure of a firm's performance because this measure has been widely applied for the study of merger and firm fundamentals in many studies, such as Healy et al. (1992), Ramaswamy (1997) and Porrini (2004). As argued by Hitt et al., (1998), *ROA* is one of the powerful accounting metrics that can best reflect the effect of synergies obtained from an acquisition. The *ROA* indicates how efficient the management of an acquiring firm is at using the firm's available assets to generate earnings. To calculate *ROA, operating income before depreciation and amortization* rather than the *earnings before interest and taxes (EBIT)* is used. One reason is that by excluding depreciation and amortization it could be problematic for comparison across firms since it is hard to assume that all sample firms face the similar accounting standards, policies and business situations.

For the deflator, the *book value of total assets* is used. *Market value* is not used for the reason that the market value of an acquiring firm declines systematically over three to five years after acquisition, which may lead to upward bias (Agrawal et al., 1992). Alternatively, the market values are a forward-looking measure relying on the assumption of efficient markets that the market can correctly react to the benefits brought by acquisitions. This suggests that investor or the market is likely to overestimate the expected returns of takeovers (Jensen and Ruback, 1983; Barber and Lyon, 1996).

4.4.3. Control variables

Five controlling variables are considered for the estimation of model (2) and robustness check. These five variables are assumed exogenously and therefore employed as "investment" in estimation. Firstly, "LogSIZE", represents the size of acquiring firm, measured as the nature logarithm of firm's book value of total assets,

which proxies acquirer's financial and non-financial resources, scope and complexity of the firm's operations. Generally, the effect of acquiring firm size on profitability is found to be positive (Hall and Weiss, 1967; Fiegenbaum and Karnani, 1991; Lee, 2009). For instance, Hall and Weiss (1967) argues that firm size affects performance in several channels; a larger firm may have more diverse capabilities and market power, better abilities to achieve economies of scale and scope. Moreover, Barclay and Smith (1995a, 1995b) argue that larger firms are likely to have a higher degree of agency conflicts between managers and shareholders than smaller firms. This is possibly because the larger the firm size the smaller the percentage of equity held by top managers.

Secondly, the ratio of the total debts to total assets, denoted by "Debt", is employed for estimation. The debts include both short-term and long-term borrowings from banks and other institutions. It measures the ability that a firm can generate new funds for corporate activities externally. The higher the ratio, the higher the degree of leverage, and consequently the greater the financial risk that will be realized in a firm's operation. This in turn reduces the firm's financial flexibility but creates risk pressure on the firm management. These risky debts may cause high agency costs between shareholders that can distort strategic decision-making of firm management in terms of investment and operation (Fama and Miller, 1972; Jensen and Meckling, 1976; Fama and French 1998). Myers (1977) argues that firms holding risky debt may pass up some valuable investment opportunities. Further, the high payment of interest may take away corporate funding from business operation. It is, therefore, expected that there will be a negative relation between leverage and profitability.

The third variable is the size of acquisition relative to acquirer, measured by the transaction value deflated by the total assets of the acquiring firm. If there is more than one acquisition completed at time *t*, then the sum of two or more transaction values

divided by the number of transaction as an average value of transaction is taken to calculate the relative size of acquisitions.

According to Fuller et al. (2002), this study proxies the target size by transaction value of the deal, the relative size of acquisition can also be referred as the relative size of a target firm. It will be interesting to see if the size-fundamentals nexus is consistent with the size and stock returns relationship. The latter is found positive in the previous chapter.

Fourthly, a *Liquidity ratio (LR)* is used for robustness checks. Following Ofek (1993), the variable is constructed as the ratio of current assets and inventories to current liabilities as an indication to the ability of a firm in serving its short-term financial obligations. Liquidity ratio is expected to have mixed impacts on the profitability for the following reason. On the one hand, firms with higher liquidity ratios may support better business operations or investment opportunities. On the other hand, those unused liquid assets may be spent towards satisfying interest of empire-building management.

Finally, to control the market power of an acquiring firm, the price-cost margin (*PCM*) is employed, which is also known as the Lerner index. Collins and Preston (1976) argued that theoretically price-cost margins could better measure the degrees to which firms (or industries) have monopoly power than other measures. Later, Martin (1984), Cairns (1995) and Werden (1998) suggest that this variable is considered to be a good indicator of a market power, which measures how competitive a firm is in terms of

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pricing close to marginal costs. As suggested in Lerner (1934), Feinberg (1980) and Gaspar and Massa (2006), price-cost margin is calculated as the net profit as a percentage of the sales revenue. A positive relation between price-cost margin and firm performance is expected. Due to the direct accounting links between price-cost margin and other independent variable and the high correlation with the lagged dependent variable [31], a one-year lagged price-cost margin variable is used in robustness estimations.

4.4.4. *Data and sample selection*

To investigate the relation between operating performance and merger frequency for acquiring firms, a large database of acquisitions across the world drawn from the Securities Data Corporation (SDC) is built up, which is a very comprehensive M&A database at the firm level. Following Chang (1998), Fuller et al. (2002) and Officer (2007), the study impose the following criteria of M&A sample selection, which is essentially similar to those used in Chapters 2 and 3: the announcement date lies between January 1st, 2000 and December 31st, 2009. The bidder must own less than 50% of the target prior to acquisition and 100% afterwards. The transaction value is equal to or greater than one million dollars. The time between announcement date and completion date does not exceed 1,000 days. The financing method of a deal can be pure cash, pure stock, or a combination of cash and stock. Acquisitions are not buyback offers, repurchases and self-Tender offers. Neither the target nor the acquirer is in the financial or utilities industry. Further firms with market value lower than $15 million are omitted due to problems in the reliability of accounting data.

The initial M&A sample contains 4,918 takeovers of public, private and subsidiary targets made by 3129 global public acquirers over the time period from 2000 to 2009. To obtain accounting information, the M&A sample match these acquirers in

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[31] Liebowitz (1982) suggests that about 57% of information included by ROA can be reflected by price-cost margin.

the Thomson financials and Worldscope database. Due to some firms exited from business or being acquired[32] , the sample acquirers are reduced by 1,430. This leaves 3,488 acquisitions undertaken by 2,172 acquirers which constitute the main sample used in this chapter. Following Hitt et al. (1992) and Ghosh (2001), accounting data from 2000 to 2012 are included into present sample to ensure accounting information to be available for acquiring firms at least three-year after acquisitions. Table 4-2 reports the summary distribution for the acquiring firms across countries. For each of the following country, a particular bidder is represented only once per year, but may be represented multiple times over a 10-year period.

Table 4-3 presents the cross-sectional summary statistics of the acquiring firms engaged in the takeover for frequency, operating performance and other controlling variables in Panel A, B and C, respectively. It is found that for most of years, the 4-year merger frequencies (F_{it}^4) have a mean around 0.6, and reaches a maximum of 0.74 in 2008. This could be possibly explained as acquirers could easily borrow at low interest rate due to over liquidity of the financial market between 2005 and 2007. By comparing the merger frequency between single and multiple acquirers, wider variations are observed. The multiple acquirers perform 1.3 to 3 merger frequency higher than those of single acquirers in terms of either 4-year or the sample span measure.

Table 4-4 shows a correlation matrix for all measures. With the independent variables, the maximum correlation is at 0.31 found for firm size (13, Log of Firm size). This suggests that there is neither excessive statistic correlation, nor the multi-potential multicollinearity problem among selected variables.

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[32] If a firm is dead/inactive or acquired, its past accounting information will be not available in Thomson Financials and Worldscope.

Table 4-2. Distribution of sample acquiring firms across countries

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Country Total
Austria	1	1	0	0	1	0	0	1	0	0	4
Australia	6	13	8	4	7	11	11	11	14	8	93
Belgium	0	2	0	0	0	1	2	1	3	0	9
Bermuda	1	1	0	0	0	1	1	1	1	0	6
Brazil	1	0	1	0	2	2	1	1	1	3	12
Canada	20	27	15	15	15	13	19	22	29	15	190
Chile	0	0	0	1	0	0	0	0	0	0	1
China	1	1	0	1	1	1	1	5	5	8	24
Colombia	0	0	0	0	0	2	0	0	0	0	2
Denmark	3	1	0	1	2	1	0	2	0	2	12
Finland	9	4	4	2	3	5	11	3	6	1	48
France	12	8	5	2	7	5	8	9	8	3	67
Germany	10	5	3	1	4	6	9	3	6	4	51
Hong Kong	5	4	6	4	6	3	3	1	7	4	43
India	3	2	1	2	1	6	6	4	4	2	31
Indonesia	0	0	0	0	0	0	0	0	0	1	1
Ireland	5	4	0	2	0	2	1	2	3	0	19
Israel	1	1	1	0	4	0	3	2	2	1	15
Italy	2	4	2	2	2	2	3	1	5	0	23
Japan	30	21	26	31	35	55	60	70	62	37	427
Luxembourg	0	1	0	0	0	1	0	1	1	0	4
South Korea	1	0	1	0	1	0	9	7	1	7	27
Malaysia	1	3	2	4	13	3	3	2	2	4	37
Mexico	1	0	1	1	0	0	0	2	1	0	6
Netherlands	4	8	2	0	1	3	5	4	6	3	36
New Zealand	0	0	1	0	0	2	0	2	0	0	5
Norway	2	0	0	1	0	0	6	3	1	0	13
Peru	1	0	0	1	0	0	0	0	0	0	2
Poland	0	0	0	0	0	0	1	1	2	0	4
Philippines	2	1	0	1	0	2	0	0	1	0	7
Russia	0	1	0	0	0	0	0	0	0	0	1
Singapore	3	4	3	2	3	2	3	3	0	0	23
South Africa	4	2	2	2	2	1	2	4	2	1	22
Spain	4	2	2	1	2	0	4	3	0	1	19
Sweden	6	3	2	2	2	8	9	5	2	3	42
Switzerland	5	6	2	3	2	5	2	2	4	3	34
Taiwan	2	1	3	0	1	1	4	3	1	0	16
Thailand	0	0	0	0	0	0	0	1	1	1	3
UK	52	37	21	24	26	39	41	36	37	20	333
US	186	146	112	96	111	141	151	154	109	83	1289
Total	384	314	226	206	254	324	379	372	327	215	3001

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Table 4-3. Summary statistics of mean of merger frequency and firm characteristics

