Changes of Shareholder Wealth Associated with Cross-border Mergers and Acquisitions

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Thesis Summary

This empirical study tests the short-term stock abnormal returns associated with cross-border M&A announcements. Our countries of interest are the US and Japan. This thesis contains three empirical chapters. In the first two empirical chapters, we test the announcement effects of acquirers and targets according to acquirer and target industry characteristics and deal characteristics. We find that the factors that explicitly related to synergistic effects show significant explanatory power for the abnormal returns. In contrast, the explanatory power of the factors that are associated with agency motive tend to be mixed. In the third empirical chapter, we test the explanatory power of acquirer and target financial characteristics to the announcement returns. We find that some of the variation in the abnormal returns can be explained by the financial characteristics of the firms.

Our test provides several contributions to the M&A literature. Firstly, we show that investors are more likely to be influenced by multiple factors in response to M&A announcements. In addition, investors can have inconsistent interpretation to the same information. Secondly, we employ F-F-C four-factor CAPM that has less misspecification problems for our test compared with the standard CAPM. Also, we use the adj. BMP t-statistic to overcome the potential upward bias associated with the BMP t-statistic. Inconsistent with previous studies, we find that cross-border M&As do not always generate positive ARs for acquirers. Finally, we find that the market shows inconsistent reaction to the M&A announcements made by the US and Japanese acquirers. However, when we control for the deal characteristics and financial characteristics of acquirers and targets, we find some common patterns of the abnormal returns.

Keywords: cross-border M&As, shareholders' wealth, deal characteristics, financial characteristics, short-term event study.

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List of Abbreviations

CAPM	Capital Asset Pricing Model
F-F-C	Fama-French and Carhart
OLS	Ordinary Least Square
ARCH	Auto-Regressive Conditional Heteroskedasticity
GJR	Glosten, Jagnnathan and Runkle
GARCH	Generalized Auto-Regressive Conditional Heteroskedasticity
BLUE	Best Linear Unbiased Estimator
ARs	Abnormal Returns
SARs	Scaled Abnormal Returns
CARs	Cumulative Abnormal Returns
SCARs	Scaled Cumulative Abnormal Returns
M&As	Mergers and Acquisitions
ICC	Increase of Corporate Control
BMP	Boehmer, Musumeci and Poulsen
adj.BMP	Adjusted BMP test

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Chapter One

Introduction to the Thesis

1.0 Introduction

In the recent decades, cross-border mergers and acquisitions (M&As) has become an important form of foreign direct investment. The number of cross-border M&As has increased substantially from 3,442 in 1990 to 10,044 in 2015, and the annual transaction value increased more than 600% from 98 billion to 721 billion US dollars during the time (World investment report, 2016).

Conceptually, as domestic M&As, cross-border M&As create value by: 1) reallocating operate assets towards their best possible use, and 2) increasing the operating efficiency of scale and scope. However, this concept only holds under rational conditions, and the concept cannot explain value destroying M&As commonly observed by previous researchers. Therefore, agency cost and management hubris have been used to explain the negative market reaction around M&A announcements and the poor performance of newly acquired firms (see, e.g., Jensen, 1986; Roll, 1986; Berkovitch and Narayanan, 1993; Seth et al., 2002).

Compared with domestic M&As, cross-border M&As are more likely to create value due to: 1) the segmentation across markets, 2) the differences in regulatory arrangements across countries, and 3) the function of reducing cost of capital by lowering production cost asymmetry and risk-sharing (see, e.g. Houston and Ryngaert, 1994; Harris and Ravenscraft, 1991; Hagendorff et al., 2008). At the same time, the difficulties of corporate control and information asymmetry associated with the geographical distance as well as culture distance can add substantial costs to cross-border acquirers (see, e.g. Buch and DeLong, 2004; Rossi and Volpin, 2004; Hwang,

2011; Erel et al., 2012).

Due to the increase in potential risks and value creation opportunities, it is important to test the effectiveness of domestic M&A theories in the cross-border M&As. In addition, cross-border M&A also challenges investor's perception of foreign investment opportunity value, given the long geographic and culture distance. Thus, the cross-border M&A study also provides a good platform to test market efficiency. While a considerable number of cross-border M&A studies have been published in the last decade, our understanding of the factors that determine the change in shareholders wealth is still limited. As Bris and Cabolis (2008) documented, the difference between the cross-border M&As and domestic M&As is still not well understood by researchers.

In addition to the limited understanding of the cross-border specific factors, we also argue that the M&A research discipline is still immature. There are two important limitations in prior studies. Firstly, the result of M&As can normally be explained by multiple theories. For instance, both synergistic effect (see, e.g. Sharma and Ho, 2002; Lambrecht, 2004) and market for corporate control (see, e.g. Hagendorff et al., 2008; Aggarwal et al., 2011) have been used to explain the positive abnormal stock returns around domestic M&A announcements. However, the previous studies have not provided a comprehensive justification for the determinants of M&As. This problem also creates room for selective use of theories. Secondly, some previous studies bind each explanatory variable with a single interpretation. However, the indication of variables can be significantly influenced by market environment and economic structure. For instance, Jensen (1986) and Masulis et al. (2007) use the free cash flow as a determinant of management entrenchment. They suggest that excess cash holding can incentivise managerial power and thereby introduce high agency costs in the M&A deals. However, McConnell and Servaes (1995) suggests that the effect of free cash flow should be assessed based on the external investment opportunity as excess cash

holding can prevent underinvestment when the market is growing.[1]

These two limitations (amongst others) suggest that alternative explanations are needed for the results associated with cross-border M&As. Furthermore, when we compare the inconsistent results from previous studies, we cannot always determine whether the inconsistencies are due to the selective use of certain theories or the different underlying features of the data. In addition, the inconsistent methodologies used in the previous studies further increase the difficulty to compare the evidence provided in previous studies. For instance, Travlos (1987) finds that cash payment results in higher abnormal return to bidders. He argues that cash payment reduces the free rider problem. Harford et al. (2012) find that bidders experience higher abnormal returns when they use equity to finance M&As. The result indicates that the equity payment can be a sign of low agency cost. Thus, even though previous M&A studies provide rich evidence and theories in explaining investor behaviour associated with M&A announcement, the inconsistent use of methodologies, and the selective use of theories mean that a systematic study is needed. For this reason, we are motivated to provide a study that empirically and systematically examine the investor behaviour in cross-border M&As.

1.1 Research objectives

Section 1.0 introduced several issues surrounding the previous M&A studies. In order to address the weaknesses in previous studies, this study is designed to serve the following purposes.

i) Previous studies have not provided consistent explanation for the variability of the abnormal returns following cross-border M&A announcements. Often this is due to the use of different specifications of the pricing model. In our case, we

[1] The study of Servaes (1995) focuses on capital structure instead of M&As. This may be the reason why the concept of Servaes (1995) is rarely tested in M&As studies.

use equilibrium-type CAPMs to generate the abnormal returns. We then test the agency theory, synergy theory, market for corporate control and cost of information asymmetry by using the proxies from acquirer's and target's industry characteristics, financial characteristics and M&A deal characteristics. By comparing our results, our study can provide important insights of the factors that determine investor behaviour associated with cross-border M&A announcement.

ii) Secondly, this study tests the power of the M&A theories in the cross-border manner involving two of the world's largest economies. The abnormal returns associated with M&A for these two countries will likely be less affected by information transparency and protective legislations compared those of less developed countries. In addition, we believe that the cross-border M&A events provide a useful platform to allow us to test acquirers and targets' abnormal returns in relatively deep markets that are less affected by thin trading. This setting also allows us to examine issues that relate to information transmission. For example, we can test how quickly the effects of the announcements die out and whether investors can price in the M&A before announcements. By documenting the characteristics of the abnormal returns, our result can also provide useful insights about stock market efficiency.

1.2 Contributions of my Research to Empirical Work

This study contributes to the M&A research discipline in the following ways.

i) After we have systematically tested the M&A theories, we find that factors related with synergy theory show strong explanatory power for announcement returns. More importantly, we find that acquirer and target abnormal returns cannot be explained by single determinant. Rather, the market response varies by acquirer's previous performance, acquirer's industry characteristics and the

characteristics of the M&A. For instance, we find that leverage ratio, as a common used free cash flow indicator, is positively related with abnormal returns when the US acquirers initiate conglomerate M&As. In contrast, leverage shows negative correlation with abnormal returns when the US acquirers initiate vertical M&As. It implies that in vertical M&As, the indication of leverage ratio is shifted from agency cost to cash flow reservation for future investment opportunity, where the low leverage ratio can reduce the possibility of underinvestment. Thus, if the market examines the value of M&As by using the financial ratios of acquirers, the interpretation of the same financial ratio can change as the M&A characteristics change. Our finding implies that future M&A research may need to consider the interconnection between explanatory variables and construct a more dynamic test model.

ii) We explain the inconsistent announcement returns associated with country specific factors (see, e.g. Siegel et al., 2011). We show that when we control for the acquirer's financial characteristics, type of M&As and industry characteristics, the investor behaviour becomes more consistent across the US and Japan.

1.2 Thesis Layout

The thesis is organised as follows. Chapter Two discusses the existing literature of empirical studies of M&As. In Chapter two, we present prior research work on share price behaviour associated with of M&As, and also discusses the limitations in the previous studies. Chapter Three presents our research methodology. The chapter also presents our data source, event distribution and statistical summary of our data. Chapter Four reports our empirical findings associated with the US and Japanese acquirers' stock returns. In this chapter, we also test the effect of acquirer's industry characteristics and deal characteristics on acquirer's stock returns. Chapter Five reports our empirical

findings associated with the US and Japanese targets' stock returns. We also test the effect from the industry and deal characteristics. Chapter Six reports our empirical tests associated with the financial characteristics of acquirers and targets. Chapter Seven concludes this thesis and outlines the limitations. We also recommend potential areas for further research.

Chapter Two

Literature Review

2.0 Introduction

This chapter documents theories and concepts underpinning the previous studies on Mergers and Acquisitions (M&As). Previous studies point out factors from three dimensions that explain the abnormal returns (ARs) of acquirers and targets: the M&A motives, the resistance to facilitate successful M&As, and the stock market efficiency to price in the M&A announcement. The motive determines the potential value creation by M&As. The resistance determines the wealth transfer between acquirers and targets. The market efficiency determines to what extent the change of acquirers and targets value can be incorporate into the announcement returns. In practices, the factors in three dimensions jointly influence the outcome of M&As. As most previous studies only focus on factors from one dimension, it can cause significant difficulty to examine the inconsistent evidences presented in the previous studies. As a result, the previous studies provide limited contribution to explain the ARs associated with M&As. This problem becomes more significant when inconsistent methods are employed in the previous studies. Thus, by contrasting the theories and concepts proposed in the previous studies, we also point out the limitations in the M&A research discipline.

This chapter is organized as follows: section 2.1 reviews the relevant literatures with regard to the motives of M&As. Section 2.2 discusses the impact related to the resistance of target firm to engage in the M&As. Section 2.3 discusses the informational efficiency when price in M&A announcements. Section 2.4 and 2.5 discusses the method of payment and merger wave, and their relationships with M&A motives and resistance. Section 2.6 provides conclusion of this chapter.

2.1 Motives for M&A

Assume the market is not perfectly efficient, following the announcement of an M&A, the share price is likely to alter to incorporate the future performance changes of acquirers and targets. The motives that are often put forward in M&As as their informational effect can influence outcome expectation. As a result, the motive of M&As is commonly used to explain ARs surrounding the announcement period (see, e.g. Morck et al. 1990; Berkovich and Narayanan, 1993). The various types of motives purposed in previous studies and their informational effects are discussed below.

2.1.1 Synergy motive

The efficiency theory suggests that M&As are mainly motivated by synergistic effect where acquirers intend to construct better operating portfolios that increase the corporate efficiency of the combined entity. This synergy motive can also be incorporated into the theory of maximizing shareholders value. If investors also perceive that the acquirers will benefit from the synergistic effect, a positive AR is expected around the announcement day (see, e.g. Berkovich and Narayanan, 1993; Sharma and Ho, 2002; Hankir et al., 2011; Erel et al., 2015). Two types of synergy motives have been proposed in the previous literatures: the operating synergy and the financial synergy.

Operating synergy

The concept of operating synergy suggests that M&As can unify two firms' corporate resources to reduce the marginal production cost. In horizontal and vertical M&As, the operating efficiency can be improved by economies of scale or scope that result in complementary effect of production lines, reduce the cost of the inventory management and increase in distribution networks efficiency (Sharma and Ho, 2002; Lambrecht, 2004; Lewis and Webb, 2007).

Inconsistent with the prediction of synergy motive concept, empirical studies show that the M&As do not always lead to the synergistic effect when combining resources. Sharma and Ho (2002) find that the corporate acquisitions show insignificant and sometimes negative impact on post-acquisition operating performance for the combined entity. Behr and Heid (2011) find that M&As tend to result in profitability deterioration due to the decline in operational efficiency. It is worth noting that the inconsistent estimation of post-acquisition performance can lead to the inconsistent M&A outcome measurements. Chatterjee and Meeks (1996) argue that the change of accounting practices explains the inconsistent post-acquisition profitability in various periods. Sharma and Ho (2002) further suggest that the choice of performance indicators can explain the inconsistent results in the previous studies. The study shows that the performance indicators can change to various directions and provide contradict implications to the performance change after M&As.[2] Furthermore, various accounting measurements also lead to the different conclusions about the financial benefits of the M&As. For instance, Sharma and Ho (2002) measure cash flow on total assets by using the book value of total assets, whereas Ramaswamy and Waegelein (2003) use the market value of total assets.

The existence of unrealizable synergistic effects in domestic M&As may also explain why many empirical studies find the ARs of the acquirers are typically insignificant or negative. For instance, Rau and Vermaelen (1998) find that the US acquirers experience insignificant and negative CARs, and similarly, Moeller et al. (2005) find that acquirers tend to suffer from significant losses on their stock value. Some studies therefore explain negative ARs by the bidders' managerial entrenchment or hubris (see Malmendier and Tate, 2008; Harford, et al, 2012).

In contrast to domestic M&As, empirical studies find that the cross-border M&As are

[2] For instance, they find that the efficiency indicators (e.g. return on assets) tend to reveal efficiency descending after M&As whilst cash flow indicators (e.g. Cash flow from operations/ total assets) tend to show the increase in profitability of the combined entity.

more likely to generate significant and positive ARs to the bidders (see e.g. Doukas and Travlos, 1988; Francis et al., 2007). The more substantial AR may be explained by market segmentation (see, e.g. Erel et al., 2012), and thereby the scale effect can lead to higher value creation in the cross-border M&A (see, e.g. Buch and Delong, 2004; Campa and Hernando, 2006).

Eun et al. (1996) and Gubbi et al. (2010) further report a reverse internalization pattern (i.e. acquirers take over the intangible asset from target to improve their existing product lines) in cross-border M&As. The two studies provide the evidence of the reverse internalization from two perspectives. Eun et al. (1996) find that acquirer's CARs can be explained by acquirer's R&D intensity. In their study, the acquirer's R&D intensity has been interpreted as the capability of internalizing target R&D resources. Seth et al. (2002), on the other hand, use the target R&D spending as the proxy of reverse internalization.[3]They find that the intangible asset value of target firm positively and significantly correlates with the AR of acquirers. The reverse internalization may also explain the evidence of cross-border acquisition between emerging and developed economy. Kiymaz (2004), Hagendorff et al. (2008) and Boubakri et al. (2008) find that acquirers from emerging economies yield higher ARs in cross-border M&As than those from developed economies. All three studies emphasize that the acquirers can be benefit from voluntarily adopting the more efficient management from targets to increase the market value of their assets.

Financial synergy

Lewellen (1971) and Leland (2007) suggest that acquirers can benefit from conglomerate M&As that reduce the default risk and increase in debt capacity.

[3] Seth et al. (2002) measure the target intangible asset ratio by using formula

$$\frac{\text{Target R\&D,advertising and marketing expenditures}}{\text{Annual sale revenue of target}}$$

Acemoglu et al. (2009) and Beladi et al. (2013) suggest that vertical M&As can reduce the contract cost and cash flow uncertainty. Levy and Sarnat (1970), Shih (1994) and Leland (2007) indicate that the reduce in cash follow uncertainty and increase in debt capacity provides firms the opportunities to issue cheap debt and to construct an optimal capital structure. However, the effect of financial synergy associated with of diversification is difficult to be tested empirically.

Laeven and Levine (2007) and Chollet et al. (2011) emphasize that conglomerate M&As can also create complementary effect in the acquirer and target firm's operating portfolio. Milbourn et al. (1999) further suggest that the increase in production line diversification can encourage the development of acquirer's management capability, and thereby increases the operating efficiency of the combined entities in the long-run. Despite the difficulty to isolate the effect of financial synergy, the empirical studies also show inconsistent evidence of the shareholder wealth changes associated with conglomerate M&As. For instance, Sharma and Ho (2002), Megginson et al. (2004) and Doukas and Kan (2008) find that the diversification through M&A reduces the acquirer's business focus and leads to a significant reduction in its operating cash flow. This evidence is consistent with the finding of Lang and Stulz (1994), who find that the Tobin's Q of the joint entities in diversification M&A is significantly smaller than their peers.

Target's fund cost reduction can be another type of financial synergy. Erel et al. (2015) and Khatami et al. (2015) indicate that M&A can relieve target's financial constraints, and thereby increases its corporate efficiency and reduces the cost from underinvestment. Francis et al. (2008) further suggest that the reduction of target fund cost can explain the significant and positive CARs of acquirers in the cross-border M&A. They find that the combined entities realize significant higher post-merger operating performance improvement when firms from integrated financial markets with lower cost of capital acquiring targets from segmented financial markets.

In domestic M&As, the potential loss of synergistic effect and the improvement of financial structure may explain the inconsistent evidence of investor behaviours. Sherman and Pettway (1987) find that acquirers benefit from a positive but insignificant CARs after the diversification M&As. In contrast, Morck et al. (1990), Laeven and Levine (2007) and Akdogu (2009) provide evidence that acquirers experience the significantly negative stock returns when the M&As are characterized as diversification. Furthermore, Morck et al. (1990) and Laeven and Levine (2007) further argue that as diversification M&As are likely to result in value decrease of acquirers, these M&As can be motivated by empire building. We will further discuss the literature about agency cost in section 2.1.3.

In cross-border M&As, the evidence of investor behaviour is still inconsistent. Francis et al. (2008) find that acquirers experience significantly higher CARs when they acquire targets from segmented financial market. Even so, Santos et al. (2008) still show that acquirers are likely to experience diversification discount in cross-border M&As. Scott (1977) and Doukas and Kan (2006) test the distribution of financial synergistic value between bondholders and shareholders. They find that the value of acquirers' outstanding bonds is significantly increased after the financial conglomerates. They argue that the increase in bond value results in a wealth shift from the shareholders to the bondholder. Thus, the effects of financial synergy do not appear to impact the stock returns of acquirers in both domestic and cross-border M&As.

It is worth noting that most empirical studies show the positive and significant CARs experienced by targets regardless the returns of acquirers and regardless the domestic or cross-border M&As. (see e.g. Berkovich and Narayanan, 1993; Betton, 2009; Hankir et al., 2011). Even when Ahern (2012) and Moeller et al. (2005) adjust the impact from size effect to the stock returns, targets still experience significantly higher returns than

acquirers.[4] Berkovich and Narayanan (1993) and Seth et al. (2002) further find that target firms may still experience positive and significant CARs even in value destruction M&As. [5]

2.1.2 Market power motive

Stigler (1964) suggests that M&As can be used as a method to increase the market shares and gain control of the market place. Lambrecht (2004) suggests that the combined entity with an increased amount of market shares can be benefit from monopoly and monopsony, and thereby increase its bargaining power to the upstream and downstream.

The empirical studies provide inconsistent evidence of the explanatory power of market power motive. Shahrur (2005) finds that significant and positive CARs are experienced by acquirers' corporate suppliers and customers when acquirers make the M&A announcements. This evidence challenges the market power motive concept, as the increased market power of the combined entities should impose negative impacts to the profit margin of acquirers' suppliers and customers. On the other hand, the increased stock prices of acquirers' suppliers and customers is in line with the concept of synergy motive, as the more efficient combined entities will benefit the demand of their suppliers and surplus of their customers. Hankir et al (2011) employ a similar approach to measure the market response to the market power change. They find that acquirer and its competitors experience significant stock value increase. With an assumption that the post-acquisition restructuring will reduce the size of the combined entity and thereby increase the market share of every firm in acquirer's industry, they argue that

[4] The idea of adjusting the size effect on the return difference is that if the wealth distribution is not significantly associated with the size of acquirer and target, the target should experience higher stock return due to their small capitalization.

[5] Both Berkovich and Narayanan (1993) and Seth et al. (2002) define the value destruction M&As by the negative total CARs (sum of bidder's CARs and target's CARs)

market power can be a major motive to initiate M&As.[6] They further argue that the change in market power also explains the size effect, as the bargaining power change is more significant to the smaller acquirers.[7] The conflict results between Shahrur (2005) and Hankir et al (2011) may be resulted by their indirect measurements of market power changes. Accordingly, the evidence provided by both studies is not solid to examine the concept of market power motive.

Hagendorff et al. (2008) find that the size of the M&A deals does not affect CARs of the acquirers. Based on this evidence, they argue that the market power motive does explain the CARs of bidders. Consistent with Hagendorff et al. (2008), Devos et al. (2008) find that the increase in financial synergies and market power only have weak explanatory power to the CARs following M&As. Behr and Heid (2011) and Hankir et al. (2011) further argue that the market power should not be regarded as the predominant acquisition motive.

2.1.3 Market for corporate control

The concept of market for corporate control suggests that acquisition can be motivated by taking over the low effective management in the targets to improve their operating efficiency (Manne, 1965). As a result, acquirers can be benefit from the increase in market value of the acquired assets. Some previous studies have also used this concept to explain the commonly exhibited positive and significant CARs of target firms (see, e.g. Akhigbe and Martin, 2000; Malmendier et al., 2016).[8] Market for corporate control

[6] The corporate restructurings of the combined entities are commonly exhibited, As the restructurings can reduce the size of combined entity, the M&A should also increase the market share of acquirers' competitors in the short term (when there is no new competitors entering into this market).

[7] The size effect here is referring to the empirical evidence (see e.g. Moeller et al. 2004) that shows the acquisitions initiated by smaller firms tend to generate higher abnormal returns to the acquirers.

[8] Notice that, the positive return of targets can be explained by many other concepts, for instance, target revaluation (see, e.g. Bradely et al., 1983). We will further discuss target returns in section 2.5.

is also an important reason why governments support M&A activity as it conceptually improves the overall market efficiency.

Early empirical studies support the view that market for corporate control motivates the outperformed firms to takeover inefficient targets. Rege (1984), Comment and Schwert (1995) and North (2001) find that firms with ineffective corporate governance and exhibited higher agency costs are more likely to be acquired. In addition, North (2001) indicates that once the low efficient firm is acquired, the acquirer is likely to replace target's managers to implement more effective control. Martin and Mcconnell (1991), Safieddine and Titman (1999) and Mathews (2007) suggest that the threat of being taken over will discipline the top managers of firms, and thereby significantly improve firms' financial performance. This evidence provides an indirect support to the motive of market for corporate control.

Notice that, several previous studies have documented so called "financial arbitrage" motive in domestic and cross-border M&As. They suggest that the trend of cross-border M&As can be explained by currency appreciation (see, e.g. Froot and Stain, 1991; Harris and Ravenscraft, 1991) and stock price misevaluation (see, e.g. Shleifer and Vishny, 2003; Baker et al., 2009). The financial arbitrage predicts that the appreciation of acquirers' local exchange rate or stock values can significantly facilitates initiating cross-border M&As. However, the profit from arbitraging short-term exchange rate increase and stock price misevaluation (either overvaluing acquirers or undervaluing targets) should be relatively small comparing with the cost of M&A transaction and performance change associated with restructuring. Thus, a more possible explanation is that the outperformed company (in the sense of high Tobin's Q) and outperformed economy (in the sense of appreciation of its currency) can create more value from market for corporate control.

Despite the evidence showing that market for corporate control explains the trend of M&As, in practice, acquirers tend not to have strict rules for measuring the exact gains

from replacing inefficient management. Neither can they ensure the extent to which efficiency can be improved. For instance, Maksimovic et al. (2010) find that the efficiency of using target assets does not change significantly after post-acquisition restructuring. Thus, the acquisitions motivated solely by the improvement of targets' corporate governance can be somewhat risky, and thereby the market for corporate control should not be considered as a predominant motive. Furthermore, acquirer may suffer from its over-confidence to improve the target corporate governance, and it has been documented as hubris motive. We will further discuss the hubris motive in section 2.1.4.

In cross-border M&As, market for corporate control can be a more substantial motive as Doidge et al. (2007) show that the corporate governance has higher variation at a country level. Lel and Miller (2015) find that the threat of M&As significantly increases CEO turnovers of the firms from poor shareholder protection countries. In addition, when acquirers and targets operate under different corporate governance arrangements, the corporate control transaction from acquirers to the targets can generate higher corporate efficiency improvement and result in more significant and positive stock market response (Hagendorff et al., 2008; Aggarwal et al., 2011). Hernando et al. (2009) and Erel et al. (2012) find that firms from country with better accounting disclosure system are more likely to acquire targets from less developed markets, and acquirers in these M&As are more likely to realize positive CARs. In addition, the less efficient enterprises in concentrated market (Hernando et al., 2009) and the enterprises in the less regulated market (Caiazza et al., 2012) are more likely to be the targets in cross-border M&As. Consistent with the market for corporate control, Kiymaz (2004) also shows that US acquirers experience higher CARs when they takeover targets from developing countries.

Notice that, the market for corporate control may not be the only theory that can explain the positive acquirers stock returns in the cross-border M&As when taking over targets from less regulated market. Regulatory arbitrage suggested by Karolyi and Taboada

(2015) may also explain the evidence as the acquirers from countries with stricter regulations can benefit from allocating capitals to less regulated markets to create more investment opportunities. Thus, the effect of market for corporate control in the cross-border M&As should be further tested.

2.1.3 Agency motive

Agency theory also seeks to explain the motive of M&As. As the power of managers and their compensation plans are commonly tied to the size of a firm, managers can use M&As to increase their own wealth. The motive that is attributed to agency problem, empire-building tendency and managerial entrenchment is often documented as agency motive in the previous studies. The concept of agency motive anticipates a potential shift of the wealth from shareholders to the managers. Thus, if investors capture the existence of agency motive, negative CARs should be arisen (Berkovitch and Narayanan, 1993). In addition, targets may also be benefit from weak acquirers' shareholder value protection. As a result, the agency motivated M&As can also lead to a wealth shift from acquirers to targets, and higher CARs of the target firms are expected (Kadyrzhanova and Rhodes-Kropf, 2011).

Based on the different proxies used to measure the agency cost, empirical studies provide evidence shows inconsistent implications to the effect of agency motive. The free cash flow is a proxy that is commonly used to determine the degree of agency cost in a firm. Under the free cash flow hypothesis, firms with substantial free cash flow provide their managers a high degree of freedom to invest in negative net present value projects including M&As to serve for their own wealth (Jensen, 1986). Harford (1999) also concludes that rich free cash flow firms are more likely to make value destroying M&As. However, McConnell and Servaes (1995) show that free cash flow can prevent underinvestment when firms experiencing external investment opportunities. Thus, if acquirers foreseen the significant synergy from the integration, managers may increase cash holding to prevent the financial constraints. Huang et al. (2013) further suggest

that the rate of cash holding is positively correlated with the degree of investors' protection in a firm. The two contradictory interpretations of free cash flow may explain the study results of Andrade and Stafford (2004), who test empire-building behaviour through expansion priority of the firms with high free cash flow. [9] They find no significant evidence to support that the potential agency problematic firms are more likely to choose merger (empire-building) than non-merger investment. They argue that the acceptance of negative NPV projects may due to an overabundance of available cash flows rather than the agency motive.

The choice of target (private or public) and financing method have also been used as proxies to identify the agency motive. Fuller et al. (2002) and Harford et al. (2012) find that acquirers who disproportionately avoid private targets exhibit lower performance synergy and more negative announcement returns. They argue that the managers' avoidance of private targets is due to their higher interests in empire-building rather than value creation. Harford et al. (2012) suggest that the high ownership concentration of the private target could potentially create a new body of large shareholder who would monitor the behaviour of managers. However, this idea may be biased by self-selection problem, where acquirers cannot effectively acquire private targets in a hostile manner as would otherwise be possible in the secondary market. In addition, the choice of payment method and target public status can also be related with other factors such as merger waves resulted by industry IPOs (Aktas et al, 2016), and thereby Harford et al. (2012) may over simplify this issue with the agency theory. The informational effect of the payment method and merger wave will be further discussed in the later sections.

The optimal business boundary is another method to test the agency motive. If the motive of an acquisition is empire building, bidders should keep a high retention rate of newly acquired assets in order to maximize the size of the integrated firm.

[9] In this study, Andrade and Stafford (2004) compare firms' preference to make a non-merger investment and merger.

Maksimovic and Phillips (2001) and Maksimovic et al. (2011) find significantly high closure and sell ratios for the joint entity. This finding is inconsistent with the empire-building motive. Gorton et al. (2009) suggest that empire-building is not the sole motive for acquisitions.[10] They argue that the less efficient performance will result in an undervaluation of the acquirer's share price, and increase the likelihood of being a future target. Thus, the threat of being taken over may exceed the desire to increase management power.

More recent evidence (e.g. Humphrey and Vale, 2004; Lambrecht, 2004) implies that agency motive, if it exists, should not be a dominant motive for initiating M&As. The concept of co-existence of multi motives explains the ambiguous correlation between agency characteristics of bidders and their CARs. Maksimovic et al. (2011) suggest that the overbidding activity and the corresponding negative CARs are associated with the misevaluation of potential synergy and the over-confidence of managing the new acquired assets rather than the management self-interest. Ozkan (2012) shows that although CEOs benefit from increase in compensation after the cross-border acquisitions, the bidders do not always experience negative and significant CARs.

