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階段性併購與主併企業績效間關係之研究

The Acquirer Performance Following Sequential Mergers and Acquisitions

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致謝辭

在研究所短暫的歲月裡，經歷了許多的成長與歷練，尤其是在論文的寫作過程中，透過不斷的思考與辯證，以及何耕宇教授不厭其煩的指點迷津，學生最後才得以準時完成論文，所以非常感謝何耕宇教授的教誨與指導。另外，也謝謝周冠男、徐之強兩位口試委員給予學生鞭辟入裡的建議，讓學生能夠更清楚掌握論文的寫作脈絡。在撰文的過程之中，也謝謝我的好同學們，如時傑、黃婷、家維、德隆等都給予我很多的幫助與鼓勵。最後，非常感謝我的父母親一路走來始終作為我的心靈支柱，給予我無盡的力量與支持，冠羽才能不畏艱難的面對所有的挑戰。謝謝所有提攜過我的長輩與同儕，也謝謝台大圖書館和管理學院所提供的資源以及對學生的栽培，謝謝大家！

摘要

本文旨在研究階段性併購對於主併企業營運績效的影響。過去關於併購的文獻多著重於併購如何創造企業價值，較少關注於不同的企業併購行為對於企業營運績效的影響。近年來台灣企業採納階段性併購的比例有增加的趨勢，故本文將以實質選擇權理論與資源基礎觀點來分析階段性與一次性併購對於企業營運績效的影響。研究結果顯示，一次性併購對於公司營運績效的影響，在一年期間，優於階段性併購。但如果企業擁有較少的內部資源或負債比例較高，則進行階段性併購將能夠緩和其所帶來的負向異常報酬。而就三年期間而言，階段性併購和一次性併購對於企業營運績效的影響並無顯著差異，故主併者在考量併購行為對於企業一年內營運績效的影響時，應先衡量內部資源的多寡，才能夠極大化併購所創造的企業價值。

關鍵字：階段性併購；異常營運績效；實質選擇權；資源寬裕

Abstract

From the perspective of real option and resource-based theories, this study examines acquiring firms' abnormal operating performance following sequential mergers and acquisition, and explores whether resources affect firms' performance after the acquisitions are completed. Recently, enterprises in Taiwan have taken sequential mergers and acquisitions more often as strategies to expand their business maps. Our results show that sequential acquisitions perform worse than one-time acquisitions in terms of one-year abnormal operating performance. However, for three-year abnormal operating performance, there is no significant difference between one-time acquisitions and sequential acquisitions. In addition, we suggest that acquiring firms with abundant resources or low debt-to-equity ratio should avoid sequential acquisitions, while firms with less resources or limited debt could consider sequential acquisitions as strategies to enter into new markets or new business fields.

Key Words：Sequential Acquisitions, Abnormal Operating Performance, Real Options, Organizational Slack

Content

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Chapter 1 Introduction

There is a stream of finance research focusing on the performance of firms involved in mergers and acquisitions (M&As). Studies related to stock abnormal returns following a takeover announcement have reached a consensus that target firms' shareholders benefit from the M&As. Nevertheless, acquiring firms' shareholders may incur negative returns (Agrawal, Jaffe and Mandelker, 1992; Gregory, 1997) or neither gain or loss from M&A events (Frank, Harris, and Titman, 1991).

Moreover, if the combined equity value increases as a result of the takeovers (Jensen and Ruback, 1983), it is still difficult to recognize whether the equity value increases in takeovers are from real economic gains or market inefficiencies. Therefore, some scholars have suggested using accounting indexes to measure firms' post-takeover performance (Healy, Palepu, and Ruback, 1992).

Current studies have already focused on the determinants and consequences of M&As. For example, scholars have stated that synergies can result from knowledge-transfer process, social networking, and more resources gaining from target firms. Bresman, Birkinshaw and Nobel (2009) state that knowledge management is more important for firms to maintain their competitive advantages than before. The acquirers can reinforce their knowledge base through the knowledge-transfer process during acquisitions, thereby helping acquirers to expand into new markets rather than competing in the originally competitive market. In addition, Kiessling and Richely (2005) mention that synergy can stem from acquiring intangible assets such as social networking. When company acquires the target firm for its network and relationship, it sends a signal that the firm must believe it could generate more value through the network or relationship than others, or its acquisition move would be meaningless (Wernerfelt, 1984).

There are still more studies discussing the rationale behind M&As. Williamson

(1973) brings the transaction cost theory to indicate that the purpose of taking acquisition is to minimize the sum of production and transaction cost. Also, from the resource-based view (Wernerfelt, 1984), a firm can maximize its value by obtaining target firm's valuable resources through acquisition (Madhok, 1997; Das and Teng, 2000).

Nonetheless, prior studies seem to ignore the impact of different types of M&A behavior on firm's post-takeover performance, since there has been a trend for firms to take sequential acquisitions rather than one-time acquisitions. Therefore, we will focus on this issue and employ the real option theory to try to explain this phenomenon.

Companies consider taking sequential acquisitions for several reasons. On the basis of real option theory, by acquiring fractional shares of the target firm, the acquirer can obtain more internal information than outsiders. Accordingly, transforming into an insider of the target firm eliminates downside risks of asymmetric information situation. In other words, if the acquirer finds out the target is an unfavorable investment, it can stop investing more, thereby avoiding a huge sum of loss than one-time acquisition's costly exit in the bad-state situation.

Consequently, enterprises can take sequential acquisitions as real option for them to eliminate the downside risks through partial acquisitions of shares. In contrast, if target firms' performance are getting better than they have expected before, they can continuously invest in the targets with lower potential downside risks because they already obtain more information through the process and eventually merge all of them. Because of the above consideration, we would like to compare whether different M&A behavior will have an influence on the post-takeover operating performance based on real option theory in this research.