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Panel A: Mean [standard deviation] of 1-year M&A variables													
F_{it}^1 *(Frequency of 1-year shock)*	0.23	0.17	0.12	0.11	0.13	0.17	0.20	0.20	0.17	0.11	0.00	0.00	0.00
	[0.66]	[0.46]	[0.38]	[0.34]	[0.41]	[0.43]	[0.46]	[0.49]	[0.45]	[0.34]	[0.02]	[0.00]	[0.00]
F_{it}^1 *(Frequency of 1 year shock for Single acquirers)*	0.08	0.08	0.05	0.05	0.07	0.09	0.12	0.12	0.11	0.08	0.00	0.00	0.00
	[0.27]	[0.27]	[0.23]	[0.23]	[0.25]	[0.28]	[0.32]	[0.32]	[0.31]	[0.26]	[0.03]	[0.00]	[0.00]
F_{it}^1 *(Frequency of 1 year shock for Multi acquirers)*	0.46	0.30	0.22	0.18	0.23	0.29	0.32	0.31	0.27	0.15	0.00	0.00	0.00
	[0.93]	[0.62]	[0.52]	[0.45]	[0.54]	[0.56]	[0.59]	[0.64]	[0.58]	[0.41]	[0.00]	[0.00]	[0.00]
Panel B: Mean [standard deviation] of 4-year M&A variables													
F_{it}^4 *(Frequency of 4-year shock)*	0.23	0.40	0.52	0.63	0.53	0.53	0.61	0.70	0.74	0.67	0.48	0.28	0.11
	[0.66]	[0.87]	[1.01]	[1.10]	[0.91]	[0.88]	[0.90]	[0.97]	[0.99]	[0.92]	[0.77]	[0.58]	[0.34]
F_{it}^4 *(Frequency of 4-year shock for Single acquirers)*	0.14	0.17	0.17	0.16	0.15	0.16	0.19	0.23	0.25	0.25	0.18	0.11	0.05
	[0.35]	[0.38]	[0.38]	[0.36]	[0.36]	[0.36]	[0.39]	[0.42]	[0.43]	[0.43]	[0.38]	[0.31]	[0.21]
F_{it}^4 *(Frequency of 4-year shock for Multi acquirers)*	0.19	0.31	0.40	0.47	0.38	0.37	0.42	0.47	0.49	0.43	0.30	0.17	0.06
	[0.63]	[0.85]	[1.00]	[1.11]	[0.91]	[0.87]	[0.90]	[0.99]	[1.02]	[0.93]	[0.74]	[0.52]	[0.27]

Note: The table contains the sample characteristics of the merger frequency and firm characteristics of the acquirers used in the study. The results are based on a sample of 2,172 firms, undertaking 3,488 acquisitions. The frequency variable data come from the SDC database. The firm characteristics come from Thomson financials and Worldscope. F_{it}^1, F_{it}^4 and F_{it}^{10} counts the number of acquisitions of a firm i in year t, year t plus the three preceding years and over the sample span of 10 years, respectively. Moreover, if a firm acquires only one target within sample period, it is classified as a single acquirer; if an acquirer makes more than one takeovers, it is defined as a frequent or multiple acquirer. *LogSIZE*, represents the size of acquiring firm, measured as the nature logarithm of firm's book value of total assets. *Debt* is calculated as the ratio of the sum of short term debt, current portion of long term debt and long term debt to total assets. The size of target *(Relative size)* is its transaction value relative to the amount of total assets of the acquirer at year t. *Liquid ratio (LR)* is constructed as the ratio of current assets and inventories to current liabilities. *Price-cost margin (PCM)* is calculated as the net profit as a percentage of the sales revenue. *ROA* is defined as operating income before depreciation and amortization adjusted by fiscal year-end book value of total assets. *LogLP* is the logarithm of sales per employee. *COA* is defined as operating cash flow deflated by the total assets of acquiring firm. Standard deviations are shown in brackets.

Table 4-3. Summary statistics of merger frequency and firm characteristics- Continued

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Panel C Mean [standard deviation] of accumulative(10-years) M&A variables													
F_{it}^{10} *(Frequency of 10-year shock)*	0.23	0.40	0.52	0.63	0.76	0.93	1.13	1.33	1.50	1.61	1.61	1.61	1.61
	[0.66]	[0.87]	[1.01]	[1.10]	[1.25]	[1.37]	[1.47]	[1.58]	[1.67]	[1.72]	[1.72]	[1.72]	[1.72]
F_{it}^{10} *Frequency of 4-year shock for Single acquirers)*	0.14	0.17	0.17	0.16	0.20	0.25	0.32	0.39	0.45	0.49	0.50	0.50	0.50
	[0.35]	[0.38]	[0.38]	[0.36]	[0.40]	[0.43]	[0.47]	[0.49]	[0.50]	[0.50]	[0.50]	[0.50]	[0.50]
F_{it}^{10} *Frequency of 4-year shock for Multi acquirers)*	0.19	0.31	0.40	0.47	0.56	0.68	0.81	0.94	1.05	1.11	1.11	1.11	1.11
	[0.63]	[0.85]	[1.00]	[1.11]	[1.28]	[1.42]	[1.57]	[1.73]	[1.87]	[1.95]	[1.95]	[1.95]	[1.95]
Panel D: Mean [standard deviation] of firm characteristics													
Relative size *(Relative size of target)*	0.11	0.13	0.15	0.15	0.07	0.07	0.07	0.09	0.10	0.09	0.06	0.03	0.02
	[0.45]	[0.40]	[0.59]	[0.81]	[0.27]	[0.31]	[0.17]	[0.27]	[0.25]	[0.22]	[0.18]	[0.13]	[0.31]
LogSIZE *(Total assets of acquirer)*	429.80	451.20	469.30	520.80	577.50	597.40	683.60	774.70	794.80	806.30	863.50	91520	952.80
	[11713]	[12202]	[12340]	[13115]	[13855]	[14059]	[15187]	[16228]	[16566]	[16946]	[17671]	[18155]	[18646]
Debt *(Debt in total assets)*	0.25	0.26	0.25	0.24	0.23	0.22	0.22	0.23	0.24	0.24	0.22	0.22	0.23
	[0.40]	[0.39]	[0.21]	[0.21]	[0.24]	[0.22]	[0.22]	[0.22]	[0.25]	[0.33]	[0.20]	[0.20]	[0.19]
LR *(Liquidity ratio)*	2.66	2.49	2.40	2.36	2.41	2.27	2.21	2.19	2.09	2.16	2.14	2.21	2.21
	[4.74]	[3.68]	[3.18]	[3.17]	[3.28]	[2.51]	[2.43]	[2.62]	[2.12]	[1.98]	[1.96]	[3.37]	[2.45]
PCM *(Profit-cost margin)*	0.02	0.03	0.06	0.09	0.10	0.10	0.12	0.12	0.12	0.11	0.13	0.13	0.12
	[0.60]	[0.50]	[0.36]	[0.28]	[0.28]	[0.29]	[0.24]	[0.22]	[0.20]	[0.20]	[0.16]	[0.18]	[0.20]
ROA	0.09	0.08	0.08	0.09	0.10	0.10	0.11	0.10	0.10	0.09	0.10	0.10	0.09
	[0.21]	[0.20]	[0.18]	[0.17]	[0.14]	[0.15]	[0.16]	[0.17]	[0.20]	[0.15]	[0.13]	[0.15]	[0.15]
LogLP	0.35	0.34	0.33	0.38	0.44	0.44	0.45	0.70	0.88	0.70	0.73	0.71	0.52
	[0.95]	[0.84]	[0.74]	[0.94]	[1.28]	[1.16]	[1.11]	[7.56]	[9.04]	[7.19]	[7.12]	[5.19]	[0.92]
COA	0.06	0.06	0.05	0.07	0.08	0.08	0.08	0.08	0.08	0.05	0.08	0.08	0.08
	[0.26]	[0.17]	[0.17]	[0.16]	[0.13]	[0.14]	[0.15]	[0.18]	[0.20]	[0.75]	[0.13]	[0.13]	[0.15]
Number of observations	2,169	2,172	2,172	2,171	2,172	2,170	2,171	2,171	2,168	2,170	2,169	2,171	2,170

Note: The table contains the sample characteristics of the merger frequency and firm characteristics of the acquirers used in the study. The results are based on a sample of 2,172 firms, undertaking 3,488 acquisitions. The firm characteristics come from Thomson financials and Worldscope. F_{it}^1, F_{it}^4 and F_{it}^{10} counts the number of acquisitions of a firm i in year t, year t plus the three preceding years and over the sample span of 10 years, respectively. Moreover, if a firm acquires only one target within sample period, it is classified as a single acquirer; if an acquirer makes more than one takeovers, it is defined as a frequent or multiple acquirer. *LogSIZE*, represents the size of acquiring firm, measured as the nature logarithm of firm's book value of total assets. *Debt* is calculated as the ratio of the sum of short term debt, current portion of long term debt and long term debt to total assets. The size of target *(Relative size)* is its transaction value relative to the amount of total assets of the acquirer at year t. *Liquid ratio (LR)* is constructed as the ratio of current assets and inventories to current liabilities. *Price-cost margin (PCM)* is calculated as the net profit as a percentage of the sales revenue. *ROA* is defined as operating income before depreciation and amortization adjusted by fiscal year-end book value of total assets. *LogLP* is the logarithm of sales per employee. *COA* is defined as operating cash flow deflated by the total assets of acquiring firm. Standard deviations are shown in brackets.

Table 4-4. Correlations between measures

		ROA_{t-1}	$LogLP_{t-1}$	COA_{t-1}	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	F_{it}^1 (Frequency of 1-year shock)	0.04***	0.01	0.01*	1.00							
(2)	F_{it}^4 (Frequency of 4-year shock)	0.03***	0.02**	0.01*	0.53***	1.00						
(3)	F_{it}^{10} (Frequency of 10-year shock)	0.04***	0.09***	0.01**	0.28***	0.55***	1.00					
(4)	Relative size	-0.12***	-0.05***	-0.02***	0.09***	0.17***	0.06***	1.00				
(5)	LogSIZE	0.31***	0.29***	0.07***	0.06***	0.16***	0.23***	-0.08***	1.00			
(6)	Debt	-0.09***	-0.01**	-0.03***	-0.02***	-0.02***	-0.05***	-0.00	0.12***	1.00		
(7)	LR	-0.15***	-0.08***	-0.02***	-0.00	-0.02***	-0.03***	0.03***	-0.21***	-0.19***	1.00	
(8)	PCM_{t-1}	0.10***	0.18***	0.02***	0.00	0.01	0.01	-0.00	0.05***	0.00	-0.05***	1.00

Note: F_{it}^1, F_{it}^4 and F_{it}^{10} counts the number of acquisitions of a firm i in year t, year t plus the three preceding years and over the sample span of 10 years, respectively. Moreover, if a firm acquires only one target within sample period, it is classified as a single acquirer; if an acquirer makes more than one takeovers, it is defined as a frequent or multiple acquirer. *LogSIZE*, represents the size of acquiring firm, measured as the nature logarithm of firm's book value of total assets. *Debt* is calculated as the ratio of the sum of short term debt, current portion of long term debt and long term debt to total assets. The size pf target is its transaction value relative to the amount of total assets of the acquirer at year t. *Liquid ratio (LR)* is constructed as the ratio of current assets and inventories to current liabilities. *Price-cost margin (PCM)* is calculated as the net profit as a percentage of the sales revenue. *ROA* is defined as operating income before depreciation and amortization adjusted by fiscal year-end book value of total assets. *LogLP* is the logarithm of sales per employee. *COA* is defined as operating cash flow deflated by the total assets of acquiring firm.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

4.5. Estimation results: from "need to chew" to "chew to change"

4.5.1.   *Effects of merger shocks and frequency on profitability*

To estimate the model of (2), the system GMM approach is employed for control of both firm and year dummies that capture the firm time-invariant specific effects and general market condition at each year. The models are estimated dynamically with control of the lagged dependent variable of operating performance − returns on assets (ROA). As it can be seen in Table 4-5 and 4-6, both the second order autocorrelation statistic and Hansen J statistic show statistical legitimacy and validity in using two-year (or further)-lagged explanatory or controlled variables as instruments to address the problem of endogeneity shocks in estimation.