2.1.4 Hubris motive

Hubris motive is a theoretical hypothesis proposed by Roll (1986) suggests that overconfident acquirers can pay more than the economic value for acquiring target firms. Thus, acquirers can suffer from the 'winner's curse'. This hypothesis aims to explain the evidence of acquirers' negative stock returns with no significant sign of agency motive. This hypothesis argues that the negative stock returns of acquirers are resulted by their hubristic managers who overestimate their capacity to create value from acquisitions. As hubris managers still intend to act in the shareholder's interest,

[10] The paper used positioning motive and defensive motive as the alternative name of synergy and agency motive.

the negative announcement returns will not show a strong correlation with management entrenchment and empire building (Malmendier and Tate, 2008). In the later studies, the hubris hypothesis has also been used to explain irrational continuous bidding. The hubris may cause acquirers to refuse responding the negative stock market signals and to believe that investors do not fully understand the economic value of the integration (Aktas et al., 2009). Croci and Petmezas (2015) and Malmendier et al. (2011) show that the CEO over-confidence explains the M&A frequency.

Malmendier and Tate (2008) find that announcement returns of acquirers with over-confident CEOs are significantly more negative than that with non-overconfident CEOs. In addition, the study suggests that the negative announcement returns are not resulted by the agency motive, since the overconfident CEOs also take a high proportion of shares ownership in their own companies. However, as the hubris motive is a theoretical explanation of the value destroying acquisitions occurring without agency motive patterns, the hubris hypothesis lacks projecting the direct causal relationship between over-confidence CEOs and value destroying M&As. Furthermore, Banerjee et al. (2015) show that the Sarbanes-Oxley Act significantly reduce the risk exposure of overconfident CEOs. Thus, the explanatory power of hubris motive may change over time.

In contrast to hubris motive, Aktas et al. (2009) suggest that the overbidding is associated with the pattern of learning. They suggest that CEOs will improve their target selection and the post-acquisition restructuring abilities from the market reactions of previous acquisitions. Such improvement will add value to the M&A projects, and thereby allow CEOs to accept higher bidding prices and transfer part of synergistic gain to targets. However, this theoretical explanation is also lack of support from empirical evidence, and would not appear to hold unless acquirers can precisely measure the potential synergetic value. Moreover, the value adding only explains the bidding premium involved in M&As, but fails to explain the negative CARs. Cai and Vijh (2007) use the liquidation hypothesis to explain the overbidding of the acquirer. They argue

that shares and options holding by acquirer's CEOs are not liquid assets at the time of the M&A. In order to increase the long-term value of their holdings, CEOs might offer a takeover premium to exchange for the undervalued shares of target by paying the relatively overvalued shares. This hypothesis follows a similar pattern as financial arbitrage, and thereby should not be considered as a dominant motive for M&As.

The cross-holding hypothesis is another explanation of why shareholders of the bidding firms tend to initiate value destruction acquisitions. Matvos and Ostrovsky (2008) suggest that even though over-bidding will transfer the wealth from bidder to target, external (institutional) shareholders who own both companies' shares will act more passively (i.e. not exercise their voting rights to against acquisitions) on the potential negative returns due to the compensation from the increase of target shares value. However, Harford et al. (2011) indicate that cross-holding imposes an insignificant effect on an acquisition decision. Furthermore, they find that most shareholders of the acquirers only hold a small fraction of target shares, and such small fraction does not hedge the loss from the value destruction. Even in some rare cases that shareholders hold substantial shares of both target and acquirer firms, the acquirer does not bid more aggressively than others.

Merger wave or economic shock have also been used to explain the over-bidding pattern. Akdogu (2011) argues that firms need to acquire new assets in response to economic shocks, and fail to do so will reduce their competitive edge. Thus, acquirers will accept the negative CARs, since they realize that to lose the target to a rival will impose a more significant cost to their future performance. Bradley et al. (1983) support for this view with the evidence showing that significantly negative CARs exhibited when acquirers have lost their biddings. However, this explanation is inconsistent with the evidence provided by merger wave studies, as acquirers are more likely to experience positive CARs in the early period of merger waves. Furthermore, the concept proposed by Akdogu (2011) cannot explain the over-bidding in non-wave

periods.[11]

As the conclusion of the reviews of M&A motive studies, we show that the concepts of M&A motive are a set of theoretical explanations for the market behaviours of the announcement returns. As a result, the measurement of motives becomes a critical issue in most empirical studies. The use of different estimation methods can be an important source of contradiction. For instance, Laeven and Levine (2007) suggest the negative market response is resulted by the agency motive. However, Maksimovic et al (2011) suggest that acquirers with negative CARs do not passively retain all assets acquired in a merger, and thereby the negative CARs are not necessarily resulted by the agency motive. In the study of synergy motive, this problem even becomes more difficult. Studies use both post-acquisition performance and announcement return to measure the synergy motive, and makes the empirical results less comparable across different studies. This kind of self-explained study design cannot provide solid evidence to identify M&A motives. In other words, the motive theories cannot accurately depict the theoretical situation, and the empirical tests are not powerful enough to capture the predicted effects. It can also be the case that several theoretical predictions are at work in a given situation. The job of the empiricist is to unbundle the theoretical predictions and to come up with a set of valid empirical tests.

2.2 Resistance of M&As

Empirical studies (see, e.g. Ruback, 1983; Lys and Vincent, 1995) show that resistance of M&As not only increase the chance of withdraw, but also has a close relationship with takeover premium. If the market can efficiently anticipate the potential overbidding activity from resistance, the resistance should at least partially explain the negative CARs experienced by acquirers and the positive CARs experienced by targets. This section will review the previous studies that focus on bidding resistance and the

[11] We will further discuss the merger wave effect in section 2.3.

corresponding bidding. In addition, this section will discuss the informational effects when the stock market perceives takeover resistance.

2.2.1 Tender offer, bargaining power and takeover premium

The bidding premium and CARs of the negotiation based merger agreement and auction based tender offer has been evaluated by several M&A studies (e.g. Baron, 1983; Travlos, 1987). The main difference between merger and tender offer is the participants of the competitors. The merger deal normally takes place between acquirers and targets. The tender offer represents the type of deals, where acquirers directly purchase target shares from shareholders. As a result, the third-party bidders can easily participate into the biding competition. The tender offer mechanism is resulted either from the external competition, where multiple bidders enter into the bidding competition, or from target hostility, where target managers reject the initial offer and force acquirers to directly negotiate with the target shareholders (Eckbo, 2009). Most countries' antitrust laws require bidders to publish pre-merger notifications when bidders' target share purchasing excesses a certain amount (threshold). In addition, many countries' business acquisition laws (e.g. the U.S. Williams Act) require tender offer to open for certain period of time to allow target shareholders to receive higher bids. Thus, some theoretical studies (e.g. Baron, 1983; Burkart, 1995) suggest that tender offer will potentially increase the resistance for each single bidder, and thereby increase the final premium of the deal. As a result, the acquirers who bid through tender offer are more likely to receive negative CARs.

The empirical studies (e.g. Betton et al., 2008; Betton et al., 2009; Eckbo, 2009) show that deals with merger agreement do not always involve lower premiums than the tender offers. [12] Eckbo (2009) suggests that the potential involvement of the third-party

[12] Betton et al. (2008) reported that the tender offer generally pays a lower premium than merger deal when they used M&A samples from1980 to 2002. Betton et al. (2009), however, showed that the tender

competitors can also threaten bidders in a merger deal, since the target is permitted to reject the initial agreement after they receive more valuable offers. Thus, the 'ambiguous' boundary between merger deals and tender offers explains why the acquirers use the overbidding strategy to prevent the potential competitors even in a friendly merger deal. Burkart (1995) and Aktas et al. (2010) also indicate that in a less competitive market, where few competing bidding offers can be observed, bidders will still offer premiums to respond to the pressures from potential competitors. Even so, Schwert (2000) finds a significant correlation between the hostility and the usage of tender offer. However, the study also finds mixed results for the correlation between the hostility and the bidding premium. The study shows that the low success rate un-negotiated tender offers pay a slightly lower premium in their average sample transactions. Meanwhile, deals characterized as hostile by Dow Jones News Retrieval (DJNR) and Security Data Company (SDC) show a higher average premium in the data sample. Thus, Schwert (2000) suggests that the inconsistent premiums are associated with the bargaining power rather than the hostility of the acquisition. Cai and Vijh (2007) and Aktas et al. (2010) also draw the same conclusion when they evaluate the correlation between auction cost of target firm (the degree of seeking liquidation) and the final bidding premiums. In addition, Eckbo (2009) finds that the average premiums of the M&A in 1980s (when most of the hostile bids took place) are significantly lower than in 1990s. He argues that the hostility is only the response to the low premium offered in the initial bid, and the initial bid premium is the most important parameter that affects the characteristic of the deal.

Grossman and Hart (1980) propose a theoretical model that explains the correlation between the free-rider problem and the takeover premium.[13] In this model, all the

offers pay higher premium (2.9% higher in initial bid and 5.7% higher in final bid) when they used a sample period from 1973 to 2002.

[13] To illustrate, suppose the *v* is the value increase of the target after acquisition, and *p* is the price given by the tender offer. Assume the value of target share is equal to zero. When target shareholders receive a tender offer, the expected value of the share becomes: Prob (Success/Retain)*v.* Suppose the target is owned by large amount of non-cooperative shareholders, and neither of whom has a

potential synergistic value will be transferred to the target shareholder if the bidder successfully acquires the target.[14] However, in practice, the free rider problem may not be as severe as the model suggests. Indeed, the high degree of ownership dispersion is rare in modern corporations. Holderness (2006) and La Porta et al. (1999) indicate that across world major economies, relatively few firms are widely held by non-cooperative shareholders. On the other hand, the large shareholders are commonly observed across all small, medium and large capitalization firms.

The ambiguous impact on the bidding premium can explain the inconsistent CARs associated with various takeover methods. Schwert (2000) finds that the deals characterized as tender offer, auction and hostile have an insignificant impact on the CARs of acquirers. He also suggests that the indistinguishable CARs between friendly merger and hostile takeover may be the result of ambiguous definition of what a hostile takeover is. Since the takeover premium is incorporated into the M&A bargaining, the hostility may only be associated with the low premium that the bidder is willing to pay. Bradley (1980) finds that the bidding firm receives significant and positive CARs in the successful tender offers. This study assumes the tender offer functions as the takeover for corporate governance, and argues that positive CARs are associated with the expectation of more efficient usage of target resources. Betton et al. (2007) and Betton et al. (2008) also find that the bidding firms receive significantly negative CARs in the merger deal and positive CARs in the tender offer. Although both studies do not provide the direct explanation of why the returns of merger deal and tender offer are different, both studies suggest that the auction method (toehold) may influence the premium and the observed CARs.[15]

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substantial amount of shares that influence the successful of the acquisition. Thus, the expected value of target share after M&A becomes *v*. Based on this expectation, the best strategy of the existing shareholders is to restrict the tender offer (since the rational tender value *p* offered by rational bidder will be less than *v*).

[14] If all target shareholders restrict to tender their shares, the offer cannot success.

[15] Bidder's abnormal returns by using the tender offer are insignificantly positive in Betton et al. (2007) and Betton et al. (2009), but significantly positive in Betton et al. (2008)

2.2.2 Toehold and Termination fees

Toehold and termination fees are two typical methods that are used by bidder to prevent the success of the M&A. Toehold refers to the bidding strategy that the bidder purchases target outstanding stock before announcing the takeover intention. Termination fee exists in friendly merger deals, where the target firms agree to compensate bidders when the target decided to terminate the merger deal.

Toehold (pre-offer ownership stake in the target) is commonly used in tender offers.[16] Chowdry and Jegadeesh (1994) propose a theoretical model suggests that the usage of toehold can reduce the free-rider problem in the tender offers, and thereby increase the successful rate of biddings and reduce the final premiums.

Betton and Eckbo (2000) test the function of toeholds in the bidding contests. This study finds a significantly negative correlation between the usage of toehold and the final premium of the deal. This empirical evidence is consistent with the theoretical model. In addition, this study finds that the toeholds will significantly increase the single-bid success rate and reduce the hostile response from the target. Betton and Eckbo (2000) suggest that the toehold provides the competitive advantage to the bidders, and thereby reduces the potential bidding competition and the subsequent final premium. Betton et al. (2007) suggest that toeholds impose an expectation on the auction outcome, and thereby increase the willingness of the entrenched target managements to accept the offer. Betton et al. (2009) also find that the usage of toehold is negatively correlated with the final premium of the acquisition. In addition, they find that the use of toehold has declined steadily in friendly merger environment of the early 1980s, but still is the norm in hostile bids. They argue that the toehold, especially short-

[16] Betton et al. (2009) reported that toehold M&A has declined steadily since the early 1980s, and now is rarely used in friendly merger, but still commonly used in the hostile tender offer.

term toehold has been treated as a signal of hostility[17], where toehold can potentially impose a cost on the entrenched target managers by increasing the probability that the initial bidder wins the deal. Therefore, the usage of toehold is more likely to cause the target to reject friendly merger negotiations.

Betton and Eckbo, (2000) and Betton et al., (2009) show that toehold bidders experience a significantly higher average CARs compared with zero-toehold bidders. The result of both studies implies that the market has incorporated the effect of toeholds into the announcement returns. In addition, the commonly used toehold strategy in the hostile tender offers may explain the different CARs between the merger deal and the tender offer.

Termination fees have been commonly applied in recent merger deals. The initial function of termination fee is to protect the shareholders' wealth of both bidder and target.[18] Since the termination fee increases the breaking up cost of the target, it not only increases the successful rate of the merger deal, but also violates the wealth of the target shareholder to choose the highest bidding price. The effects of the termination fees are often tested under two contradictory hypotheses: the agency hypothesis, and the efficiency hypothesis. The agency hypothesis assumes that the target managers use the termination fee to lock up their personal profit on certain merger deal, and to eliminate the possibility that the hostile bidders may replace the current management after the successful takeover. [19] Thus, agency hypothesis suggests that to use the termination fee will result in a negative effect to target shareholders' welfare. The efficiency hypothesis assumes that the termination fees act as the compensation to the

[17] This evidence is inconsistent with the empirical finding of Betton and Eckbo (2000), which showed the toehold negatively correlated to the target hostility. The contradictory evidence may come from the inconsistent definition of hostility. Betton and Eckbo (2000) also showed that toeholds are mainly used in tender offer, and this evidence consist with the argument of hostile effect in Betton et al. (2009)

[18] The termination fee is mainly used to protect bidder's wealth. However, in recent years, more and more bidder fee grants have been observed in the merger deals (Bates and Lemmon, 2003).

[19] Hartzell et al. (2003) observed side payments to target management in 'friendly' merger deals.

bidding cost from bidders, and encourage potential bidders to initiate the M&A (Berkovitch and Khanna, 1990). Thus, the efficiency hypothesis suggests that termination fee will benefit the target shareholders by encouraging more potential bidders.

Bates and Lemmon (2003) and Officer (2003) indicate that termination fees granted by targets impose substantially positive impact on the deal completion. Both studies show that acquirers with an offer of termination fee provide an average higher premium to the target. In addition, they show that target firms that provide termination fee agreement receive 3% higher CARs. On the other hand, they also find that the deals with termination fee would not impose a significant influence on the CARs of the bidders. Thus, they suggest that the usage of termination fee serves to target shareholder's wealth by encouraging more potential bidders. Andre et al. (2007) also evaluate the effect of termination fee under agency and efficiency hypotheses. The study finds that the termination fee does not correlate with the directors' post acquisition compensation such as position retaining or golden parachutes, and concludes that termination fee has been used as a contractual device to serve target shareholders. On the other hand, the study finds that the use of termination fee does not impose a significant effect on the final premium and the target CARs.[20] This study argues that the termination fee and bidding premium are jointly established during the negotiation process, and thus the market will not react differently to the level of termination fees in the deal.

Jeon and Ligon (2011) evaluate the effect of various size of termination fee in the merger deal. They find that the low and medium levels of termination fees exhibit the significantly positive correlation with the completion of the deal. However, the high-level termination fees exhibit the significant and negative effect on the completion of the high premium deals. They find that the market in general does not react to the

[20] This study did not test the bidder's CARs.

information of termination fee, but will show negative response to the target CARs if they use ‘unreasonable’ high level of termination fees. The study argues that the provision of high value termination fees determines the agency problem in the target firms. However, this explanation is inconsistent with the common practices that higher terminations can provide stronger effect to lock up the deals. Moreover, it is unreasonable to believe that the target managers tend to ‘use’ high value termination fee to break up the merger deals. Thus, a more realistic explanation is that the existence of high premium merger deal indicates the high value of the target. Thus, the low completion rate may be the result of strong bidding competition and causing target to end the current merger deal to seek higher premiums.

2.2.3 Defensive strategies from targets

The defensive mechanisms are normally used when a firm is under the threat of being a hostile takeover target. This mechanism serves the interest of both target management and the shareholders. Essentially, shareholders can adopt the defensive strategy to prevent the firm value disruption by hostile acquisitions. Target management may use the defensive mechanism to remain entrenched in the sense that target CEOs are more likely to be replaced after the acquisitions (see e.g. Barclay and Holderness, 1991). Several M&A studies suggest that the usage of the defensive mechanism implies the agency problem in the firm, and thereby reduces the potential bidding premium (e.g. Manry and Stangeland, 2004). However, Bradley et al. (1983) argue that firms with defensive mechanisms will still receive high CARs due to the market anticipation that the low effective management will ultimately be replaced in the future. Comment and Schwet (1995) and Kadyrzhanova and Rhodes-Kropf (2011) suggest that the defensive mechanisms can increase the bargaining power of the targets, and thereby potentially increase the final takeover premium. As a result, the defensive mechanisms will give rise to the positive CARs. The defensive mechanisms can be classified into two types: the general defensive mechanisms that affect all potential acquirers, and the specific

mechanisms that aim at specific bidders. The following section will introduce the dominant anti-takeover strategies of both types, and evaluate their influences on the bidding premium and the announcement returns.

Poison Pill

Poison pill (shareholder rights plan) is a typical general defensive mechanism that discourages all the potential bidders. Poison pill dilutes the acquirer's shareholding by issuing the rights of purchasing cheap shares to the existing shareholders. As a result, the poison pill increases the difficulty of acquirers to acquire over 50% target shares. Since the nature of the pill is akin to a dividend, the pill can be adopted anytime without shareholder vote.

Recent empirical studies show inconsistent results on whether the effect of poison pill will impose a significant effect on the final premium and the bidder's CARs. Comment and Schwert (1995) find that poison pill does not reduce the likelihood of being acquired. Instead, the target with poison pill will significantly increase the takeover premium. On the other hand, the study also finds a significantly positive correlation between the firm size and the probability to adopt poison pill. This evidence weakens the argument that poison pill imposes a direct effect on the final bidding premium, since the pill can possibly be a proxy of the relative size effect (see Leland, 2007), where the larger targets normally own more bargaining power over the smaller ones. Danielson and Karpoff (2006) provide a positive correlation between the likelihood of being taken over and short-term pill adoption. In addition, they find that targets with poison pill receive significantly higher CARs than no-pill targets. Thus, they suggest that the poison pill has been used as a bargaining tool rather than the defensive strategy to add barrier to the potential bidders. Betton et al. (2009) find a contradictory result of the effect of poison pill. They show that poison pill significantly increases the probability of no bidder wins outcome. In addition, they find that poison pill will not impose a

significant effect on the bidding premium and bidder's CARs. Both findings of this study are inconsistent with Comment and Schwert (1995). The inconsistent results may come from the simultaneous existence of several bidding and defensive strategies. For instance, Officer (2003) finds that when bidders initiate M&As towards the targets with poison pill, bidders appear to acquire significantly greater toeholds.

Change of Capital Structure and Share Repurchase

Share repurchase and increase in short-term leverage ratio are two defensive mechanisms that discourage all the potential bidders. In practice, these two strategies are often used at the same time. Stulz (1988) provides a control model, which suggests that managers can increase their voting control via issuing debts to repurchase shares. As a result, the repurchase increases the cost to the hostile bidder to acquire target shares. Sinha (1991) provides a theoretical model that assumes the share repurchase as a kind of reinvestment to the firm. He suggests that share repurchase will increase the acquisition cost to allocate the external resource to investment in the firm explicitly.

Gervey and Hanka (1999) and Safieddine and Titman (1999) provide the consistent evidence that proves the leverage ratio has been used to deter the hostile takeovers. In addition, both studies suggest that the high leverage ratio will increase the bidding premium on a successful bid. Billett and Xue (2007) find that firms conduct share repurchase when they anticipate the high probability to become takeover targets. In addition, the study finds that firms that conduct share repurchase does not reduce their probability to be acquired. Thus, this study argues that share repurchase is served as a bargaining power mechanism rather than a defensive mechanism.

Unlike the poison pill that can be launched at any time when the firm receives hostile takeover offers, the share repurchase mechanism requires the target firms to have certain extent of cash flow or to have the ability to issue debt. Billett and Xue (2007)

find that the size and the extent of free cash flow significantly influence the probability of target to conduct a share repurchase. These requirements may make the studies of share repurchase very detailed and context specific. In addition, the size and free cash flow can also impose effects on both bidding premium and announcement return. Thus, the more recent studies tend not to include the short-term share repurchase in their testing variables.

Greenmail

Greenmail is a type of defensive mechanism that aims at specific acquirers. Greenmail refers to the activity that target management repurchases the target's shares from the hostile acquirer. Giammarino et al. (1997) suggest that greenmail potentially increases the takeover premium by eliminating a lower value bidder from the competition, and thus encouraging new potentially higher valued bidder. In addition, the study finds that firms with more free cash flows are more likely to use greenmail as a strategy to prevent the disrupted takeover. Thus, the study argues that greenmail can also reduce the free cash flow (agency) problem of the target.

Since greenmail requires the target firms to pay a premium to the hostile acquirers, several studies (e.g. Ang and Tucker, 1988) indicate that the usage of greenmail exhibits the agency problem of the target. Manry and Nathan (1999) find that firms with higher level of external board directors are less likely to pay high premium greenmail. Manry and Stangeland (2004) find that firms with lower operating performance near the takeover announcement are more likely to use greenmail to deter the hostile takeover. The evidence from both studies confirms the agency hypothesis that entrenched management tends to sacrifice shareholders' wealth to maintain their job position.

2.2.4 Bargaining power and bidding premium

Schwert (2000) suggests that bargaining power difference between acquirers and targets determines the final takeover premium. Cai and Vijh (2007) find that target CEOs may voluntarily accept low takeover premium due to the willingness to liquidize their shareholding in the short term. The study suggests that the targets CEOs' illiquidity discount reduces their bargaining power, and thereby reduces the resistance for being taken over. Gupta et al (1997) find that the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) imposes a significant effect on the smaller firms' willingness to be acquired. The study finds that after 1989, the acquisition between large acquirers and smaller targets results in higher CARs to the acquirers and lower CARs to the targets due to the bargaining power change. Ahern (2012) evaluates the synergy distribution in the vertical M&A, and tests the correlation between bargaining power differences in the supply chain and the distribution of total CARs. The study finds that when the bidder belonging to the industry owns higher bargaining power than that of the targets, the acquirers tend to experience higher CARs.

Although many empirical studies find the consistent result to support the bargaining power hypothesis, the hypothesis seems to be not consistent with the size effect, which suggests that smaller acquirers tend to receive higher ARs.[21] Moeller et al. (2004) suggest that the large acquirers tend to pay higher premium and experience higher post acquisition restructuring cost. Thus, the increase in bargaining power is not able to trade off cost increase, and thereby the large acquirers are more likely to experience negative ARs.

[21] Although bargaining power can depend on many other factors, the smaller firms generally have less bargaining power than larger firms.

2.2.5 Resistance in cross-border M&As

The information efficiency barriers will increase the resistance of cross-border M&As due to the long geographical and cultural distance between the acquirers and the targets. Buch and Delong (2004), Focarelli and Pozzolo (2008) and Siegel et al. (2011) suggest that difference in language significantly hold back the cross-border merger activities. Focarelli and Pozzolo (2008) and Siegel et al. (2011) further argue that the culture distance imposes a significantly negative effect on the international investment flows. Kiymaz (2004) suggests that the exchange rate may also affect the wealth of the bidding. However, considering that the M&A deal clear date is normally later than the announcement date, the exchange rate may not impose significant effect on the CARs near announcement date.

Risk reduction mechanisms show various effects on the cross-border M&As. Mantecon (2009) finds that toehold does not impose significant effect on the acquirers' CARs. Rather, bidders operate acquired assets in a joint venture experience significant and positive CARs. Boubakri et al. (2008) find that bidders acquiring with tender offer experience higher returns than using mergers, although both methods lead to positive and significant long-term CARs.

Several studies find that regulation environment of target firms influence the acquirers' wealth in cross-border M&As. Buch and Delong (2004) show that poor information transparency in the target country significantly discourages the takeover activities. In contrast, Kiymaz (2004) and Hagendorff et al. (2012) show that bidders tend to pay higher premium to the target in more favourable economic condition. The high premium may explain the finding from Kiymaz (2004), Hagendorff et al. (2008) and Boubakri et al. (2008), where targets with low shareholder's protection environment experience CARs. These studies argue that the higher returns are the compensation to the shareholders of acquiring firms to bear the additional risks.

As a conclusion, the previous theoretical and empirical studies show that the resistance and hostility may only be a response to the initial bidding premium of the acquirers, and thereby the final premium and CARs may not correlate with the target resistance. Although the bidding and defensive strategies can impose a significant effect on the premium, the simultaneously existence of various strategies may distort the results of the empirical studies. In addition, most studies of takeover resistance dismiss the potential synergy from the M&As, where positive and significant CARs may correlate with the synergistic effect of M&As. In cross-border M&As, acquirers may experience higher resistance and risks than domestic M&As (see, e.g. Buch and Delong, 2004; Focarelli and Pozzolo, 2008). Many bidding strategies may not be able to impose significant effect on reducing the risks in biddings. However, empirical studies show inconsistent relationship between risks and CARs. Boubakri et al. (2008) and Mantecon (2009) suggest that bidders experience higher CARs in lower risk biddings, whereas Hagendorff et al. (2008) and Boubakri et al. (2008) find that shareholders experience higher CARs to compensate for the risks bearing.

2.3 Measurement of M&A announcement effect

If the market is efficient, the CARs observed during the M&A announcement period should be contributed by the expectation of the change performance after the M&A and the wealth transfer due to the takeover premium. However, a number of studies (e.g. Hong and Stein, 1999; Jegadeesh and Titman, 2002) suggest that investors commonly overreact or underreact to the market information. In the field of M&A studies, for instance, Moeller et al. (2004) and Moeller et al. (2005) show that acquisitions initiated during 2000 and 2001 result in extremely high stock value destruction. Moeller et al. (2005) argue that "losses this large are unlikely to be explained by the acquisition alone…acquiring firm shareholders would have been better off if management had burned the cash or shares used to pay for the acquisition…" (:765). This evidence

explicitly suggests the existence of overreaction in the announcement returns. Thus, the following section will review the previous studies that focus on the rationality of investors and their responding to the M&A announcement.

2.3.1 Efficient market hypothesis and Announcement return measurement

The efficient market hypothesis and the behavioural hypothesis have been widely used to explain the stock returns in the capital market. The efficient market hypothesis suggests that the stock price will correctly and instantly react to the market information, whereas the behavioural hypothesis suggests that current changes in the stock price are mainly resulted by the previous over- or under-reactions.

Fama (1965) tests the predictability of future stock price. The study concludes that the stock price follows a random walk pattern, where the future stock price does not correlate with the previous movement. The study suggests that the change in stock price is only resulted by the new information.

The evidence against the random walk pattern is documented by later studies. Lo and Mackinlay (1988) find positive serial correlation in the weekly holding period returns, and this positive serial correlation is especially strong for the small capitalization stocks. This evidence shows an under-reaction pattern in the short-term stock returns, which challenges the random walk hypothesis. However, the study also shows the pattern of under-reaction disappears in the sub sample of large capitalization firms in a monthly based observation interval. Therefore, the study argues that the result does not necessarily reject the efficient market hypothesis, instead imposes restrictions upon asset pricing models.

Jegadeesh (1990) shows the serial correlation in the returns of medium holding period, which is highly significant in the twelve-month returns. He suggests that the empirical

result rejects the random walk hypothesis with an explicit momentum pattern in the returns of a medium stock holding period. Jegadeesh and Titman (1993) argue that previous winners (i.e. high return stocks) tend to continuously realize higher returns in the medium term. Jegadeesh and Titman (2001) and Jegadeesh and Titman (2002) test the cross-sectional factors in the momentum pattern. Both studies suggest that the momentum pattern is not attributed to the cross-sectional factors such as firm size and industry characteristics, as the momentum pattern exists in both large and small stocks and the market beta for previous winner and loser are virtually equal.

Although the random walk hypothesis has been rejected by recent empirical studies, most of these studies still argue that the short and medium term over- and under-reaction does not suggest the market inefficiency, rather the adjustments for the mispricing of the new information. De Bondt and Thaler (1985), Fama and French, (1988), Jegadeesh and Titman (1993) and Jeadeesh and Titman (2001) find the stock price of previous losers tend to show a significantly reversal pattern in the longer horizon, and Jegadeesh and Titman (1993) find that the abnormal return realized by medium term momentum will be significantly reduced in the long term.

Hong and Stein (1999) characterized investors into two “boundedly rational agents”: news watchers and momentum traders. The study suggests that the news watchers are more likely to underreact in the short run due to the gradual diffusion of new information. Such under-reaction can create arbitrage opportunity to the momentum traders. On the other hand, if most momentum traders do not incorporate the true value of the stock with their trading strategies, their arbitrage strategy will lead to overreaction in longer horizons. As a result, when news watchers realize the prices have already overshot the long-run equilibrium, a reversal pattern will be observed in the long horizon returns. Fama (1998) suggests that the market anomalies are chance and temporary results. In respond to the market information, the market anomalies split randomly between overreaction and under-reaction. Fama (1998) and Titman (2002) argue that the market will adjust the previous under-reaction and overreaction, and

thereby the long-term return anomalies will disappear. In addition, Fama (1998) indicates that the inappropriate estimation model is the main reason that leads to long-term anomalies shown in previous studies.

The efficient market hypothesis is the fundamental principle of many M&A studies. It assumes that market will efficiently incorporate the gains or losses to M&A in the CARs. However, the rejection on the random walk hypothesis (e.g. Lo and Mackinlay, 1988; Jegadeesh, 1990; Jegadeesh and Titman, 1993) suggests that the change in wealth associated with M&As may not be instantly reflected in the stock price. The mispricing resulted from over-reaction or under-reaction may violate the 'normal returns' used as the benchmark of the announcement effect. This means that the empirical model needs to capture market anomalies that can affect the abnormal returns.