More specifically, we believe sequential acquisition as a role to help reduce potential downside risks and preserve the opportunity for future growth of target firm. In contrast,

one-time acquisition enables the acquirer to obtain new resources such as information, knowledge, and social networking at one time, and to combine these new resources with their own to create the synergy. In consequence, whether sequential or one-time acquisition will improve more of the firm's performance is what we concern.

Precedent studies research on this issue, however, have not reached an agreement. Jiao (2010) investigates this topic with samples in China industry and claims that firm's operating performance of one-time acquisition is better than sequential acquisition. In contrast, Lee (2011) uses the pharmaceutical industry data in the U.S and states that taking sequential acquisition is better for the firm's operating performance than one-time deal. Still, Chang (2012) has consistent findings with Lee (2011) when using pharmaceutical industry data in Europe, claiming that sequential acquisition is better than one-time deal. Nevertheless, previous studies consider merely acquirer's operating performance without matching a comparison group to determine the acquirer's abnormal operating performance. As a result, it is worthwhile to figure out the relationship between M&A behavior and the firm's operating performance under a more appropriate measurement structure.

In conclusion, acquirers taking sequential M&As have worse abnormal operating performance than one-time deals in one-year measurement, while the negative effects of taking sequential M&As will be alleviated when firms have less resources or higher debt-to-equity ratio. On the other hand, there is no significant difference between sequential and one-time M&As when we measure the three-year abnormal operating performance.

This study is then organized as follows. The next chapter gives a review of previous literature and the development of hypotheses. Chapter 3 describes data and methodologies. Chapter 4 presents the empirical results related to abnormal operating performance of acquiring firms. Finally, Chapter 5 provides the conclusions and suggestions.

Chapter 2 Literature and Hypotheses Development

We now discuss M&A studies in order to develop our hypotheses. First, we review strategic studies of M&A motivation for acquiring firms and empirical evidences of operating performance to develop the Hypothesis 1. Then we derive our Hypotheses 2a, 2b and 3 about M&A behavior and operating performance on the basis of real option theory and resources-based theory.

2.1 Abnormal Operating Performance Following Mergers and Acquisitions

Research on firm's stock returns following M&As have already reached a consensus that much of the gains accrue to shareholders of the target firm. Acquiring firms' shareholders incur negative returns (Agrawal et al., 1992; Gregory, 1997) or neither gain or loss from M&A events (Frank, Harris, and Timan, 1991). Besides, if the combined equity value increases due to the takeovers (Jensen and Ruback, 1983), it is still difficult to recognize whether the equity value increases in takeovers are from real economic gains or market inefficiencies (Healy, et al, 1992). Therefore, some scholars suggest using accounting indexes to measure firms' post-takeover performance, thereby forming a second important stream of M&A research on firm's operating performance.

However, operating performance empirical evidences using accounting measures do not reach an agreement on the effect of acquisitions. Some scholars report losses, for example, Ravenscraft and Scherer (1987) find out a significantly negative relationship between operating ROA and tender offer activity. They study 471 acquirers between 1950 and 1977 that firms with tender offer activity are 3.1% less profitable than firms without the M&As, *ceteris paribus*. While other scholars report gains for acquiring firms such as Healy, Palepu, and Ruback (1992). They choose 50 largest U.S. mergers between 1979 and mid-1984 to study the post-takeover performance, using industry performance as a

benchmark.

In terms of strategic management perspectives to review the M&A rationale, the motivation can be classified into three dimensions, i.e., personal, economic and strategic reasons. Certain companies take M&As for management's own purpose and not for companies' benefits. Others attempt to solve problems due to economic downturns. Still others take M&As out of strategic reasons, aiming to enlarge market share or to improve the company's sales. Additionally, some researchers indicate that firms are capable of creating additional value through the procedure of acquisitions. Kiessling and Richey (2005) introduce the social networking theory to account for that value is generated by additional network relationship obtained from the target firm. Despite M&As are often referred to as failure regarding the post-performance measure derived from financial statements, these firms believe that acquiring target firms may provide more value through integrating target firms' social network relationship. And this value enables the acquirers to expand their client bases and to obtain more information regarding the entire industry which could not be demonstrated on the financial statements analysis.

Furthermore, according to the resource-based view, Das and Teng (2000) point out that firms can enhance their competitive advantages through efficient management and acquiring valuable resources from their competitors. James (2002) for example illustrates the procedure of value creation from obtaining critical resources in pharmaceutical industry according to the resource-based view.

For transaction cost theory, firms can determine whether they should do a vertical integration through examining asset specificity, uncertainty, and transaction frequency (Rindfleisch and Heide, 1997). By comparing the opportunity costs and direct transaction costs, companies tend to make an optimal decision on the minimum cost. In this way, firms can maximize their value.

From the view of knowledge-based theory, scholars suggest the most important resource in a firm is knowledge (Grant, 1996), thus claiming that the primary task of management is to establish the coordination necessary for knowledge integration. Bresman et al. (2009) also elaborates the value creation process of knowledge-transfer during M&As.

In general, companies take acquisitions based on economic benefits or strategic motivation, while empirical work shows inconsistent evidences of abnormal operating performance for the acquiring firms. Therefore, we derive our Hypothesis 1 to test whether there is abnormal operating performance after the M&As for acquiring firms.

H1: There is abnormal operating performance for acquiring firms compared to non-acquiring counterparts.

2.2 The Real Options Theory and Sequential Mergers and Acquisitions

The real option perspective has been extensively applied in various fields in recent years. For instance, researchers utilize this view into joint venture and indicate that when firms expands into a new market with uncertainty, joint venture is a sort of commonly adopted strategy (Balakrishnan and Koza, 1993; Reuer and Koza, 2000). Joint venture ensures that the acquiring firm does not get involved too deeply in the new market. It is also similar to the concept of buying call option and the toehold investment.