With the control of endogeneity problems in estimation of more than 20,000 observations, Table 4-5 and 4-6 identifies how much ROA can drop by adding one extra new firm into the existing business of the acquirer. The amount of the drop depends on time of a merger shock that can last. The marginal reduction of profitability with respect to merger frequency is high immediately after the shock, then the reduction becomes lower in subsequent years after the shocks.

However, the shock cannot last forever as shown by F_t^{10} in Table 4-5 and Table 4-6 where the 10-year-lasting impact of the frequency on ROA does not appear. In contrast to the long-term impact, the short-term impact of frequency is significant, and in the shorter period the impact becomes stronger and higher, see F_t^4 and F_t^1 in the Table 4-5 and Table 4-6. A key message of these findings is clear: the accumulation of merger shocks diverts effort from profitable activities in the short term, and the shorter

the accumulation period is, the more the demand is for diverting attention to digest the shocks. This message implies that merger shocks impacts profitability adversely and dynamically: it is stronger in the short run then it is weakened gradually over time, and eventually it disappears or even it turns oppositely in the long run when the synergy effects generated by the merger become dominant.

The findings in Table 4-5 and Table 4-6 raise an argument that has two parts. The first part is consistent with digesting theory (McCarthy, 1963) and the chewing theory (Kusewitt, 1985). McCarthy explains a negative performance impact of merger frequency as the firm cannot efficiently and effectively digest and absorb a lot of new integrations in a short time period due to the clash of cultures and conflict of objectives between the acquirer and the acquired firm. Kusewitt (1985) regards this digesting problem or difficulty as "biting off more than you can chew".

The second part of the argument arises when time is taken into account in the process of digestion, the long or longer process helps the firm to gradually absorb the merger shocks, and then enables it to release more merger synergies for business improvement. Therefore, time matters for changing performance effects of merger shocks or frequency, "time helping chew" is important. This part extends the existing digesting theory and the chewing theory into a dynamic context in arguing merger shocks and frequency: the effect changes with time. Evidence in Table 4-5 and 4-6 support this dynamic argument. Particularly, in Table 4-6, the first three columns are estimation for firms that had only one merger over the sample span. The merger shock in the first year of the event affects the acquiring firm negatively, see F_t^1 in column (1) of Table 4-6. The negative effect of the merger shock becomes weaker to non-significant in subsequent years of the occurrence, see F_t^4 in column (2) of Table 4-6.

Further, in the long-term process, the shock effect turns to an opposite direction: significantly positive on profitability improvement, see F_t^{10} in column (3) of Table 4-6.

Clearly, the change of the shock effect with time for the single acquirers illustrates the point of the dynamic argument for merger shocks. For multi-acquirers, a similar pattern of the change in the performance effect of the shocks and frequency appears: from the stronger to the weaker over time, see Column (4), (5) and (6) of Table 4-6. The different paces of the change between the single and the multi-acquirers reflect a number or quantity that matters for the impact of merger shocks on business.

Table 4-5. Estimation of effect of merger frequency. (Aggregate sample)

Dependent variable: ROA_{it}	(1)	(2)	(3)	(4)	(5)	(6)
ROA_{it-1}	0.467***	0.473***	0.483***	0.473***	0.480***	0.473***
	(12.16)	(11.46)	(11.30)	(12.66)	(12.62)	(9.64)
$LogSIZE_{it}$ (Total assets of acquirer)	0.024***	0.018***	0.012**	0.019***	0.014***	0.012**
	(5.06)	(4.35)	(2.38)	(3.66)	(3.28)	(2.35)
$DEBT_{it}$ (Debt in total assets)	-0.058**	-0.046*	-0.059***	-0.054**	-0.049*	-0.055***
	(-2.38)	(-1.90)	(-2.93)	(-2.00)	(-1.83)	(-2.85)
$RSIZE_{it}$ (Relative size of target)	-0.000	-0.001	-0.001	0.000	-0.001	-0.002*
	(-0.39)	(-1.47)	(-1.44)	(0.52)	(-1.18)	(-1.86)
F_{it}^1 (Frequency of 1-year shock)	-0.009***			-0.008***		
	(-5.02)			(-4.62)		
F_{it}^4 (Frequency of 4-year shock)		-0.004**			-0.004**	
		(-2.04)			(-2.05)	
F_{it}^{10} (Frequency of 10-year shock)			-0.002			-0.002
			(-1.05)			(-1.49)
LR_{it} (Liquidity ratio)				-0.003	-0.005	-0.006
				(-0.59)	(-0.88)	(-0.50)
PCM_{it-1} (Price-cost margin)				0.024***	0.022**	0.036*
				(2.64)	(2.38)	(1.92)
Constant	-0.439***	-0.327***	-0.190*	-0.316***	-0.229**	-0.185*
	(-4.53)	(-3.79)	(-1.84)	(-2.97)	(-2.46)	(-1.76)
Firm fixed	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES
AR(1) test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) test (p-value)	0.904	0.877	0.667	0.681	0.628	0.618
Hansen J-stat	0.656	0.337	0.401	0.449	0.290	0.220
F-stat	46.35	42.96	48.25	39.56	47.91	51.02
No. of pooled observations	26035	26035	25812	25812	25812	25812
Number of firms	2172	2172	2167	2167	2167	2167

Note: Reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the P-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the P-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.????

Table 4-6. Estimation of effect of merger frequency on single and multiple acquirers

Sub-Sample of Acquirers:	Single	Single	Single	Multi	Multi	Multi
Dependent variable: ROA_{it}	(1)	(2)	(3)	(4)	(5)	(6)
ROA_{it-1}	0.394***	0.389***	0.435***	0.482***	0.494***	0.492***
	(6.99)	(6.87)	(9.37)	(9.31)	(10.07)	(9.08)
$LogSIZE_{it}$ (Total assets of acquirer)	0.022***	0.020***	0.025***	0.022**	0.020***	0.017**
	(3.26)	(3.21)	(4.16)	(2.36)	(3.88)	(2.28)
$DEBT_t$ (Debt in total assets)	-0.067	-0.061	-0.041	-0.002	-0.014	-0.008
	(-1.26)	(-1.16)	(-1.35)	(-0.05)	(-0.38)	(-0.21)
$RSIZE_t$ (Relative size of target)	-0.000	0.003	-0.000	0.002	-0.002	0.000
	(-0.01)	(0.60)	(-0.42)	(1.20)	(-1.49)	(0.87)
F_{it}^1 (Frequency of 1-year shock)	-0.004			-0.007***		
	(-1.31)			(-3.60)		
F_{it}^4 (Frequency of 4-year shock)		0.010			-0.003**	
		(0.65)			(-2.06)	
F_{it}^{10} (Frequency of 10-year shock)			0.026**			-0.002
			(2.41)			(-0.99)
Constant	-0.367***	-0.345***	-0.480***	-0.425**	-0.385***	-0.321**
	(-2.89)	(-2.86)	(-3.96)	(-2.12)	(-3.46)	(-1.99)
Firm fixed	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES
$AR(1)$ test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
$AR(2)$ test (p-value)	0.557	0.552	0.650	0.521	0.502	0.503
Hansen J-stat	0.660	0.756	0.987	0.491	0.420	0.587
F-stat	14.67	15.20	19.03	21.15	19.46	18.96
Number of pooled observations	15401	15401	15401	10634	10634	10634
Number of firms	1285	1285	1285	887	887	887

Note: Reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the P-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the P-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

The dynamic chewing theory developed in this chapter is different from Jensen (1986)'s agent theory in predicting the effect of merger shocks on performance. The agent theory regards profit reduction after merger shocks as a result of acquisitions made by management for its own utility maximization at expense of shareholder value and the firm's profitability. If the agent theory is valid, the performance effect of merger shocks will be downward permanently or at least in the long run since the merger is intended to maximize management's personal utility rather than firm's profitability. In contrast, the chewing argument regards the short-run deterioration of profitability after merger shocks as "digesting constraint" rather than "management's intention". The "digesting constraint" expects to change performance once the constraint is removed or weakened, but the "management's intention" expects a difficult to change the intended change unless the management is changed.

4.5.2.   Effects of controls

As shown in Table 4-5 and 4-7, the control variables mostly follow the expectations made in Section 4.4.3. Firm size (*LogSIZE*) leads to a significantly positive impact on acquirer's profitability, suggesting that larger firms have a higher rate of returns. This positive relation could be explained by scale and scope efficiencies in large firms, which is consistent with Hall and Weiss (1967), Fiegenbaum and Karnani (1991) and Lee (2009), but contradictory to Shepherd (1972) who documents economies of scale and scope for smaller firms, and diseconomies of scale for larger consolidations. The coefficient on the debt ratio (*DEBT*) is statistically highly significant. With a negative sign, it is associated with poorer operating performance which could possibly be due to agency issues stemming from risky debt (Fama and Miller, 1972; Jensen and Meckling, 1976; Fama and French 1998) and consistent with Taub (1975) and Booth et al. (2001).

The market power of acquiring firms (or *price-cost margin, PCM*) is calculated as the percentage of net profits in firm's sales revenues. The price-cost margin is significantly positive, consistent with Gugler et al. (2003) who state that the increasing

market power can lead to the improvement in acquirer's profits. This could possibly be explained by the market price of a good or service in excess of marginal cost and long-term average cost. In the case of liquidity (LR), the impact associated with the availability of liquid resources, which can be used for either firm or managerial purposes, is ruled out. Finally, *RSIZE* is insignificantly related to return on assets of acquiring firm, which is different from its positive effect on capital market for stock returns.

Further, Table 4-5 and Table 4-6 also report the statistical validity of estimations on the basis of the SYS-GMM. The results suggest that there is first-order correlation but residuals in second differences (*AR (2)*) are uncorrelated. The specification tests reported also include a Hansen test for over-identifying restrictions (J-statistic) which validates the adequacy of the instruments used in the system GMM. The results reported in both tables indicate that the null hypothesis of valid GMM instruments for both the exploratory and control variables, cannot be rejected. Therefore, it can be concluded that GMM is econometrically legitimate for instruments and estimations.