2.4.2 Long-term and Short-term event studies

The empirical studies that use different event windows show results of the post-acquisition stock returns of the bidding and target firms. Most long-term post-acquisition performance studies suggest that the bidding firms tend to suffer from either insignificant or negative CARs (e.g. Limmack, 1991; Agrawal et al., 1992; Gregory, 1997). In short term event windows, although most UK and US based M&A studies report the insignificant or negative CARs of bidding firms (e.g. Dodd, 1980; Higson and Elliot, 1998), some studies show that the bidding firms in Europe (Campa and Hernando, 2004) and Canada (Ben-Amar and Andre, 2006) realize positive CARs. Notice that some early short run studies (e.g. Asquith et al., 1983; Franks and Harris, 1989) show the significant positive returns to the acquirers. This may be because the sample periods used in these studies (i.e. acquirers earn high abnormal returns in early periods such as 1950s and 1960s from the imperfect anti-trust regulations).

Researchers show conflicting views toward choosing the appropriate event window to

examine the share returns. Jegadeesh and Titman (1993) suggest that investors tend to overreact to new information. The short event window may not be able to capture the pre-announcement price mark up (Fama, 1998). In addition, stock returns observed by short event windows can be influenced by market anomalies such as the January effect (see. Jegadeesh, 1990).

Even though the long-term event study can reduce the bias from investor's overreaction, the conceptual framework of the long-term study has significant problems. Kothari and Warner (1997), Lyon et al. (1999) and Sudarsanam and Mahate (2006) suggest that short event windows will provide a better estimation of CARs, which may eliminate the misspecification problem (the abnormal returns are not sensitive to the specific performance benchmarks) in the long run event windows. Sudarsanam and Mahate (2006) argue that the CARs estimated in long horizon windows are influenced by the overlapping events and positively skewed (not normally distributed) abnormal returns. In addition, they argue that the asset pricing model commonly used in the long run studies can influence the CARs by the bad model problem.

2.4.3 Abnormal estimation models

To test price behaviours during M&As, researchers usually use asset pricing models. Single factor Capital asset pricing model (CAPM), Fama-French three-factor CAPM, and Carhart four-factor CAPM are the main asset pricing models used in the M&A studies (see, e.g. Eun et al., 1996; Moeller et al., 2004; Gregory, 1997; Alexandridis et al., 2006; Aybar and Ficici, 2009).

CAPM is introduced by Sharpe (1964), which emphasizes the correlation between the expected returns and systematic risks. Fama and French (1992) and Fama and French (1993) indicate that the size and book to market ratio contains the explanatory power to the variation in the stock returns. Fama and French (1993) extend the asset-pricing

model by including the size (SML) and book to market ratio (HML) portfolios in the CAPM model. Compared with standard CAPM, the three-factor CAPM shows less biased estimation (Fama and French, 1997) and significantly reduces the market return anomalies (Fama and French, 1996). Carhart (1997) accounts the momentum factor that is observed by Jegadeesh and Titman (1993), and further constructs a four-factor model with the additional factor: one-year momentum (PR1YR). This study suggests that the one-year momentum significantly explains the return of portfolio. However, Aretz et al. (2010) suggest that the Carhart model does not always outperform the Fama-French model.

In the M&A event studies, the choice of the pricing model is important since tests of market efficiency require that economic agents are rational and that the researcher has an equilibrium-based model to test the pattern of returns. In this regard, the Fama-French and Carhart models are considered to be equilibrium based models, and thereby should outperform to the standard CAPM. Empirically, Fama and French (1996) suggest that the market return anomalies significantly disappear under the Fama-French three-factor model. In addition, the study suggests that Fama-French three-factor model can also capture the long-term reversal pattern, where previous losers tend to have positive coefficients of SML and HML. Barber and Lyon (1997) suggest that using index to measure the long run return will cause misspecification due to the new listing, rebalancing and positively skewed abnormal returns. They argue that by controlling the size and book to market ratio via applying Fama-French three-factor model will reduce the misspecification problem in the measuring the benchmark of abnormal returns.

The bad model problem is the main weakness in the asset pricing measurements. Fama and French (1993) suggest that three-factor model overestimates the returns during the IPO or SEO sample period. Fama and French (1997) argue that the constant risk loading and imprecise estimation of risk premium will result in the bad model problem. However, even to replace the constant slope regression by the rolling regression, it only results in the small improvement of the forecast errors.

2.3.3 Volatility and trading volume

Although neither the Fama-French three-factor model nor Carhart four-factor models contains the volatility as an estimator of the expected return, the correlation between volatility and the return has been discussed in many financial studies. French et al. (1987) find a positive relationship between expected return and the stock price volatility. Consistent with French et al. (1987), Banerjee et al. (2007) find that the volatility provides strong prediction ability to the return of the stock portfolio even control the four risk factors proposed by Fama and French (1993) and Carhart (1997). Jones et al. (1994) and Antweiler and Frank (2004) suggest that volatility is associated with the disagreement of market information, which is more likely to increase the trading volume of the stock. Shive (2012) suggests that investors with privileged information (local investors) reduce the volatility and increase the expected return, and thereby reduce the CARs exhibited near the merger announcement.

Amihud (2002), Pastor and Stambaugh (2003) and Bekaert et al. (2007) use the trading volume as a proxy of illiquidity of the firms. When comparing the trading volume with the change of stock price, it shows the capacity of the shareholders can buy or sell their shares without introducing a significant share price change. Under the equilibrium perspective, Amihud (2002) predicts that high illiquidity type firms should experience higher ARs in order to compensate for the risks from illiquidity.

2.4 Merger wave

Previous studies (e.g. Lambrecht, 2004; Kadyrzhanova and Rhordes-Kropf, 2011) show a change in the average abnormal return of the bidding firm in the different stage of a merger wave. Empirical studies find that the acquirers benefit from high CARs in the beginning of a merger wave and suffer from a high value lost near the end of wave. Moeller et al. (2005) show that acquirers initiate the acquisition announcement during

2000 and 2001 are suffered from the extremely large stock value destruction that is even larger than the total value transactions involved in the M&As. The study suggests that the value destruction cannot be explained by either previous performance or the size of the acquirers. Although the different announcement returns in various period of a merger wave are surely associated with market over-reaction and under-reaction, the simple market anomalies cannot explain the systematic appreciation or depreciation of the M&A announcement.

In the beginning of a merger wave, firms use acquisition as an expanding method to response to the economic shock, which is either resulted from economic expansion that changes purchasing power or from release of new technology that breaks existing market equilibrium (Martynova and Renneboog, 2008; Gorton et al., 2009). In this stage, their announcement effect is more likely to be positive due to the expectation of high synergistic effect resulted from the quick response to the new market information. Meanwhile, even some bidders make a relatively less synergy acquisition, due to the expectation that these firms will become future targets, the acquisition announcement of these bidders may still receive a significant positive market response (Martynova and Renneboog, 2008; Akdogu, 2009).

In the later period of a merger wave, the number of potential synergistic targets is reducing, and thus the M&A initiated at this stage will result in less synergy than at the beginning of a merger wave. In addition, the strong bargaining power of target firms increases the potential of overbidding (Kadyrzhanova and Rhordes-Kropf, 2011) and a shrink of economic growth (Lambrecht, 2004) reduces the potential to yield a positive announcement effect. Thus, without controlling the sample period, the result of pervious empirical studies can be potentially influenced by merger wave and lose their generalization.

Empirical studies also find the motives, the choice of finance method, and other deal characteristics are influenced by with the macroeconomic features, including merger

wave. Shleifer and Vishny (2003) argue that the wave in 1990s represent the motive that acquirers tend to use their current overvalued stocks to exchange for the relatively undervalued target stock in order to improve the long-term market return. Baxamusa and Georgieva (2015) also find that the change of macro liquidity (which has a close relationship with merger wave) influence the intension to use tender offer to secure the deal and it also has significant correlation with the future synergy. Tarsalewska (2015) shows that the economic life cycle can influence the choice of merger targets.

2.5 Method of payment

Draper and Paudyal (1999) suggest that method of payment is an important variable that explains the abnormal returns associated with the M&As. Method of payment contains the information related with M&A motives (see, e.g. Harford et al., 2012), takeover resistance (see, e.g. Grossman and Hart, 1980), and stock overvaluation (see, e.g. Draper and Paudyal, 1999; Shleifer and Vishny, 2003). However, empirical studies show contradictory evidence. Travlos (1987) finds that cash payment is correlated with higher CARs of bidders, whereas Harford et al. (2012) finds that bidders experience higher CARs when they use equity to finance M&As. The contradictory results are supported by various theories.

Amihud et al. (1990) explain the payment method by the agency motive of managers. They find that cash financed acquisitions generate insignificant returns for the acquirers, whereas the equity financed acquisitions generate significantly negative abnormal returns. In this study, they test the percentage of share control by managers, and they find that the higher the managerial ownership fraction of the acquiring firm, the more likely the firm to use cash financing. Fuller et al. (2002) and Harford et al. (2012) also explain the finance method under the agency theory. However, both studies show an opposite argument and results with that of Amihud et al. (1990). They find that the bidding offers financed by equity generate higher abnormal returns to the acquirers.

Harford et al. (2012) argue that the avoidance of using all-equity offers implies the possibility that the entrenched managers tend to avoid creating new large shareholders. However, Karampatsas et al. (2014) find that the credit rating is positively correlated with the probability to use cash to finance the M&A. As high credit rating implies the low agency cost (see, e.g. Krishnaswami et al.,1999; Ashbaugh-Skaife et al., 2006), the evidence provided by Karampatsas et al. (2014) provides a contradict prediction for cash payment compare with Harford et al. (2012).

Draper and Paudyal (1999) and Shleifer and Vishny (2003) and Giuli (2013) argue that the choice of using equity offers suggests the possibility of the acquirer's stock price overvaluation. Once the market receives the overvaluation signal from the method of payment, acquirers are more likely to experience negative CARs. Cai and Vijh (2007) extend this overvaluation hypothesis, and suggest that CEOs who hold large proportion of acquirers' shares tend to sacrifice short-term abnormal returns for the long-term growth. Fu et al (2013) also indicate a close relationship between stock overvaluation and equity finance. Furthermore, this study suggests that the intention of use overvalued equity in M&A may not act in shareholder's interest, as they observe significant overpay and weak synergy after M&As. Thus, contradict with Harford et al. (2012) and equity payment can also be associated with agency motive. Aktas et al. (2016) evaluate the relationship between industry IPOs (which partially related with economic shock and thereby merger wave) and method of payment. The study finds that the agree of paying private target stock instead of cash identifies the anticipation of cluster of IPOs in target's industry. The result of this study is consistent with the evidence of Harford et al. (2012) but provides an alternative explanation. However, this evidence provides a contradict implication with the evidence from Malmendier et al. (2016). Malmendier et al. (2016) show that when M&A deals withdrawn, the targets received cash offers tend to experience 15% increase in their stock value compare with pre-announcement period. In contrast, the value change of targets received equity offers remains inconsistent. Thus, if the equity offer predicts an industry IPO, Malmendier et al. (2016) should observe opposite effect of cash and equity offers. Consequently, the

result of Aktas et al. (2016) may be lack of generality and cannot be used as an evidence to predict the motive as well as the result of M&As.

Berkovitch and Narayanan (1990) argue that cash offers or the high fraction cash used in a mixed offer implies high bidding competitions. Schwert (2000) and Shleifer and Vishny (2003) also indicate that the cash offers could be a signal of hostile takeover. Eckbo (2009) indicate that the average premium of all-cash bids tends to be higher than all-stock bids, which suggests that cash financing is associated with high competitions among the bidding contest. Draper and Paudyal (1999) suggest that the cash offer indicates the eagerness of acquirers to lockup the valuable M&A deals. Travlos (1987) suggests that even though cash financing may dilute the value of the combined entity, it can significantly reduce the free rider problem by penalizing the free riders.

Erel et al. (2012) find a consistent result that the different local stock market returns explain the trend of cross-border takeover. However, since most cross-border M&As are financed by cash (Eun et al., 1996) due to the lack of world stock market integration in early years (Harris and Revenscraft, 1991), the effect of payment method in cross-border M&As is rarely tested. The recent increase of cross listing allows researchers to observe the informational effect of the equity payment on the CARs of the bidders. Eije and Wiegerinck (2010) suggest that the informational effect of overvaluation still explains the positive CARs yield by cash offer in the cross-border M&A. Consistent with this evidence, Ahern et al. (2012) find that M&A that mainly financed by cash yield significant and positive CARs to the bidder. Burns et al. (2007) suggest that cross-listed firms are more likely to use equity as the method to finance, although the study finds insignificant difference between the return of cash and equity financed M&As.

As a conclusion, method of payment relates to many important factors that influence the CARs of the acquirers. Theoretically, the method of payment has close relationship to motive and target defensive mechanism, and thereby has been commonly used as a proxy in previous studies. However, due to a lack of systematic analysis of various

theoretical implications and the contradictory evidence from the previous studies, the existing evidence in M&A literature provides a relatively confused implication to the effect of payment method.

2.6 Conclusion

This chapter reviews the previous theoretical and empirical studies in the field of M&A. In regard to the factors that explain the return of M&As, this chapter characterizes the previous studies into three categories: M&A motives, target resistance and return anomalies. In fact, these categories interconnect with each other. More importantly, some underpinning theories of these categories are sometimes contradicting with each other. For instance, agency theory suggests that firms with high degree of agency problem prefer to finance M&A via cash (Harford et al., 2012), whereas defence concept suggests that finance M&A via cash can reduce the free rider problem, and thereby reduce the takeover premium. Meanwhile, these contradictory theories have different implications to the expected CARs, and thereby result in the difficulty in building a powerful framework that can consistently explain the different outcomes of the M&A.

Chapter Three Methodology

3.0 Introduction

This chapter presents the research methodology used to examine the stock returns associated with cross-border M&As. The methodology developed here is based on the extant literature in finance research methodologies. As we find that the previous M&A studies tend not to have a consistent methodology in either measuring or analysing the abnormal returns associated with M&A announcement (see e.g., Croci and Petmezas, 2010; Kothari and Warner, 2006), this chapter also discusses the stock return model and test statistics used in the previous studies to justify the methodology chosen in this study. This consideration will form the basis for our empirical analysis in the following empirical chapters. In this chapter, we also discuss the data sources, sample selection process and explanatory variables. The chapter is organized as follow. Section 3.1 discusses the model used to generate the abnormal returns. Section 3.2 discusses the test statistics used for inferences. Section 3.3 reports on the data and summary statistics. Section 3.4 concludes the chapter.

3.1 Estimation of stock returns

Our study focuses on the stock returns associated with the cross-border M&As. If the stock market is efficient and economic agents are efficient and rational, the M&A announcements should generate insignificant abnormal returns (ARs) as the market would have already priced in the outcome of the M&As. However, in practice, the market is not semi-strong efficient. This means that we expect the ARs around the announcement dates to be non-zero.

The concept of AR implies that the return of a security at the time *t* contains two components, the expected (normal) return and unexpected (abnormal) return. Given that:

$$R_{i,t} = K_{i,t} + e_{i,t} \quad (1)$$

where $R_{i,t}$ is the return of stock *i* at time *t*, $K_{i,t}$ is the normal return (the expected return or predicted return), and $e_{i,t}$ is the abnormal return (or the return difference between the observed return and normal return).[22]

3.1.1 Fama-French and Carhart four-factor model

As we show in the Eq (1), the abnormal return is the difference between normal return and the unexpected return. According to Fama and French (1993), the AR is depending on two factors: whether the pricing model is in equilibrium and whether agents use all available information. Thus, without introducing cross-sectional variation into the pricing model, the estimation of AR can involve potential biases. For instance, Croci and Petmezas (2010) use average historical returns as expected returns. Without using a reliable capital asset pricing model (CAPM), the ARs observed during the announcement period can be significantly influenced by systematic risk (market beta). Doukas and Travlos (1988), Gupta et al. (1997), Mantecon (2009), and Shahrur (2005) use single factor CAPM to estimate expected returns. Their results are not as reliable as those from the Fama and French (1993), as investors require compensation for risks associated with size and growth rate. Thus, small and high growth firms can experience higher return in the event period. When these stock characteristics are not taken into account, the standard CAPM tends to overestimate the AR for the small firm and underestimated the AR for the large firm (Fama and French, 1992). As a result, the basic market model may cause a consistent price anomaly for the expected returns in

[22] This framework is introduced by Brown and Warner (1980).

the estimation periods, that is named as bad model problem in Fama (1998). Fama (1998) also shows that the anomaly tends to disappear after controlling for size and BE/ME. By introducing the portfolios controlling by size and BE/ME, Fama and French proposed a three factors CAPM as

$$R_{i,t} - R_{f,t-1} = \alpha_i + \beta_i(R_{m,t} - R_{f,t-1}) + \lambda_i SMB_t + \gamma_i HML_t + \varepsilon_{i,j} \quad (2)$$

$R_{i,t}$ is the percentage return on stock i at the time t; $R_{f,t-1}$ is the risk-free rate; $R_{m,t}$ is the return on the market index; SMB_t is the return on a portfolio of small stocks minus the return on a portfolio of large capital stocks; HML_t is the return on a portfolio of high book to market ratio stocks minus a portfolio of low book to market ratio stocks; WML_t is the price momentum as in Carhart, 1997); $\varepsilon_{i,j}$ is the conditional error. Specifically, the SMB and HML is constructed based on a 2×3 portfolio sorts on size (SMB_t), and B/M (HML_t) at the end of June of each precious year t. SMB_t is constructed using the return of the portfolio of bottom 10% market capitalization firms minus the return of the portfolio of top 10% market capitalization. HML is the return of the portfolio of top 30% Book to Market ratio firms minus the return of bottom 30% of B/M ratio firms, where book value is measured based on the fiscal year ending in calendar year t-1 and market capitalization is based on the value at the end of December in calendar year t-1.

Fama and French (1993) argue that their pricing factors work well in explaining the cross-section of average stock returns. However, Jegadeesh and Titman (1993) argue that from a behavioural finance prospective, the compensation for risk explanation cannot explain the momentum in the stocks return. In order to capture the effect from momentum, Carhart (1997) employs a momentum portfolio as an additional factor to generate a four-factor CAPM.

As such, we follow Carhart (1997) to use a four-factor CAPM, hereafter, (F-F-C) to estimate the ARs. The four-factor CAPM can be written as:

$$R_{i,t} - R_{f,t-1} = \alpha_i + \beta_i(R_{m,t} - R_{f,t-1}) + \lambda_i SMB_t + \gamma_i HML_t + \delta_i WML_t + \varepsilon_{i,j} \quad (3)$$

where:

momentum WML is also constructed based on a 2×3 portfolio sorts on momentum (WML_t) at the end of June of each precious year *t*. WML is the size weighted return of top 30% monthly lagged return firms (so called winner in Carhart, 1997) minus bottom 30% monthly lagged return firms (so called loser in Carhart 1997).

One of the assumption in the F-F-C CAPM is that the slope of four factors remain unchanged in the non-event period.[23] If the estimation period spans in the period that can significantly influence the investors' expectation on profitability and investment opportunity, the slope captured by F-F-C CAPM can be contaminated. Financial crisis can be one of such event. Lemmon and Lins (2003) and Bates (2012) show that investment opportunities decrease during crisis periods because of the fall in business confidence. As such, we modify the F-F-C CAPM model with a dummy to capture the crisis effect to the M&A announcement returns. The modified model is shown as follow:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i\left(R_{m,t} - R_{f,t}\right) + \lambda_i SMB_t + \gamma_i HML_t + \delta_i WML_t + \omega_i Dummy_t + \varepsilon_{i,j} \quad (4)$$

where dummy is the dummy variable for the crisis effect. It takes on value 1 if the estimating period spans in the crisis period, and 0 otherwise.

The asset pricing models assume the expected excess returns are normally distributed (see, e.g. Kothari and Warner, 1997; Fama, 1998; Lyon et al., 1999) during the non-event (estimation) period. However, daily stock returns tend to show volatility clustering, and autoregressive conditional heteroscedastic (ARCH) effect. As such, the returns are unlikely to be normally distributed. Corhay and Rad (1996) show that the conditional variance in the data causes the ordinary least square (OLS) method to overestimate the regression parameters following positive shocks relative to the ARCH

[23] In the Fama (1998), he defines the three important corporate events. They are mergers, share repurchases and seasoned equity offering (SEO).

approach and underestimate the parameters following a negative shock.

In order to capture the conditional volatility and improve estimation efficiency, we employ the generalized ARCH (GARCH) method. We use the asymmetric GARCH method developed by Glosten, et al. (1993), hereafter, GJR-GARCH as the estimation method to capture the tendency for negative shocks that have more pronounces impacts on returns (i.e. it is documented as the leverage or asymmetric effect). The mean equation of the GJR-GARCH is same to Eq. (4), and the variance equation of the GJR-GARCH can be written as:

$$h^2_{i,t} = \mu_i + \varphi\varepsilon^2_{i,\,t-1} + \delta_i\, h^2_{i,t-1} + \eta_i K_{i,t-1}\varepsilon^2_{i,t-1} \qquad (5)$$

where μ_i is the permanent component; φ is the coefficient for prior news; δ_i is the coefficient for prior conditional volatility; and, η_i is the coefficient for asymmetry effect. $K_{i,t-1}$ is the dummy variable that takes on a value of 1 if $\varepsilon_{i,t-1}$ is negative; zero, otherwise. Notice that the Eq. (5) is used to complete the estimation for the GJR-GARCH. The coefficients of these estimates are not relevant for capturing the ARs as ARs are estimated by out of sample data.

3.1.2 AR estimation window and event window

Determining the optimal size of the event window in the event studies tends to face an unavoidable dilemma. How long or short should the event window be? A short event window may not be long enough to indicate the point at which the impact of the announcement dies out or to determine whether the market has anticipated the announcement. Presumably, it is why Gregory (1997) and Sudarsanam and Mahate (2006) use a long-term estimation window to test the value change associated with M&As. However, the short run event study method provides more reliable estimations on price shock associated with M&A announcement (Kothari and Warner, 2006). In

Chapter 2, we have documented three main advantages to use short run method. Firstly, the short run event study method is well specified. In contrast, the method of long run method tends to provide unreliable results because of the general tendency for returns to compound over time. Secondly, the short run method is more powerful when the event day is specified. Kothari and Warner (2006) show that the power to detect the abnormal performance decreases with the increase in event window. Thirdly, the short run method is not highly sensitive to the normal return estimation model. This is contrast to the long run event study method, where the AR is sensitive to the assumption about the return generating process.

In our study, the AR is estimated in a short run event window of 11 days (t=-5 to t=5), where t=0 is the M&A announcement day. Testing the ARs in five days before and after the announcement day can capture the anticipation behaviours and delayed market responses. We use an estimation window of 285-days (t=-300 to day t=-15) to estimate the coefficients of the CAPM. Based on Eq. (4), the ARs are estimated using:

$$AR_{i,t} = \left(R_{i,t} - R_{f,t}\right) - [\hat{\alpha}_i + \hat{\beta}_i\left(R_{m,t} - R_{f,t}\right) + \hat{\lambda}_i SMB_t + \hat{\gamma}_i HML_t + \hat{\delta}_i WML_t + \omega_i Dummy_t \quad (4)$$

where the coefficients β_i, λ_i,γ_i, and δ_i are estimated coefficients under the GJR-GARCH-M method over the estimation window (t=-300 to t=-15) before the announcement date.

We also estimate the cumulative abnormal returns (CARs). The CARs provide an overall inference for the investors' behaviour in the event window. That is, the CAR allows for the accumulation of returns over time. We therefore cumulate the ARs over our 11-day window starting from day t=-5 to the day t=5. The CAR for stock *i* at day *t* is measured as:

$$CAR_{i,(t_{-5},t)} = \Sigma_{t=-5}^{T} AR_{i,t} \quad (6)$$

where T is the number of cumulating days from t=-5.

3.2 Test statistics

Based on the efficient market theory, F-F-C CAPM assumes that the daily anomaly (or excess return) in the non-event period should be randomly distributed. However, Brown and Warner (1985) show that daily excess returns are not random.[24] Thus, the estimated AR in the event period may also be influenced by the autocorrelation and heteroskedasticity. It can lead to the biased analysis if the standard student *t*-test is used. In addition, this cannot be adjusted by the in-sample error adjustment procedure (e.g. Newey-West procedure)[25]. In order to overcome the effect of excess return correlation, Boehmer et al. (1991) propose a standardized AR (SAR) in the *t*-statistical test (so called BMP *t*-test). The SAR is estimated as follow:

$$SAR_{i,t} = \frac{AR_{i,t}}{\hat{S}(AR_i)} \text{ , where} \quad (7)$$

$$\hat{S}(AR_i) = \sqrt{\frac{1}{N-1}\Sigma_{i=1}^{n}\left(AR_{i,T} - \overline{AR_i}\right)}$$

The $\hat{S}(AR_T)$ is the standard deviation of the excess returns (regression residuals) in the estimation period; N is the number of excess returns in the estimation period (in this case, 285); $AR_{i,T}$ is the regression residual at the day *T* (in this case, it is from -300 to -15); $\overline{AR_i}$ is the mean of the regression residuals in the estimation period.

Thus, the BMP *t* statistics of ARs is estimated as:

$$BMP\ t.-stat = \frac{1}{N}\Sigma_{i=1}^{n}\frac{SAR_{i,t}}{\hat{S}(SAR_t)} \quad (8)$$

where $\hat{S}(SAR_t) = \sqrt{\frac{1}{N-1}\Sigma_{i=1}^{n}\left(SAR_{i,t} - \overline{SAR_t}\right)^2}$, $\overline{SAR_t} = \frac{1}{N}\Sigma_{i=1}^{n}SAR_{i,t}$. Here, $SAR_{i,t}$

[24] This study was published before Fama (1993). So, it estimates the AR by only using single factor CAPM. However, Fama (1998) suggests that the three-factor model cannot fully explain the cross-section of stock returns, and therefore the ARs can influenced by non-normality.

[25] Newey-West procedure is designed to overcome the autocorrelation and heteroskedasticity in the error terms in a regression. However, as this study uses the coefficients of the regression to estimate ARs, the in-sample error correction procedure cannot help to adjust the ARs.

denotes the Boehmer, et al. (1991) standardized AR for stock *i* on day *t*, whereas $\hat{S}(SAR_t)$ denotes the cross-sectional standard deviation of standardized AR on day *t*.

Notice that, Boehmer et al. (1991) have not estimated standardize CARs (SCARs) in their study. In the later event studies, SCAR has been estimated in two ways. Eun et al. (1996) estimate the SCARs by using the same method as estimating SAR. They employ the standard deviation of the cumulative residuals in the estimation period (which replaces $AR_{i,T}$ in the second part of Eq. (7) with $CAR_{i,T}$). However, cumulating the residuals in a long estimation window can lead to significantly large standard deviations.[26] When applying the estimated standard deviation in the BMP-*t* test, it overstates the event period's standard deviation and leads to a type II error.[27] Campbell et al. (1997) propose two estimation method for the SCARs. The first method is to use the standard deviation of CARs in the event window to standardize the CARs. Statistically, this method can standardize the distribution of the CARs and perform an unbiased *t* statistic test. However, the standard deviation in the event window may also contain the induced volatility from the event. Thus, the SCARs estimated by this method can also be biased by type II error. The second method proposed by Campbell et al. (1997) is to cumulate the SARs in the event period (see, Eq. (7) above) to be SCARs. This method has one interesting implication. It suggests that the standard deviation used to standardise ARs is the same with the one to standardise CARs.[28]

Although Campbell et al. (1997) suggest that the difference between two methods should be insignificant. However, if we assume that the M&A announcements can result

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[26] It would not be surprising that the estimation period is across several corporate events that lead ARs clustering. Thus, under the estimation method of Eun et al. (1996), the standard deviation of the CARs would be significantly large.

[27] The study assumes that the standard deviation in the estimation period should be the same as the event period disregards the length of the cumulative period.

[28] It can be easily to shown that $\frac{\Sigma_{t=-5}^{T} AR_{i,t}}{\hat{S}(SAR_t)} = \Sigma_{t=-5}^{T} SAR_{i,t}$, where here $\Sigma_{t=-5}^{T} AR_{i,t}$ is CAR_i at day *t*, and $\Sigma_{t=-5}^{T} SAR_{i,t}$ is $SCAR_i$ at day *t*.

in volatility clustering in ARs and CARs, the outcome difference between the two methods should be positively correlated with the scale of AR clustering in the event period. Thus, in our event study, we believe that the second method is more appropriate as the first method is more likely to introduce type I error. Thus, we use the second method in this study. The BMP-*t* statistic can be stated as follows:

$$BMP-t.-stat = \frac{1}{N}\Sigma_{i=1}^{n}\frac{SCAR_{i,t}}{\hat{S}(SCAR_t)} \quad \text{where:}$$

$$SCAR_{i,(t_{-5},t)} = \Sigma_{t=-5}^{T} SAR_{i,t} \quad \text{and,} \qquad (9)$$

$$\hat{S}(SCAR_t) = \sqrt{\frac{1}{N-1}\Sigma_{i=1}^{n}\left(SCAR_{i,t} - \overline{SCAR_t}\right)^2} \;;\; \overline{SCAR_t} = \frac{1}{N}\Sigma_{i=1}^{n} SCAR_{i,t}$$

Here, $SCAR_{i,(t_{-5},t)}$ denotes the SCAR *i* at day *t*. $\hat{S}(SCAR_t)$ is the cross sectional standard deviation of SCARs at day *t*.