A toehold investment following Zardkoohi's (2004) view means acquiring firm merely purchases fractional shares of the target firm instead of taking over it at one time. This acquisition pattern is called sequential acquisition. Further, Xu, Zhou, and Phan (2009) define sequential acquisition with discretion that a block-share transaction is one that acquire 5% or more of share at one time, and the acquirer should own more than 50% of the target's shares during the period of research. This sequential mode implies that the acquirer takes over the target firm by purchasing shares partially each time, so they are

capable of obtaining more information of the acquired firm to eliminate the downside risk of uncertainty and still keeps the infinite profits simultaneously.

Xu et al. (2009) then propose to apply this theory into M&A behavior. They claims that firms can generate value through sequential acquisition mode to reduce the negative effects incurred by asymmetric information because they can become an insider from outsider through the toehold investment. In their research, they provide evidences that private firms relatively lacking of sufficient information concerning the target firms tend to use sequential acquisition as their strategy to take over the target. In doing so, they can create real options to reduce the risk of uncertainty by obtaining more firm-specific information and thus to enjoy a better real option value. Nevertheless, they don't further discuss whether sequential acquisition or one-time acquisition generates better performance for firms in M&As.

From the view of real options theory, firms should consider taking sequential acquisition instead of one-time deal mainly to eliminate uncertainty (McGrath and Nerkar, 2004; Jiang et al., 2009; Xu et al., 2009). When firms are confronted with the decision on how to acquire a target, the existence of uncertainty may lead to different outcomes. As it is difficult to evaluate the future situation, firms can defer the decision time later until the occasion turns out to be clearer. According to this logic, when firms acquire a target firm, they face three options. First, they can decide whether to acquire the target firms at one time. Second, reject the M&A opportunities. Third, they can take sequential acquisitions which creates a call option on the target firms' performance.

The last option is also called growth option (Kumar, 2005; Tong and Reuer, 2007) since the value of option is based on the growth opportunity of the target firm. When firms expand their business through M&As, they firstly decide whether to take one-time acquisition or sequential acquisition. If one-time acquisition is chosen, then the outcome

is irreversible since it makes no change to the situation. On the other hand, if sequential acquisition is chosen, it creates a real option that defers the decision-making procedure until the situation becomes clearer by making a toehold investment. If later the external situations become favorable, the acquirer can exercise the option and benefit from the growth opportunity of the target firm. In contrast, if the condition turns out to be unfavorable such that this investment case is not worthwhile any more, the acquirer still can avoid the enormous sunk cost to exit than one-time acquisition.

In result, the real option theory explains why acquiring firms could enjoy more profit or better performance by sequential acquisition. For one thing, the acquiring firm could delay the acquisition of a target firm until it gains sufficient information to invest further when the target is growing up fast. For another, if the target's performance deteriorates and the acquirer wants to exit, then the maximum loss would just be equal to the toehold investment, compared to the enormous loss incurred by one-time acquisition. Accordingly, making a toehold investment or taking sequential acquisition is similar to buying a call option for the acquirer, and it can exercise it when the situation is favorable to itself. Moreover, there is no time limit on the real option compared to the financial options, so it can create more value because of the unlimited time.

Because the real option gives the acquiring firm a choice to reduce the downside risk, we expect firms taking sequential acquisition performs better than one-time acquisition. Prior studies provide the empirical results to support the superior performance of sequential acquisition (Tong and Reuer, 2007; Jiang et al., 2009; Chang, 2012). Therefore, we derive our Hypothesis 2a based on this logic that there is significant abnormal operating performance for acquiring firms compared to non-acquiring counterparts.

H2a: Abnormal operating performance following sequential acquisitions is better than that following one-time acquisitions.

Nonetheless, one-time acquisition could still have its advantage over sequential acquisition, thereby we introduce the resource-based theory below to find the benefits one-time acquisition can obtain.

2.3 The Resource-Based Theory and One-time Mergers and Acquisitions

In the strategic management field, the most widely used perspective on M&As is the resource-based theory (Wernerfelt, 1984; Rumelt, 1984; Barney, 1988, Dierrickx & Cool, 1989; Kunc and Morecrodft, 2010). Firm resources consist of all assets, capabilities, organizational process, information, and knowledge. Wernerfelt (1984) indicates that a company is like a broad set of resources and not only comprised of the products it owns. Das and Teng (2000) also states that the resource-based view puts an emphasis on the analysis of various resources owned by a firm, in that many resources are firm-specific and not perfectly mobile or imitable. Consequently, in order to gain more competitive advantages, which result in abnormal returns or economic rents, firms are willing to sustain its resource heterogeneity.

Barney (1991) believes that enterprises owing heterogeneous resources could achieve better performance, he also claims that there are two assumptions behind the resourced-based theory. Firstly, firms within the industry may be heterogeneous with respect to the resources they control. Secondly, the resources may not be perfectly mobile across firms, and therefore heterogeneity can be durable and enable the firm to attain superior performance for a long period of time. Vorhies, Morgan and Andy (2009) also applies resource-based view to point out that a firm's operating performance is contingent on the procedure of capability building based on accumulated resources. Terziovski (2010) mentions the relationship between a firm's innovative practice and the performance among the small and medium firms in manufacturing sectors. Since the resource-based theory is widely used in research, here we follow previous scholars and employ this view

in our paper to support our ideas.

In addition, Kumar (2005) indicates that the company's performance will be negatively affected in lights of real options view. In this way, we try to look at another effect which may erode the benefits following sequential acquisitions. Because the firm does always face risk even though without the real option, they should already consider carefully all possible risk they would encounter before they make moves. That is, companies should be well prepared for any possible circumstances. For firms taking the one-time acquisitions, they should be well prepared to face any possible risks. In contrasts, for firms taking the sequential acquisitions, they are either not well-prepared or unable to evaluate possible risks in advance. In consequence, they are destined to have inferior performance by this motivation behind this behavior.