4.5.3.   *Effect of merger shocks on profitability for different expected merger shock-lasting time*

To further show that shock effects on the business changes with time, the model (2) is re-estimated by following the same logic to define merger frequency in section 4.4.1. The estimated coefficients are sorted by expected merger shock-lasting time, for instance 1-year, 2-year, 3-year, 4-year and consecutively continued to the sample span. The pattern of these estimates in Table 4-7 shows how the effects of merger shocks on performance gradually change over time. To provide more clearly visual evidence of findings, coefficients of estimations from Table 4-7 are plotted in figure 4-1. This shows supportive evidence of the "chew to change" argument developed by this study, but Jenson's agent theory which expects a negative change that can last in the long run in the merger context.

Table 4-7. Estimation of effect of merger frequency over different lengths of expected merger shock-lasting time

| Dependent variable: ROA_{it}	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ROA_{it-1}	0.4666***	0.5399***	0.4676***	0.4734***	0.4648***	0.4661***	0.4702***	0.4825***	0.4635***	0.4830***
	(12.16)	(9.85)	(12.11)	(11.46)	(12.49)	(12.46)	(12.52)	(12.82)	(12.73)	(11.30)
$LogSIZE_{it}$ (Total assets of acquirer)	0.0238***	0.0176***	0.0229***	0.0183***	0.0245***	0.0251***	0.0301***	0.0219***	0.0305***	0.0121**
	(5.06)	(3.93)	(4.93)	(4.35)	(5.34)	(5.40)	(5.38)	(4.77)	(5.35)	(2.38)
$DEBT_t$ (Debt in total assets)	-0.0575**	-0.0493**	-0.0530**	-0.0458*	-0.0533**	-0.0551**	-0.0527**	-0.0569**	-0.0481**	-0.0588***
	(-2.38)	(-2.01)	(-2.18)	(-1.90)	(-2.21)	(-2.29)	(-2.17)	(-2.41)	(-1.99)	(-2.93)
$RSIZE_t$ (Relative size of target)	-0.0003	-0.0032***	-0.0022*	-0.0015	-0.0015	-0.0004	-0.0024**	0.0005	0.0037	-0.0015
	(-0.39)	(-2.88)	(-1.88)	(-1.47)	(-1.35)	(-0.48)	(-2.14)	(0.73)	(1.47)	(-1.44)
F_{it}^1 (Frequency of 1-year shock)	-0.0085***			-0.008***						
	(-5.02)			(-4.62)						
F_{it}^2 (Frequency of 2-year shock)		-0.0073***			-0.004**					
		(-4.51)			(-2.05)						
F_{it}^3 (Frequency of 3-year shock)			-0.0055**			-0.002				
			(-2.13)			(-1.49)				
F_{it}^4 (Frequency of 4-year shock)				-0.0041**						
				(-2.04)						
F_{it}^5 (Frequency of 5-year shock)					-0.0036*					
					(-1.85)					
F_{it}^6 (Frequency of 6-year shock)						-0.0029*				
						(-1.80)				

Note: Reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the P-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the P-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

Table 4-7. Estimation of effect of merger frequency over different lengths of expected merger shock-lasting time- Continued

F_{it}^7 (Frequency of 7-year shock)							-0.0028**			
							(-2.03)			
F_{it}^8 (Frequency of 8-year shock)								-0.0026*		
								(-1.66)		
F_{it}^9 (Frequency of 9-year shock)									-0.0019	
									(-0.64)	
F_{it}^{10} (Frequency of 10-year shock)										-0.0017
										(-1.05)
Constant	-0.4388***	-0.3190***	-0.4112***	-0.3194***	-0.4538***	-0.4552***	-0.5695***	-0.3996***	-0.5804***	-0.1903*
	(-4.53)	(-3.56)	(-4.46)	(-3.83)	(-4.80)	(-4.92)	(-4.92)	(-4.23)	(-4.91)	(-1.89)
Firm fixed	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
$AR(1)$ test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$AR(2)$ test (p-value)	0.904	0.763	0.891	0.877	0.896	0.891	0.883	0.855	0.891	0.861
Hansen J-stat	0.656	0.381	0.282	0.337	0.602	0.586	0.401	0.433	0.334	0.279
F-stat	46.35	45.06	44.58	42.96	45.88	46.59	46.02	43.65	45.51	39.68
Number of pooled observations	26035	26035	26035	26035	26035	26035	26035	26035	26035	26035
Number of firms	2172	2172	2172	2172	2172	2172	2172	2172	2172	2172

Note: Reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the P-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the P-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

Figure 4-1. How the effects of merger shocks on performance gradually change over the lengths of expected merger shock-lasting time
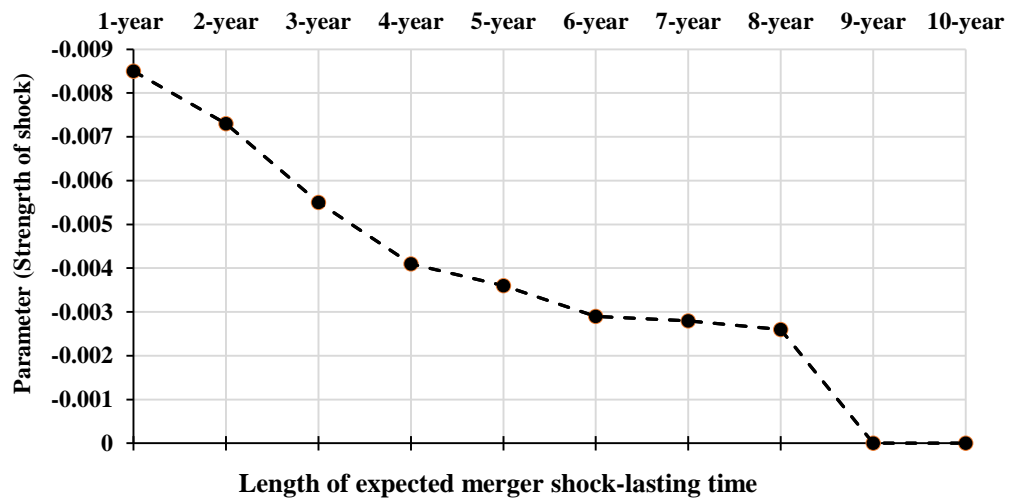
4.6. Robustness checks

4.6.1.   How long will the shock last?

Based on findings discussed above, the lasting effect of acquisitions is examined based on the argument of lasting effect made in Chapter 3, which shows that merger strategy is partly a function of accumulation process between the time and the quantity and that therefore the impact of an acquisition to acquiring firm may not only appear in the current year, but also continue for a period of time. Thus, the lasting effect could be seen as a dynamically continuous and declining process. Following earlier papers by Healy et al. (1992) and Switzer (1996), the change of a lasting effect is tracked for different points of time, the acquisition year, 1, 2, 3, 4 and 5 years later through fixed effects distributed-lag model of the form:

$$y_{it} = \beta_0 + \alpha \sum_0^5 x_{t-s} + \theta Z + c_i + \varepsilon_{it}, \tag{10}$$

where *y* is firm performance; x is frequency measured by *Number of mergers*, which counts the number of acquisitions that a firm undertakes in year *t*. and it is lagged from t-1 to t-5 in order to see how long a merger shock can last.

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Table 4-8. The lasting effect of a merger shock

Dependent variable (ROA)	(1) Full Sample	(2) Single Acquirers	(3) Multi Acquirers
t	-0.00271*	0.00152	-0.00373***
	(-1.80)	(0.83)	(-2.74)
t-1	-0.00084	0.00198	0.00012
	(-0.56)	(1.15)	(0.10)
t-2	-0.00372**	0.00177	-0.00341***
	(-2.39)	(1.08)	(-2.76)
t-3	-0.00314*	0.00274*	-0.00244**
	(-1.88)	(1.77)	(-2.00)
t-4	-0.00039	0.00333**	-0.00133
	(-0.31)	(2.19)	(-1.29)
t-5	-0.00099	-0.00010	-0.00061
	(-0.81)	(-0.07)	(-0.66)
Constant	0.12197**	0.00664	0.18318***
	(2.26)	(0.27)	(5.92)
R-squared	0.0688	0.134	0.104
Firm fixed	YES	YES	YES
F-stat	11.18	8.988	9.226
No. of pooled observations	17359	10271	7088

Note: This table reports the results from the Panel OLS estimation of the model: $y_{it} = \beta_0 + \alpha \sum_0^5 x_{t-s} + \theta Z + c_i + \varepsilon_{it}$, The dependent variable is operating income before depreciation and amortization normalized with total assets. All t-statistics are based on robust, firm-clustered standard errors. Firm and year dummies are included.

***,** and * represent significance at the 1%, 5% and 10% level, respectively.

As displayed in column (1) of Table 4-8, acquisitions significantly decline the profitability of acquiring firm in the acquisition year (t) due to digesting costs incurred during that year. The negative effect of acquisitions on acquirer's ROA reaches its highest peak in year 3 (t-2) after the merger shock of year t, and then the effect starts to decrease gradually and disappears afterwards. For the clarity of presentation, the results of other control variables are not presented here, but are available from the authors upon request.

Further, the full sample is divided into two sub-samples of single and multiple acquirers. The results for the sample of single ones indicate that acquisitions significantly improve firm performance in the 4 years after the merger shock (t-3), and then the effect reaches peak in year 5 (t-4). In year 6 (t-5), the effect terminates. By contrast, the results for multiple acquirers show a very similar picture to that which emerged from the full sample.

To provide more clearly visual evidence of these findings, these changes are plotted in figure 4-2. These results contribute the corporate indigestion and synergy creation explanations in explaining the dynamic effect of a merger shock. It is found that the results are showing a similar pattern regardless of how to divide the sample according to single and multiple acquirers: acquisitions initially reduce the ROA of acquiring firms, then boost it up and the effects finally become neutral over 5-6 years after the merger shocks.

In sum, the results suggest a consistent argument that the more acquisitions a firm carries out, the lower the efficiency gains are from frequent acquisitions. Furthermore, the effect of a merger shock on performance usually last for 5-6 years after the merger occurred.