In the BMP-*t* statistic, one important assumption is that the cross sectional excess return correlation in the event period is insignificant (see, e.g. Brown and Warner, 1985; Boehmer, et al, 1991; Campbell et al., 1997). In other words, the event days of the sample stocks do not overlap with each other. In practice, the overlap of event day tends to be unavoidable. Thus, Kolari and Pynnonen (2010) suggest that the BMP-*t* statistic is biased by the cross-sectional correlation of ARs and tends to over- reject the null hypothesis.[29] Thus, Kolari and Pynnonen (2010) further adjusted the BMP-*t* test to account for the cross-sectional variance. The adjusted BMP-*t* test (*adj*. BMP-*t*) is given as:

$$Adj.BMP-t-stat = \frac{1}{N}\Sigma_{i=1}^{n}\frac{SAR_{i,t}}{\hat{S}(SAR_t)}\sqrt{(1-\bar{r}) \,/\, (1+(n-1)\bar{r})} \qquad (10)$$

and

$$Adj.BMP-t-stat = \frac{1}{N}\Sigma_{i=1}^{n}\frac{SCAR_{i,t}}{\hat{S}(SCAR_t)}\sqrt{(1-\bar{r}) \,/\, (1+(n-1)\bar{r})} \qquad (11)$$

[29] Kolari and Pynnonen (2010) suggest that the return cros-sectional correlation is a positive infinite matrix, and thereby the average cross-sectional correlation should be positive or at least non-significantly negative. In our test, we find that the cross-sectional correlation can be negative. However, due to the weak cross-sectional correlation, neither the positive or negative average correlation influence the *t* statistic significantly.

where $\bar{r}$ is the average of the sample cross-correlations of the estimation-period residuals.[30] Assuming that $\bar{r}$ remains the same for the CARs, the *Adj.*BMP can estimate the CARs by simply replacing the SAR from Eq (10) with SCAR.

3.3. Sample Description

3.3.1 Data source and sample selection

We extract our M&A samples from the Thomson ONE Database. We focus on the changes in control, and therefore limit the sample to the M&A where acquirers announce more than 10% of target share acquiring. Both acquirers and targets must be listed on their local stock market exchanges. Each stock must have traded 300 days prior to the acquisition announcement and 5 days after the announcement. The M&As were announced between 1st of January 1990 and 30th of June 2015. We also exclude the M&A events in our sample when an M&A is initiated by multiple acquirers. Notice that the sample of our Japanese firms only cover the period between 1st of January 1991 and 31st of 2013. This is a constraint imposed on the period over which the pricing factors have not been constructed by Fama and French.

Our sample period spans two major financial crises: the East Asian financial crisis in 1997, and the recent global financial crisis of 2007/08.[31] Following Lemmon and Lins (2003), we define the East Asian financial crisis period as the period 1st July 1997 to 1st August 1998. Brunnermeier (2009) identifies the period of global financial crisis period as February 1st, 2007 to October 1st, 2008. Crisis periods are not always precisely defined. Brunnermeier (2009) identify the end of global financial crisis as October 1st, 2008, since this was the point of coordinated international bailout. However, the

[30]Following Kolari and Pynnonen (2010), we employ Pearson correlation to estimate the cross-sectional correlation. Compare with Spearman rank correlation, the Pearson correlation contains economic information for the adjustment. However, one of the weaknesses of employ the Pearson correlation is that we cannot ensure the consistent variance of the estimation residuals.

[31] Further information about our data and statistical summary are shown in the section 3.3.

descending trend of the US financial market continuous after 2008 and bottomed in March 2009. Bates (2012) also finds that the Volatility Index[32] of the US financial market in 2010 was still 20% higher than in the pre-crisis period. Thus, it might be difficult to draw a clear line for the end of the 2007/2008 global financial crisis. On the other hand, our study is only focusing on the AR of acquirers and targets in the cross-border M&A instead of the returns of market indexes. After March 2009, investors may have regained their confidence in financial market. Thus, the impact from financial crisis to the coefficients of the F-F-C CAPM portfolio returns may be less significant. Thus, we use March 31st, 2009 as the end of the global financial crisis. We also assume that the Japanese firms are only influenced by the East Asian financial crisis and the US firms are only influenced by the global recent financial crisis.

The market value data, share and index returns of the US firms are obtained from the Center for Research in Security Prices (CRSP). For the Japanese firms, similar data are obtained from Thomson Datastream. The US market portfolio return used in the F-F-C four factor model is obtained from the data library of Kenneth R. French. The daily return of the US three-month treasury bill rate is used as the daily risk-free rate in the US market.[33] The Japanese F-F-C four factors are obtained from Prof. Nathan Joseph. This dataset is constructed in a similar manner to the method shown in data library of Kenneth R. French. We use the Japanese six-month treasury bill rate as the risk-free rate for Japanese stocks.

Table 3.3.1 reports the details of our sample M&A events. We have a sample of 979 cross-border M&As initiated by the US acquirers to acquire Japanese targets (US-JP, here after), and 2094 cross-border M&As initiated by the Japanese acquirers to acquire the US targets (JP-US, here after). In the US-JP, 437 acquirers listed in the US stock

[32] It is also called fear index (See, Schwert, 1989).

[33] The risk-free rate in the data library of Kenneth R. French is fixed one the calendar month. Since treasury bill rates are variable, we adjust the market excess return by the daily annualized three-month treasury bill return.

exchange, and 229 Japanese targets are listed in the Japanese stock exchange. However, 16 the US acquirers and 73 Japanese targets have no trading data in the range between 300 days prior to the acquisition announcement and 5 days after the announcement. As a result, we have 425 acquirers and 156 targets in our final US-JP sample. In the JP-US, we have 1502 listed Japanese acquirers and 329 listed the US targets. However, we have the trading data missing for 776 Japanese acquirers and 7 the US targets. As a result, 726 Japanese acquirers and 322 the US targets are used in our final sample.

Table 3.3.1 Sample selection

	Total US-JP M&As	Total JP-US M&As
Initial sample:	979	2094
Acquirers		
listed firms	437	1502
Data missing	-13	-776
Final sample	**424**	**726**
Acquired less than 50%	**136**	**360**
Acquired more than 50%	**288**	**366**
Targets		
listed firms	229	329
Data missing	-73	-7
Final sample	**156**	**322**
Acquired less than 50%	**144**	**195**
Acquired more than 50%	**12**	**127**

Even though we define the M&A as 10% target share acquiring due to the limited M&A events between the US and Japan, we notice that 50% target share acquisition has commonly used as a benchmark in previous studies. Thus, in table 3.3.1, we split the sample into target takeover (acquiring more than 50% of target shares) and increase in ownership (acquiring less than 50% of target shares). We will also test the investor behaviour associated with target takeover and increase ownership in later sections.

3.3.2 M&A Sample distribution

Table 3.3.2 M&A distribution

Year	No. of M&A	Transaction Value	No. of M&A	Transaction Value	No. of M&A	Transaction Value	No. of M&A	Transaction Value
	US-JP used		US-JP total		JP-US used		JP-US total	
1990	4	1.900	10	11.033	0	0.000	226	116.096
1991	7	105.997	21	201.975	0	0.000	130	40.904
1992	8	15.868	20	15.499	21	108.575	63	62.320
1993	7	28.562	17	28.562	16	44.167	35	32.722
1994	8	20.162	20	46.473	25	11.324	47	25.373
1995	12	68.087	20	58.932	22	237.361	40	188.114
1996	12	192.413	22	136.652	32	140.312	57	88.806
1997	14	52.285	25	53.213	31	96.688	54	66.908
1998	30	255.952	51	294.020	22	53.276	43	126.091
1999	32	779.805	68	477.224	50	74.340	73	68.374
2000	41	124.663	80	111.592	38	685.369	70	396.897
2001	25	437.960	53	102.019	34	107.249	50	78.643
2002	25	75.356	42	58.242	20	241.748	30	199.219
2003	22	947.716	54	461.579	14	23.959	26	32.082
2004	20	73.583	46	156.791	16	122.890	30	94.846
2005	19	330.818	34	134.825	28	67.175	44	80.266
2006	17	146.183	28	118.754	35	173.421	48	327.063
2007	24	947.162	67	342.611	36	135.680	54	174.647
2008	17	114.304	38	110.961	44	247.280	68	821.914
2009	12	0.000	41	141.417	37	126.239	49	106.847
2010	14	100.595	43	366.724	50	381.675	75	248.490
2011	12	54.969	27	109.097	34	440.507	60	365.558
2012	14	539.597	36	327.745	67	1055.241	92	898.692
2013	9	2384.701	25	1274.719	54	224.440	77	269.904
2014	9	272.929	29	198.390	0	0.000	65	928.078
2015	10	352.929	15	242.849	0	0.000	44	963.997

This table presents the M&A announcement distribution over the period January 1, 1990 to June 30, 2015. The Transaction value denotes the average transaction value of the M&As initiated the year. The transaction value of is in the unit of one million US dollar.

Table 3.3.2 presents the sample distribution of the used and total US-JP and JP-US M&As announced between 1st of January 1990 and 30th June 2015. Due to the data missing, the number of announcement and average deal value is 0 in 1990, 1991, 2014 and 2015 for the JP-US M&As.

Figure 3.3.2 presents the bar and line chart of the US-JP and JP-US M&A distribution. The bar chart shows the number of announcements in each year from 1990 to 2015. The line chart presents the average value of the M&A in each year from 1990 to 2015.

Figure 1 US-JP M&A Distribution

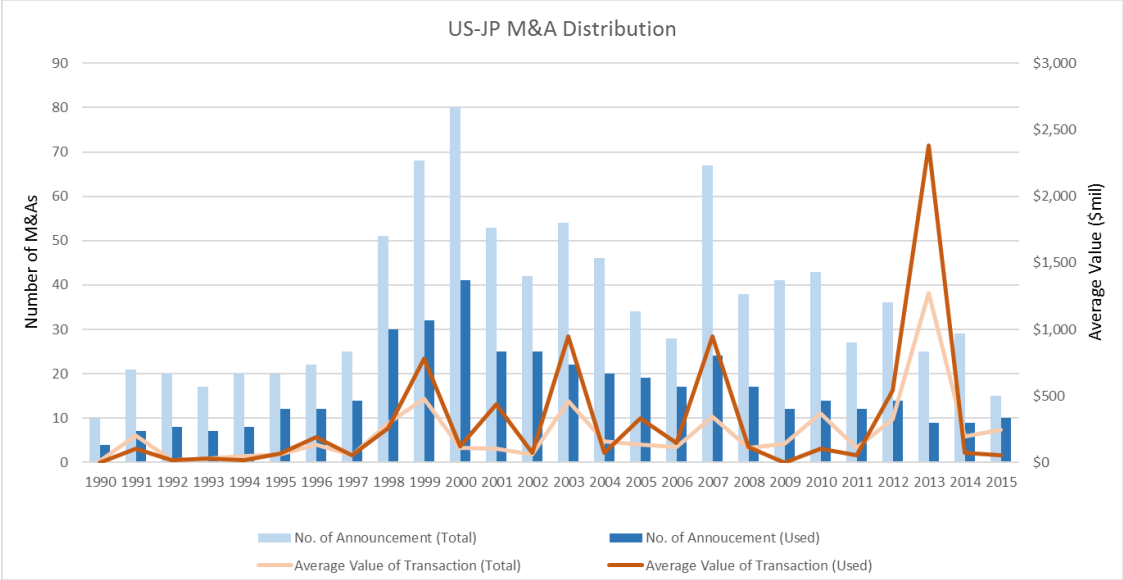

Figure 2 JP-US M&A Distribution

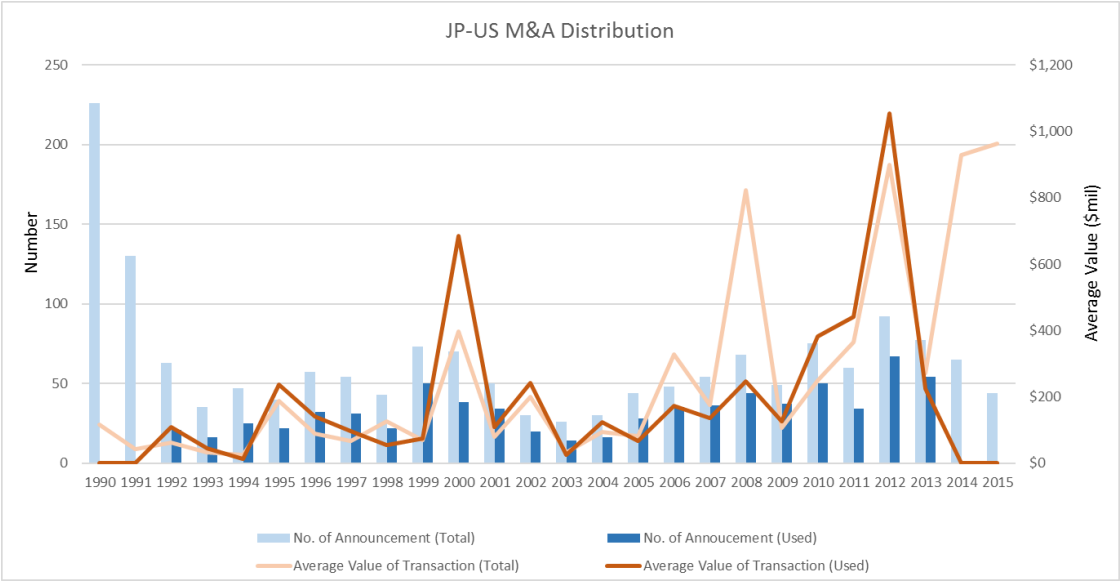

Figure 1 shows that the number of US-JP M&A increase annually from 1990 and reach its highest level in 2000. Then it drops significantly in the following years. The trend is consistent to that documented by Moeller et al. (2004). We also find that the average value of the M&A follows an upward trend. However, we find high fluctuations in the

average M&A value. It may be influenced by the small number of large M&As. In our sample, the number of M&As follows the trend of total M&A events. In addition, we find that the average deal value in our used sample is higher than that in the total sample. It may suggest that deal initiated by listed the US acquirers tend to be larger than the ones initiated by unlisted the US acquirers.

Interestingly, Figure 2 shows that the trend for the JP-US M&As announcement frequency is almost opposite to the US-JP M&As. The number of M&As drops annually starting from 1990 to 1998. After the East Asian financial crisis, the number of M&A has significant increase in 1999 and 2000. There is also an increase in the trend from 2003 to 2012. The trend suggests that the global financial crisis does not result in significant impact on the JP-US M&As. Consistent with the US-JP M&As, we also find that the average transaction value in our used sample tend to be higher than the average sample.

3.3.3 Descriptive statistics of F-F-C four factors over the full period

Table 3.3.3 reports the descriptive statistics for the four explanatory variables (i.e. excess market returns, SMB, HML and WML) used in the four-factor CAPM (see, Eq (3)). The mean of market's excess returns, SMB, HML and WML portfolio returns are positive in the US and negative (except HML) in Japan. The pricing factors for the US and Japan seem to capture different economic conditions. All variables contain significant skewness and kurtosis. The Jarque-Bera statistic also confirms the non-normality distribution. Notice that most of the variables (e.g. excess market return, SMB and WML in the panel A and SMB, HML and WML in the panel B) have negative skewness. The negative skewness shows a strong tendency for the returns to be below the mean return. The negative skewness can lead to a negative asymmetric effect, a statistic condition that can be captured by GJR-GARCH. The significant Q-statistic for the square of variables also confirm the presence of ARCH effects. It is well known

that the use of the GJR-GARCH method leads to better estimation efficiency relative to the standard OLS.

Table 3.3.3 Descriptive statistics of F-F-C four factors over the full period

Variables	N	Mean	Std. dev	Skewness	Kurtosis	Jarque-Bera	Auto(1)	Auto(2)	Auto(3)
Panel A: The US market F-F-C factors									
$R_{m,t} - R_{f,t}$	6425	0.035[a]	1.135	-0.120[a]	11.236[a]	17821.927[a]	5.626[a]	16.263[a]	16.514[a]
SMB_t	6425	0.006	0.589	-0.243[a]	7.294[a]	4902.447 [a]	10.084[a]	10.241[a]	12.528[a]
HML_t	6425	0.012	0.598	0.111[a]	10.183[a]	13557.847[a]	49.345[a]	49.362[a]	49.374[a]
WML_t	6425	0.029[a]	0.861	-0.954[a]	15.207[a]	40076.924[a]	208.370[a]	215.500[a]	217.620[a]
Panel B: Japanese market F-F-C factors									
$R_{m,t} - R_{f,t}$	5660	-0.004[a]	0.012	0.228[a]	7.563[a]	875.499[a]	38.822[a]	39.220[a]	40.360[a]
SMB_t	5660	-0.001[a]	0.008	-0.694[a]	6.640[a]	631.722[a]	36.009[a]	36.945[a]	38.390[a]
HML_t	5660	0.001[a]	0.003	-0.305[a]	5.155[a]	208.675[a]	71.591[a]	103.887[a]	114.604[a]
WML_t	5660	-1.896E-04[a]	0.005	-0.274[a]	4.721[a]	135.762[a]	113.973[a]	138.578[a]	140.757[a]

This table presents the descriptive statistics of explanatory variables over the period January 1, 1990 to June 30, 2015. Std. dev. denotes the standard deviation. Auto (n) denotes the Q-statistic for autocorrelation based on the square of the variables at various lags. [a], [b] and [c] denote the statistical significance at the 1%, 5% and 10% level, respectively.

3.3.4 Mean and skewness of GJR-GARCH mean estimation coefficients

Table 3.3.4 reports the Mean and skewness of the coefficients of the F-F-C four factors and crisis dummy estimated by by the equation (2) under GJR-GARCH. The coefficient of SMB_t is significant in the Panel A, and the F-F-C four factors are all significant in the panel B. The SMB_t is significant in the Panel C. The results show that the F-F-C pricing factors have significant explanatory power to our sample firms' daily stock returns. We find the Dummy variable has the significant and negative coefficient in the Panel B and Panel D. It suggests that the East Asian financial crisis has significant impact on the Japanese firm's stock returns. Surprisingly, we find that the coefficient of the Dummy is insignificant in the panel A and panel C. Overall, because we only have a small number of firms initiate M&As across crisis and non-crisis period, we cannot identify the extend of explanatory power increases by adding the crisis dummy. However, theoretically, it is justifiable to include the dummy in the estimation model.

Table 3.3.4 Mean and skewness of GJR-GARCH mean estimation coefficients

Variables	N	mean	Std. dev	Skewness	Kurtosis	Jarque-Bera	Auto(1)	Auto(2)	Auto(3)
Panel A: The US acquirers									
$R_{m,t} - R_{f,t}$	424	1.107[a]	0.481	1.020[a]	9.223[a]	757.631[a]	0.249	0.333	2.091
SMB_t	424	0.271[a]	0.738	1.216[a]	5.883[a]	251.350[a]	23.067[a]	33.797[a]	36.492[a]
HML_t	424	0.001	0.860	-0.741[a]	7.928[a]	467.745[a]	10.912[a]	12.821[a]	12.967[a]
WML_t	424	-0.040	0.529	0.492[a]	7.349[a]	351.309[a]	0.1519	0.2037	0.8245
$Dummy_t$	21	-0.070	0.980	-1.421[a]	5.896[a]	14.403[a]	0.002	0.003	0.004
Panel B: Japanese acquirers									
$R_{m,t} - R_{f,t}$	726	0.015[a]	0.118	0.722[a]	6.470[a]	427.028[a]	14.367[a]	14.440a	16.964[a]
SMB_t	726	-0.906[a]	0.593	-0.050	2.643	4.151	78.568[a]	107.352[a]	131.154[a]
HML_t	726	-1.030[a]	0.685	-0.930[a]	5.691[a]	323.655[a]	21.834[a]	24.869[a]	29.343[a]
MOM_t	726	-0.072[b]	1.131	0.235[a]	4.012[a]	37.664[a]	54.557[a]	62.773[a]	63.059[a]
$Dummy_t$	82	-0.002[a]	0.004	0.515[b]	3.837[c]	6.021[b]	2.485	2.749	2.806
Panel C: The US targets									
$R_{m,t} - R_{f,t}$	322	0.993[a]	0.732	1.386[a]	14.520[a]	1883.595[a]	0.998	1.883	2.501
SMB_t	322	0.590[a]	0.868	1.348[a]	6.367[a]	249.665[a]	0.405	2.754	2.840
HML_t	322	-0.035	0.979	-1.051[a]	10.411[a]	796.163[a]	2.259	5.568[c]	5.612
MOM_t	322	-0.121	0.667[a]	-0.716[a]	10.032[a]	691.063[a]	0.073	1.474	1.505
$Dummy_t$	16	0.036	0.321	0.379	2.421	0.606	0.012	0.044	0.122
Panel D: Japanese targets									
$R_{m,t} - R_{f,t}$	156	0.055[a]	0.179	1.475[a]	7.475[a]	186.746[a]	0.003	0.109	3.286
SMB_t	156	0.019	0.239	-1.212[a]	7.095[a]	147.226[a]	1.578	2.427	2.436
HML_t	156	-0.027	0.479	-4.326[a]	42.576[a]	10667.482[a]	1.461	4.084	4.098
MOM_t	156	-0.072	0.528	-3.939[a]	31.956[a]	5853.192[a]	0.008	0.813	0.828
$Dummy_t$	9	-0.003[a]	0.003	-1.434[a]	4.575[a]	4.014	0.218	0.232	0.232

This table presents the descriptive statistics of regression coefficient of the explanatory variables over the period January 1, 1990 to June 30, 2015. The coefficients are estimated under the Eq (5) with GJR-GARCH model. Std. dev. denotes the standard deviation. Auto (n) denotes the Q-statistic for autocorrelation based on the square of the variables at various lags. [a], [b] and [c] denote the statistical significance at the 1% and 5% level, respectively.

3.4. Conclusion

This chapter has presented the methodology we use in our empirical chapters. Through the discussion of the various estimation models used in the previous studies, we justify why we use F-F-C four-factor CAPM as well as why we use the GJR-GARCH to improve on estimation efficiency above that of the standard OLS. We also discuss the inconsistent *t* statistics employed in the previous studies, and justify the reason we use

adj.BMP to estimate the statistical significance of the estimated ARs. In the section 3.3, we present the data set and our sample selection. We also show that the F-F-C four factors and our crisis period dummy significantly explain the estimation period stock return. In addition, the statistical property of the F-F-C four factors also justifies our choice of the GJR-GARCH for the AR estimation.

Chapter Four

Estimation of abnormal returns of the US and Japanese acquirers

This chapter reports the changes in shareholder's wealth of acquirers in cross-border M&A announcements. We test the announcement effect on the ARs and CARs of the US acquirers that take over Japanese targets (US-JP, hereafter) and Japanese acquirers that take over the US targets (JP-US, hereafter). As we have discussed in Chapter 2, the previous studies tend to have biased test design and statistical analysis.[34] The inconsistent results and the corresponding interpretations in the cross-border M&A literature provide limited insight in understanding investor behaviour. In addition, the factors that influence the investor's behaviour in the cross-border M&As are rarely tested across different countries with a consistent methodology. Thus, when we review the studies that employ M&A events from different countries, the results tend not to be comparable as indicated before.

In order to address the above issues, this chapter is designed to serve the following purposes. Previous cross-border M&As studies (see, e.g. Francis et al., 2008) have reported that the acquirers experience significant and positive CARs. However, the use of non-equilibrium asset pricing model and the test statistics that does not account the time-series correlation of ARs can lead to potential upward bias and provide less reliable results.[35] For this reason, section 4.1 in this chapter examines whether the cross-border acquirers show significant AR during the announcement period under the more equilibrium-based F-F-C CAPM. Furthermore, based on the previous studies, we expect the acquirers' ARs to be influenced by acquirer's portfolios and deal characterises. In order to test our hypotheses, in Sections 4.2 to 4.7, we examine the

[34] As we have discussed in Chapter 2, some previous studies tend to selective use of theories and use non-equilibrium models to estimate expected returns.

[35] Francis et al. (2008) use single factor CAPM. Compared with F-F-C four factor CAPM, it can cause upward bias. For further explanation, see Chapter 3 section 3.3.1.

factors (method of payment, merger relationship and other acquirer and deal characteristics) that influence investor behaviour associated with the cross-border M&A announcements across acquirers from the US and Japan. Based on the evidence provided by Baxamusa and Georgieva (2015), we expect that investor behaviour associated with M&A announcements will vary across sub- periods. In order to test this hypothesis, section 4.8 examines the stability of ARs and CARs in different sub-periods.

4.1 Acquires ARs and CARs under Fama-French and Carhart model

In this section, we present the empirical results for ARs and CARs estimated using F-F-C four-factor CAPM. Following Kolari and Pynnonen (2010), we employ adjusted BMP *t*-statistic (*adj*.-BMP) to account for the serial correlation and cross-sectional correlation of ARs and CARs (see Chapter 3).

The prior evidence shows that the cross-border acquirers tend to experience significant and positive ARs (see, e.g. Eije and Wiegerinck, 2010; Francis et al., 2008) during the announcement period, whereas the ARs of domestic acquirers tend to be insignificant (see, e.g. Fee and Thomas, 2004; Alexandridis et al., 2014). The higher announcement return can be due to investors' anticipation of higher value creation when acquirers access another market with different culture, economic and legislative background.

Table 4.1 shows the ARs and CARs, and the statistical test results for $\pm$ 5 days encompassing pre- and post-announcement dates. Panel A reports the ARs and CARs of the US acquirers and Panel B reports the ARs and CARs of Japanese acquirers.

Panel A of Table 4.1 shows that US acquirers experience insignificant ARs and CARs during the announcement period. This result is inconsistent with Eije and Wiegerinck, (2010) and Francis et al. (2008). Incidentally, our result is in line with some domestic M&A studies (see, e.g. Fee and Thomas, 2004; Alexandridis et al., 2014) that report

insignificant ARs experienced by acquirers. There are several reasons that can cause the discrepancies between our result and the results shown in previous cross-border M&A studies. Firstly, we only focus on US-JP acquisitions, whereas the Eije and Wiegerinck, (2010) and Francis et al. (2008) use the worldwide cross-border M&As as sample in their studies. Thus, the deal and the acquirers in our studies may have specific characteristics. Secondly, and more importantly, we use the F-F-C four-factor CAPM which is likely to reduce the magnitude of the ARs. We will further study these characteristics in later sections.

Table 4.1 Abnormal and cumulative abnormal returns for the US and Japan acquirers

DAYs	ARs	*adj.*-BMP	CARs	*adj.*-BMP	ARs	*adj.*-BMP	CARs	*adj.*-BMP
	Panel A: The US Acquirers				**Panel B: Japanese Acquirers**			
-5	0.2520	1.36	0.2520	1.36	0.0643	1.17	0.7453	1.09
-4	-0.0169	-1.09	0.2351	0.69	-0.0623	-1.10	0.6830	0.09
-3	0.1098	0.52	0.3450	0.79	0.1665	1.56	0.8496	0.87
-2	0.1209	1.17	0.4659	1.13	-0.0001	0.05	0.8494	0.73
-1	0.1551	-0.80	0.6210	0.80	-0.0268	-0.41	0.8226	0.45
0	0.1382	0.13	0.7592	0.77	0.1256	0.80	0.9482	0.68
1	0.1213	1.04	0.8805	1.15	0.1172	1.94[c]	1.0655	1.31
2	0.0900	0.33	0.9705	1.04	0.1302	1.91[c]	1.1956	1.79[c]
3	0.1720	1.02	1.1425	1.19	-0.0081	-0.16	1.1875	1.61
4	-0.1163	-1.14	1.0263	0.80	0.0778	0.49	1.2653	1.65[c]
5	0.1796	1.20	1.2059	1.09	-0.0793	-1.26	1.1861	1.25

The AR and CAR are measured in percentage terms. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

Notice that in Panel A, the mean of AR at day t=-1 has opposite sign to the *adj*.-BMP *t* statistic test. It is meanly resulted by the *adj*.-BMP *t* statistic test replacing normal AR with standard AR (SAR) (see, Chapter 3). As a result, the mean used in the statistical test can have opposite sign to the mean of ARs and CARs.

Panel B also shows that AR and CAR are insignificant at announcement dates. We find that Japanese acquirers experience positive and significant AR on the day t=1 and day t=2, and significant and positive CAR on day t=2 and day t=4. Even though the result may imply that Japanese acquirers also do not experience significant ARs, the significant ARs can arise with a lag as the news needs to cross markets and the market

takes time to react to the announcement information. Thus, the significant and positive ARs experienced by Japanese acquirers can be resulted by their M&A announcements.

Eije and Wiegerinck, (2010) suggest that the product and financial market imperfection lead to higher ARs for the acquirers in the cross-border M&As. However, market imperfection may not explain our results as we find only Japanese acquirers experiencing significant ARs. Apart from the market imperfection, there are several reasons that may explain the different investor behaviour across the US and Japan. For instance, Gaisford and Ivus (2014) suggest that the small country may gain more from cross-country risk diversification. Another explanation is that the US stock market is more efficient than the Japanese stock market and investors may have already priced in the M&A announcements before the announcement date. The different ARs may also be explained by the deal or firm characteristics (e.g. acquirers' industry, method of payment and targets' public status). For instance, Eun et al. (1996) suggest that Japanese acquirers are more R&D intensive. Thus, they can create higher value by efficiently internalizing targets' R&D resources. We will further test the factors that influence the ARs of acquirers in the following sections.

It is interesting to notice that the significance level of the ARs and CARs shown in the previous studies are much higher than ours.[36] We suggest that there are three basic level elements in our study which reduce the significance level of our test results. Firstly, we employ F-F-C four-factor CAPM whereas previous studies typically estimate the basic one-factor CAPM or even use the average stock price to estimate ARs. Compared with the F-F-C four-factor CAPM, the standard CAPM tends to overstate the magnitude of the ARs (see, Fama and French, 1996).[37] Secondly, we use the GJR-GARCH

[36] For instance, Eije and Wiegerinck (2010) show that the US cross-border acquirers experience positive CAR at a significance level p=0.000 in both -5 to +5 and -3 to +3 cumulative windows.

[37] Fama and French (1996) suggest that three factor model can capture the average stock returns anomalies better than standard CAPM. Thus, the significance level of ARs under F-F-C four-factor CAPM should be lower than standard CAPM.

estimation method instead of the standard OLS method, which reduces the volatility clustering in the residuals and increases estimation efficiency relative to the OLS. Thirdly, and most importantly, our study employs more sophisticated test statistic: the *adj*.BMP *t*-statistic to overcome the common issues of serial correlation and the cross-sectional correlation in event studies. This more sophisticated estimation method is likely to place a downward effect on the significance level of ARs and CARs. As we still find that Japanese acquirers experience significant CARs during the announcement period, our result appear to provide reliable evidence about the change in shareholder wealth in cross-border M&A.

4.2 Merger relationship

The previous studies (see, e.g. Lewis and Webb, 2007; Sharma and Ho, 2002; Lambrecht, 2004) find the ARs can depend on the nature of merger relationship (horizontal or vertical). These studies suggest that the merger relationship can be a proxy for evaluating i) the synergistic effect in the acquisition (see, e.g. Acemoglu et al., 2009; Dos Santos et al., 2008); ii) the amount of agency costs in the acquirers (see, e.g. Laeven and Levine, 2007); and iii) the reduction of information asymmetry risks in the target market (see, e.g. Garfinkel and Hankins, 2011; Beladi et al., 2013). Following previous studies, we examine the investor behaviour associated with merger relationship in the cross-border M&As.