Besides, based on the resource-based theory, firms obtaining more resources can build up and sustain their instinct competitive advantages (Barney, 1991). Through one-time acquisitions, the acquiring firms can obtain all the resources from the target firms, including physical capital resources, human capital resources, and organizational capital resources. So there is a belief that one-time acquisitions allows the firms to obtain more resources than sequential acquisitions. Barney (1991) claims firms with more resources can achieve superior performance by implementing their own strategies and fully exerting their capacities to sustain their competitive advantages. In addition, M&As can bring synergy to the acquirers and realize in future that can improve the firms' future performance (Chatterjee, 1986: Brush, 1996; Carpon L., 1999). In comparison to firms which take sequential acquisitions without fully controlling the targets, they can merely exert their capabilities with partial resources, thereby leading to inferior performance. From this considerations, we form Hypothesis 2b that abnormal operating performance following one-time acquisitions may outperform sequential acquisitions.

H2b: Abnormal operating performance following sequential acquisitions is worse than that of one-time acquisitions.

2.4 Moderating Effect of Organizational Resources on Operating Performance

Because different M&A behavior may have different effects on the firm's acquisitions, we further discuss how organizational resources can moderate or affect the firm's post-takeover performance before we continue to report the empirical results. Bourgeois (1981) states that the capability to adapt to dramatic changes in the environment is frequently linked to the absorption mechanism termed organizational slack. According to Bourgeois' definition, organizational slack is a cushion of actual or potential resources available for a company to accommodate itself to internal pressure to external changes. Firms with more slacks are easier to make a change caused by the environment.

Slack resources in an organization play important roles, it helps to resolve conflicts and the problems within the organization can also be solved with sufficient slack. Moreover, slack can be employed as a buffer to isolate the technical core of the firm from external turbulences. Eventually, slack may act as a facilitator of strategic behavior, which enables the firm to implement new strategies. Although studies based on agency theory argue that organizational slack will have negative effects (Jensen and Meckling, 1976; Sappington, 1983). Consistent with this view, firms with lower leverage or higher organizational slack will have worse performance. In contrast, in terms of financial distress view, Opler and Titman (1994) use sales growth and market share as proxies of performance and find that there is a negative and significant relationship between firm performance and financial distress. Also, Andrade and Kaplan (1998), the higher the firm's leverage, the higher its probability of financial distress.

Accordingly, when firms proceed with M&As, there are still problems which may

encounter the process of resources integration. When the acquiring firm has to integrate the resources acquired from the target, it always faces internal conformity costs (Rosenzweig and Singh, 1991; Slangen and Hennart, 2008). This issue is relevant to the internal resources available for the company, different M&A behavior, and also the firm's performance. We measure the amount of organizational resources with an opposite index that previously research uses — debt-to-equity ratio (Hambrick and D'Aveni, 1988, Bromiley, 1991). The higher the ratio, the fewer resources available for a firm. With fewer resources in the firm, it is more limited and inflexible to manage the internal conformity costs. In contrast, the higher the organizational slack, the more buffer of slack for acquirer to integrate the new resources it obtains from takeover, thus the relationship between acquisition behavior and performance should become more significant.

Since researchers followed by resource-based theory are convinced that the benefits of slack resources outweigh its costs (Sharfman, Wolf, Chase and Tansik, 1988), we derive the third hypothesis in this study through the above logic. That is, the greater the slack within the firm, the better performance of the acquiring firms after M&As.

H3: Acquirers' post-takeover operating performance improves with more organizational slack.

Chapter 3 Data and Methodology

3.1 Data

The data for the empirical tests are obtained from Securities Data Company (SDC) M&A database and Taiwan Economics Journal (TEJ) database. The former is mainly searched for the M&A events taking place from 2000 to 2009 in Taiwan excluding financial industry events. The latter contains detailed information including all the financial statements and figures of companies in Taiwan. There are 297 M&A events

collected from SDC database after setting the constraints for Taiwan acquirers to own more than 50 percent of shares after transaction. In addition, we delete some samples we couldn't obtain their financial figures of firm performances in the period of the events since we have to analyze their operating performance.

From the above procedure, we construct a sample of 142 cases of complete acquisitions, which are categorized into two major groups. The first is the one-time acquisition, in which the acquirer purchases 100% shares of the target firm through one transaction at one time. Second is the sequential acquisition, in which acquirer purchases the target firm's shares at least 5% in each transaction through at least two times and own over 50% in the end. According to Xu (2009), the time of a two-step sequential acquisition is set at the year before the first purchase. For a three-step sequential case, two observations are included in the sample and thus the time is set at the year before the first and second transactions respectively. Among our observations, 95 cases belong to one-time acquisitions and 47 belong to sequential acquisitions of the whole sample, while in three-year data, due to lack of financial figures at the end of third fiscal year, the observations decrease from 142 to 130, which sequential acquisitions account for 30.77% (40 of 130) and one-time acquisitions account for the rest of the samples (90 of 130).

3.2 Methodology

Ever since Barber and Lyon (1996) evaluate the accounting-based methods to measure firm's performance, many scholars adopt industry, size, and pre-performance based matching. For instance, in Loughran and Ritter (1997), firms are matched by using the following criteria: 1) 2-digit SIC, assets within 25%-200%, closest EBITDA/assets and 2) if there is no match, assets within 90%-110%, closest but higher EBITDA/assets. Ghosh (2001) then selects firms by the same 2-digit SIC code, total assets between 25% and 200%, and closest ratio of operating cash flow to market value of assets (sales). Also, Powell and Stark (2005) choose

their matched firms with an initial size between 25% and 200% within the acquiring firms and targets industries.