Figure 4-2. How long does the performance effect of a merger shock last?
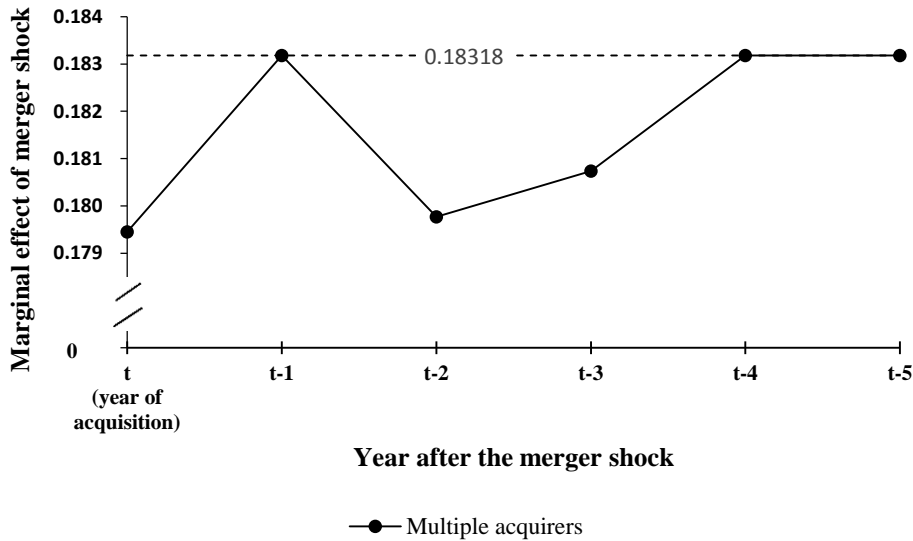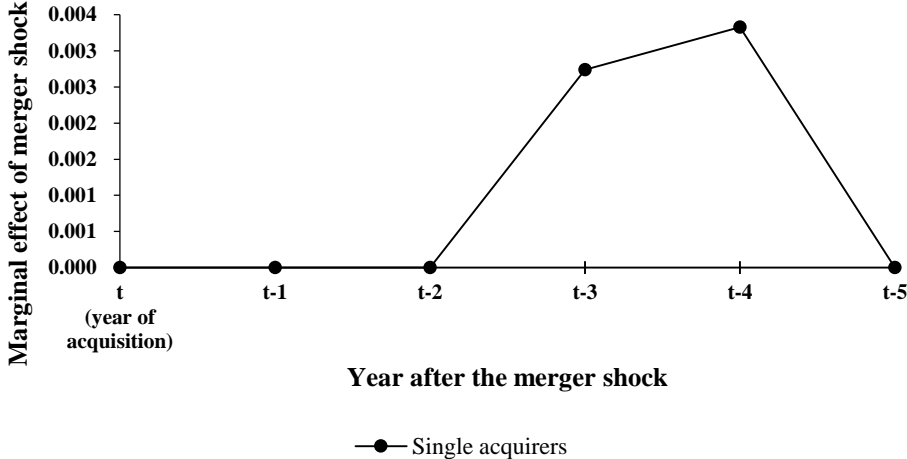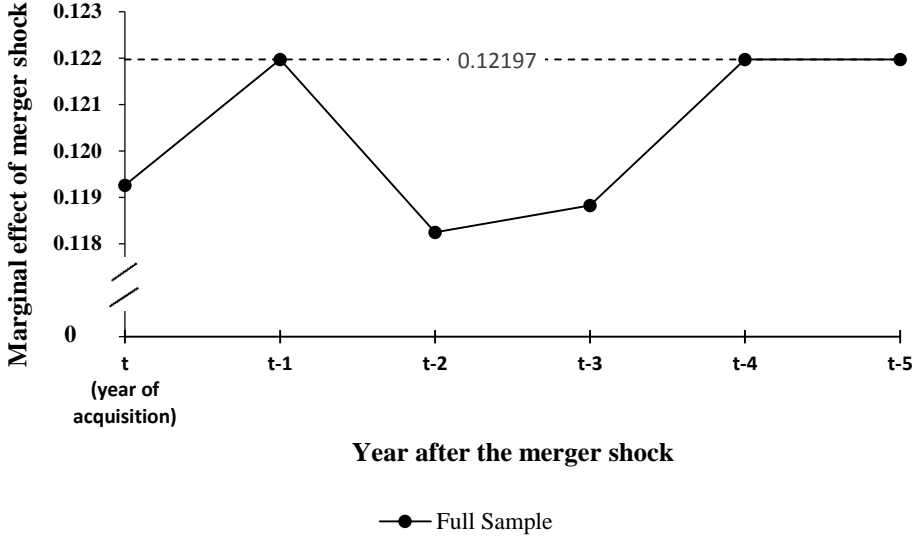

Full Sample

Single acquirers

Multiple acquirers

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Table 4-9. Estimation of effect of merger frequency on labor productivity

Dependent variable: $LogLP_{it}$	(1)	(2)	(3)	(4)	(5)	(6)
$LogLP_{it-1}$	0.781***	0.716***	0.764***	0.800***	0.710***	0.752***
	(9.81)	(8.78)	(6.56)	(9.52)	(7.93)	(5.94)
$LogSIZE_{it}$ (Total assets of acquirer)	0.042**	0.039***	0.038**	0.043**	0.036**	0.043**
	(2.46)	(2.74)	(2.07)	(2.48)	(2.23)	(2.28)
$DEBT_{it}$ (Debt in total assets)	-0.107	-0.092	0.119	-0.184	-0.114	0.159
	(-0.74)	(-0.67)	(0.82)	(-1.16)	(-0.74)	(1.01)
$RSIZE_{it}$ (Relative size of target)	-0.014***	-0.021***	0.001	-0.014***	-0.019***	0.001
	(-3.35)	(-4.11)	(1.59)	(-3.61)	(-3.38)	(0.80)
F_{it}^1 (Frequency of 1-year shock)	-0.066***			-0.072***		
	(-7.05)			(-8.09)		
F_{it}^4 (Frequency of 4-year shock)		-0.024***			-0.025**	
		(-2.81)			(-2.44)	
F_{it}^{10} (Frequency of 10-year shock)			-0.002			-0.003
			(-0.33)			(-0.51)
LR_{it} (Liquidity ratio)				-0.023	-0.022	0.015
				(-1.33)	(-1.37)	(0.78)
PCM_{it-1} (Price-cost margin)				-0.029	0.041	0.011
				(-0.41)	(0.51)	(0.14)
Constant	1.840**	2.774***	2.168*	1.662	2.987**	2.175
	(2.13)	(2.80)	(1.65)	(1.62)	(2.49)	(1.41)
Firm fixed	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES
$AR(1)$ test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
$AR(2)$ test (p-value)	0.631	0.994	0.401	0.787	0.597	0.928
Hansen J-stat	0.296	0.266	0.353	0.287	0.428	0.474
F-stat	443.0	419.8	45.56	411.7	34.18	406.2
No. of pooled observations	23881	23564	25945	23845	25727	23563
Number of firms	2156	2146	2169	2154	2164	2146

Note: The dependent variable is the logarithm of sales per employee as the measure of organizational productivity. Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

Table 4-10. Estimation of effect of merger frequency on firm labor productivity for single and multiple acquirers

Sub-sample of acquirers	Single	Single	Single	Multi	Multi	Multi
Dependent variable: $LogLP_{it}$	(1)	(2)	(3)	(4)	(5)	(6)
$LogLP_{it-1}$	0.770***	0.807***	0.902***	0.859***	0.838***	0.859***
	(9.33)	(10.85)	(14.73)	(4.95)	(5.05)	(6.55)
$LogSIZE_{it}$ (Total assets of acquirer)	0.038*	0.025	0.029	0.040	0.046	0.035
	(1.85)	(1.35)	(1.53)	(1.23)	(1.36)	(1.31)
$DEBT_{it}$ (Debt in total assets)	-0.048	-0.022	-0.021	-0.180	-0.127	-0.188
	(-0.26)	(-0.12)	(-0.12)	(-0.85)	(-0.60)	(-0.98)
$RSIZE_{it}$ (Relative size of target)	-0.008	-0.002	-0.001	-0.016**	-0.024***	0.001
	(-1.28)	(-0.10)	(-0.97)	(-2.42)	(-2.79)	(1.62)
F_{it}^{1} (Frequency of 1-year shock)	-0.002			-0.060***		
	(-0.01)			(-6.08)		
F_{it}^{4} (Frequency of 4-year shock)		0.031			-0.023**	
		(0.54)			(-2.11)	
F_{it}^{10} (Frequency of 10-year shock)			0.040**			-0.002
			(2.02)			(-0.36)
Constant	2.039**	1.830**	0.607	0.966	1.056	1.092
	(2.25)	(2.01)	(0.84)	(0.50)	(0.65)	(0.71)
Firm fixed	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES
$AR(1)$ test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
$AR(2)$ test (p-value)	0.379	0.375	0.400	0.823	0.795	0.817
Hansen J-stat	0.339	0.234	0.321	0.337	0.338	0.653
F-stat	244.3	274.3	395.5	227.2	203.9	248.7
No. of pooled observations	13931	13931	13931	9950	9950	9950
Number of firms	1275	1275	1275	881	881	881

Note: The dependent variable is the logarithm of sales per employee as the measure of organizational productivity. Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

4.6.1.   Labour productivity

For further robustness tests, the logarithm of sales per employee is adopted as the measure of firm productivity to see if there is a consistent conclusion.

Table 4-9 reports panel regression results for productivity. The estimation results are consistent with findings of Table 4-5. For example, a significantly negative relationship between 4-year merger frequency and acquiring firm labour productivity is found for the full sample in column (2) of Table 4-9 (-0.024, $t=$ -2.81). However, when focusing on the results of 10-year merger shock (Column (3) of Table 4-9), the negative effect disappears. Turning to the estimation of merger shock on the productivity for single acquirers and multiple acquires (Table 4-10), there is still no change in the conclusions.

4.6.2.   Cash-based measure

Several studies on takeover performance suggest that in measuring the performance of an acquiring firm after a merger event, the earning-based measurements could be problematic due to the susceptibility of accounting information to managerial manipulation through earnings management and change of accounting policies (Stanton, 1987; Erickson and Wang, 1999; Powell and Stark 2005). In terms of measurement selection, Barber and Lyon (1996) suggest that the use of operating cash flow is good alternative.

Therefore, a cash-based variable which is widely accepted by existing studies, is introduced in later robustness tests: operating cash flow returns. Following Healy et al. (1990), operating cash flow is defined as sales, minus cost of goods sold, and selling and administrative expense, plus depreciation, goodwill expense and deferred tax, and adjusted for changes in working capital. This value is then deflated by the total assets of the acquiring firm. The performance measure is therefore less affected by the method of

accounting for the merger such as the recognition of bad debts or the accounting policies adopted on the valuation of inventories and/or the method of financing the takeover (Healy et al., 1990; Powell and Stark, 2005).

Table 4-11 suggests that the results are still consistently robust. For example: The relation between 4-year merger frequency and cash flow returns is significantly negative (-0.004, t=-1.99). However, when turning to a 10-year measure of merger shock, the effect disappears (-0.003, t=-1.63). For single and multiple acquirers in Table 4-12, the results are still similar to those found in section 4.5.