Based on our cross-border M&A sample, we classified the merger relationship into four groups: horizontal acquisition, vertical acquisition, conglomerate acquisition, and increase of corporate control (ICC). Following the previous studies, we employ the Standard Industrial Classification (SIC) code and input/output (I/O) code (see, e.g. Fan and Lang, 2000; Acemoglu et al., 2009) to classify the horizontal, vertical and conglomerate acquisition. We classify M&As as horizontal acquisitions when the acquirer and target share the same primary SIC code. Following Fan and Goyal (2006)

and Ahern and Harford (2009), we classify M&As as vertical if I/O codes of the acquirer and target have more than 1% relativeness. We classify M&As as conglomerate if I/O code relativeness is less than 1%.[38] ICC is the acquisition made by acquirers who have already hold a significant amount of the target shares. Compared with other types of organisational structure, ICC mergers suffer less from risks associated with information asymmetry and also creates less value from the market for corporate control. Without differentiating ICC from the other organisational structures, our result may be weakened by the effect of ICC. In our study, we categorize the M&As as ICC when the acquirer has already hold more than 10% of target shares.

Table 4.2.1 presents the ARs of the US and Japanese acquirers in different merger relationships. Our sample consists of 95 horizontal, 160 vertical, 146 ICC and 123 conglomerate M&A initiated by the US acquirers. Correspondingly, there are 173 horizontal, 143 vertical, 81 ICC and 329 conglomerate M&As initiated by Japanese acquirers. Panel A to D show the ARs of horizontal, vertical, ICC and conglomerate acquirers, respectively. As ARs in our sample are not normally distributed (see Chapter 3), we also employ the non-parametric Kruskal Wallis statistic to test whether ARs in different panels are significantly different from each other.

In Panel A, we find that both the US and Japanese acquirers experience insignificant ARs and CARs on the announcement day. The only significant AR we find in this panel

[38] We notice that the I/O code contains several weaknesses. Firstly, as it is composed based on the US industry input and output, it may not be able to capture the Japanese industry complementary relationship. Although Claessens et al. (2000) use I/O as the proxy for industry relativeness in their Asian country studies, they suggest that despite the high similarity of the Japanese and US industry pattern, the I/O code may still be a less precise method in defining the industry relationship. Secondly, we find that the I/O code is based on early SIC code, which fails to capture the information of many new industries. Thirdly, using the SIC or I/O code may only capture the primary industry of acquirers and targets. The M&A may be motivated by the development of an acquirer's secondary industry business. Even though the I/O code and SIC code may contain weaknesses, we still argue that using the I/O code and SIC code provide a more precise and comparable result compared to manually classified industry relationship. Indeed, only very early studies (see, e.g. Amihud and Lev, 1981; Johnson and Houston, 2000) use such subjective method.

is the significant and positive AR experienced by US acquirers on day t=-2. This significant AR may be the effects of market noise. Our result is consistent with Fee and Thomas (2004) who suggest that a larger proportion of value created from the synergistic effect is converted into the target shareholders' wealth due to their high bargaining power. In Chapter 5, we show that the bargaining between acquirers and targets can reduce the acquirers' wealth gain in the M&A, but it should not be able to determine the difference in ARs across different panels (see Chapter 5, section 5.2). Thus, the insignificant ARs in the horizontal panel may be resulted by other factors such as high post-acquisition restructuring cost and information asymmetry that trade off the value created by the horizontal integration.

In panel B, we show that the US acquirers experience positive and significant AR on day t=1. Japanese acquirers experience negative and significant ARs on day t=1, t=3, t=4 and t=5. Although the market response is insignificant on the announcement day for both US and Japanese acquirers, the significant AR on day t=1 is likely to be a delayed market response. Acemoglu et al. (2009) and Beladi et al. (2013) indicate that vertical M&As are motivated by the reduction in contract costs and improve in cash flow certainty. Considering that Japanese accounting information disclosure and shareholders' protection laws are less mature than the US ones, cross-border vertical M&As may generate higher benefit for the US acquirers than Japanese acquirers.[39]

[39] Aggarwal et al. (2008) show that the information transparency and shareholder's protection in the US firms is higher than the Japanese firm.

Table 4.2.1 Abnormal returns of the US and Japanese acquirers taking horizontal, vertical, increasing corporate control and conglomerate acquisition

The US Acquirers									
	Panel A: Horizontal		Panel B: Vertical		Panel C: ICC		Panel D: Conglomerate		
Days	ARs	*adj.* -BMP	ARs	*adj.* -BMP	ARs	*adj.* -BMP	ARs	*adj.* -BMP	Kruskal Wallis
-5	0.1941	0.20	0.3195	0.44	0.2430	-0.02	0.2355	1.26	0.35
-4	0.2893	-0.15	-0.2465	-0.11	-0.2228	-0.21	0.2486	-0.73	2.74
-3	0.8961	1.53	-0.3562	-0.77	0.4745	1.66[c]	-0.2334	0.08	9.68[b]
-2	0.6732	1.94[c]	0.4806	1.70	-0.4455	-0.98	-0.2300	0.10	7.76[c]
-1	-0.1131	-0.79	0.6883	1.61	-0.0948	0.04	-0.0505	-1.18	2.00
0	0.1993	0.52	-0.2546	-0.74	0.3475	0.08	0.4223	0.71	3.61
1	-0.1217	-0.58	0.1855	1.77[c]	0.0275	0.78	0.1702	0.61	0.49
2	0.0713	-0.48	0.0427	0.39	0.0665	-0.86	0.1461	0.92	0.88
3	0.2097	0.53	0.0270	0.32	0.2494	1.89[c]	0.2375	0.80	0.04
4	-0.2211	-0.24	0.1957	0.94	0.1350	0.26	-0.6470	-1.68[c]	3.62
5	0.2957	1.04	-0.0944	-0.23	-0.0121	-0.63	0.6802	1.58	6.32[c]
Japanese Acquirers									
Days	ARs	*adj.* -BMP	ARs	*adj.* -BMP	ARs	*adj.* -BMP	ARs	*adj.* -BMP	Kruskal Wallis
-5	0.9040	0.12	-1.2890	-0.78	0.3544	1.09	1.6923	1.11	3.21
-4	0.7602	-0.31	-1.3990	-0.70	0.3028	0.95	1.4456	0.92	3.30
-3	0.5894	-0.80	-1.5172	-0.89	0.4417	1.03	1.6971	0.99	4.91
-2	0.3427	-1.21	-1.7066	-0.84	0.4035	1.03	2.0025	1.06	6.25[c]
-1	0.0660	-1.57	-2.0591	-1.04	0.4821	1.05	2.3898	1.20	6.06
0	-0.0519	-1.45	-2.4601	-1.33	0.6129	1.14	2.6407	1.36	8.07[b]
1	0.0595	-1.09	-2.8037	-1.85[c]	0.8824	1.18	2.8142	1.63	11.42[a]
2	0.4279	-0.72	-2.7893	-1.56	0.5368	1.13	3.0256	1.72[c]	9.58b[b]
3	0.6031	-0.56	-3.2125	-1.82[c]	0.3504	0.91	3.0781	1.74[c]	10.67[b]
4	0.3003	-0.63	-3.2023	-2.04[b]	0.4347	0.91	3.1324	1.68[c]	10.89[b]
5	0.6641	-0.56	-3.1252	-1.76[c]	0.3016	0.68	3.1281	1.51	8.77[b]

The ARs are measured in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

This explanation is also in line with Mantecon (2009), who finds that the acquisition between two joint venture entities experience higher CARs when the target is in the country with lower economic freedom.[40] In addition, if investors expect Japanese acquirers have already experienced lower contract cost and cash flow risk in the US, the acquirers may lose flexibility to employ better suppliers or distributors and increase internal transaction cost after the vertical integration. This may explain why Japanese vertical acquirers experience negative ARs.

In the panel of ICC, we find that neither the US nor Japanese acquirers experience significant AR on the announcement day. Our result suggests that the market does not expect ICC to create strong synergistic effect. Comparing with the horizontal and vertical M&As, ICC may not be able to create scale and scope effect, nor the cost from information asymmetry. It is also possible that acquirers who initiate ICC type of M&A do not acquire sufficient amount of target shares. To test whether insignificant ICC announcement effect is a result of low percentage target share acquiring, we perform a test to compare the acquirer's ARs and CARs when takeover more or less than 50% percent of target shares. The results are presented in table 4.2.2.

The table 4.2.2 shows that the US acquirers in both less and more than 50% of target share takeover groups experience insignificant ARs and CARs. This result is confirmed by non-parametric Mann–Whitney U test. On the other hand, Japanese acquirers who acquired more than 50% target shares experience significant and positive AR at day t=1, and significant and positive CARs over day t=2 to day t=5. This result may suggest that the amount of share control impose a more significant effect on Japanese acquirers' ARs.

[40] Although this study is focusing on the cross-border M&As between joint venture entities. We argue that the increasing the corporate control serves the similar function as takeover joint venture partner.

Table 4.2.2 ARs and CARs the US and Japan acquirers taking over more or less 50% of target shares

	The US Acquirers bid less than 50%				The US Acquirers bid more than 50%				ARs	CARs
DAYs	ARs	*adj.*-BMP	CARs	*adj.*-BMP	ARs	*adj.*-BMP	CARs	*adj.*-BMP	M-W U	M –W U
-5	0.0306	0.46	0.0306	0.46	0.3565	1.97[b]	0.3565	1.97[b]	0.57	0.57
-4	-0.0006	-0.53	0.0300	0.14	-0.0245	-1.21	0.3320	0.77	1.38	0.34
-3	0.4036	1.40	0.4336	0.93	-0.0289	-0.62	0.3031	0.22	0.66	0.42
-2	-0.1789	0.62	0.2347	0.85	0.2625	1.16	0.5656	0.76	1.04	0.35
-1	-0.2646	-1.14	0.0099	0.31	0.3533	0.33	0.9189	0.78	0.07	0.15
0	0.0895	-0.41	0.0796	0.03	0.1612	0.64	1.0801	0.94	0.07	0.05
1	0.4062	1.39	0.4857	0.77	-0.0131	-0.04	1.0669	0.88	0.21	0.02
2	0.1127	0.74	0.5984	0.86	0.0793	-0.48	1.1462	0.63	0.25	0.09
3	0.2692	1.81[c]	0.8676	1.14	0.1262	-0.28	1.2724	0.52	0.18	0.11
4	0.7909	1.92[c]	1.6584	1.55	-0.5446	-2.37[a]	0.7278	-0.36	3.78[a]	1.13
5	-0.0549	0.40	1.6035	1.31	0.2904	1.42	1.0182	0.08	0.93	0.63
	Japanese Acquirers bid less than 50%				**Japanese Acquirers bid more than 50%**				**ARs**	**CARs**
-5	-0.0142	0.35	-0.0142	0.35	0.1414	1.38	0.1414	1.38	0.54	0.54
-4	-0.0346	-0.70	-0.0488	-0.22	-0.0895	-0.88	0.0519	0.38	0.23	0.18
-3	0.3257	2.08[b]	0.2770	0.95	0.0099	-0.06	0.0618	0.27	1.52	0.71
-2	0.0294	0.56	0.3064	1.06	-0.0292	-0.57	0.0326	-0.07	0.54	1.15
-1	-0.2882	-1.39	0.0182	0.28	0.2302	0.98	0.2628	0.40	1.84[c]	0.07
0	0.0571	-0.21	0.0753	0.15	0.1930	1.56	0.4558	0.96	0.90	0.15
1	0.0390	0.79	0.1143	0.42	0.1942	1.95[c]	0.6500	1.63	0.30	0.53
2	0.1397	1.14	0.2540	0.72	0.1208	1.59	0.7708	2.05[b]	0.27	0.12
3	0.0263	0.48	0.2803	0.81	-0.0420	-0.80	0.7289	1.69[b]	1.07	0.22
4	0.0718	0.18	0.3521	0.82	0.0838	0.54	0.8127	1.72[b]	0.40	0.02
5	-0.2900	-2.28[b]	0.0621	0.20	0.1280	0.50	0.9406	1.78[b]	1.97[b]	0.48

The AR and CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. The M –W U denotes the Mann–Whitney U test. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

We further investigate the distribution of the four types of M&As in the more or less than 50% groups. The table 4.2.3 shows the distribution of four types of M&A in more or less than 50% target takeover.

As we expected, the ICC has the smallest number of announcements of than 50% takeover. However, for Japanese acquirers, we find that the percentage of ICC in total sample is not significantly lower in the more than 50% of the bidding group. Thus, we can conclude that in ICC, the size of target share acquiring does not have a significant effect on the ARs, given our established minimum cut-off point.

Table 4.2.3 number of observations for each type of M&A in more or less than 50% of target bidding

The US acquirers				
	Horizontal	Vertical	ICC	Conglomerate
Bid less than 50%	31	58	99	48
Bid more than 50%	64	102	47	75
Japanese acquirers				
	Horizontal	Vertical	ICC	Conglomerate
Bid less than 50%	104	62	40	160
Bid more than 50%	69	81	41	169

We also find that the US acquirers who initiate conglomerate M&As do not experience significant returns during the announcement period. The only significant AR on day t=-4 is more likely to be driven by the unrelated market noise. The announcement effect for the US acquirers is consistent with the previous studies (see, e.g. Villalonga, 2004; Dos Santos et al., 2008) that show that the conglomerate integration neither increases nor decreases the shareholders' wealth.

Unlike the US acquirers, Japanese acquirers experience positive and significant ARs on day t=2, t=3 and t=4. Although we do not observe significant AR on the announcement day, the continuation of the positive ARs can be interpreted as a positive market response to the acquisition announcement. There are two reasons that can explain the different investor behaviours associated with conglomerate M&As across the US and Japan. Firstly, Japanese investors tend to be more optimistic than the US investors in response to the M&A announcements (Kang et al., 2000). Japanese firms have historically maintained a close relationship with Japanese commercial banks (the main bank system). Pinkowitz and Williamson (2001) and Kang et al. (2000) report that the main bank provides significant liquidity support as well as monitoring to Japanese acquirers. Secondly, the acquirers from the two countries may have different characteristics. When we examine the US and Japanese conglomerate acquirers, we find that a large number of Japanese conglomerate acquirers are general trading companies. These firms tend to already have highly diversified business sectors before

the M&As. Thus, Japanese conglomerate acquirers can be more experienced in integrating businesses from different industries, which in turn, may result in lower costs in the post-M&A restructuring. It is worth noting that when we examine the M&A experience of the US and Japanese acquirers, we find that most US and Japanese conglomerate acquirers have initiated more than two acquisitions in the past. Thus, the M&A experience may not be the reason why markets act differently to the announcements.

To test for differences in the ARs across the forms of merger relationships, we apply the Kruskal–Wallis statistic to the ARs across the various groups. The result shows that the ARs of the US acquirers for the different merger relationships are not significantly different. This result is inconsistent with *adj*-BMP test, which shows that the acquirers experience positive and significant ARs in the vertical panel but experience insignificant ARs in the other panels. It might because the Kruskal–Wallis statistic is non-parametric, so the result is unaffected by the particular distribution of the ARs. For Japanese acquirers, Kruskal–Wallis test shows that ARs in at least one panel are significantly different from the ARs in the other panels from day t=0 to day t=5. This result is consistent with the result of *adj*-BMP test.

Table 4.2.3 presents the CARs of the US and Japanese acquirers in different merger relationships. Panel A to Panel D show the CARs of the horizontal, vertical, ICC and conglomerate acquirers.

Different to the ARs shown in table 4.2.1, we cannot find any significant CARs around the announcement date in table 4.2.3. The insignificant CAR may imply that investors do not show consistent response to any specific type of M&A announcements. The Kruskal-Wallis test also shows that the CARs experienced by the US and Japanese acquirers are not significantly different across the panels.

Table 4.2.3 Cumulative abnormal returns for the US acquirers taking horizontal, vertical, increasing corporate control and investment acquisition

The US Acquirers									
	Panel A: Horizontal		Panel B: Vertical		Panel C: ICC		Panel D: Conglomerate		
Days	CARs	*adj.* -BMP	CARs	*adj.* -BMP	CARs	*adj.* -BMP	CARs	*adj.* -BMP	Kruskal Wallis
-5	0.1941	0.20	0.3195	0.44	0.2430	-0.02	0.2355	1.26	0.35
-4	0.4834	0.02	0.0730	0.24	0.0202	-0.17	0.2486	-0.73	0.68
-3	1.3796	0.82	-0.2831	-0.20	0.4947	1.03	-0.2334	0.08	8.36[b]
-2	2.0527	1.62	0.1975	0.52	0.0491	0.30	-0.2300	0.10	8.60[b]
-1	1.9397	1.01	0.8858	1.08	-0.0457	0.31	-0.0505	-1.18	7.15[c]
0	2.1390	1.00	0.6312	0.50	0.3018	0.27	0.4223	0.71	4.37
1	2.0173	0.80	0.8167	1.12	0.3293	0.70	0.1702	0.61	2.75
2	2.0886	0.46	0.8594	1.11	0.3958	0.34	0.1461	0.92	3.25
3	2.2982	0.54	0.8863	1.08	0.6452	0.90	0.2375	0.80	2.78
4	2.0772	0.49	1.0820	1.22	0.7802	0.92	-0.6470	-1.68[c]	2.73
5	2.3729	0.74	0.9876	1.16	0.7681	0.50	0.6802	1.58	2.47
Japanese Acquirers									
Days	CARs	*adj.* -BMP	CARs	*adj.* -BMP	CARs	*adj.* -BMP	CARs	*adj.* -BMP	Kruskal Wallis
-5	0.9040	0.12	-1.2890	-0.75	0.3544	1.09	1.6923	1.11	7.29[c]
-4	1.6642	-0.10	-2.6880	-0.72	0.6572	1.02	3.1379	1.02	7.08[c]
-3	2.2536	-0.36	-4.2052	-0.78	1.0989	1.03	4.8351	1.01	6.66
-2	2.5963	-0.61	-5.9117	-0.80	1.5024	1.04	6.8375	1.03	5.84
-1	2.6623	-0.86	-7.9708	-0.85	1.9845	1.06	9.2273	1.08	5.19
0	2.6105	-1.01	-10.4309	-0.94	2.5974	1.08	11.8681	1.14	4.45
1	2.6700	-1.04	-13.2346	-1.08	3.1797	1.11	14.6822	1.23	3.65
2	3.0979	-1.00	-16.0239	-1.15	3.7165	1.12	17.7078	1.31	3.42
3	3.7011	-0.94	-19.2364	-1.23	4.0669	1.10	20.7859	1.37	3.30
4	4.0013	-0.90	-22.4387	-1.33	4.5016	1.09	23.9183	1.42	3.15
5	4.6654	-0.86	-25.5639	-1.38	4.8032	1.05	27.0464	1.43	3.02

The CARs are measured in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

Overall, we find that the types of acquisition can explain the announcement returns in the cross-border M&As. We also find that the US and Japanese market act inconsistently to the M&A announcement. We suggest that the risks from information asymmetry and shareholder's protection in the target country influence the market interoperation to the M&A announcement.

We need to highlight several important issues with our test procedure. Firstly, we find that the ARs and CARs in most subgroups are not significant on day t=0. Thus, the type of acquisitions may not be a strong determinant of the ARs. Secondly, we find that acquirers in the horizontal and ICC M&As experience insignificant ARs. In theory, we suggest that the insignificant ARs in the two panels should be driven by different reasons. However, we cannot find other better proxy to test the difference. Indeed, this problem exists in most M&A studies. When we compare the insignificant ARs found by previous studies (e.g. Malmendier and Tate, 2008; Sherman and Pettway, 1987), it is difficult to justify the main factor that results in the insignificant ARs. Thirdly, our classification of the merger relationships may not capture all the synergic effects we wish to test. For instance, when an acquirer takes over a firm in the target country, it may also take over the supplier and distributor networks. Thus, the boundary between the horizontal and vertical can sometimes be ambiguous.

4.3 Acquiring listed or unlisted target

Fuller et al. (2002) and Harford et al. (2012) indicate that acquirers are more likely to experience negative market responses when they inappropriately avoid the unlisted targets in M&A. The negative ARs may reflect the high bargaining power of listed targets. Grossman and Hart (1980) and Schwert (2000) also show acquirers experience negative CARs when they take over listed targets. However, different to Fuller et al. (2002) and Harford et al. (2012), Grossman and Hart (1980) and Schwert (2000) explain the negative CARs by free rider problem. They suggest that when the target is listed,

free riders can dilute the acquirers' shareholders' wealth.

In this study, we categorise the public status of the target firms into listed and unlisted. Following Officer (2007), we categorize the subsidiaries as unlisted firms. Officer (2007) indicates that acquiring subsidiaries shares common characteristics with acquiring the unlisted targets. Acquirers can be risked by high information asymmetry and benefit from low target bargaining power considering the target's weak capability to access external funds. Surprisingly, we find that the majority of target firms are unlisted in both US-JP and JP-US cross-border M&As.

Table 4.3.1 shows the ARs and CARs of the US and Japanese acquirers who take over the listed and unlisted targets. The sample consists of 367 unlisted biddings and 57 listed biddings initiated by the US acquirers. In addition, there are 662 unlisted biddings and 64 listed biddings initiated by Japanese acquirers. In Panel A, we report the acquirers' AR when they bid listed targets (listed bidding). In Panel B, we report the acquirers' ARs when they bid unlisted targets (unlisted bidding). In Panel C and Panel D, we report the acquirer's CARs in listed and unlisted bidding, respectively.

Panel A shows that the US acquirers who take over listed targets do not experience either significant ARs or CARs during the announcement period. Consistent with Fuller et al. (2002) and Harford et al. (2012), we find that the acquirers in the unlisted bidding experience positive and significant CARs from day t=-3 to day t=5. The return continuations suggest that investors appreciate the US acquirers to takeover unlisted Japanese targets. Officer (2007) reports that unlisted firms or subsidiaries experience takeover premium discount about 15% to 30% compared with public firms. The less wealth shift from acquirers to targets may explains the more positive ARs and CARs experienced by the US acquirers. The high cost of accessing external funding for unlisted targets may also explain the significant and positive CARs of acquirers in the unlisted bidding (see, e.g. Francis et al., 2008). In this case, acquirers can create higher value from financial synergy and have higher bargaining power over their targets.

Table 4.3.1 Abnormal returns and cumulative abnormal returns for the US and Japanese acquirers who bid listed and unlisted targets

The US Acquirers										
	Panel A: Listed bidding		Panel B: unlisted bidding			Panel C: Listed bidding		Panel D: Unlisted bidding		
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**Mann–Whitney U**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**Mann–Whitney U**
-5	-0.0970	-0.98	0.3062	1.42	1.25	-0.0970	-0.63	0.3062	1.42	1.25
-4	-0.0634	-0.14	-0.0096	0.79	0.32	-0.1604	-1.23	0.2966	1.52	0.79
-3	0.2675	0.83	0.0853	1.14	0.20	0.1071	-0.79	0.3819	1.89[c]	0.89
-2	0.0083	0.59	0.1384	1.13	0.54	0.1154	-0.38	0.5203	2.16[b]	0.71
-1	0.6352	0.80	0.0805	0.16	1.04	0.7506	-0.29	0.6008	1.95[c]	0.80
0	-0.0459	-0.37	0.1668	1.49	0.61	0.7047	-0.53	0.7676	2.39[a]	0.87
1	-0.2438	-0.58	0.1781	1.61	1.11	0.4610	-0.62	0.9457	2.66[a]	1.14
2	0.1664	1.36	0.0781	0.31	0.93	0.6274	-0.13	1.0238	2.60[a]	0.97
3	0.4841	0.48	0.1236	1.46	0.33	1.1115	-0.15	1.1474	2.80[a]	0.99
4	-0.0275	-0.09	-0.1301	0.03	0.34	1.0840	-0.33	1.0173	2.64[a]	0.83
5	-0.3894	-0.47	0.2680	0.98	0.90	0.6946	-0.13	1.2853	2.78[a]	1.05
Japanese Acquirers										
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**Mann–Whitney U**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**Mann–Whitney U**
-5	2.4297	2.36[a]	0.5825	0.30	0.44	2.4297	2.36[a]	0.5825	1.25	1.65[c]
-4	2.8268	2.57[a]	0.4758	-0.05	0.52	5.2566	2.49[a]	1.0583	1.11	1.77[c]
-3	3.1515	2.51[a]	0.6270	0.45	0.63	8.4081	2.53[a]	1.6853	1.12	1.74[c]
-2	2.5497	2.50[a]	0.6851	0.60	0.48	10.9578	2.55[a]	2.3704	1.12	1.67[c]
-1	2.2672	2.34[a]	0.6829	0.56	0.10	13.2250	2.53[a]	3.0533	1.08	1.54
0	2.0063	2.21[b]	0.8459	1.08	-0.07	15.2312	2.50[a]	3.8992	1.14	1.42
1	2.4566	2.29[b]	0.9310	1.30	0.05	17.6878	2.50[a]	4.8302	1.24	1.36
2	2.8294	1.93[b]	1.0377	1.40	-0.04	20.5172	2.44[a]	5.8679	1.33	1.28
3	3.3272	2.31[b]	0.9807	1.18	0.10	23.8444	2.45[a]	6.8485	1.38	1.24
4	3.2159	1.99[b]	1.0768	1.47	0.00	27.0602	2.42[a]	7.9253	1.43	1.19
5	2.9430	1.78[c]	1.0162	1.36	-0.20	30.0032	2.37[a]	8.9416	1.46	1.14

The ARs and CARs are measured in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

Despite these results, the Mann–Whitney U test shows that that ARs are insignificantly different across that types of bids. We suggest that the difference in sample size may reduce the power of Mann–Whitney U test. Thus, our *adj*-BMP test results can be more reliable to identify the effect of listed and unlisted bidding.

Interestingly, the market response for listed and unlisted biddings initiated by Japanese acquirers shows opposite signs. Japanese acquirers experience significant and positive ARs and CARs when they bid for the US listed targets. On the other hand, when they bid the unlisted targets, Japanese acquirers only experience insignificant ARs and CARs. This is potentially due to the better accounting disclosure system in the US and thereby the Japanese acquirers who bid listed targets are compensated by less information asymmetry. However, we cannot justify whether the reduction of the information asymmetry can trade-off for the high bargaining power of listed targets.

Other possibility is that the size of the US unlisted target is relatively smaller than the Japanese unlisted targets. Thus, when Japanese acquirers takeover the unlisted US targets, they cannot be benefit from increasing market power or diversification. To test the size effect on the target public status, we present the average size of the deal in table 4.3.2. Following Fuller et al. (2002), we measure the size by deal value to acquirer's total assets.

Table 4.3.2. Relative deal size of the US and Japanese public and private bidding

The US acquirers			
	Public bidding	**Private bidding**	**t-statistics**
Deal value / Total asset	0.0352	0.0447	0.48
Japanese acquirers			
	Public bidding	**Private bidding**	**t-statistics**
Deal value / Total asset	0.0391	0.0465	0.47

The deal value and total asset value are converted into USD based on the average exchange rate during 365 days before the announcement.

Table 3.3.2 shows that the relative deal size is not significantly different between public

and private bidding for both the US and Japanese acquirers. Thus, the size effect should not explain the different ARs experienced by acquirers from the two countries when bidding the unlisted targets.

In addition, in the listed bidding panel, we find that the ARs and CARs of Japanese acquirers are significant and positive over the entire announcement period. This result implies that investors anticipate the M&A announcement from other information sources beforehand. We have tested several possibilities to explain the pre-announcement significant returns. We have checked the industry of the Japanese acquirers and the merger relationship with the listed targets. However, we cannot find any significant evidence that the investor behaviour is influenced by the two factors above. In addition, bidding for the foreign listed target can also be driven by the purpose of cross-listing (see, e.g. Doidge et al., 2009). By taking over the listed targets, acquirers can reduce the listing cost in the target's country. However, we have not found a trend that Japanese acquirers list their shares on the US market after the acquisition. Moreover, by checking the bidding experience of the Japanese acquirers, we find that the acquirers in the listed bidding tend to have more experience of acquisition activities. However, we also have not found evidence that more experienced acquirers experience higher average ARs or CARs.

Overall, we suggest that the target public status can determine the AR of acquirers. However, we find it difficult to explain the opposite market reactions to the announcements experienced by the US and Japanese acquirers. Furthermore, even if we only focus on the results of the US acquirers, we still find that the positive CARs can be explained by more than one theories.

4.4. Method of payment

Previous studies indicate that the method of payment can influence investor behaviour

during the M&A announcement period. Draper and Paudyal (1999) and Shleifer and Vishny (2003) indicate that the using stock payment may be a sign of the perceived overvaluing an acquirer's stock price. Thus, an acquirer's stock value may decrease when it finances M&A by stock. However, even though stock payment can exchange the overvalued acquirer's stock for the undervalued target assets, Fu et al. (2013) argue that stock financing may not be able to benefit acquirer's shareholders. Instead, the overvalued acquirers tend to have higher agency cost. Thus, investors may show negative response to the pure stock payment as it can be the signal of the stock overvaluation and high agency cost in the acquirer. In addition, Schwert (2000) and Shleifer and Vishny (2003) suggest that pure cash payment may reduce the resistance of the target and in turn reduce the cost of completing an acquisition.

The method of payment in this study is defined as the proposed payment method reported in the M&A announcements. Compared to the final payment method, the proposed payment method should have more significant impact on the announcement returns. Consistent with Boubakri et al. (2008), we find that cross-border M&As are mainly financed by cash. In our sample of 181 the US acquirers and 397 Japanese acquirers who disclosed their proposed payment method, only 28 US acquirers and 26 Japanese acquirers use common stock or mixed method as the final finance method.[41] In addition, due to our small sample size, we can only classify all the non-cash payment in one subgroup instead of classifying them into more granular level as in some other studies.

Table 4.4 reports the ARs and CARs of the US and Japanese acquirers according to their forms of payment. The sample consists of 152 cash payment and 27 non-cash payment US-JP M&As, and consists 369 cash payment and 25 non-cash payment JP-US M&As. Panel A and Panel B report the ARs of the acquirers financing M&As by

[41] The mixed payment method is mainly referring to the cash and stock payment. There are also a small number of M&As financed by cash and convertible bond, cash and debt, ordinary shares and assets.

cash and non-cash. Panel C and Panel D report the CARs of the acquirers who finance the M&As by cash and non-cash, respectively.