Hence, in order to compare with previous studies, we take recommendations of Barber and Lyon (1996) to derive our matching approach, which is similar to the methodology employed by Loughran and Ritter (1997) and Ghosh (2001). We construct our benchmarks with the following initial criteria:

3.2.1 Calculation of Abnormal Operating Performance

The notation $PE_{i,t}$ here is the operating performance of event firm *i* in year *t*. The operating performance of matched firms *i* in year *t* is $PM_{i,t}$

We define the firms' abnormal operating performance as difference between performance of event firms and matched firms. Thus, the abnormal operating performance of firm *i* in year *t*, $A(PE_{i,t})$ is:

$$A(PE_{i,t}) = PE_{i,t} - PM_{i,t} \quad (1)$$

In addition, we use a change model as Barber and Lyon suggest to calculate the change of abnormal performance of a firm from year *t* to the subsequent period *t+n*. $PE_{i,t+n}$ is defined as the operating performance of event firm *i* in year *t+n*, while $PM_{i,t+n}$ is operating performance of matched firms *i* in year *t+n*. Change of abnormal performance from year *t* to year *t+n*, $\Delta A(PE_{i,t+n})$ is:

$$\Delta A\left(PE_{i,t+n}\right) = \left(PE_{i,t+n} - PM_{i,t+n}\right) - (PE_{i,t} - PM_{i,t}) \quad (2)$$

We then divide our time span according to firm performance into two types: one-year performance, and three-year performance. Also, we match the acquiring firms with matched firms without undertaking M&A activities in the same event periods. Further, we choose similar firms as comparison group rather than using industry performance to narrow down the size difference between acquiring firms and their counterparts. To elaborate more in detail, we apply three filters to our comparison group: industry, size,

and book-to-market ratio.

First, we contain all firms in the same industry (defined by TEJ industry groups) as acquiring firm *i* in year *t* (M&A year), excluding firm *i*. Firm *i* is matched to other firms with book value of total assets within 70%-130% which yields the well-specified test statistics in sampling (Barber and Lyon, 1996). However, if there is no match, we will release the range to 25%-200% as Powell and Stark (2005). Second, we sort the firms in the same industry by size, which is measured as book value of total assets, and use in year *t*-1 so that matched firms can be held constant over time. Finally, we select the matched firm whose year *t* book-to-market ratio is closest.

Studies have adopted various proxies to evaluate abnormal performance such as value of growth options (VGO) (Tong, Reuer and Peng, 2008; Lee, 2011), earnings per share changes (Iyengar and Zampelli, 2009), and return on assets (ROA) since it is widely used to measure operating performance (Lin, Yang, Arya, 2009; Morgan, Vorhies, and Mason, 2009). In this paper we use the return on sales (ROS), which is the ratio of operating income to sales, to measure the firm's operating performance.

The reason we choose ROS as our index is because it overcomes some drawbacks of other indexes pointed out by Barber and Lyon (1996). In their research, they favor the use of operating income since indexes such as earnings per share (EPS) can be easily affected by the accrual methods of interest expense, special items, income taxes, and minority interest. Also, researchers studying corporate events that result in changes in capital structure (for instance, M&As). These changes influence interest expense and earnings, but leave operating income unaffected. Hence, they believe operating income is a cleaner measure than earnings of the productivity of operating assets.

Moreover, scholars also indicate the drawbacks of return on asset. One is that the total assets on a company's balance sheet are recorded at historical cost, while operating

income is recorded in current dollars. Second, ROA index would be lower in that the recent acquisitions are reflected on the balance sheet in near-current dollars.

Consequently, we adopt ROS as our index to measure operating performance, although it still has some disadvantage that it does not directly measure the productivity of assets, meaning that if a firm's sales and operating income both increase proportionately, its ROS could have no change even if its asset base increases through acquisitions. But since both of the numerator and denominator of ROS are from income statement and thus in current dollars, it could be more appropriate as a measure.

3.2.2 Multivariate Regression

We employ a similar measurement of sequential acquisitions as Xu et al. (2009), except that all firms can acquire fractional shares of the targets for more than two times instead of only two or three times. Then we control several variables that might affect firm's operating performance. The multivariate regression formula is:

$$\Delta A\left(PE_{i,t+n}\right) = \alpha + \beta_1 \times D_{SeqMA} + \beta_2 \times Slack_i + \beta_3 \times D_{SeqMA} \times Slack_i + \beta_4 \times D_{BusRel} + \beta_5 \times D_{Offer} + \beta_6 \times D_{Attitude} + \beta_7 \times D_{GD} + \beta_8 \times Size_i + \beta_9 \times ROA_i + \beta_{10} \times Tech_i + \varepsilon_i \quad (3)$$

We classify the M&A behavior into sequential acquisition or one-time acquisition, with the former measured by dummy variable: D_{SeqMA}. An acquiring firm is coded 1 if it acquires of stock percentage of the target for over 50% through two or more time transactions (hence defined as a sequential acquisition) (Xu et al., 2009). On the other hand, a buyer is coded 0 if it acquires 100% stock of the target through a one-time transaction (hence defined as a one-time acquisition). Among all the samples, there are 47 sequential acquisitions and 95 one-time acquisitions.

With the resource-based theory and potential effect of financial distress on firm performance, we include organizational slack as part of our independent variables.

According to Bourgeois and Singh (1983), slack can be divided into three categories: available, recoverable, and potential slack that differentiate the extent to which resource are available (Hambrick and D'Aveni, 1988). Bromiley (1991) then employ indicators of each kind of slack. A firm's current ratio (current assets divided by current liabilities), represents available slack, and selling, general, and administrative expenses divided by sale (SG&A/sales) represents recoverable slack. There are two measures for potential slack: the debt-to equity ratio and the interest coverage ratio (income before taxes and interest charges divided by interest charges). Companies with high debt-to-equity ratio have relatively lower ability to obtain additional funds through incurring debt and thus has little potential slack. In contrast, companies with larger income relative to interest charges have better ability to take on additional debt than a corporation with lower income.

Here we adopt the potential slack: $Slack_i$, which is measured by debt-to-equity ratio for our moderator variables. Debt-to-equity ratio can refer to the firm's lone-term capability. A firm's financial structure will influence its M&As behavior. Firms with lower debt ratio can raise more funds when they need to undertake acquisition. There is also more capacity for a company with lower debt ratio when conformity cost happens after acquisition. Because available slack is a short-term index, we suspect the debt-to-equity ratio will have a better explanatory effect than current ratio, since the former is more important to consider than the latter during acquisition, and can be a determinant factor regarding whether the company have enough fund and flexibility to acquire another company.