4.6.3.   Additional sensitive checks

The findings are also robust in a wider range of alternative regressions, notably in three areas: firstly, following the same logic as Section 4.4.1 to count the merger frequency by deal characteristics, namely, payment method, target listing status, geographic scope (See, Appendix A.). Secondly, estimating the relation between different measure of firm performance and merger frequency with a lag by the following model, which reduces the impact of simultaneity since past merger frequency and current performance are not determined in the same period[33] (See Appendix B):

$$y_{it} = \beta_0 + \alpha y_{it-1} + \beta_1 X_{it-1} + \beta_2 Z_{it-1} + \gamma_t T_t + c_i + \varepsilon_{it}, \tag{11}$$

where X presents the merger frequency variables and Z includes the control variable. Overall, it is found that none of these alternative approaches yielded significantly different results, and the inference of the effect of merger frequency on firm performance remains unchanged. Thirdly, reexamining the argument on two sub-samples of US and EU acquirer. The conclusion of the study remains unchanged. In addition, it is found that the negative effects of merger shocks for EU and Asian acquirers are stronger than the US ones. (See, Appendix C.)

Table 4-11. Estimation of effect of merger frequency on firm cash flow returns on assets

Dependent variable: COA_{it}	(1)	(2)	(3)	(4)	(5)	(6)
COA_{it-1}	0.528***	0.531***	0.483***	0.431***	0.440***	0.435***
	(9.82)	(9.98)	(10.17)	(6.66)	(7.00)	(5.92)
$LogSIZE_{it}$ (Total assets of acquirer)	0.020***	0.020***	0.019***	0.022***	0.021***	0.011**
	(4.03)	(5.10)	(3.32)	(4.15)	(4.96)	(2.24)
$DEBT_{it}$ (Debt in total assets)	-0.027	-0.023	-0.034	-0.058	-0.053	-0.042
	(-0.76)	(-0.64)	(-0.98)	(-1.51)	(-1.38)	(-0.76)
$RSIZE_{it}$ (Relative size of target)	0.000	-0.001	-0.000	0.000	-0.001	-0.000
	(0.24)	(-1.02)	(-0.32)	(0.28)	(-1.21)	(-0.25)
F_{it}^1 (Frequency of 1-year shock)	-0.007***			-0.008***		
	(-3.68)			(-4.30)		
F_{it}^4 (Frequency of 4-year shock)		-0.004**			-0.004**	
		(-1.99)			(-2.12)	
F_{it}^{10} (Frequency of 10-year shock)			-0.003			-0.002
			(-1.63)			(-1.51)
LR_{it} (Liquidity ratio)			-0.007	-0.008	-0.006	-0.007
			(-1.38)	(-1.54)	(-0.70)	(-1.38)
PCM_{it-1} (Price-cost margin)			0.045**	0.042**	0.036*	0.045**
			(2.35)	(2.19)	(1.69)	(2.35)
Constant	-0.377***	-0.378***	-0.354***	-0.404***	-0.376***	-0.171
	(-3.73)	(-4.79)	(-3.06)	(-3.63)	(-4.36)	(-1.56)
Firm fixed	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES
AR(1) test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) test (p-value)	0.339	0.328	0.401	0.641	0.597	0.650
Hansen J-stat	0.429	0.548	0.353	0.324	0.428	0.317
F-stat	32.78	33.90	45.56	33.47	34.18	38.68
No. of pooled observations	25945	25945	25945	25727	25727	25727
Number of firms	2169	2169	2169	2164	2164	2164

Note: The dependent variable is defined operating cash flow as sales, minus cost of goods sold, and selling and administrative expense, plus depreciation, goodwill expense and deferred tax, and adjusted for changes in working capital, then deflated by the total assets of acquiring firm. Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

Table 4-12. Estimation of effect of merger frequency on cash flow returns on assets for single and multiple acquirers

Sub-sample of acquirers	Single	Single	Single	Multi	Multi	Multi
Dependent variable: COA_{it}	(1)	(2)	(3)	(4)	(5)	(6)
COA_{it-1}	0.496***	0.532***	0.525***	0.434***	0.421***	0.405***
	(7.25)	(7.54)	(7.78)	(5.07)	(11.30)	(4.10)
$LogSIZE_{it}$ (Total assets of acquirer)	0.020***	0.020***	0.027***	0.029***	0.026***	0.013***
	(2.68)	(3.03)	(3.75)	(2.72)	(4.10)	(2.77)
$DEBT_{it}$ (Debt in total assets)	-0.023	-0.005	-0.008	-0.047	-0.057	-0.018
	(-0.40)	(-0.10)	(-0.16)	(-1.14)	(-1.22)	(-0.87)
$RSIZE_{it}$(Relative size of target)	0.001	0.002	-0.005	-0.001	-0.003*	0.000
	(0.64)	(0.31)	(-0.81)	(-0.99)	(-1.80)	(0.39)
F_{it}^1 (Frequency of 1-year shock)	-0.005			-0.007***		
	(-1.61)			(-3.09)		
F_{it}^4 (Frequency of 4-year shock)		0.003			-0.005**	
		(0.16)			(-2.41)	
F_{it}^{10} (Frequency of 10-year shock)			0.024***			-0.001
			(2.77)			(-1.16)
Constant	-0.363***	-0.361***	-0.537***	-0.147	-0.498***	-0.235**
	(-2.59)	(-2.96)	(-3.73)	(-1.18)	(-3.85)	(-2.53)
Firm fixed	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES
$AR(1)$ test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
$AR(2)$ test (p-value)	0.556	0.483	0.504	0.647	0.567	0.681
Hansen J-stat	0.242	0.437	0.670	0.243	0.318	0.260
F-stat	25.68	19.23	20.05	12.37	21.30	20.50
No. of pooled observations	15336	15336	15336	10609	10609	10609
Number of firms	1283	1283	1283	886	886	886

Note: The dependent variable is defined operating cash flow as sales, minus cost of goods sold, and selling and administrative expense, plus depreciation, goodwill expense and deferred tax, and adjusted for changes in working capital, then deflated by the total assets of acquiring firm. Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

4.7. Conclusions

Is a market response to a merger announcement consistent with what actually happens to the fundamentals of the firm after the announcement? Notably, the market expectation about a merger effect on changing firm performance is quite consistently related to what has been actually changed in the firm after the merger shock.

In previous chapter, it is found that the investors perceive a lower value if the acquiring firm is involved in frequent mergers. This is because more mergers are expected to attract a considerable amount of management attention away from profitable activities in order to digest the challenges of new business integration at least in the short run. This "digesting constraint" argument is evident in the estimations reported in this chapter. Firms becomes less profitable in the short run after a merger shock, and this adverse effect can be more severe if a firm is involved in more frequent mergers.

Further evidence shows that, the effect of merger shocks is not static and persistent, and it changes with time. The shock adversely affects profitability in the short run, usually lasting a couple of years, and then the negative effect on performance could be turned either oppositely, if the firm digests the shock successfully, or continuously but diminishing over time if the digestion takes longer such as for frequent acquisition. This finding implies that the pace of firm resilience to a merger shock can be affected by its merger strategies. The pace can be slow if the firm pursues frequent mergers aggressively. Overall, the performance effect of a merger shock is dynamic and it changes with time. This dynamic view of merger shocks in this study opens a new vision for research on mergers.

Appendix A

Table A1. The effect of 1-year merger shock on returns on assets by deal-level characteristics.

Dependent variable: ROA_{it}	(1)	(2)	(3)	(4)	(5)
ROA_{it-1}	0.467***	0.478***	0.465***	0.458***	0.466***
	(12.35)	(12.50)	(12.41)	(11.55)	(12.36)
$LogSIZE_{it}$ (Total assets of acquirer)	0.027***	0.027***	0.027***	0.026***	0.027***
	(5.08)	(4.85)	(5.08)	(4.71)	(5.07)
$DEBT_{it}$ (Debt in total assets)	-0.059**	-0.069**	-0.059**	-0.072***	-0.059**
	(-2.43)	(-2.26)	(-2.45)	(-2.78)	(-2.41)
$RSIZE_{it}$ (Relative size of target)	-0.000	0.000	-0.000	0.000	-0.000
	(-0.07)	(0.11)	(-0.11)	(0.20)	(-0.11)
Target listing status					
F_{it}^1:Public targets	-0.026***				
	(-7.61)				
F_{it}^1:Private targets	0.001				
	(0.33)				
Payment method					
F_{it}^1:Pure cash deals		-0.094			
		(-0.97)			
F_{it}^1:Pure stock deals		0.021			
		(0.16)			
F_{it}^1:Foreign targets			-0.019***		
			(-5.18)		
F_{it}^1:Domestic targets			-0.008***		
			(-3.87)		
F_{it}^1:Related targets				-0.010***	
				(-4.32)	
F_{it}^1:Diversified targets				-0.010***	
				(-3.88)	
Interactions					
F_{it}^1:Cash-public					-0.019***
					(-5.09)
F_{it}^1:Stock-public					-0.025***
					(-5.85)
F_{it}^1:Cash-private					0.002
					(0.83)
F_{it}^1:Stock-private					-0.005
					(-1.01)
Constant	-0.495***	-0.488***	-0.494***	-0.460***	-0.489***
	(-4.65)	(-4.54)	(-4.65)	(-4.27)	(-4.64)
Firm fixed	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES
AR(1) test (p-value)	0.000	0.000	0.000	0.000	0.000
AR(2) test (p-value)	0.898	0.908	0.909	0.925	0.896
Hansen J-stat	0.466	0.435	0.475	0.893	0.469
F-stat	44.54	44.26	44.43	42.33	44.54
Number of pooled observations	26035	26035	26035	26035	26035
Number of firms	2172	2172	2172	2172	2172

Note: Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

Table A2. The effect of 4-year merger shock on returns on assets by deal-level characteristics.

Dependent variable: ROA_{it}	(1)	(2)	(3)	(4)	(5)
ROA_{it-1}	0.472***	0.460***	0.466***	0.466***	0.478***
	(10.53)	(10.19)	(10.37)	(10.25)	(10.29)
$LogSIZE_{it}$ (Total assets of acquirer)	0.020***	0.021***	0.021***	0.020***	0.017***
	(7.62)	(6.19)	(6.06)	(5.90)	(5.67)
$DEBT_{it}$ (Debt in total assets)	-0.049**	-0.047**	-0.046**	-0.046**	-0.047**
	(-2.27)	(-2.14)	(-2.08)	(-2.11)	(-2.15)
$RSIZE_{it}$ (Relative size of target)	-0.004***	-0.003***	-0.004***	-0.004***	-0.003***
	(-4.49)	(-4.01)	(-4.93)	(-4.44)	(-3.51)
Target listing status					
F_{it}^4:Public targets	-0.009***				
	(-4.37)				
F_{it}^4:Private targets	-0.007***				
	(-3.07)				
Payment method					
F_{it}^4:Pure cash deals		-0.005**			
		(-2.26)			
F_{it}^4:Pure stock deals		-0.010***			
		(-3.82)			
F_{it}^4:Foreign targets			-0.007***		
			(-3.17)		
F_{it}^4:Domestic targets			-0.008***		
			(-4.09)		
F_{it}^4:Related targets				-0.008***	
				(-3.09)	
F_{it}^4:Diversified targets				-0.007***	
				(-3.63)	
Interactions					
F_{it}^4:Cash-public					-0.005*
					(-1.86)
F_{it}^4:Stock-public					-0.012***
					(-2.83)
F_{it}^4:Cash-private					-0.000
					(-0.14)
F_{it}^4:Stock-private					-0.009**
					(-2.06)
Constant	-0.359***	-0.379***	-0.375***	-0.360***	-0.295***
	(-6.86)	(-5.54)	(-5.40)	(-5.20)	(-4.96)
Firm fixed	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES
AR(1) test (p-value)	0.000	0.000	0.000	0.000	0.000
AR(2) test (p-value)	0.887	0.911	0.903	0.903	0.869
Hansen J-stat	0.544	0.455	0.367	0.461	0.242
F-stat	45.10	44.44	43.18	41.70	37.85
Number of pooled observations	26035	26035	26035	26035	26035
Number of firms	2172	2172	2172	2172	2172

Note: Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

Table A3. The effect of 10-year merger shock on returns on assets by deal-level characteristics.