The table shows that both the US and Japanese acquirers do not experience significant ARs and CARs during the announcement period. Our result is inconsistent with Shleifer and Vishny (2003), Eije and Wiegerinck (2010), and Schwert (2000) who find the method of payment significantly explains the CARs. However, these studies are based on domestic M&As whereas in the cross-border M&As it is a common practice to use cash payment.

Overall, we suggest that the method of payment cannot explain the ARs and CARs during the announcement period. As most cross-border M&As are financed by cash, the method of payment in cross-border M&A may not contain valuable information for investors to anticipate the real bargaining power or the result of the M&A. The method in this section however, may contain two weaknesses. Firstly, Harford et al. (2012) indicate that the cash payment is a signal of empire building when the target is listed. However, due to the sample size, we cannot do the cross test for the method of payment and target public status. Secondly, we cannot separate the mixed and pure stock payment, and this can reduce the power of our test (see, Martynova and Renneboog, 2009).

Table 4.4 Abnormal returns and cumulative abnormal returns for the US and Japanese acquirers who use with different finance method

The US Acquirers										
	Panel A: Cash payment		Panel B: Non-cash Payment			Panel C: Cash payment		Panel D: Non-cash Payment		
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**Mann–Whitney U**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**Mann–Whitney U**
-5	0.0850	-0.63	0.9423	1.59	0.90	0.0850	-0.48	0.9423	1.61	0.90
-4	0.0706	0.47	-0.2897	0.43	0.26	0.1556	0.06	0.6525	1.44	0.74
-3	0.1830	0.78	-0.0579	0.60	0.28	0.3386	0.18	0.5946	0.80	0.81
-2	0.0288	0.08	-1.1900	-0.30	0.20	0.3674	0.47	-0.5954	0.02	0.31
-1	0.1199	0.50	0.4932	0.45	0.03	0.4873	0.24	-0.1022	0.31	0.31
0	-0.0357	1.50	-0.6214	-1.21	1.49	0.4516	0.95	-0.7236	-0.59	1.04
1	-0.2485	-0.76	-0.0846	0.41	0.68	0.2030	0.72	-0.8083	-0.63	0.86
2	0.0218	0.40	-0.6546	-0.13	0.01	0.2249	0.91	-1.4628	-0.75	1.13
3	-0.0674	0.32	1.6799	1.55	1.69[c]	0.1575	0.97	0.2171	0.02	0.29
4	-0.4316	-1.15	0.2119	1.26	1.86	-0.2741	0.18	0.4289	0.42	0.38
5	0.0672	-0.20	-0.2499	0.44	0.68	-0.2070	0.03	0.1790	0.43	0.19
Japanese Acquirers										
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**Mann–Whitney U**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**Mann–Whitney U**
-5	0.8428	0.72	1.3646	0.49	0.28	0.8428	0.72	1.3646	0.49	0.28
-4	0.6610	0.25	1.8043	0.45	0.20	1.5038	0.49	3.1689	0.48	0.26
-3	0.9662	0.81	2.1004	0.33	0.03	2.4699	0.60	5.2693	0.42	0.18
-2	0.8788	0.62	2.0383	0.22	0.03	3.3487	0.61	7.3076	0.36	0.14
-1	0.9727	0.83	2.4415	0.18	0.04	4.3214	0.67	9.7490	0.32	0.14
0	1.0983	1.23	2.6181	0.26	0.14	5.4197	0.78	12.3671	0.31	0.13
1	1.3870	1.35	2.6356	0.22	0.20	6.8067	0.88	15.0027	0.30	0.18
2	1.5332	1.29	3.0949	0.45	0.40	8.3399	0.95	18.0976	0.32	0.22
3	1.5357	1.27	2.9513	0.53	0.42	9.8756	1.00	21.0489	0.35	0.25
4	1.6155	1.32	2.6591	0.26	0.18	11.4911	1.04	23.7080	0.35	0.25
5	1.5393	1.24	3.2878	0.61	0.45	13.0304	1.07	26.9958	0.38	0.28

The US AR and CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP t-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

4.5 The ARs and CARs of acquirers in different industries

As the cross-border M&A is a process of business resource reallocation, the characteristics of different industries (e.g. output variation, contract cost, information asymmetry) may explain the motivation as well as friction in the M&As. If the investors efficiently price these characteristics, the industry of the acquirers can be a determinant of the announcement returns.

Following Acemoglu et al. (2009) and Kiymaz (2004), we classify the acquirers' industry by using 4-digit standard industrial classification (SIC) code. We find that several acquisitions are initiated by the investment subsidiaries of a non-finance company (e.g. Microsoft Global Finance). For these cases, we use the secondary SIC code of the acquirers to match the industry identity of the subsidiaries.

Based on the Fama-French 10 industry classification[42], we classify our 435 samples of the US acquirers and 735 samples of the Japan acquirers into 7 industry areas, which are consumer products[43], finance[44], health care, manufacturing, high technology, retail and service.[45]

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[42] We found that if we follow the Fama French 10 industry portfolio classification method, we will have a large number of acquirers being categorised into "other" and "high tech" group. In the 10 portfolio classification method, Fama and French integrated service in the high tech portfolio and integrated finance, insurance and many other industries in the other portfolio. Thus, we believe that the 10 industry portfolio is not an efficient method for our study. Thus, we further classify the finance from the "other" industry and classified high technology industrial and service firms from the "hiTec" industry. We also combined Consumer Durables and Consumer Nondurable products manufacturer since the sample size of each group is too small.

[43] "Consumer products" contains both Consumer Durables and Consumer Nondurable.

[44] "Finance" contains insurance and banking.

[45] Notice that, we exclude some event in this test due to the small size of sample number. We exclude the whole sales, telecom, mining and energy industry. In addition, we exclude the US retail industry acquirers since only less than 10 public American retailers initiated cross-border M&As to Japan target between 1990 and 2015.

Table 4.5.1 presents the average ARs of the US and Japanese acquirers from consumer products, manufacturing, finance, health care, and high technology, service and retail industry sectors. Our sample consists 33 the US acquirers from consumer products industry, 98 from finance industry, 35 from healthcare industry, 59 from high-technology industry, 88 from manufacturing industry; and consists 75 from service industry. The corresponding samples for Japanese acquirers are 123 firms in consumer industry, 23 in finance industry, 46 in healthcare industry, 69 in high-technology industry, 194 in manufacturing industry, 70 in service industry, and 121 in retailer industry.

We find that the Japanese high technology acquirers experience significant and positive AR on day t=1. The significant AR can be a delayed market reaction to the M&A announcement. This result is in line with Eun et al. (1996) and Seth et al. (2002), who show that the acquirers from R&D intensive industries experience higher CARs. However, we find that the US acquirers from high technology group do not experience significant AR during the announcement period. It is also worth noting that the high technology industry acquirers in both the US and Japan do not show significant trend to choose targets from specific industries.

There are two reasons may explain why only Japanese high technology acquirers experience significant ARs. Firstly, Japanese high technology acquirers have the highest R&D intensity among Japanese acquirers. Following Eun et al. (1996), we use R&D to Sales ratio as the proxy of R&D intensity. As it shown in table 4.5.2, we find that Japanese acquirers in high technology industry have the highest R&D to Sales ratio. In contrast, the US acquirers in high technology have the second lowest R&D/Sales.

Table 4.5.1 Abnormal returns for the US acquirers in consumer products, finance, health care, high technology and service industry sector

The US Acquirers													
	Consumer products		Finance		Health Care		High-Tec		Manufacturing		Service		Kruskal Wallis
Days	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	
-5	0.6195	0.51	-0.0268	-0.55	-0.0743	-0.20	0.5450	0.59	0.4862	0.28	0.1839	1.72[c]	4.22
-4	-0.4228	-0.53	-0.0264	0.99	-0.7618	-1.62	-0.4433	-0.21	0.0741	0.23	0.4577	0.77	3.83
-3	0.0242	0.53	-0.6075	-1.22	0.0381	-0.19	-0.0474	0.00	0.6857	2.98[a]	0.7125	1.99[b]	11.43[b]
-2	-0.1469	-0.36	0.0192	0.03	-0.0331	-0.38	-0.3391	0.40	0.3593	1.08	0.4727	2.15[b]	9.30
-1	0.2656	0.33	0.0667	0.50	0.6650	0.18	0.8814	1.27	0.2157	0.58	-0.2983	-1.20	2.93
0	0.6719	1.32	0.1807	0.80	0.4645	0.18	-0.6705	-1.00	0.3584	1.16	0.0597	0.11	3.13
1	0.6030	0.66	0.6587	1.69[c]	-0.1608	-0.16	-0.0470	0.45	-0.1456	0.56	-0.0558	-0.27	3.01
2	-0.6975	-2.00[b]	-0.0101	0.48	0.2697	1.06	0.0957	0.70	0.5595	1.90[c]	0.0427	0.15	5.75
3	0.0643	0.17	0.2189	0.92	0.0040	0.18	0.4609	1.20	-0.0118	-0.05	0.5465	1.57	2.91
4	-0.6825	-1.29	0.0020	0.41	0.9098	2.52[a]	-0.7503	-1.22	-0.3321	-0.92	-0.3741	-0.59	9.21
5	0.1489	0.84	0.1210	0.07	0.2411	0.16	-0.0448	0.26	0.7148	1.70	0.0035	-0.52	2.08

The Japanese Acquirers															
	Consumer products		Finance		Health Care		High-Tec		Manufacturing		Service		Retailer		Kruskal Wallis
Days	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	ARs	*adj.*-BMP	
-5	0.2205	1.03	0.4087	1.07	0.2228	-0.22	-0.0782	0.01	-0.0140	0.45	0.6824	2.14[b]	-0.3692	-0.78	5.55
-4	-0.1622	-0.73	-0.4873	-0.62	0.1506	0.75	-0.3625	-1.29	-0.1212	-0.15	-0.4137	-1.64[c]	0.0465	0.05	4.86
-3	0.3543	1.52	-0.8951	-1.37	-0.0575	-0.76	-0.0740	0.29	0.1596	1.44	0.0091	0.37	0.3992	2.15[b]	5.23
-2	-0.0969	0.00	0.2934	-0.02	-0.0369	-0.05	-0.0592	0.01	-0.2879	-0.98	0.5826	1.44	0.3527	2.16[b]	5.89
-1	-0.4058	-0.62	-0.3293	0.12	-0.3402	-0.92	0.4077	0.69	0.2278	0.86	0.0873	0.38	-0.1544	-0.35	3.28
0	-0.0018	0.87	-0.5643	-0.47	-0.4721	-1.06	0.4366	1.24	0.0811	-0.07	0.5039	0.91	0.2731	1.45	6.82
1	-0.0776	0.20	0.3653	0.44	0.1851	0.30	0.4389	1.76[c]	0.3480	1.48	-0.0119	0.15	-0.0063	0.46	2.05
2	0.2078	1.37	0.6164	1.11	-0.0846	-1.29	-0.7387	-1.44	0.3194	0.91	-0.2015	-0.79	0.1753	0.82	7.96
3	-0.1083	-0.92	0.4630	0.53	-0.3647	-0.72	-0.4945	-1.46	-0.0282	0.50	0.5647	0.95	-0.0060	0.82	7.43
4	-0.2470	-0.39	0.2174	0.81	-0.4345	-0.98	1.0319	2.06[b]	0.0033	0.49	0.3837	1.38	-0.1062	-0.87	9.78
5	-0.3939	-1.19	0.1379	0.30	-0.9313	-2.58[a]	0.2539	0.69	-0.0247	0.36	0.0233	-0.08	0.2548	1.10	11.33[c]

The AR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

Secondly, as table 4.5.2 shows that the US and Japanese high technology acquirers have the lowest and second lowest asset values, respectively, the high technology acquirers may not be able to create much value from the scale effect compared to other acquirers. In contrast, high technology acquirers can create value from the complimentary effect of intangible assets. In this case, the information asymmetry may impose a more significant effect on the high technology acquirers. In considering the weaker information transparency and accounting disclosure system in Japan, the higher risks from information asymmetry may lead the US high technology acquirers to experience insignificant ARs.

We do not find evidence that the acquirers from healthcare, manufacturing, service and retailer industry experience significant ARs from the M&A announcement. Although several significant ARs appear during the announcement period (e.g. the US manufacturing acquirers experience significant ARs on day t=-3 and day t=2; the Japanese acquirers from service industry experience significant ARs at day t=-5 and day t=-4), the long gap between the announcement day and the significant AR day weakens their correlation to the announcement.

Table 4.5.2 Average Total asset and R&D/Sales of acquirers in different industries

	The US Acquirers						
	Consumer	**Finance**	**Health care**	**Hi-Tec**	**Manufacturing**	**Service**	**Retailer**
Average total assets (ml)	32.12	517.8	13.72	7.530	48.47	9.633	n.a.
R&D/Sales	5.7577	0.1747	2.1278	0.2330	1.1735	0.4958	n.a.
	Japanese Acquirers						
Average total assets (bl)	4.197	8.772	0.8772	1.071	2.231	1.204	4.746
R&D/Sales	0.0372	0.0029	0.0998	0.0465	0.0255	0.0372	0.002

The value of total assets shown in table 4.5.2 are in local currency. ml and bl denotes for a unit of million and billion respectively.

Notice that, acquirers in health industry shares serval common characteristics with the acquirers in high technology industry. In table 4.5.2, we show that acquirers in the two industries have low total asset values. In addition, acquirers in high technology and

health industries are R&D intensive. However, Dranove and Lindrooth (2003) and Ho and Hamilton (2000) indicate that the combined entities do not experience significant change in the cost efficiency or product quality. Their study may explain the reason why acquirers in the healthcare industry do not experience significant ARs.

The Table 4.5.1 shows that US finance acquirers experience significant and positive ARs on day t=1. On the other hand, we find that Japanese acquirers from the finance industry do not experience significant ARs. Our result can be explained by the regulatory arbitrage documented by Karolyi and Taboada (2015). The relatively less matured market and regulations in Japan may provide the US acquirers more investment opportunities. We also find that the US finance acquirers tend to acquire targets from different industries whereas Japanese finance acquirers are more likely to acquire targets in the financial industry. The choice of targets may also confirm the existence regulatory arbitrage. Market for corporate control may be another explanation for the inconsistent investor behaviours. Finance institutions are more likely to encourage their targets to adopt more advanced accounting disclosure system to increase the information transparency (Campa and Hernando,2006). As a result, target firms will reduce their cost of funds in the future (Doidge et al., 2007). Aggarwal et al. (2011) also suggest that once the target firms are acquired by the finance institutions from foreign countries, they are more likely to be forced to improve their corporate governance and information disclosure. The corporate governance index reported in Doidge et al. (2007) and Aggarwal et al. (2011) shows that the shareholders in the US are more likely to benefit from the market for corporate control due to their high corporate governance rating and more advanced disclosure system.[46]

Table 4.5.3 presents the CARs for the US and Japanese acquirers from consumer

[46] Most corporate governance index was constructed after 2000, which only covers 2/3 of our analysis period. However, if we consider the trend of the Japanese financial reporting system development and the Japanese financial market development, it is reasonable to assume that the corporate governance rating of the US is higher than Japan from 1990.

products, manufacturing, finance, health care, and high technology, service and retail industry sectors.

We find that M&A announcements do not result in significant CARs for both the US and Japanese acquirers. The only expectation is that Japanese acquirers in the retail industry experience significant and positive CARs from day t=0 to day t=3. When we review the Japanese acquirers in the retail industry, we find that the sample is highly overlap with the acquirers who initiate conglomerate M&As. Thus, the significant and positive CARs may not be a result of the synergy effect but low risks involved in the M&As.

The insignificant CARs in most panels might be resulted by inconsistent reactions during the announcement period. In table 4.5.1, we show that the significant ARs tend to be surrounded by return reverse. The Kruskal Wallis test also confirms that acquirers from different industries do not experience significantly different CARs.[47]

[47] The only significant Kruskal Wallis test result is the US acquirers on day t=-2. However, it is still too far away from the announcement day to show the significant correlation between the result and the announcement.

Table 4.5.3 Cumulative abnormal returns for the US acquirers in consumer products, finance, health care, high technology and service industry sector

The US Acquirers													
	Consumer products		Finance		Health Care		High-Tec		Manufacturing		Service		Kruskal Wallis
Days	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	
-5	0.6195	0.58	-0.0268	-0.61	-0.0743	0.32	0.5450	0.48	0.4862	0.05	0.1839	1.05	4.41
-4	0.1967	-0.16	-0.0532	0.87	-0.8361	-0.12	0.1017	-0.04	0.5603	0.07	0.6416	0.59	1.38
-3	0.2209	0.37	-0.6607	-0.39	-0.7980	-0.14	0.0543	-0.50	1.2461	1.34	1.3541	1.27	5.31
-2	0.0740	0.30	-0.6415	-0.11	-0.8311	-0.41	-0.2848	-0.52	1.6054	1.35	1.8268	2.04[b]	9.34[b]
-1	0.3396	0.46	-0.5748	0.14	-0.1662	-0.22	0.5965	0.33	1.8211	0.96	1.5285	1.25	2.66
0	1.0115	1.03	-0.3941	0.50	0.2983	0.12	-0.0740	-0.08	2.1794	1.56	1.5882	1.24	2.67
1	1.6145	1.27	0.2646	1.16	0.1375	-0.29	-0.1211	-0.12	2.0339	1.63	1.5324	0.93	2.57
2	0.9170	0.57	0.2546	1.34	0.4072	0.08	-0.0254	-0.10	2.5933	2.34[a]	1.5751	0.76	2.69
3	0.9813	0.74	0.4735	1.64	0.4111	0.08	0.4354	0.32	2.5815	2.02[b]	2.1216	1.39	2.70
4	0.2989	0.32	0.4755	1.31	1.3209	1.11	-0.3149	0.12	2.2494	1.20	1.7475	0.68	1.18
5	0.4478	0.72	0.5965	1.22	1.5620	0.92	-0.3596	0.20	2.9642	1.85[c]	1.7509	0.75	1.01

The Japanese Acquirers															
	Consumer products		Finance		Health Care		High-Tec		Manufacturing		Service		Retailer		Kruskal Wallis
Days	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	
-5	0.2205	1.01	0.4087	1.07	0.2228	-0.22	-0.0782	0.01	-0.0140	0.45	0.6824	2.14[a]	-0.3692	-0.78	3.80
-4	0.0583	0.26	-0.0785	0.22	0.3733	0.32	-0.4407	-0.80	-0.1353	0.21	0.2687	0.22	-0.3227	-0.53	0.74
-3	0.4126	1.05	-0.9737	-0.36	0.3158	-0.24	-0.5148	-0.43	0.0243	0.96	0.2778	0.34	0.0765	0.77	1.51
-2	0.3157	0.87	-0.6803	-0.37	0.2790	-0.22	-0.5739	-0.35	-0.2636	0.29	0.8604	0.95	0.4292	1.72	2.97
-1	-0.0901	0.51	-1.0095	-0.26	-0.0612	-0.58	-0.1662	0.00	-0.0358	0.61	0.9477	0.94	0.2747	1.32	1.02
0	-0.0919	0.76	-1.5738	-0.40	-0.5333	-0.96	0.2704	0.48	0.0454	0.50	1.4516	1.19	0.5479	1.80[c]	3.87
1	-0.1695	0.76	-1.2084	-0.21	-0.3483	-0.81	0.7094	1.13	0.3934	1.07	1.4397	1.07	0.5415	1.80[c]	2.62
2	0.0382	1.08	-0.5921	0.19	-0.4329	-1.14	-0.0293	0.59	0.7128	1.28	1.2382	0.79	0.7168	1.92[c]	1.92
3	-0.0701	0.76	-0.1291	0.36	-0.7976	-1.35	-0.5238	0.15	0.6846	1.31	1.8029	0.99	0.7108	1.98[b]	1.85
4	-0.3171	0.59	0.0884	0.63	-1.2321	-1.51	0.5081	0.62	0.6879	1.38	2.1866	1.27	0.6046	1.61	2.26
5	-0.7110	0.26	0.2263	0.68	-2.1635	-2.10[b]	0.7620	0.75	0.6633	1.43	2.2099	1.19	0.8594	1.81[c]	5.29

The CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

4.6 R&D intensity

In section 4.5, we suggest that the R&D intensity can explain the different investor behaviour of the high technology acquirers. In this section, we test whether the acquirers' industry is a proxy for the level R&D intensity. For testing purposes, we classify the acquirers in our sample into high and low R&D intensity groups. We use the R&D to Sales ratio to define the R&D intensity, and classify acquirers in the top and bottom 33 percentile of R&D/Sales as high and low R&D intensive acquirers, respectively.

Table 4.6 presents our test results. Our sample consists 70 the US acquirers with low R&D spending and 70 with high R&D spending; and 170 Japanese acquirers with low R&D spending and 170 with high R&D spending. Panel A and Panel B show the ARs of high and low R&D intensive acquirers, respectively. Panel C and Panel D show the CARs of high and low R&D intensive acquirers, respectively.

We find that acquirers do not experience significant ARs and CARs on the announcement dates. We find several significant ARs (e.g. the US high R&D intensive acquirers experience significant ARs on day t=-4 and day t=2), but all the significant ARs are far away from the announcement day. Thus, we conclude that R&D intensity cannot explain the ARs and CARs of the acquirers. Our result also suggests that acquirer's industry is not a proxy of R&D intensity.

Table 4.6. Abnormal returns and cumulative abnormal returns of high and low R&D intensive acquirers

The US Acquirers										
	Panel A: High R&D Intensity		Panel B: Low R&D Intensity			Panel C: High R&D Intensity		Panel D: Low R&D Intensity		
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**M-W U**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**M-W U**
-5	-0.0199	0.10	0.4073	1.28	0.09	-0.0199	0.10	0.4073	1.28	0.09
-4	0.5899	1.83[c]	-0.2793	-1.16	1.30	0.5700	1.05	0.1280	1.06	1.25
-3	0.1759	0.65	-0.3165	0.35	0.73	0.7458	1.05	-0.1885	0.83	1.31
-2	0.0805	0.50	0.6789	1.48	0.77	0.8264	1.19	0.4903	1.20	1.19
-1	0.4086	0.03	0.0390	-0.97	1.30	1.2349	1.20	0.5293	1.18	1.42
0	0.2177	0.67	-0.0964	-0.49	0.56	1.4527	1.46	0.4329	1.14	1.43
1	-0.0621	-0.19	-0.2546	0.45	0.08	1.3906	1.27	0.1783	0.97	1.30
2	-0.4568	-2.06[b]	0.0404	1.03	-1.39	0.9338	0.79	0.2187	1.08	0.99
3	0.1131	0.05	-0.2989	0.07	0.25	1.0468	0.72	-0.0802	0.92	1.04
4	0.0734	-0.76	-0.8769	-1.42	0.65	1.1202	0.52	-0.9571	0.45	1.37
5	0.2399	0.21	0.7500	1.73[c]	-0.34	1.3601	0.51	-0.2071	0.91	1.10
Japanese Acquirers										
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**M-W U**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**M-W U**
-5	0.0994	0.69	0.2006	1.32	-0.06	0.0994	0.69	0.2006	1.32	-0.06
-4	-0.1798	-0.96	-0.1215	-0.30	-0.32	-0.0804	-0.10	0.0791	0.68	-0.41
-3	0.1080	0.04	0.0114	0.07	-0.02	0.0277	-0.06	0.0905	0.58	-0.19
-2	-0.2334	-1.37	0.1220	0.76	-0.71	-0.2057	-0.70	0.2125	0.84	-0.71
-1	-0.2361	-1.34	-0.3496	-0.97	0.05	-0.4418	-1.18	-0.1371	0.06	-1.00
0	-0.0973	-0.77	-0.0699	-0.26	-0.46	-0.5391	-1.35	-0.2070	-0.05	-0.89
1	0.0416	0.71	0.1016	1.24	-0.60	-0.4975	-1.04	-0.1054	0.42	-0.57
2	0.0839	0.41	0.5536	3.12[a]	-2.08	-0.4136	-0.82	0.4482	1.33	-1.00
3	0.0796	0.10	0.3496	1.36	-0.79	-0.3340	-0.76	0.7978	1.68[c]	-1.07
4	-0.0584	-0.49	-0.0138	0.38	-0.11	-0.3924	-0.86	0.7840	1.69[c]	-1.33
5	-0.1917	-1.46	-0.0335	-0.47	-0.50	-0.5841	-1.24	0.7505	1.52	-1.51

The ARs and CARs are measured in percentage. *adj*-BMP denotes the adjusted BMP t-statistic. M-W U denotes the Mann–Whitney U test. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

4.7 Announcement effect on market illiquidity acquirers

Following the asset pricing theories, many previous studies indicate that the market liquidity status will influence the expected returns of a firm (see, e.g. Amihud, 2002; Pastor and Stambaugh, 2003; Bekaert et al., 2007). Investors of highly illiquid firms may experience risks when liquidating their stock holdings. Thus, investors may show less willingness to invest in illiquid firms. As a compensation for the additional risks that are taken on by investors, a premium is generally offered to account for the liquidity risk. The previous studies found that in the price shock period, illiquidity explains why certain firms experience higher excess returns than the others. Pastor and Stambaugh (2003) find that the illiquidity effect is still significant even they adjust the Fama French factors.

Following Amihud (2002), we measure the market illiquidity by using the average ratio of daily absolute return to the trading volume in dollars. We take an average of the illiquidity ratios for each acquirer from day -300 to day -15. Based on our sample size, we classify our samples into high illiquidity (HI) acquirers, medium illiquidity (MI) acquirers and low illiquidity (LI) acquirer for the top 30 percent illiquidity (HI), middle 40% illiquidity (MI) and bottom 30 percent illiquidity acquirers (LI).

Table 4.7 presents the ARs and CARs of HI acquirers, MI acquirers and LI acquirers. Our sample consists of 127 the US low illiquidity, 170 medium illiquidity, and 127 high illiquidity acquirers; and consists of 218 Japanese low illiquidity, 290 medium illiquidity, and 218 high illiquidity acquirers.

Table 4.7 Abnormal returns and cumulative abnormal returns for the US and Japanese low illiquidity, medium illiquidity and high illiquidity acquirers

The US Acquirers														
	Low Illiquidity		Medium Illiquidity		High Illiquidity			Low Illiquidity		Medium Illiquidity		high Illiquidity		
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**Kruskal Wallis**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**Kruskal Wallis**
-5	0.2396	1.23	-0.0512	-0.49	0.5895	1.12	0.10	0.7049	0.45	0.0187	0.55	1.7501	-0.40	0.10
-4	-0.1466	1.03	0.0332	0.05	0.0757	0.31	0.07	0.5583	0.56	0.0519	0.56	1.8258	-0.40	0.07
-3	-0.4091	-1.15	0.1256	0.46	0.5612	3.37[a]	0.92	0.1492	0.13	0.1775	0.42	2.3870	0.01	0.92
-2	-0.1788	-0.43	0.0677	0.83	0.4668	2.51[a]	1.59	-0.0296	0.01	0.2452	0.45	2.8539	0.32	1.59
-1	-0.0157	0.03	0.1685	0.54	0.2655	0.32	1.88	-0.0453	-0.03	0.4137	0.57	3.1194	0.30	1.88
0	0.2216	0.82	0.0669	1.34	0.1274	0.18	1.31	0.1762	0.23	0.4806	1.13	3.2467	0.27	1.31
1	0.4188	1.86[c]	-0.1023	-0.09	0.0539	0.60	0.62	0.5950	0.70	0.3783	1.04	3.3006	0.18	0.62
2	-0.2372	-0.34	0.3334	1.68[c]	0.1648	0.20	0.86	0.3578	0.55	0.7117	1.66[c]	3.4654	0.15	0.86
3	0.2463	1.74[c]	0.1891	0.57	0.0602	0.72	1.09	0.6041	0.81	0.9008	1.56	3.5256	0.19	1.09
4	-0.1700	0.09	-0.2085	-0.71	0.0595	0.75	1.14	0.4341	0.66	0.6923	0.92	3.5851	0.25	1.14
5	0.0180	-0.37	0.3947	0.84	0.1113	1.11	1.46	0.4520	0.54	1.0869	1.29	3.6964	0.37	1.46
Japanese Acquirers														
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**Kruskal Wallis**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**Kruskal Wallis**
-5	-0.0058	0.52	0.6643	0.44	1.5775	0.57	0.91	-0.0058	0.66	0.6643	0.48	0.0158	0.55	2.04
-4	-0.1115	0.36	0.7661	0.60	1.3945	0.01	1.06	-0.1174	0.52	1.4304	0.58	0.0297	0.28	1.83
-3	-0.0083	0.71	0.9981	0.62	1.5589	0.50	1.13	-0.1256	0.30	2.4286	0.61	0.0453	0.36	1.70
-2	0.0188	0.90	1.0757	0.80	1.4538	0.35	1.05	-0.1068	0.62	3.5042	0.69	0.0598	0.36	1.49
-1	-0.3446	0.52	1.0698	0.64	1.7426	0.74	1.80	-0.4514	0.49	4.5740	0.70	0.0773	0.44	1.50
0	-0.3176	0.47	1.2934	1.06	1.8688	0.99	2.24	-0.7689	0.15	5.8674	0.78	0.0960	0.54	1.53
1	-0.1237	0.65	1.4209	1.13	1.8992	1.15	1.53	-0.8927	0.12	7.2883	0.86	0.1150	0.64	1.48
2	-0.0520	0.61	1.4573	0.80	2.1816	1.64	1.50	-0.9446	0.24	8.7456	0.87	0.1368	0.78	1.46
3	-0.1583	0.60	1.4624	0.84	2.2585	1.45	1.76	-1.1030	0.32	10.2080	0.89	0.1594	0.86	1.39
4	-0.2657	0.54	1.7290	1.11	2.3327	1.44	2.17	-1.3687	0.32	11.9370	0.93	0.1827	0.93	1.40
5	-0.4893	0.32	1.8230	1.09	2.2246	1.38	2.88	-1.8580	0.15	13.7600	0.97	0.2049	0.98	1.44

The AR and CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

Overall, we the effect of market illiquidity is not conclusive. We find that all the US LI, MI and HI acquirers experience significant and positive ARs during the announcement period. However, none of these significant ARs are close to the announcement date. The significant and positive AR on day t=1 experienced by LI may be related to the M&A announcement; however, this result is inconsistent with our hypothesis that investors of high illiquidity acquirers should be compensated for higher returns.