Moreover, M&As for diversification tend to perform worse than the related M&A (Berger and Ofek, 1995; Maquieira et al., 1998), thus we control business relatedness, D_{BusRel} , measured by dummy variable and coded 1 if the first two digits of SIC code of the acquirer and target are different, coded 0 otherwise. Attitude, $D_{Attitude}$ is coded 1 if

the acquisition type is not a friendly takeover, otherwise 0. Tender offer is structured as a take-it-or-leave-it proposal, directly to the target firm shareholders. Several studies report larger announcement returns to bidders in tender offers, as compared with friendly negotiated transactions. Sudarsanam, Holl and Salami (1996) also state that hostile takeovers could bring more value both to acquirers and target firms. Payment method, D_{Offer} , coded 1 if the payment is entirely or partly in cash, otherwise 0. Scholars have found that transaction on cash could bring better performance to the firm compared to fully stock transaction (Asquith, Bruner and Mullins, 1987; Huang and Walking, 1987; Travlos, 1987; Grullon et al., 1997; Louis, 2004). Geographical diversification, D_{GD} , is coded 1 if the acquirer and target are in the same industry, otherwise 0. It is expected that value creation is greater in domestic operations than in different countries from the elimination of redundant costs by geographical overlapping (Houston and Ryngaert, 1994). Firm size, $Size_i$ is measured by the natural logarithm of total assets one year before the M&A event. Large size often brings economies of scale or scope that may be difficult to imitate (Roberts and Dowling, 2002). Prior performance of the acquirer, ROA_i is measured by the return on asset one year before, which might have an impact on current performance. We also take into account technological intensity, $Tech_i$, by the ratio of R&D expenses divided by total sales, as considerable R&D costs can be saved by acquiring target firms, thereby leading to superior operational performance (Dikova and Witteloostuijin, 2007). We summarize all variables definition in Table 1.

Chapter 4 Empirical Results

4.1 Descriptive Statistics

We classify our observations into two groups to describe their characteristics. Table 2 shows the distribution of one-time acquisitions and sequential acquisitions during the

sample period. In our sample, 95 (66.90%) events are classified as one-time acquisitions, while 47 (33.10%) events are sequential acquisitions. Sequential M&As in Taiwan frequently occurs in 2009, which accounts for 29.79% (14 of 47) of the overall sequential acquisition events and 66.67% (14 of 21) of the whole sample in 2009.

In Table 3, we then summarize the whole sample's descriptive statistics of the independent variables, including means, mediums, standard deviations, minimum, and maximum values.

4.2 Abnormal Operating Performance Following Mergers and Acquisitions

For the purpose of comparing the abnormal operating performance of sequential acquisition with one-time acquisition, we first include some control variables in Model 1. Then we further include the dummy variable of sequential acquisition in Model 2 to check how the acquisition behavior influences firm's operating performance. In Models 3 and 4, we add potential slack as the moderator variable, in order to test whether the moderating effect of organizational slack is powerful enough to strengthen or weaken the relationship between acquisition behavior and firm performance.

4.2.1 Univariate Analysis

Based on the Table 5 (one year) and Table 6 (three years), there are no significant supports to our Hypothesis 1, which means there is probably an absence of abnormal operating performance for acquiring firms when undertaking mergers and acquisitions. In addition, we do the two-sample *t* test both in one-year and three-year periods to test if there are difference of abnormal operating performance between two groups we have classified. Tables 5 and 6 show that there could exist no difference of abnormal operating performance between the sequential acquisitions and one-time deals, since the statistical results of mean difference are not significant.

4.2.2 Multivariate Analysis

4.2.2.1 Direct Effect of One-time and Sequential Mergers and Acquisitions

The relationship between abnormal operating performance and M&A behavior has been tested in Model 4 of Table 7. The one-year result indicates that there exists a negative relationship between sequential acquisition and firm's abnormal operating performance in the short run, and the coefficient in Model 4 is -0.203 with a significant level of p-value lower than 0.1, which supports to our Hypothesis 2b. To the contrary, it does not support to Hypothesis 2a in Model 4. While in three-year models, the relationship between abnormal operating performance and M&A behavior becomes insignificant following results in Models 2 to 4. In all, this finding indicates that enterprises undertaking sequential acquisitions can get a worse performance than one-time acquisitions in one-year period, while in three-year period, M&A behavior could mean no difference to acquirers when making decision to take over the target firms.

4.2.2.2 Moderating Effect of Organizational Slack

In Table 7, we add the organizational slack in Model 3 and also the interaction term of slack and sequential acquisition in Model 4. Our Hypothesis 3 states that organizational slack is positively related to the firm's operating performance. Because higher debt-to-equity ratio implies organizational resources will be limited and inflexible, the firm's performance will be lower. In Model 3 to 4 in both periods, we can find this negative relationship, though it's not statistically significant. However, the coefficient of the interaction term in Model 4 is 0.134 significant with a p-value lower than 0.1, which does not provide a support to our Hypothesis 3 that there exists a moderating effect to improve the abnormal operating performance if acquirers take sequential acquisitions. Consequently, acquiring firms' one-year post-takeover performance of undertaking sequential acquisitions is worse than one-time acquisitions, while the negative effects of

taking sequential acquisitions will be alleviated when firms are with less resources or higher debt-to-equity ratio.

In contrast, firms with more resources should take one-time acquisitions to gain superior performance. Nevertheless, it is only meaningful to the one-year models since the three-year models' coefficients are mostly insignificant, which means that no matter what different levels of resources a firm has, it has no impact on the firm's performance.

We also check the R^2 after adding the interaction term into our models. We only take a look at the one-year model since it is significant. The R^2 increases from 13.45% to 14.88%, showing that there is an improvement of explaining power of this model with the interaction term. The moderating variable plays an important role between the firm's M&A behavior and abnormal performance in one-year measurement, but in three-year measurement, it does not need to be considered.