Dependent variable: ROAit	(1)	(2)	(3)	(4)	(5)
ROAit-1	0.464***	0.466***	0.467***	0.460***	0.489***
	(12.41)	(12.14)	(11.94)	(11.17)	(12.00)
LogSIZEit (Total assets of acquirer)	0.027***	0.026***	0.025***	0.027***	0.020***
	(4.94)	(4.67)	(4.74)	(3.43)	(3.23)
DEBTit (Debt in total assets)	-0.060**	-0.054**	-0.048*	-0.062*	-0.052*
	(-2.34)	(-2.15)	(-1.67)	(-1.72)	(-1.82)
RSIZEit (Relative size of target)	-0.000	0.000	0.000	0.000	-0.000
	(-0.22)	(0.05)	(0.14)	(0.17)	(-0.15)
Target listing status					
F_{it}^{10}:Public targets	0.003				
	(0.17)				
F_{it}^{10}:Private targets	0.003				
	(1.26)				
Payment method					
F_{it}^{10}:Pure cash deals		-0.002			
		(-0.56)			
F_{it}^{10}:Pure stock deals		-0.011			
		(-0.39)			
F_{it}^{10}:Foreign targets			-0.017		
			(-0.45)		
F_{it}^{10}:Domestic targets			-0.003		
			(-1.24)		
F_{it}^{10}:Related targets				-0.005	
				(-0.92)	
F_{it}^{10}:Diversified targets				0.001	
				(0.02)	
Interactions					
F_{it}^{10}:Cash-public					-0.003
					(-0.59)
F_{it}^{10}:Stock-public					-0.011
					(-0.84)
F_{it}^{10}:Cash-private					0.030
					(0.49)
F_{it}^{10}:Stock-private					-0.039
					(-0.95)
Constant	-0.504***	-0.471***	-0.445***	-0.493***	-0.367***
	(-4.30)	(-4.01)	(-4.21)	(-2.64)	(-3.01)
Firm fixed	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES
AR(1) test (p-value)	0.000	0.000	0.000	0.000	0.000
AR(2) test (p-value)	0.894	0.890	0.894	0.904	0.827
Hansen J-stat	0.460	0.453	0.322	0.902	0.457
F-stat	43.53	48.73	43.07	32.81	38.82
Number of pooled observations	26035	26035	26035	26035	26035
Number of firms	2172	2172	2172	2172	2172

Note: Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.

***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

Appendix B

Table B1. The effect of 1-year lagged merger frequency on current firm performance.

Dependent variable:	(1) ROAit	(2) ROAit	(3) ROAit	(4) LPit	(5) LPit	(6) LPit	(7) COAit	(8) COAit	(9) COAit
Dependent variableit-1	0.471***	0.483***	0.491***	0.700***	0.707***	0.737***	0.530***	0.534***	0.495***
	(12.31)	-11.81	-11.26	(9.12)	-9.04	-6.38	(9.52)	-9.69	-10.63
LogSIZEit-1 (Total assets of acquirer)	0.022***	0.016***	0.009*	0.046***	0.038***	0.042**	0.020***	0.021***	0.019***
	(4.51)	-4.1	-1.86	(2.73)	-2.63	-2.4	(3.86)	-4.94	-3.4
DEBTit-1 (Debt in total assets)	-0.047***	-0.039**	-0.041**	-0.065	-0.068	0.040	-0.025	-0.021	-0.027
	(-2.66)	(-2.30)	(-2.52)	(-1.56)	(-0.73)	-0.37	(-0.94)	(-0.81)	(-1.02)
RSIZEit-1 (Relative size of target)	-0.002**	-0.002*	-0.001	-0.033***	-0.018***	0.001	-0.002*	-0.002	0.000
	(-2.04)	(-1.69)	(-1.18)	(-3.05)	(-4.27)	-1.36	(-1.71)	(-1.46)	(-0.33)
F_{it-1}^{1} (Frequency of 1-year shock)	-0.006***			-0.069*			-0.006***		
	(-2.68)			(-1.84)			(-2.74)		
F_{it-1}^{4} (Frequency of 4-year shock)		-0.004**			-0.017**			-0.005**	
		(-2.26)			(-2.54)			(-2.35)	
F_{it-1}^{10} (Frequency of 10-year shock)			-0.001			-0.002			-0.003
			(-0.57)			(-0.44)			(-1.63)
Constant	-0.389***	-0.287***	-0.124	3.116***	2.908***	2.448*	-0.386***	-0.393***	-0.356***
	(-4.08)	(-3.52)	(-1.30)	(3.69)	-2.98	-1.84	(-3.56)	(-4.64)	(-3.13)
Firm fixed	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES
AR(1) test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) test (p-value)	0.995	0.955	0.841	0.486	0.864	0.959	0.341	0.356	0.404
Hansen J-stat	0.547	0.316	0.330	0.205	0.304	0.200	0.491	0.537	0.458
F-stat	43.62	41.74	36.25	384.6	411.2	498.0	29.46	30.64	43.16
Number of pooled observations	26034	26034	26034	23880	23563	23563	25944	25944	25944
Number of firms	2172	2172	2172	2156	2146	2146	2169	2169	2169

Note: Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

Appendix C

Table C1. Estimation of effect of merger frequency on returns on assets across sub-samples of US, EU and Asian acquirers

Dependent variable: ROA_{it}	US (1)	US (2)	US (3)	EU (4)	EU (5)	EU (6)	Asia (7)	Asia (8)	Asia (9)
ROA_{it-1}	0.616***	0.624***	0.628***	0.521***	0.514***	0.535***	0.468***	0.456***	0.405***
	(6.77)	(6.06)	(7.98)	(5.90)	(12.58)	(9.08)	(4.72)	(4.57)	(5.55)
$LogSIZE_{it}$ (Total assets of acquirer)	0.016**	0.008*	0.013**	0.020*	0.015**	0.014*	0.004	0.025***	0.009
	(2.46)	(1.67)	(2.26)	(1.75)	(2.04)	(1.91)	(0.36)	(3.50)	(1.37)
$DEBT_{it}$ (Debt in total assets)	0.051	0.047	0.057	0.048	0.047	0.025	-0.015	-0.016	-0.012
	(0.64)	(0.59)	(1.01)	(1.29)	(1.52)	(0.77)	(-1.32)	(-0.29)	(-1.08)
$RSIZE_{it}$ (Relative size of target)	-0.001	-0.003	0.000***	-0.003*	-0.010**	-0.000	-0.016**	-0.008*	-0.000***
	(-0.40)	(-1.35)	(3.67)	(-1.93)	(-2.17)	(-1.40)	(-2.16)	(-1.76)	(-3.41)
F_{it}^1 (Frequency of 1-year shock)	-0.011***			-0.019***			-0.026**		
	(-3.47)			(-4.71)			(-2.36)		
F_{it}^4 (Frequency of 4-year shock)		-0.005***			-0.018*			-0.018**	
		(-2.68)			(-1.94)			(-2.03)	
F_{it}^{10} (Frequency of 10-year shock)			-0.002			-0.002			-0.002
			(-0.83)			(-1.02)			(-0.87)
Constant	-0.321**	-0.151	-0.244**	-0.384*	-0.280*	-0.262*	-0.031	-0.409***	-0.089
	(-2.42)	(-1.54)	(-2.14)	(-1.71)	(-1.92)	(-1.77)	(-0.14)	(-2.94)	(-0.98)
Firm fixed	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES
$AR(1)$ test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$AR(2)$ test (p-value)	0.693	0.709	0.714	0.245	0.241	0.247	0.533	0.526	0.444
Hansen J-stat	0.582	0.269	0.845	0.412	0.414	0.179	0.563	0.793	0.395
F-stat	15.87	14.35	15.29	12.96	32.30	19.35	11.98	11.87	12.84
Number of pooled observations	10119	10119	10119	5975	5975	5975	6871	6871	6871
Number of firms	845	845	845	498	498	498	573	573	573

Note: Results reported in this table have been obtained using system GMM estimations using the two-step estimation including the Windmeijer correction to the reported standard errors. The lagged dependent variable, the M&A and the firm variables are instrumented. Year dummies are not reported. AR1 and AR2 report the p-values of the tests for first-order and second-order serial correlation in the first-differenced residuals. The Hansen statistic reports the p-value of the Hansen test of over-identifying restrictions. Data is for 2000–2012. Robust standard errors are in parentheses.***,**,* denotes significance at the 1%, 5% and 10% level, respectively.

5.   Conclusions

5.1. Findings and contributions

Many empirical studies have attempted to identify the impacts of mergers and merger frequency on the acquiring firm's performance (e.g. Fuller et al., 2002; Ismail, 2008; Billett and Qian; 2008). Most of these studies found that M&A activities have a negative effect on a firm's performance. If this result is true, why do firms still pursue takeovers? Why have M&A activities been prevalent all over the world? The contradiction between research findings and business activities in the real world motivates our study.

The results of this thesis paint a different picture of the effect of acquisitions, particularly frequent acquisition, on the performance of acquiring firms in the worldwide framework of corporate finance. Merger strategy or merger frequency doubtlessly played an increasingly important role in business growth and the success of corporations from both the investor and the decision maker's perspective. Unlike earlier studies, the empirical analysis in this thesis shows that mergers and acquisitions have not only created wealth but also business failure.

This thesis examined merger effect taking into account the impact of merger frequency on the acquiring firm's performance from both short-term and long-term perspectives. It conducts short term univariate and multivariate analysis of the effect of merger frequencies on the expectation of investors have about the integration of a new business and its effect on performance in the future. Findings from the univariate analysis in the Chapter 2 emphasize the distinction of the creation of synergy, and division of gains between acquirers with different merger frequencies from an investor

perspective. Based on comparative results of announcement returns, acquiring firms with a higher merger frequency are found to perform worse than ones with a lower merger frequency. This finding is consistent and robust across different time lengths, different regions, different time periods, different ownerships of target firms, different size of deals and different payment methods made by the acquirers. The chapter also shows that announcement returns for acquiring firms decline after the first deal, indicating that the market reacts more strongly to the first deal.