We find that the US MI acquirers experience significant AR on day t=2 whilst HI acquirers experience significant AR on day t=-2, which are both far away from the announcement day.

On the other hand, the Japanese acquirers from different illiquid sub-groups do not experience significant ARs and CARs on or near the announcement day.

The Kruskal Wallis test also shows that the three subgroups of the US and Japanese acquirers are not significantly different from each other. Our result implies that the liquidity status of an acquirer in the cross-border M&A may not be an important determinant of the significant ARs and CARs. Due to the information asymmetry in cross-border M&As, investors tend to be more cautious, and thereby invest less in respond to the announcement. Thus, the illiquid may not be as important as other synergistic factors.

Thus, we conclude that the market liquidity status of acquirers is not an effective determinant for the ARs. Although we suggest that high illiquidity firms might compensate the shareholders with return premiums, this is not always the case in a large corporate event like M&A where shareholders' wealth are more likely to be influenced by other major factors such as the synergetic effect and bargaining power of the targets.

4.8 Announcement effect in the different time period

Our sample covers the M&A events over a longer than twenty years' period. Investors may change their interpretations of the M&A announcements in different times. There are several factors that may lead to such changes. Firstly, the improvement in accounting disclosure quality in our sample countries (see, e.g. Alimehmeti and Paletta, 2014; Bebchuk et al., 2008) and the increase in monitoring situations involved (see., e.g. Alimehmeti and Paletta, 2014; Bebchuk et al., 2008; Chen et al, 2007) may significantly improve the information transparency in recent years. Thus, if investors are risk averse due to the strong information asymmetry in a cross-border manner, we should observe inconsistent market responses in different periods. In addition, as more and more M&As take place, the gains from M&As decreases as market inefficiency decreases. As a result, we expect to observe less significant ARs in the later years. Thus, in this section, we examine whether the ARs and CARs are stable over different period of time.

In order to compose this test, we split our sample into three time periods. Our sample period is from 1990 to 2015. We test whether the ARs and CARs are consistent between the first nine calendar years (from 1990 to 1998) and the last nine calendar years (from 2007 to 2015). Martynova and Renneboog (2008) indicate that the investor's interpretation of M&A announcements can be significantly inconsistent in the different stages of merger waves. Thus, in order to overcome the effect from merger wave, our periods choice also avoids the M&A clustering in our event sample (see, chapter 3, figure 1 and figure 2).

Table 4.8.1 shows the ARs and CARs experienced by the US and Japanese acquirers in different time periods. Our sample consists of 102 US-JP M&As before 1998 and 121 US-JP M&A after 2007. For the JP-US M&As, the samples consist of 169 before 1998 and 322 after 2007.

Table 4.8.1 Abnormal and cumulative abnormal returns for the US and Japan acquirers

	The US Acquirers in 1990 to 1998				The US Acquirers in 2007 to 2015				ARs	CARs
DAYs	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**M-W U**	**M –W U**
-5	0.3148	0.68	0.3148	0.92	0.0124	0.00	0.0124	0.26	0.75	0.75
-4	-0.1577	-0.11	0.1570	0.33	0.1749	0.90	0.1873	0.68	0.77	0.18
-3	0.1065	0.95	0.2636	0.53	-0.1101	-0.12	0.0771	0.32	1.21	0.74
-2	0.3254	0.46	0.5890	0.83	0.0021	1.35	0.0792	0.88	0.57	0.62
-1	0.2646	0.59	0.8536	0.86	-0.3764	-0.84	-0.2972	-0.07	0.60	0.78
0	0.4829	1.50	1.3364	1.49	0.3005	1.01	0.0033	0.73	0.11	0.35
1	0.1428	0.88	1.4792	1.46	0.4235	1.41	0.4268	1.16	1.09	0.34
2	0.0394	-0.27	1.5186	1.38	0.323	1.51	0.7498	1.76[c]	1.18	0.00
3	-0.1962	-0.28	1.3224	1.39	0.0658	1.24	0.8156	2.06[b]	0.45	0.08
4	0.1129	0.62	1.4353	1.23	-0.4858	-1.43	0.3298	1.15	1.69[c]	0.12
5	0.2205	1.10	1.6558	1.47	0.4403	0.58	0.7701	1.31	0.65	0.10
	Japanese Acquirers in 1990 to 1998				**Japanese Acquirers in 2007 to 2015**				**ARs**	**CARs**
-5	0.0216	1.60	0.0216	-0.33	0.0322	0.14	0.0322	-0.20	2.15	2.15
-4	0.0232	1.39	0.0448	-0.50	-0.0756	0.03	-0.0434	-0.14	2.13	2.13
-3	0.0270	1.72[c]	0.0718	-0.22	-0.0522	0.11	-0.0956	-0.28	2.24	2.16
-2	0.0272	1.84[c]	0.099	-0.03	-0.0473	0.17	-0.1429	-0.21	2.35[b]	2.20
-1	0.0313	2.36[a]	0.1303	0.28	-0.2511	-0.10	-0.3940	-0.43	2.78[a]	2.35
0	0.0358	3.08[a]	0.1662	0.66	-0.2995	0.01	-0.6935	-0.76	3.10[a]	2.52
1	0.0360	2.91[a]	0.2021	0.96	-0.0789	0.48	-0.7724	-0.76	2.64[b]	2.54
2	0.0369	2.85[a]	0.2391	1.17	0.1418	0.64	-0.6306	-0.60	2.57[c]	2.51
3	0.0372	2.75[a]	0.2763	1.35	0.1558	0.65	-0.4748	-0.44	2.54[c]	2.49
4	0.0381	2.49[a]	0.3144	1.42	0.2149	0.90	-0.2600	-0.25	2.32[c]	2.46
5	0.0382	2.38[a]	0.3526	1.43	0.0632	0.64	-0.1968	-0.22	2.38[c]	2.44

The AR and CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. The M –W U denotes the Mann–Whitney U test. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

In general, the market does not price the US acquirers' announcements differently across the two periods. The US acquirers only experience significant and positive CARs on day t=2 and t=3 in between 2007 and 2015. These significant CARs are more likely to be driven by market noise given the long gap from the announcement day. The insignificant Mann–Whitney U test results also confirm our interpretation. Based on this result, we conclude that the ARs and CARs of US acquirers are not significantly influenced by the change of investors' interpretations. This may be due to the US investors being more sophisticated and their decision making being less reliant on the accounting disclosures. The voluntary accounting information disclosure taken by the

US firms may also explain why consistent investor behaviours are consistent over two periods (see, e.g. Lang and Lundholm, 2000).

In contrast, Japanese acquirers experience significant and positive ARs in between 1990 and 1998. This may suggest that Japanese investors are more optimistic as we discussed above (in section 4.2) as they may significantly price in for the information asymmetry whilst giving more positive response to the synergistic effect from market imperfection. Therefore, we can conclude that the ARs and CARs of the Japanese acquirers in different time periods are unstable. It is worth noting that this result may reduce the power of our tests in the early sections. The significant ARs and CARs may be influenced not only by the portfolio of the Japanese acquirers but also by the time periods of the sample event.

4.9 Conclusion and evaluation

In general, we suggest that acquirers' shareholders do not benefit from the cross-border M&As. Although this result is inconsistent with the previous studies, we suggest that the inconsistency mainly comes from the different AR estimation method used our study. To further explore the factors that influence the ARs and CARs of acquirers, we also test the factors including industry classification, organisational structure, method of payment, and public status of targets. We find that the factors related to M&A synergy such as the merger relationship and industry R&D intensity have the strongest explanatory power to the ARs and CARs of acquirers. Thus, we suggest that the synergistic effect dominates the market behaviour in the cross-border M&As.

We also find that the US stock market and Japanese stock market have inconsistent responses to the cross-border M&A announcements from acquirers sharing similar characteristics. We suggest that shareholders' protection and accounting information disclosure differentiate investors' interpretations to the risks and profits in the cross-border M&A.

Chapter Five

Examine Abnormal returns of the US and Japanese targets

5.0 Introduction

In both cross-border and domestic M&As, target firms are likely to experience positive and significant ARs during the announcement period (see, e.g. Bradely et al., 1983; Gupta et al.,1997; Ahern, 2012). Previous studies explain the positive market reaction from two perspectives: i) the positive AR is due to the wealth transfer from acquirers to targets (see, e.g. Eckbo, 2009); and ii) M&A announcement can lead to the increase in target's Tobin's Q (see, e.g. Dong et al., 2006; Malmendier et al., 2016). The former perspective is based on the agency theory. It implies that the entrenched managers of acquirers are willing to sacrifice their shareholders' wealth by accepting excessive premium to complete the value destroying M&A. This theory also predicts that the corresponding acquirers of the high AR targets should experience negative AR due to the wealth transfer (see, Jensen, 1986, Schwert, 2000). The latter perspective is based on the theories of synergy and market for corporate control. By increasing the value of target assets, both acquirers and targets should experience significant and positive ARs (see, e.g. Aggarwal et al., 2011; Bradely et al., 1983). Thus, the two hypotheses lead to contradictory predictions for the covariance of target and acquirer ARs.

Despite the theoretical explanations, the effect of wealth transfer is rarely tested. As we discussed in the Chapter 2, the deal characteristics and acquirer and target's portfolio should determine investors' perceptions of the synergy and bargaining power of acquirers and targets. As a result, we expect that the deal characteristics and acquirer and target's portfolio explain the AR of targets in announcement period. In addition, as the synergistic effect influenced by the macro liquidity in different time period, we also hypothesize that the target experience inconsistent ARs in different time periods. In order to test our hypotheses, this chapter examines the target's AR based on the deal

and portfolios.

This chapter is structured as follows. Section 5.1 examines ARs and CARs of the target firms. In Sections 5.2 to 5.7, we examine the ARs based on the factors associated with target's portfolio and deal characteristics (including industry characteristics, merger relationship, acquirers' public status). Section 5.8 examines the stability of target's ARs across different time periods. Section 5.9 concludes.

5.1 Targets ARs and CARs under Fama-French and Carhart model

In this section, we present the ARs, CARs of the targets. Similar to acquirers, we use an 11-day event window (from t =-5 to day t=5, in which the day t=0 is the announcement day) is employed. In this chapter, our targets of interest are the US targets acquired by Japanese firms and the Japanese targets acquired by the US firms.

Previous empirical studies (see, e.g. Eun et al., 1996; Malmendier et al., 2016) show that the cross-border M&A targets experience significant and positive ARs and CARs during the announcement period. Despite the premiums that targets may receive when the deal is completed, other studies proposed two potential reasons that may explain the targets' ARs during the announcement period. Firstly, M&As lead to a revaluation of the target market value. Dong et al. (2006) emphasize that investors' misevaluation of target share price is an important reason for the M&A taking place. Thus, the M&A announcements can impose a positive informational effect on the target price even if the deal fails. Second and more importantly, even if the deal is dropped, the target firm are more likely to become potential target for other acquirers and receive better acquisition offers in the next few years (see, e.g. Akhigbe and Martin, 2000; Malmendier et al., 2016). [48]

[48] This paper suggests that the targets with cash offer are more likely to receive better offers in the future. Since most cross-border acquisitions are financed by cash, the finding of Malmendier et al. (2016) may be applicable in our study.

Table 5.1 shows the ARs and CARs using the ± 5 days encompassing pre- and post-announcement day.[49] Our sample consists 156 Japanese listed targets and 322 the US listed targets.

In table 5.1, we find that both the US and Japanese targets experience significant and positive ARs and CARs on the announcement day. Compared with table 4.1, we find that target firms in cross-border M&As experience more positive and significant ARs and CARs. We have also observed a return continuation pattern experienced by the US targets, where the ARs are continuously significant and positive between day t=0 and day t=1. This result implies that the Japanese stock market might be more efficient and be able to instantly price the value of M&As for targets. However, this implication is inconsistent with Visaltanachoti and Yang (2010) and Otsubo, (2014) who suggest that the US stock market is more efficient in pricing M&As deals than the Japanese stock market. Farquhar (1982) indicates that the presence of serial correlation in returns can be used to measure the market efficiency. Following Farquhar (1982), we find that correlations in ARs on day t=0 and day t=1 are insignificant for both the US and Japanese targets.[50] Thus, the return continuation might be attributed to gradual new information release from the acquirers and targets, and lead to continuous pricing adjustments.

Overall, our result is consistent with the previous studies (see, e.g. Jensen and Ruback, 1983; Jarrell et al., 1988; Andrade et al., 2001), which shows that the targets experience substantially positive returns during the announcement period. Note that in Chapter 4, we stated that the application of F-F-C CAPM model and *adj*.BMP can reduce the significance level of ARs and CARs. Thus, even with this CAPM, we still find that

[49] Notice that, the time zone difference between the US and Japan can result in the Japanese investors to react one calendar day later than the US investors, if the announcement information is published by the US acquirers. On the other hand, the announcements from the Japanese acquirers are less likely to result the US investors to react one calendar day earlier since the announcement is less likely to be made before 5 am (see, e.g. Becker et al., 1990).

[50] We use spearman rank test to test the serial correlation. We find that the AR correlation of the US and Japanese targets between day t=0 and t=1 is -0.035 (p=0.52), and 0.078 (p=0.331), respectively.

target firms generally experience positive and significant ARs and CARs in the cross-border M&As.

Table 5.1 Abnormal and cumulative abnormal returns for the US and Japan targets

	The US Targets				Japanese Targets			
DAYs	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**
-5	0.8261	3.12[a]	0.8261	2.28[b]	0.3813	0.59	0.3813	0.68
-4	0.1795	1.42	1.0055	2.49[b]	0.2173	0.34	0.5986	0.72
-3	-0.0181	1.93[c]	0.9874	3.17[a]	0.2435	0.61	0.8421	0.94
-2	0.4602	2.61[a]	1.4477	3.67[a]	-0.0913	0.47	0.7508	0.97
-1	1.2614	4.98[a]	2.7091	4.78[a]	2.5156	4.90[a]	3.2664	3.58[a]
0	5.9013	9.04[a]	8.6103	9.36[a]	4.1876	4.74[a]	7.4540	5.94[a]
1	1.8265	3.72[a]	10.4368	10.86[a]	-0.1209	0.34	7.3331	5.67[a]
2	0.5192	0.56	10.9560	10.97[a]	-1.6167	-0.48	5.7164	5.14[a]
3	-0.0555	0.44	10.9005	10.37[a]	0.4886	-0.21	6.2050	4.85[a]
4	0.0818	0.77	10.9823	10.38[a]	0.2863	-0.42	6.4913	4.66[a]
5	0.0026	-0.03	10.9848	9.44[a]	0.8754	2.19	7.3667	5.19[a]

The ARs and CARs are measured in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

5.2 Wealth transfer and conversance between acquirers and targets ARs

Previous studies explain the positive market reaction from two perspectives: i) the positive AR is due to the wealth transfer from acquirers to targets (see, e.g. Eckbo, 2009); and ii) M&A announcement can lead to the increase in target's Tobin's Q (see, e.g. Dong et al., 2006; Malmendier et al., 2016). However, the two theories indicate contradictory relationships between the targets' and acquirers' ARs. Based on the agency and hubris theory, we should expect a wealth transfer from acquirers to targets and observe a negative covariance between the target and acquirer ARs (see, e.g. Aktas et al., 2009; Kadyrzhanova and Rhodes-Kropf, 2011). It is because the agency problematic acquirers tend to pay substantial premium in the M&As. Based on synergy or market for corporate control, we should expect investors to revalue the market value of targets (North, 2001), which leads to a positive covariance between the acquirers' ARs and targets' ARs. We argue that it is important to test the dominant factor that

contribute to the significant target ARs. This test can help us explain whether the negative or insignificant ARs experienced by acquirers are attributed to the agency and hubris motive, or the low expected synergistic effect from the combination.[51]

To perform this test, we use the acquirers' $CAR_{(-1,1)}$ (i.e. we sum ARs from day t=-1 to day t=1) computed from the average acquirer returns. We examine whether the target firms experience different ARs when acquirers experience high and low $CAR_{(-1,1)}$. We sort the target ARs and CARs by their corresponding acquirer's $CAR_{(-1,1)}$. We define the acquirers who experience the top 33 percentile returns as high return acquirers and the bottom 33 percentile returns as low return acquirers.[52] We then group the corresponding targets based on acquirer returns. Our sample consists of 43 the US targets with high CAR acquirers, and 43 the US targets with low CAR acquirers; and consists of 20 Japanese targets with high CAR acquirers and 20 Japanese targets with low CAR acquirers.

Table 5.2 shows that the acquirer returns do not explain the US target ARs and CARs during the announcement period. Targets with both high and low return acquirers experience significant and positive ARs (at 1% significance level) on the announcement day. The targets with high return acquirers experience significant and positive ARs on day t=-1. However, the continual significant ARs from day t=-1 to day t=0 do not lead to significantly different CARs on the announcement day. The Mann–Whitney U test also confirms that the ARs and CARs of the targets in the both panel are not significantly different.

[51] Target ARs always tend to be positive, we should therefore observe a positive relationship between the acquirer and target ARs when the acquirers experience high ARs.

[52] In an unreported test, we find that the $CAR_{(-1,1)}$ of high return acquirers is significantly higher than the low return acquirers. Under Mann-Whitney U test, the standard test statistic of the high and low $CAR_{(-1,1)}$ difference is 7.86 for the US acquirers, and 5.41 for Japanese acquirers.

Table 5.2 The ARs and CARs of the targets with high and low acquirer returns

The US targets with low acquirer returns					The US targets with high acquirer returns				ARs	CARs
DAYs	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**M-W U**	**M –W U**
-5	0.4934	1.17	0.4934	1.03	1.5505	0.96	1.5505	0.05	-0.81	-0.81
-4	0.4936	0.39	0.9870	1.01	-0.5954	-1.05	0.9550	-0.41	0.58	0.09
-3	1.0707	0.98	2.0577	1.65[c]	-1.8935	-0.65	-0.9385	-0.76	0.32	0.64
-2	-0.5876	-1.42	1.4701	0.67	0.5673	0.49	-0.3711	-0.97	-0.89	-0.52
-1	0.6327	0.38	2.1028	0.65	2.3823	2.23[b]	2.0111	-0.17	-1.42	-0.98
0	7.8377	2.88[a]	9.9405	2.33[b]	5.9979	3.82[a]	8.0090	1.75[c]	-0.38	-0.09
1	1.8354	0.67	11.7759	1.99[b]	2.8655	1.11	10.8745	1.68[c]	0.29	0.21
2	0.4120	0.43	12.1879	2.17[b]	0.4364	1.43	11.3109	2.23[b]	-0.61	-0.06
3	-0.0148	-0.75	12.1731	1.89[c]	0.4048	1.42	11.7157	2.46[b]	-1.80[c]	-0.17
4	0.3522	0.76	12.5253	2.24[b]	0.0880	-0.28	11.8037	2.33[b]	0.80	-0.02
5	-0.6032	-0.87	11.9221	1.72[c]	0.3748	0.12	12.1785	1.70[c]	-0.85	-0.06
Japanese targets with low acquirer returns					**Japanese targets with high acquirer returns**				**ARs**	**CARs**
-5	1.9356	1.92[c]	1.9356	1.40	0.2356	0.58	0.2356	-0.04	0.81	0.81
-4	-0.4724	-0.67	1.4632	0.79	0.8207	0.81	1.0564	0.68	-1.89[c]	0.00
-3	1.3220	2.54[b]	2.7852	2.43[b]	-0.3435	-1.10	0.7128	-0.46	2.08[b]	1.46
-2	-0.6195	-0.85	2.1657	1.55	-0.7085	-0.28	0.0043	-0.94	-0.46	1.11
-1	-0.0065	0.08	2.1592	0.91	6.5157	2.96[a]	6.5200	0.92	-2.16[b]	-1.27
0	3.9347	1.84[c]	6.0939	1.80[c]	4.2306	2.02[b]	10.7506	1.80[c]	-0.22	-0.62
1	0.1971	0.31	6.2910	1.58	0.4401	0.26	11.1907	1.62	0.46	-0.62
2	-0.8067	-1.16	5.4843	1.14	1.2475	0.42	12.4382	1.06	-0.30	-0.92
3	-0.4020	-1.42	5.0823	0.86	2.8644	1.86	15.3025	1.87[c]	-1.46	-1.22
4	-0.1949	-0.01	4.8874	0.76	-0.1453	-0.57	15.1572	1.51	0.41	-0.78
5	0.8623	0.95	5.7497	1.27	-0.7136	-0.99	14.4436	0.78	1.81[c]	-0.54

The ARs and CARs measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. The M –W U denotes the Mann–Whitney U test. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

We also find that Japanese targets experience significant and positive ARs and CARs on the announcement day regardless of whether they are acquired by the high or low return acquirers. The Mann–Whitney U test shows that Japanese targets with high acquirer returns experience significantly higher AR on day t=-1. This result implies that investors are more likely to anticipate high synergy M&A deals. However, the Mann–Whitney U test also suggests that the CARs of the two test groups are insignificantly different from each other during the announcement period. Thus, we can conclude that although we observe significant AR difference on day t=-1, this does not lead to

significantly different CARs during the entire announcement period.

Our test result provides several interesting implications. Firstly, when acquirers can create high value from the M&As (either by synergistic effect or market for corporate control), the revaluation of the target market value is a more important determinant for the ARs experienced by both acquirers and targets.[53] That explains why both acquirers and targets can experience significant and positive ARs. Secondly, when acquirers cannot create value from M&As (which also implies that the M&A is motivated by agency motive), the wealth transfer determines the ARs of both acquirers and targets, which explains why targets can still experience significant and positive ARs when acquirers experience significantly negative market responses.

Our test result also suggests that the target's AR is independent of the acquirer's CARs. Thus, our test result does not support either of the two arguments. We suggest that the explanatory powers of the agency and synergy theories are largely dependent on the acquirer and deal characteristics. In order to further explore the determinants, we repeat the portfolio and deal characteristic test carried out in Chapter 4 in the following sections. By comparing the patterns of the acquirer and target ARs, we intend to explore the factors that change the explanatory power of the two theories.

5.3 Merger relationship

In Chapter 4, we find that the merger relationship explains the acquirer ARs. We argue that investors may expect different degrees of synergetic effects and risks to be experienced by acquirers in different types of merger relationships. Therefore, if we observe different target ARs and CARs in different types of relationships, it can help us

[53] Notice that, the wealth shift between the acquirers and targets may not be immediately reflected in the price. As more deal details to be published, this should continue to influence the ARs of acquirers and targets. Thus, our test result may only reflect the short term investor's interpretation instead of the true wealth transition between the acquirers and targets. In addition, our interpretation has one limitation.

to identify the return relationships between acquirers and targets.

Following Chapter 4, we classify our merger relationship into four types: horizontal, vertical, increase of corporate control (ICC) and conglomerate. Table 5.3 shows the returns of the US and Japanese targets in different types of mergers.

In table 5.3.1, we find that the US targets experience significant and positive ARs and CARs on the announcement day in all four types of mergers. Our sample consists of 184 the US listed targets in horizontal M&As, 66 in vertical, 22 in ICC and 50 in conglomerate M&As. For Japanese listed targets, we have 45 firms in horizontal M&As, 9 in vertical, 17 in ICC and 86 in conglomerate M&As. Panel A denotes the horizontal M&A, Panel B denotes the vertical M&A, Panel C denotes the ICC and Panel D denotes the conglomerate.

Consistent with our results in table 5.1, we find the US targets experience significant and positive ARs on the announcement day across the panels. However, we find that the significance level of the AR on the announcement day is the lowest for the vertical panel (the vertical targets experience positive average AR at 5% significance level comparing with 1% for the other panels). There can be two possible reasons. Ahern (2012) indicates that the market dependence (in this case, the vertical relationship) can create strong bargaining power for the acquirers which means less bargaining power for targets. Also, that is more uncertainty regarding the successful outcome of mergers for vertical compared to horizontal mergers as acquirers will be less familiar with such operations. Thus, less premium may be received by the targets. The second reason is that vertical M&A can only reduce the external transaction costs between the acquirers and targets. Thus, the synergetic effect may not be as strong as other types of M&As.

Consistent with the US targets, the Japanese targets in all the panels also experience significant and positive AR on the announcement day. In addition, we also find that the vertical integration lead the Japanese targets experience less significant AR at the

announcement day. It is interesting if we compare the results with the ones in table 4.2.1 (see, Chapter 4, section 4.2), we find that Japanese vertical acquirers (who take over the US targets) are the only type of acquirers who experience significant and negative ARs during the announcement period (on day t=1), and the US vertical acquirers are only type of acquirers experience significant and positive AR surrounding the announcement day (on day t=1). The results in table 5.2.1 and 4.2.1 may suggest that the risk reduction effect associated with vertical M&As only influence the outcome of acquirers. For targets, the announcement return is more likely to be influenced by synergistic effect and thereby the vertical targets experience weak positive returns. The Kruskal-Wallis test result shows that the ARs on the announcement day are not significantly different across each type of integration. This is in line with our results for acquirers.

In the previous section, we find that the sign of anticipation behaviour (i.e. significant ARs before the announcement day). In this test, we find that ICC targets of both the US and Japan acquirers do not experience the pre-announcement ARs. It may imply that ICC is more difficult to anticipate as for both external investors and insiders. However, the AR in the ICC panel on the announcement day is not significantly different from the ARs in the other panels. The result in the ICC panel provides an inconsistent evidence to the notion from with Cai et al. (2011) and Cornett et al. (2011). They suggest that the pre-announcement market anticipation will significantly reduce the AR in the announcement period.

Table 5.3.1 Abnormal returns for the US targets and Japanese taking horizontal, vertical, increasing corporate control and investment acquisition

The US targets									
	Panel A: Horizontal		Panel B: Vertical		Panel C: ICC		Panel D: Conglomerate		
Days	ARs	*adj.* -BMP	ARs	*adj.* -BMP	ARs	*adj.* -BMP	ARs	*adj.* -BMP	Kruskal-Wallis
-5	1.0717	2.91[a]	0.4920	0.93	-0.0050	0.52	1.0752	1.25	1.61
-4	0.2245	0.96	0.2776	0.77	-1.7759	-2.96[a]	0.8711	2.03[b]	6.90[c]
-3	-0.5854	-0.10	0.9357	1.83[c]	0.8712	1.55	0.5671	1.87[c]	4.17
-2	0.5653	2.16[b]	-0.1821	0.10	0.3464	-0.20	0.8956	2.48[b]	4.00
-1	1.1142	3.35[a]	1.6288	1.91[c]	0.9305	1.20	1.5917	3.57[a]	2.79
0	6.2335	7.63[a]	2.8352	2.05[b]	9.6692	2.90[a]	7.6773	3.85[a]	4.17
1	2.4351	4.05[a]	2.0030	1.18	1.5803	1.26	-0.5153	-0.86	3.93
2	0.5649	0.33	0.8812	1.28	0.2795	-0.46	-0.1016	-0.46	6.19
3	-0.4254	-0.39	0.6563	1.39	0.0589	0.64	0.0032	-0.76	1,85
4	0.1123	0.95	0.5122	0.70	0.1056	0.22	-0.6836	-1.17	0.86
5	-0.0077	-0.61	-0.6108	-1.53	-0.6251	0.49	0.8582	1.63	4.68
Japanese targets									
Days	ARs	*adj.* -BMP	ARs	*adj.* -BMP	ARs	*adj.* -BMP	ARs	*adj.* -BMP	Kruskal-Wallis
-5	1.2842	2.03[b]	-0.5795	-0.38	1.1636	1.40	-0.1813	-0.84	5.75
-4	0.8893	1.24	0.7339	2.03[b]	-0.1753	-0.08	0.0221	-0.30	6.01
-3	0.7759	1.20	1.7695	0.94	-0.3589	-1.28	0.0258	-0.16	5.35
-2	-0.0773	0.80	2.7665	0.59	-0.6058	-0.90	-0.1977	0.23	2.70
-1	3.9494	3.88[a]	15.6424	0.35	1.0765	0.95	2.0068	3.43[a]	3.78
0	3.8334	3.05[a]	2.0484	1.75[c]	4.6504	2.94[a]	3.0882	2.73[a]	2.12
1	-1.8531	-1.17	-4.8641	0.13	2.7469	1.26	0.0249	-0.30	3.86
2	-5.0332	-0.99	-3.6555	-1.50	-0.5945	-0.16	0.3206	0.19	4.09
3	3.4277	1.91[c]	-1.6992	-1.50	-0.3341	-1.22	-0.4625	-0.98	5.90
4	1.1782	-0.20	3.4367	1.29	0.9898	1.14	-0.1035	-0.39	3.87
5	0.5653	0.10	0.8630	0.98	-0.7085	-0.35	1.0644	2.75[a]	1.41

The CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

Table 5.3.2 shows the CARs of the US and Japanese targets in different types of merger relationship.

Consistent with the ARs shown in table 5.2.1, we find that the CARs of the targets are significant and positive for horizontal, vertical and Conglomerate acquisitions. The US and Japanese targets of ICC only start to experience significant and positive CARs from day t=1. However, as we continue to see significant CARs following the announcement, this may indicate that target shareholders associated with ICC also experience significant wealth increase.

The Kruskal-Wallis test show that the US targets do not experience significantly different CARs on the announcement day whereas Japanese targets experience significantly different CARs upon M&A announcement. This may be due to the delay in the market response to the announcements when M&As take in the form of ICC.