Chapter 5 Conclusions and Suggestions

Since previous studies haven't reached a consensus of the direction of abnormal operating performance, we continuously introduce real option theory and resource-based view into our study to measure the impact on abnormal operating performance following M&As. Although recent research finds out that firms with information disadvantage tend to take sequential acquisitions, prior works investigate this issue have not adopted the structure of abnormal operating performance to measure the change due to M&A events. Therefore, here we follow Baber and Lyon (1996) and use Taiwan's data to reconsider this issue.

On the basis of resource-based perspective, we believe that firms with more resources or less debt-to-equity ratios are more capable of integrating additional resources obtained from targets, thereby improving the post-takeover performance of the acquiring

firms. Nevertheless, our statistical results do not have a support to this idea, but show a significantly positive coefficient on the interaction term of potential slack and sequential acquisitions in one-year period. Hence, we suspect that if acquiring firms' resources are less or they have higher debt-to-equity ratio, then they may take sequential acquisitions when they face a great deal of asymmetric information problem.

On the other hand, real option theory further explains the value of sequential acquisitions created from deferring the decision time and target firms' unexpected growth. Thus, we are also interested in the influence on abnormal operating performance and sequential acquisitions. In our study, the statistical result does not support this idea. Nevertheless, we still can notice that the sample selection process following the definition of one-time and sequential M&As (Xu, Zhou, and Phan, 2009) may not make a distinction of acquirers which initially only intend to invest in target firms instead of merging the target firms. Besides, the definitions we use to select the samples of one-time and sequential M&As could not contain some firms which abandon the M&A cases, that is, they do not complete the M&A events.

Therefore, even if the result appears to be irrelevant in the relationship of M&A behavior and firms operating performance in three-year period, it is still worthwhile for managers in enterprises to consider the value of sequential acquisitions because the real option from sequential acquisitions have no time limit. Also, it does not require the acquiring firms to further enhance their debt-to-equity ratios to finance the investments.

In practice, Taiwan enterprises sometimes find it difficult to deal with the resources integration after M&As, especially for intangible assets such as human resources, social networking, and knowledge management. Further, the definition of sequential M&As could be more general to consider the events that the acquirers finally decide to abandon the investments or the events that the acquirers originally just invest in target firms instead

of intending to take over the targets. Therefore, it still deserves to investigate this issue further.

In conclusion, with the one-year measurement of abnormal operating performance, acquiring firms with sufficient resources should take one-time acquisitions, but firms with less resources and under serious information asymmetry problem could consider undertaking sequential mergers and acquisitions to control the operating performance one year after M&As.

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Table 1 Summary of Variable Definitions

This table summarizes the definition of variables in multivariate regression. The abnormal operating performance of ROS is composed by $A(PE_{i,t+n})$ minus $A(PE_{i,t})$, which $\Delta A(PE_{i,t+\mathrm{n}})$ represents the difference between ROS of event firms and matched firms. ROS is the proportion of operating income to total net sales at the end of fiscal year. The measurement period n contains one-year and three-year in our study.

Variables		Measurement
Abnormal Operating Performance	$\Delta A(PE_{i,t+\mathrm{n}})$	Abnormal operating performance of ROS in the measurement periods.
Sequential Mergers and Acquisitions	D_{SeqMA}	1 for sequential acquisition ; 0 for one-time acquisition
Debt-to-equity Ratio	$Slack_i$	Total liabilities divided by total equity.
Business Relatedness	D_{BusRel}	1, if the first two digits of SIC codes of acquirer and target are different ; 0,otherwise.
Attitude	$D_{Attitude}$	1, if the acquisition is not a friendly takeover ; 0, otherwise.
Payment Method	D_{Offer}	1, if the acquisition is entirely or partly paid by cash ; 0, otherwise.
Geographical Diversification	D_{GD}	1, if the acquirer and target are not in the same nation.
Firm Size	$Size_i$	Natural logarithm of total assets.
Prior Firm Performance	ROA_i	ROA of the acquirer in the previous year.
Technological Intensity	$Tech_i$	R&D expenses divided by total sales.

Table 2 Distributions of Mergers and Acquisitions by Types and Years

This table shows the frequency distribution of M&A events of acquiring firms in years from 2000 to 2009. All acquiring firms have data on SDC, and M&A data are limited by (1) the transaction is completed, (2) sequential M&A firms should own more than 50% of shares after acquiring the target firms, and (3) one-time M&A firms should own 100% of shares after acquiring the target firms. The percent in each column is defined as the proportion of frequency to the total events in the same group.

	Sequential M&As				One-time M&As				Whole Sample			
Year	Frequency	Percent	Cumulative Frequency	Cumulative Percent	Frequency	Percent	Cumulative Frequency	Cumulative Percent	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2000	0	0.00%	0	0.00%	5	5.26%	5	5.26%	5	3.52%	5	3.52%
2001	4	8.51%	4	8.51%	7	7.37%	12	12.63%	11	7.75%	16	11.27%
2002	3	6.38%	7	14.89%	7	7.37%	19	20.00%	10	7.04%	26	18.31%
2003	3	6.38%	10	21.28%	12	12.63%	31	32.63%	15	10.56%	41	28.87%
2004	3	6.38%	13	27.66%	9	9.47%	40	42.11%	12	8.45%	53	37.32%
2005	5	10.64%	18	38.30%	15	15.79%	55	57.89%	20	14.08%	73	51.41%
2006	5	10.64%	23	48.94%	15	15.79%	70	73.68%	20	14.08%	93	65.49%
2007	5	10.64%	28	59.57%	5	5.26%	75	78.95%	10	7.04%	103	72.54%
2008	5	10.64%	33	70.21%	13	13.68%	88	92.63%	18	12.68%	121	85.21%
2009	14	29.79%	47	100%	7	7.37%	95	100%	21	14.79%	142	100%

Table 3 Descriptive Statistics of Independent Variables

Where D_{SeqMA} represents sequential M&As, D_{BusRel} represents business relatedness, $D_{Attitude}$ represents attitude and D_{Offer} represents payment method. For the other control variables, D_{GD} stands for the geographical diversification, Slack stands for the firm's debt-to-equity ratio, Size stands for the firm size defined as the book value of total assets, and ROA stands for the firm's ROA performance one year before the M&A event. Finally, Tech represents technological intensity as defined in Table 1. The whole sample contains 142 events.