These significant findings provide clear evidence of how the acquiring managements or firms may develop hubris from their previously successful experiences on mergers and acquisitions. The development of hubris with more mergers drives down the expectation of investors for better performance in the future of the new integration, thus lowering the value of the firm. This result also suggests that although it is expected that the performance of acquiring firms will decline after their first deal or second deals of mergers due to growing hubris in M&A, this does not mean that the management learning effect shall be rejected.

Chapter 3 is about the short-run multivariate analysis extends the research of frequent acquisition by examining how frequency affects stock performance in two dimensions: number and time. This chapter develops a new method of defining the merger frequency that interacts the number of mergers with the time that a merger effect may last after the event occurrence. It employs a more internationally representative sample with control of firm specific fixed effects.

Based on these research settings, it is found that the negative effect of the short term and medium term merger frequency decreases over time and may become insignificant. This suggests that two managerial behaviours co-exist. More specifically,

the negative effects of hubris on performance of acquiring firm may be offset or weakened by positive effects developed from increasingly managerial learning which drives up the market expectation for the future improvement of new integration. If the time interval between the two mergers pursued by the firm is longer, the learning effect is expected to be stronger. These findings also imply that due to the joint effect of managerial behaviours the shock of a merger to announcement returns may not last permanently. In addition, it is found that the larger size of a merger has a positive effect on performance. This suggests that acquirers will be more careful about dealing with a larger acquisition as they may expose the firm to a high risk of devastating the business if the integration fails. This creates a risk pressure on management because any failure of a large acquisition may cause a difficulty for the acquiring firms in using its existing resources to absorb or digest the large acquisition.

If the difficulty is beyond the capability of the acquiring firm to overcome, it can result in the ruination of the existing business of the firm. In considering potential risks, any decision maker or shareholder of the firm will be much more cautious and careful in pursuing large acquisitions than the small ones, as the risk of the small size of the deal could be relatively easier for the acquiring firm to control or absorb. Therefore, this study argues that the pressure of the high risk drives the firm to perform better in large-size acquisitions. This is different from the argument by Moeller et al. (2004) who explain the size effect from the perspective of acquirer size.

The thesis also looks at the merger impacts from a fundamental perspective in the long term. Findings from the last chapter show the relation between merger frequency and acquirer's operational performance is both negative and significant. The strength of the negative effect diminishes over time. More importantly, the effect of merger frequency reverses in a long-term process: improving firm profitability for single acquirers. However, for multi-acquirers, it appears that the performance effect of frequency changes from stronger to weaker over time. Based on these findings, this

chapter extends the existing digesting theory (McCarthy, 1963) and the chewing theory (Kusewitt, 1985) into a dynamic context in arguing merger shocks and frequency: the effect changes with time.

Part of this dynamic argument is consistent with both existing digesting theory (McCarthy, 1963) and chewing theory (Kusewitt, 1985) that the negative effect of merger frequency relates to the number of acquisitions. It is so called "biting off more than you can chew". However, when time is taken into account in the process of digestion, it is found that the longer process helps the firm gradually absorb the shocks of frequent acquisition, and then allows it to create more corporate synergies for business operation. This is, "time helping chew". In addition, these findings also have important implications for management strategies related to M&A. To maximize the wealth of investors, and companies' performance, it is optimal or more appropriate to consider not only merger quantity of targets but also the time length between acquisitions. All in all, a key message of this dynamic argument for merger effects is that both merger quantity and time play a role in affecting post-merger performance.

5.2. Recommendations for future research

The findings of this thesis pose a great and complex challenge to researchers in the field of M&A studies for a need to continue studying in depth and breadth. Several areas of future research are in demand. Firstly, a larger sample is needed to validate the findings. For example, the thesis limited the research sample to public companies. It would be useful to explain greater variation in performance of frequent acquisition by repetition of the research using a sample of M&A deals by private companies. In addition, it would be useful to assess the effect of M&A deals with lower value comparing to those used in the thesis.

Secondly, the thesis limited the merger dataset to a span from 2000 to 2010. The future research could usefully extend this time period because there may be a more complex relation between merger actives and firm performance in the longer term. When a longer sample period is used, a relation that this thesis has not revealed may be found, for instance a U-shaped relationship.

Thirdly, additional research studies should directly examine the relation between announcement returns and fundamental performance. This thesis has shown that both CARs and operational performance decrease with more mergers. Based on this consistent movement, it will be better to develop a more focused and extensive investigation of the nexus between cumulative abnormal returns and the fundamentals of acquiring firms.

5.3. An exception in practice

For the last twenty years many scholars have attempted to examine the link between frequent acquisitions and acquirer's performance. However, this relation is still unclear. Most of researchers and practitioners in various disciplines have stated that frequent acquisitions are value destructive. It is interesting to question if more mergers really do drive down the performance of acquiring firms in reality. The understanding that the world is complex with many and unknown variables should not discourage scientific endeavour. Although, the findings of the thesis have found that acquirers are generally suffering losses or at best only breakeven when making frequent acquisitions, there are still some frequent acquirers that are exceptions in practice. For instance, Mittal Steel, the world largest steel company.

To illustrate this point some performance measures for Mittal Steel are plotted (See Appendix A). It is found that there are a number of consistent variations for those measures along with number of M&As over the time. This suggests that frequent acquisitions could be able to drive significant growth for a business. However, based on the findings of this thesis, it is clear that the view drawn from this single case study cannot be generalized to other cases.

5.4. Implications

Taken together, findings of the thesis suggest clear implications for business development. Firstly, acquisition facilitates growth of business but more or frequent acquisitions can lead to grow at a higher cost or expense more profits. Secondly, acquiring firms should not rush aggressively to acquire their next targets. Thirdly, firms should carefully evaluate and select which of merger strategies will provide them with the expected growth.

Overall, the thesis highlights the mergers and acquisitions can help and support the firm but also can create adverse effect on firm's performance. It contributes to the literature on studies of merger and acquisition and develops new understanding about acquisition strategy in relation to firm performance.

Appendix A

Figure A1. A comparison between the trends of market share and merger frequency
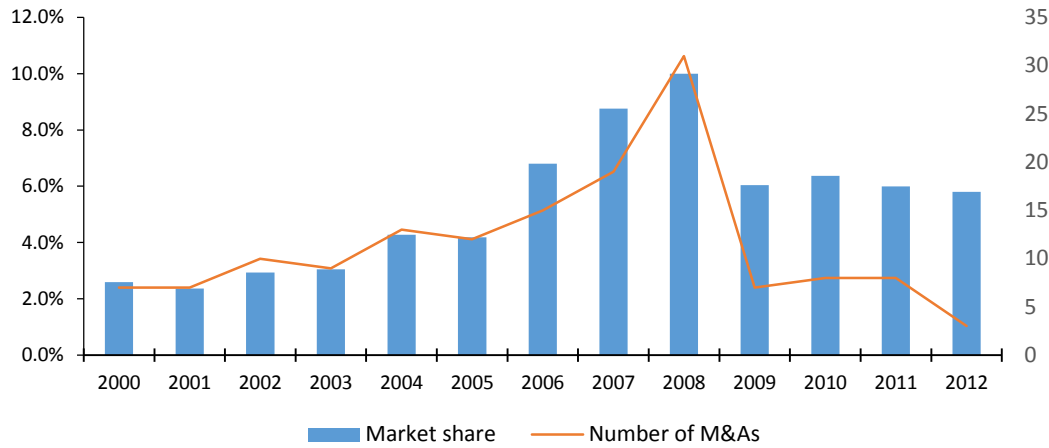
Figure A2. A comparison between the trends of return on assets and merger frequency
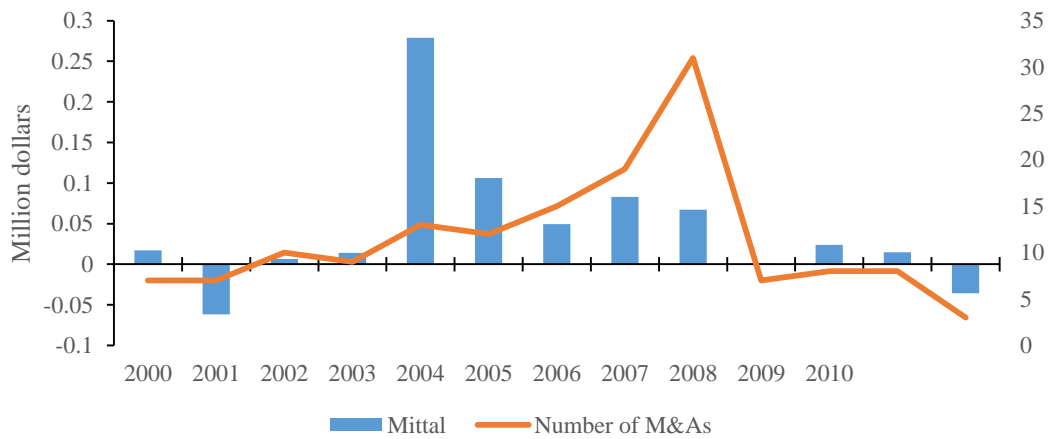
Figure A3. A comparison between the trends of profit margin and merger frequency
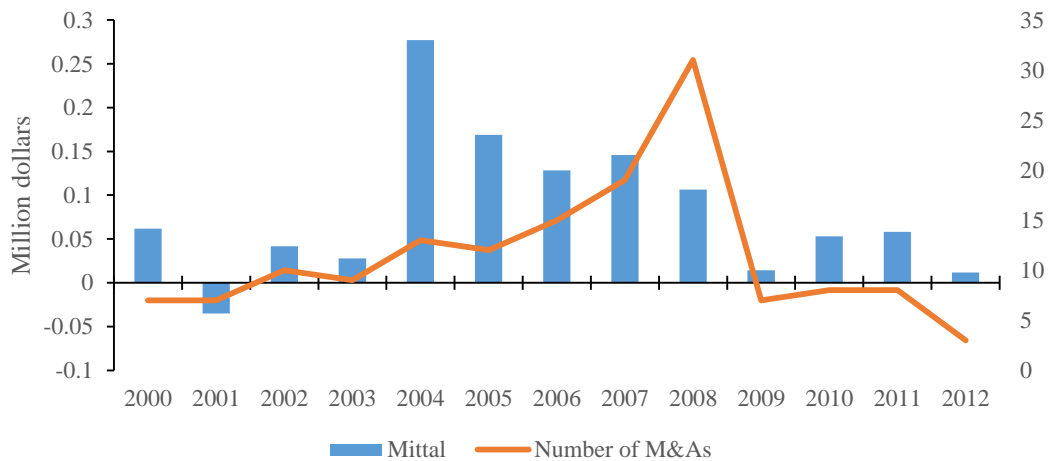
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