	Descriptive Statistics Measurement				
	Mean	Std. Dev.	Min	Max	Median
D_{SeqMA}	0.331	0.472	0	1	0
D_{BusRel}	0.465	0.501	0	1	0
$D_{Attitude}$	0.070	0.257	0	1	0
D_{Offer}	0.556	0.499	0	1	1
D_{GD}	0.275	0.448	0	1	0
Slack	1.058	0.710	0.101	3.459	0.908
Size	17.099	1.750	12.705	20.581	17.345
ROA	0.057	0.086	-0.340	0.355	0.060
Tech	0.029	0.051	0	0.447	0.016

Table 4 Correlation Analysis of Independent Variables

This table shows the correlation between each of the independent variables, which are not highly correlated. The definition of below notations are the same as defined in Table 1.

	D_{SeqMA}	D_{BusRel}	$D_{Attitude}$	D_{Offer}	D_{GD}	Slack	Size	ROA	Tech
D_{SeqMA}	1								
D_{BusRel}	0.065	1							
$D_{Attitude}$	0.333	0.075	1						
D_{Offer}	-0.005	0.093	-0.087	1					
D_{GD}	-0.131	-0.099	-0.108	0.010	1				
Slack	0.034	0.134	-0.093	-0.010	0.046	1			
Size	0.087	-0.031	0.099	-0.056	0.199	0.059	1		
ROA	-0.043	-0.041	-0.003	0.033	0.004	-0.314	0.155	1	
Tech	-0.155	-0.142	-0.100	0.050	0.018	-0.138	-0.104	-0.235	1

Table 5 One-Year Univariate Analysis of Abnormal Operating Performance

This table exhibits the univariate results of abnormal operating performance, $\Delta A(PE_{i,t+n})$, for the whole sample and M&A behavior groups. Each independent variable is insignificant under 0.1 level of significance, where the numbers in parenthesis are the T-statistics of the variables. The one-year result implies that there is probably an absence of abnormal operating performance for acquiring firms. Further, there is still no significant difference of abnormal operating performance between one-time M&As and sequential M&As.

Group	Mean	Min	Max	Median	N
Whole Sample	0.044	-1.074	2.220	0.029	142
	(1.450)				
One-time M&As	0.058	-1.074	2.220	0.034	95
	(1.340)				
Sequential M&As	0.014	-0.379	0.508	0.026	47
	(0.608)				
Mean Difference	0.044				
	(0.693)				

*, **, and *** denote statistical significance at 10 percent, 5 percent and 1 percent level respectively.

Table 6 Three-Year Univariate Analysis of Abnormal Operating Performance

Table 6 shows the three-year univariate results of abnormal operating performance, $\Delta A(PE_{i,t+\mathrm{n}})$. Each independent variable is still insignificant under 0.1 level of significance, where the numbers in parenthesis are the T-statistics of the variables. The three-year results of the whole sample, each behavior group, and the difference between one-time M&As and sequential M&As are all insignificant.

Group	Mean	Min	Max	Median	N
Whole Sample	0.032	-0.946	0.977	0.041	130
	(1.432)				
One-time M&As	0.034	-0.946	0.977	0.039	90
	(1.131)				
Sequential M&As	0.029	-0.298	0.625	0.041	40
	(0.983)				
Mean Difference	0.005				
	(0.106)				

*, **, and *** denote statistical significance at 10 percent, 5 percent and 1 percent level respectively.

Table 7 Multivariate Regression of Acquirers' Abnormal Operating Performance

Table 7 exhibits the one-year and three-year multivariate regression results of acquiring firms' abnormal operating performance with industry, size and book-to-market ratio matching. The abnormal operating performance of ROS and other control variables are the same as defined in Table 1.

	One Year				Three Years			
	Abnormal Operating Performance $\Delta A(PE_{i,t+n})$				Abnormal Operating Performance $\Delta A(PE_{i,t+n})$			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Intercept	-0.813***	-0.813***	-0.771***	-0.768***	-1.093***	-1.093***	-1.094***	-1.083***
D_{BusRel}	0.0332	0.0336	0.0451	0.0419	0.0412	0.0412	0.0384	0.0398
$D_{Attitude}$	-0.0204	0.00965	-0.0199	0.00338	0.00873	0.0121	0.021	0.0249
D_{Offer}	0.0635	0.0654	0.0651	0.0705	-0.0387	-0.0384	-0.0379	-0.0363
D_{GD}	0.0866	0.0802	0.0838	0.0736	-0.0184	-0.0191	-0.018	-0.0219
Size	0.0443***	0.0455***	0.0488***	0.0513***	0.0605***	0.0606***	0.0579***	0.0583***
ROA	0.583**	0.557*	0.315	0.294	1.209***	1.207***	1.316***	1.299***
Tech	-0.278	-0.347	-0.579	-0.607	0.755	0.749	0.854	0.835
D_{SeqMA}		-0.0542	-0.052	-0.203*		-0.00556	-0.00489	-0.0658
Slack			-0.0784	-0.119			0.0348	0.0193
Slack $*$ D_{SeqMA}				0.134*				0.0546
R-Squared	11.04%	11.48%	13.45%	14.88%	34.73%	34.74%	35.48%	35.90%
Adjusted R-Squared	6.39%	6.15%	7.55%	8.38%	30.99%	30.43%	30.64%	30.52%
N	142	142	142	142	130	130	130	130

*, **, and *** denote statistical significance at 10 percent, 5 percent and 1 percent level respectively.