Table 5.3.2 Cumulative abnormal returns for the US targets and Japanese taking horizontal, vertical, increasing corporate control and investment acquisition

The US targets									
	Panel A: Horizontal		Panel B: Vertical		Panel C: ICC		Panel D: Conglomerate		
Days	CARs	*adj.* -BMP	CARs	*adj.* -BMP	CARs	*adj.* -BMP	CARs	*adj.* -BMP	Kruskal-Wallis
-5	1.0717	2.20[b]	0.4920	0.54	-0.0050	0.57	1.0752	0.74	1.61
-4	1.2962	2.02[b]	0.7696	1.28	-1.7809	-1.36	1.9463	2.04[b]	4.49
-3	0.7108	1.88[c]	1.7053	2.29[b]	-0.9097	-0.14	2.5135	2.57[a]	2.84
-2	1.2761	2.31[b]	1.5233	1.76[c]	-0.5633	-0.78	3.4091	3.63[a]	3.10
-1	2.3903	2.93[a]	3.1520	1.83[c]	0.3672	0.25	5.0008	4.65[a]	4.98
0	8.6238	6.73[a]	5.9872	3.32[a]	10.0364	1.56	12.6781	6.46[a]	5.15
1	11.0589	8.28[a]	7.9902	3.45[a]	11.6167	3.01[a]	12.1628	5.85[a]	2.94
2	11.6238	8.24[a]	8.8714	3.81[a]	11.8961	2.88[a]	12.0612	5.51[a]	1.16
3	11.1984	8.07[a]	9.5277	3.55[a]	11.9550	2.59[a]	12.0644	4.51[a]	0.52
4	11.3107	8.04[a]	10.0399	3.99[a]	12.0606	2.60[a]	11.3808	4.23[a]	0.15
5	11.3030	7.14[a]	9.4291	2.94[a]	11.4356	2.50[a]	12.2390	5.21[a]	0.28
Japanese targets									
Days	CARs	*adj.* -BMP	CARs	*adj.* -BMP	CARs	*adj.* -BMP	CARs	*adj.* -BMP	Kruskal-Wallis
-5	1.2842	1.28	-0.5795	-0.38	1.1636	1.94[c]	-0.1813	-0.81	5.75
-4	2.1734	1.85[c]	0.1544	1.47	0.9883	1.25	-0.1592	-0.78	8.66[b]
-3	2.9493	1.90[c]	1.9239	1.58	0.6294	0.37	-0.1335	-1.03	7.89[b]
-2	2.8720	1.78[c]	4.6905	1.06	0.0236	-0.81	-0.3312	-0.71	7.35[c]
-1	6.8214	2.92[a]	20.3329	1.25	1.1001	-0.52	1.6756	1.02	10.78[b]
0	10.6547	4.64[a]	22.3813	1.87[c]	5.7505	1.37	4.7638	2.16[b]	7.03[c]
1	8.8016	3.58[a]	17.5172	1.63	8.4975	1.75	4.7887	1.94[c]	3.06
2	3.7685	2.47[a]	13.8617	1.11	7.9029	2.22[b]	5.1093	1.79[c]	2.00
3	7.1961	3.45[a]	12.1625	0.75	7.5688	1.35	4.6468	1.50	2.17
4	8.3743	2.99[a]	15.5991	0.93	8.5586	1.66	4.5433	1.47	1.71
5	8.9396	3.08[a]	16.4621	1.24	7.8501	1.27	5.6077	2.70[a]	1.07

The US and Japanese CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

5.4 Listed and unlisted acquirers

In Chapter 4, we find that the US acquirers who take over unlisted firms tend to experience more significant and positive CARs during the announcement period.[54] Despite the extensive research on targets' public status and the acquirers' announcement returns, the effect of acquirers' public status on target announcement returns are rarely tested.

In order to test the effect of bidders' public status on the target returns, we split the acquirers into two groups: listed and unlisted. Notice that, in our sample, we find some acquisitions are made by group of investors.[55] Following Bargeron et al. (2008), we exclude these cases from our test sample. Within our sample of 322 Japanese acquirers who target the US companies, we find that 248 are unlisted firms and only 43 are listed. On the other side, our sample of US initiated M&A deals are more balanced, with 75 listed acquirers and 70 unlisted acquirers.[56]

In the previous M&A studies, researchers indicate that market anticipation of the potential integration synergy can be influenced by the public status of the target. The integration of unlisted acquirers and listed targets in a merger may have the benefits such as: i) reducing the financial constraints of the unlisted acquirers since they may experience higher cost of funds than listed firms, which in turn, may create financial synergy; ii) Benefiting the shareholders of unlisted acquirers as better shareholder protection practices being transferred from the listed targets.

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[54] In Chapter 4, we have also listed several reasons that the Japanese acquirers who take over the public firm experience more positive and significant ARs and CARs. Despite the inconsistent market reaction, we suggest that the public status do influence the market anticipation to the future synergy.

[55] Group of investors refers to the scenario where multi-companies jointly acquire a target.

[56] We did not include the investor group in our sample. Thus, the number of unlisted and public acquirers is smaller than the total sample size.

Table 5.4.1 shows the ARs and CARs of the US and Japanese targets who are taken over by listed and unlisted acquirers. The US targets who are acquired by both listed and unlisted companies experience significant and positive ARs and CARs on the announcement day. Consistent with the Bargeron et al. (2008), significance intervals of ARs and CARs show that the target bids by the listed acquirers experience higher ARs and CARs than those bid by the unlisted acquirers.

Japanese targets also experience significant and positive ARs during the announcement period. Notice that, although the targets of unlisted bidders do not experience significant ARs on the announcement day, the significant AR on day t=-1 implies that the market gives positive response to the expected announcement. Consistent with the US targets, we find that the Japanese targets taken over by listed acquirers also experience more positive ARs. This is further evidenced by the continuing significant CARs of the Japanese targets of listed bidders. The Mann–Whitney U test confirms our finding that the CARs of the two test groups are significantly different from day t=0 to day t=5.

Table 5.4.1 Abnormal returns and cumulative abnormal returns for the US and Japanese targets who are bid by listed or unlisted acquirers

The US targets										
	Targets of listed bidders		Targets of unlisted bidders			Targets of listed bidders		Targets of unlisted bidders		
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**Mann–Whitney U**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**Mann–Whitney U**
-5	0.8053	2.72[a]	0.9124	1.99[b]	0.57	0.8053	2.20[b]	0.9124	1.65[c]	0.57
-4	0.0828	0.56	0.9753	1.32	0.27	0.8882	1.92[c]	1.8877	1.59	0.90
-3	-0.0546	1.59	0.1960	1.30	0.33	0.8336	2.62[a]	2.0837	1.84[c]	0.90
-2	0.3469	1.54	0.9927	1.73[c]	0.39	1.1805	2.33[a]	3.0765	2.53[b]	1.03
-1	1.2092	4.20[a]	1.4851	1.89[c]	0.60	2.3897	3.28[a]	4.5616	3.38[a]	1.50
0	6.3037	8.15[a]	5.5920	3.15[a]	0.29	8.6934	7.60[a]	10.1536	4.98[a]	1.26
1	2.2525	3.91[a]	1.1944	0.39	0.63	10.9459	8.86[a]	11.3479	6.17[a]	0.53
2	0.7632	1.15	-1.1274	-1.95	1.72[c]	11.7091	9.18[a]	10.2205	4.36[a]	0.28
3	-0.1355	0.50	0.0418	-0.07	0.34	11.5736	8.74[a]	10.2623	4.34[a]	0.41
4	0.0425	0.66	0.8525	1.30	0.39	11.6160	8.85[a]	11.1148	4.70[a]	0.10
5	-0.3204	-1.26	0.4517	0.72	1.61	11.2956	7.52[a]	11.5665	4.53[a]	0.19
Japanese targets										
Days	**ARs**	***adj.* -BMP**	**ARs**	***adj.* -BMP**	**Mann–Whitney U**	**CARs**	***adj.* -BMP**	**CARs**	***adj.* -BMP**	**Mann–Whitney U**
-5	1.0314	2.17[b]	-0.0249	-0.49	2.22[b]	1.0314	1.14	-0.0249	-0.30	2.22[b]
-4	0.4741	1.42	0.1732	-0.52	1.38	1.5055	1.92[c]	0.1483	-0.83	2.36[b]
-3	0.6639	1.34	0.0569	0.16	1.08	2.1694	2.27[b]	0.2053	-1.13	2.42[b]
-2	-0.4158	-1.03	0.3916	1.71[c]	1.60	1.7535	0.99	0.5969	0.03	0.98
-1	3.0073	3.92[a]	1.7744	2.49[a]	0.82	4.7608	2.31[b]	2.3713	1.08	1.54
0	5.7508	4.26[a]	1.9588	1.39	1.25	10.5116	4.69[a]	4.3301	1.36	2.41[b]
1	0.5013	0.46	-0.8645	-0.44	0.33	11.0129	4.55[a]	3.4656	1.22	2.39[b]
2	-0.7703	-0.17	-2.6588	-0.37	1.13	10.2426	4.19[a]	0.8068	0.75	2.25[b]
3	0.2393	0.31	0.9206	-0.49	0.31	10.4819	4.27[a]	1.7274	0.73	2.22[b]
4	-0.1906	-0.47	0.7167	-0.37	0.27	10.2913	3.62[a]	2.4441	0.78	1.86[c]
5	0.6213	0.94	1.0941	2.12[b]	0.92	10.9126	4.00[a]	3.5382	1.59	1.75[c]

The US and Japanese CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP t-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

5.5 The announcement returns and the industry of the targets

The industry characteristics may affect the potential synergy and the bargaining power in the M&A (see, e.g. Ahern, 2012). Thus, industry characteristics can be a factor in valuing acquirers and targets' stock prices during the announcement period. In Chapter 4, we test acquirers' ARs and CARs by industry. Our results suggest that acquirers' industries do not explain their ARs and CARs. On the other hand, Eun et al. (1996) indicate that acquirers or the combined entities may benefit from the reversal internalization. The R&D resources and efficient management style of the targets can create synergy after the acquisition. Therefore, this section will test the ARs and CARs of the targets by industry.

As in Chapter 4, we follow the Fama-French industry classification. We classify our sample of M&A targets into seven industry groups: Consumer product, Finance, Healthcare, Service, High technology, Manufacturing and Retailer. Notice that, due to the relatively small sample size, we do not examine the Japanese targets in the finance and healthcare and the US targets in the retailer industry.

Table 5.5.1 presents the ARs of the US and Japanese targets in different industries. Our sample consists of 15 the US targets from consumer product industry, 21 from finance industry, 44 from healthcare industry, 80 from high technology, 83 from manufacturing, 48 from service industry, 14 from retailer industry; and 37 Japanese targets from consumer product industry, 10 from healthcare industry, 16 from high technology industry, 33 from manufacturing industry, 21 from service industry, and 27 from retailer industry. In addition, as our sample of consists of 3 Japanese targets in finance industry, we do not include it in our test.

Table 5.5.1 Abnormal returns for the US and Japanese acquirers in consumer products, finance, health care, high technology and service industry sector

The US targets

	Consumer products		Finance		Health Care		High-Tec		Manufacturing		Service		Retailer		Kruskal Wallis
Days	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	
-5	0.5033	1.10	-0.0387	0.46	0.9649	0.96	0.0892	-0.79	0.9368	1.70[c]	2.7023	3.68[a]	1.0450	1.57	11.61[c]
-4	0.0463	-0.46	-1.1411	0.38	0.4903	0.28	0.0555	0.24	1.1037	3.28[a]	-0.1862	0.05	-1.6514	-2.24[b]	12.69[b]
-3	-0.2303	-0.41	1.0833	1.81	0.4991	0.22	0.1797	2.22	-0.7676	0.26	0.2195	1.11	0.0697	0.21	3.04
-2	0.6328	1.20	-0.0963	0.26	-0.0013	0.34	0.0395	0.64	0.6326	1.69[c]	1.2306	1.59	0.4706	0.85	1.96
-1	-0.0318	0.63	1.3496	0.95	2.1227	3.33[a]	1.5491	2.21[b]	0.6551	1.76[c]	1.8282	2.08[b]	0.0209	-0.18	5.01
0	6.4648	1.81[c]	9.2661	3.12[a]	9.5654	3.93[a]	6.3664	4.32[a]	5.2853	5.18[a]	3.8573	2.56[b]	5.5424	1.69[c]	1.76
1	-0.7421	-0.18	3.0905	1.35	1.5501	2.11[b]	0.4197	1.33	2.7135	2.30[b]	4.0431	1.18	0.1004	0.49	6.74
2	-1.1835	-1.97[b]	-0.8516	-0.55	0.1776	0.23	1.6024	-0.67	0.5428	1.98[b]	0.0748	-0.49	1.9120	2.14[b]	8.29
3	0.0852	-0.30	0.3671	-0.01	-0.6499	-1.30	-0.2580	1.07	-0.0324	0.39	-0.2911	-0.93	-0.2438	-0.49	3.47
4	-1.2680	-1.50	-0.2490	0.37	0.2022	0.50	-0.7497	-1.06	0.4055	1.12	0.8560	1.85[c]	-2.2946	-2.58[a]	14.25[b]
5	-0.6120	-0.21	0.1144	-0.56	0.3450	0.69	0.0265	0.19	-0.0223	0.69	-0.3035	-1.62	-0.0311	-0.10	4.81

Japanese targets

	Consumer products		Health Care		High-Tec		Manufacturing		Service		Retailer		Kruskal Wallis
Days	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	
-5	0.3937	0.35	0.7004	0.85	-0.0864	-0.14	0.4558	-0.09	0.9200	0.13	0.2757	1.59	1.99
-4	0.0083	0.03	-0.7495	-0.30	-0.0712	-0.17	1.1813	1.77[c]	1.0694	0.24	-0.3445	-0.71	4.49
-3	0.2812	0.35	-1.0258	-1.15	0.9130	0.93	0.3607	0.60	1.0194	0.93	0.1181	0.02	3.40
-2	0.1144	0.71	2.0315	1.27	0.1100	0.06	-1.0453	-1.04	-0.9551	-0.70	0.1110	0.43	3.94
-1	1.9617	1.87[c]	0.8071	0.98	2.5195	1.02	5.0938	3.90[a]	1.0160	1.10	1.5522	1.37	6.53
0	3.6853	2.85[a]	14.6156	0.46	4.4438	2.67[a]	2.8938	1.43	1.5306	0.13	5.3616	2.39[a]	2.74
1	-1.5494	-1.01	5.2017	1.21	-1.9248	-2.13[b]	-0.3994	-0.67	-0.5236	1.50	1.6505	1.07	10.87[c]
2	-0.8059	-1.18	-4.4079	0.45	1.4467	1.61	-1.0216	-0.91	-6.6745	0.75	-0.5259	-1.03	6.81
3	-0.2339	-0.55	-2.6057	-0.27	0.7417	0.90	-0.5430	-1.03	5.8734	1.22	-0.2765	-0.82	2.67
4	0.6548	0.59	-1.0214	-0.99	-0.8804	-1.18	-0.6294	-0.51	4.7015	1.03	-0.2447	-0.15	6.55
5	0.0055	0.69	3.6216	1.76	0.6568	1.80	1.2323	2.55[a]	2.5396	0.53	0.5815	1.00	2.71

The US and Japanese AR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

The results of table 5.5.1 show that the US targets experience significant and positive ARs on the announcement day across the panels. However, the significance levels of the ARs are inconsistent within different panels. We find that the US targets in the consumer product industry and in the retailer industry experience less significant AR (with a *t* value of 1.81 and 1.69, respectively) and the manufacturing targets experience the most significant AR (with a *t* value of 5.18) on the announcement day. In addition, we also find that the targets in healthcare, high technology, manufacturing and service industry experience significant AR from day t= -1.

Inconsistent with the US targets in the service industry, Japanese targets in the service and healthcare industry do not experience significant ARs during the announcement period. Japanese targets in other industries experience significant AR on or surround the announcement day.

The Kruskal Wallis test does not show significant AR difference on the announcement day for both the US and Japanese targets. However, we find that the Kurskal Wallis test shows significant result for the Japanese targets on day t=1, which is more likely to be contributed by the delayed market reaction observed in the finance and retailer panel.

Table 5.5.2 presents the CARs of the targets in the different industries. We find that the target CARs generate a more consistent set of results. Of all the test groups, the consumer product industry of the US targets and the high technology and service industry of the Japanese targets do not experience significant CARs during the announcement period. In addition, for other targets who show significant CARs on the announcement day, we also observe a continuing trend of experiencing significant CARs over the next few days. The results of target CARs further imply that investors tend to respond inconsistently to targets within different industries. Notice that, the Kruskal Wallis test does not show significant result, which is potentially due to the difference in our sample size weakening the effectiveness of the test.

Table 5.5.2 Cumulative abnormal returns for the US and Japanese acquirers in consumer products, finance, health care, high technology and service industry sector

The US targets															
	Consumer products		Finance		Health Care		High-Tec		Manufacturing		Service		Retailer		Kruskal Wallis
Days	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	
-5	0.5033	0.77	-0.0387	0.60	0.9649	1.14	0.0892	-1.57	0.9368	1.61	2.7023	2.48[b]	1.0450	1.57	11.61[c]
-4	0.5496	0.10	-1.1798	0.63	1.4552	0.76	0.1447	-1.06	2.0406	3.96[a]	2.5161	2.01[b]	-0.6065	-1.01	14.86[b]
-3	0.3193	0.21	-0.0965	1.23	1.9543	0.70	0.3244	-0.10	1.2730	4.03[a]	2.7357	2.47[b]	-0.5368	-0.77	10.74[c]
-2	0.9521	0.45	-0.1928	1.16	1.9530	0.72	0.3639	0.02	1.9056	3.94[a]	3.9662	2.99[a]	-0.0662	-0.33	12.03[c]
-1	0.9203	0.44	1.1568	1.04	4.0756	1.95[c]	1.9131	0.57	2.5607	3.75[a]	5.7944	4.04[a]	-0.0453	-0.29	8.24
0	7.3852	1.63	10.4229	2.71[a]	13.6411	3.71[a]	8.2795	2.98[a]	7.8460	6.70[a]	9.6517	5.05[a]	5.4971	1.18	4.80
1	6.6431	0.99	13.5135	4.15[a]	15.1911	4.39[a]	8.6992	3.62[a]	10.5595	7.81[a]	13.6947	5.26[a]	5.5974	1.28	6.93
2	5.4596	0.56	12.6619	3.80[a]	15.3688	4.23[a]	10.3016	3.21[a]	11.1023	8.98[a]	13.7695	5.36[a]	7.5094	2.04[b]	7.82
3	5.5448	0.51	13.0290	3.47[a]	14.7189	3.72[a]	10.0436	3.64[a]	11.0699	8.11[a]	13.4784	3.91[a]	7.2656	1.94[c]	5.47
4	4.2768	0.00	12.7800	3.04[a]	14.9211	3.77[a]	9.2938	3.16[a]	11.4754	9.09[a]	14.3345	5.20[a]	4.9710	1.16	9.24
5	3.6647	-0.22	12.8944	2.60[b]	15.2662	3.74[a]	9.3204	2.69[a]	11.4531	8.05[a]	14.0309	4.62[a]	4.9400	1.13	8.62

Japanese targets													
	Consumer products		Health Care		High-Tec		Service						Kruskal Wallis
Days	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	CARs	*adj.*-BMP	
-5	0.3937	0.35	0.7004	0.85	-0.0864	-0.14	0.4558	-0.09	0.9200	0.13	0.2757	1.59	1.99
-4	0.0083	0.03	-0.0490	0.44	-0.0712	-0.17	1.1813	1.77[c]	1.0694	0.24	-0.3445	-0.71	3.75
-3	0.2812	0.35	-1.0748	0.05	0.9130	0.93	0.3607	0.60	1.0194	0.93	0.1181	0.02	1.36
-2	0.1144	0.71	0.9566	0.81	0.1100	0.06	-1.0453	-1.04	-0.9551	-0.70	0.1110	0.43	0.60
-1	1.9617	1.87[c]	1.7637	0.96	2.5195	1.02	5.0938	3.90[a]	1.0160	1.10	1.5522	1.37	2.94
0	3.6853	2.85[a]	16.3793	1.65	4.4438	2.67[a]	2.8938	1.43	1.5306	0.13	5.3616	2.39[a]	2.36
1	-1.5494	-1.01	21.5810	1.96[b]	-1.9248	-2.13[b]	-0.3994	-0.67	-0.5236	1.50	1.6505	1.07	2.01
2	-0.8059	-1.18	17.1731	2.17[b]	1.4467	1.61	-1.0216	-0.91	-6.6745	0.75	-0.5259	-1.03	2.31
3	-0.2339	-0.55	14.5673	2.01[b]	0.7417	0.90	-0.5430	-1.03	5.8734	1.22	-0.2765	-0.82	2.01
4	0.6548	0.59	13.5460	1.93[c]	-0.8804	-1.18	-0.6294	-0.51	4.7015	1.03	-0.2447	-0.15	0.76
5	0.0055	0.69	17.1675	2.42[a]	0.6568	1.80	1.2323	2.55[a]	2.5396	0.53	0.5815	1.00	1.55

The US and Japanese CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

5.6 Target R&D intensity

In Chapter 4, we find that the R&D intensity explains the ARs of acquirers in different industries. The result is consistent with the notion of reverse internalization (see, Eun et al., 1996). Seth et al. (2002), on the other hand, indicate that the R&D intensity of targets also explains the reverse internalization pattern. Thus, in this section, we examine the effect of R&D intensity on target ARs and CARs.

Consistent with Chapter 4, we use the R&D to Sales ratio as a proxy of R&D intensity. We use the 12-month R&D spending and revenue before the announcement to measure the R&D spending and sales, respectively. In order to perform this test, we also assume that the R&D intensity of targets is independent of their bargaining power.

Table 5.6.3 reports the average R&D to Sales of targets in each industry. Notice that, firms that do not report their R&D spending are excluded from this test. For this reason, as there is no data available for targets in the finance industry, the US retailer industry, Japanese healthcare industry, we do not report these industry sectors in table 5.6.3. We also find that some US targets in the service industry tend to report significantly higher R&D spending and lower sales in the 12-month period before the M&A announcement. As a result, the average service industry R&D spending ratio is more than 1. This can be due to the industry specific characteristics (e.g. long turnover period and/or large overheads).

Table 5.6.3 Average target R&D/Sales in each industry

The US targets					
	Consumer product	**Healthcare**	**High-Tec**	**Manufacturing**	**Service**
R&D / Sales	0.1226	0.6979	0.1337	0.1601	1.725
Japanese targets					
	Consumer product	**High-Tec**	**Manufacturing**	**Service**	**Retailer**
R&D / Sales	0.0166	0.0435	0.0193	0.0015	0.0183

We find that the US targets from consumer product industry show the lowest

R&D/Sales ratio. The low R&D intensity in the consumer industry may explain the insignificant CARs in table 5.5.2.

The R&D spending shows a mixed result in explaining the Japanese target ARs and CARs. We find that targets in the service industry report the lowest R&D spending, which may explain the reason why those targets experience insignificant ARs and CARs (see, table 5.5.1 and 5.5.2). However, even the R&D spending of the high-technology targets is the highest among all industries in our test, Japanese high-technology targets also experience insignificant CARs.

To further illustrate the relationship between R&D spending and target ARs and CARs, we perform a Mann–Whitney U test to compare the ARs and CARs of targets from the highest R&D spending industry with those from the lowest R&D spending industry. Notice that, as we mention above, the R&D spending ratio in the US service industry may be overestimated due to its specific industry characteristics. Thus, we use the US industry with the second highest ratio (healthcare) to compare with the consumer product industry (low R&D spending). For the Japanese targets, we compare the manufacturing industry (high R&D spending) with the service industry (low R&D spending). Table 5.6.4 shows the result of the test.

In table 5.6.4, we show that the targets in the high R&D spending and low R&D spending industry do not experience significantly different ARs on the announcement day. However, we find that the difference among ARs is significant from day t=1 to day t=2 for both countries' targets. The result may imply that investors do not efficiently capture all target's information on the announcement day. Thus, the targets in the high R&D spending industry experience return continuation. Surprisingly, the return continuation shown in the AR does not result in the significant CAR difference over the announcement period. The insignificant Mann–Whitney U test of the CARs may be resulted by the strong volatility during the announcement period. Overall, we suggest that the R&D spending ratio do explain the different target returns in different industries.

Table 5.6.4: The ARs and CARs for high and low R&D spending industry

	The US healthcare targets				The US consumer product targets				ARs	CARs
DAYs	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**M-W U**	**M –W U**
-5	0.9649	0.96	0.9649	1.14	0.5033	1.10	0.5033	0.77	0.37	0.37
-4	0.4903	0.28	1.4552	0.76	0.0463	-0.46	0.5496	0.10	0.99	0.26
-3	0.4991	0.22	1.9543	0.70	-0.2303	-0.41	0.3193	0.21	0.28	0.54
-2	-0.0013	0.34	1.9530	0.72	0.6328	1.20	0.9521	0.45	0.26	0.17
-1	2.1227	3.33[a]	4.0756	1.95[c]	-0.0318	0.63	0.9203	0.44	1.27	0.98
0	9.5654	3.93[a]	13.6411	3.71[a]	6.4648	1.81[c]	7.3852	1.63	0.23	0.70
1	1.5501	2.11[b]	15.1911	4.39[a]	-0.7421	-0.18	6.6431	0.99	2.25[b]	1.29
2	0.1776	0.23	15.3688	4.23[a]	-1.1835	-1.97[b]	5.4596	0.56	1.67[c]	1.57
3	-0.6499	-1.30	14.7189	3.72[a]	0.0852	-0.30	5.5448	0.51	0.56	1.38
4	0.2022	0.50	14.9211	3.77[a]	-1.2680	-1.50	4.2768	0.00	1.25	1.85[c]
5	0.3450	0.69	15.2662	3.74[a]	-0.6120	-0.21	3.6647	-0.22	0.64	1.92[c]
	Japanese manufacturing targets				**Japanese Service Targets**				**ARs**	**CARs**
-5	0.4558	-0.09	0.4558	-0.59	0.9200	0.13	0.9200	-0.12	0.59	0.59
-4	1.1813	1.77[c]	1.6370	0.69	1.0694	0.24	1.9894	0.18	0.59	0.20
-3	0.3607	0.60	1.9977	0.74	1.0194	0.93	3.0088	0.16	0.22	0.08
-2	-1.0453	-1.04	0.9524	0.10	-0.9551	-0.70	2.0537	-0.65	1.20	0.47
-1	5.0938	3.90[a]	6.0462	2.12[b]	1.0160	1.10	3.0697	-0.05	1.50	1.45
0	2.8938	1.43	8.9400	2.59[b]	1.5306	0.13	4.6003	-0.48	0.22	1.18
1	-0.3994	-0.67	8.5406	2.77[a]	-0.5236	1.50	4.0768	0.49	2.19[b]	0.83
2	-1.0216	-0.91	7.5191	2.49[b]	-6.6745	0.75	-2.5977	0.58	2.00[b]	0.47
3	-0.5430	-1.03	6.9761	1.98[b]	5.8734	1.22	3.2757	1.36	0.83	0.17
4	-0.6294	-0.51	6.3467	1.70[c]	4.7015	1.03	7.9773	1.33	1.87[c]	0.17
5	1.2323	2.55[a]	7.5790	3.12[a]	2.5396	0.53	10.5169	1.27	0.47	0.44

The US and Japanese AR and CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. The M –W U denotes the Mann–Whitney U test. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

We also intend to test whether the R&D spending can explain ARs and CARs at the firm level, or it only explains the average ARs and CARs at the industry level. The test may help us understand whether the positive market response is resulted by the target's specific industry with high average R&D spending, or by the individual firm's high R&D spending. In this case, the test may justify whether the R&D spending is part of the industry characteristics, or the industry classification is the proxy of R&D spending. To perform this test, we define the highest 33% R&D spending targets as high R&D spending targets and the lowest 33% of R&D spending targets as the low R&D spending targets.

Table 5.6.5 presents the ARs and CARs of the high and low R&D spending targets. Our sample consists of 25 the US targets with high R&D spending and 25 with low R&D spending; and consists of 16 Japanese targets with high R&D spending and 16 with low R&D spending.

We find that the R&D spending ratios impose a mixed effect on the target ARs and CARs. On day t=-2, the US high R&D spending targets experience significantly higher ARs. However, on the day t=-1, the US low R&D spending targets experience significantly higher ARs. The ARs are insignificant on the announcement day in both panels. We also find the US high R&D spending target experience significantly lower AR on day t=4. The insignificant Mann–Whitney U result of CARs also confirms the weak correlation between the R&D spending and the positive market reaction. Consistent with the US targets, the Japanese targets in the high R&D spending and low R&D spending panel do not experience significantly different ARs and CARs on the announcement day. In addition, on day t=3, the high R&D spending target experiences significantly lower ARs. Since the significant result is far away from the announcement day, this is more likely to be resulted by the market noise.

The result of this test implies that as a part of the industry characteristics, high R&D intensity environment lead to the target firms experience more significant and positive ARs. On the other hand, the R&D spending cannot explain the market behaviour at the firm level. This result may suggest that investors price the targets' M&A announcement by their perception of the target's future R&D spending. Thus, the realized R&D spending has less explanatory power compared with the industry R&D spending.

We also notice that the sample size can be a weakness in this test. Many firms do not report their R&D spending in their annual reports. The relatively small sample size may reduce the power of the statistical test.

Table 5.6.5 The ARs and CARs for high and low R&D spending firms

	The US high R&D spending targets				The US low R&D spending targets				ARs	CARs
DAYs	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**M-W U**	**M –W U**
-5	1.6893	1.35	1.6893	1.45	-0.3203	-1.76	-0.3203	-1.99	-1.31	-1.31
-4	-0.3707	-0.43	1.3186	1.00	1.2137	1.30	0.8934	0.32	1.20	-0.71
-3	0.7340	1.07	2.0526	1.51	-0.0717	-0.48	0.8218	0.21	-0.55	-1.68[c]
-2	-0.6190	-0.79	1.4335	0.65	1.7038	3.08[a]	2.5255	1.53	2.80[a]	-0.03
-1	3.7733	3.14[a]	5.2068	1.86[c]	0.5971	1.81[c]	3.1227	1.66[c]	-1.76[c]	-0.59
0	6.7970	2.00[b]	12.0039	2.57[a]	12.5045	4.94[a]	15.6272	4.13[a]	1.00	0.51
1	4.1295	1.67[c]	16.1334	3.27[a]	1.6316	-0.06	17.2588	4.99[a]	-0.28	-0.15
2	0.8000	-0.10	16.9334	3.95[a]	-0.6981	-0.81	16.5607	4.00[a]	-0.44	-0.44
3	0.3465	0.35	17.2799	3.93[a]	0.7123	1.01	17.2730	4.85[a]	0.73	-0.28
4	2.3010	2.23[b]	19.5810	5.11[a]	0.6320	0.31	17.9050	4.80[a]	-2.24[b]	-0.79
5	0.1732	-0.61	19.7541	4.29[a]	-1.0200	-1.08	16.8850	3.25[a]	0.32	-0.48
	Japanese high R&D spending targets				**Japanese low R&D spending Targets**				**ARs**	**CARs**
-5	-1.5175	-0.90	-1.5175	-1.14	0.4176	-0.07	0.4176	0.09	0.75	0.75
-4	-0.1453	1.08	-1.6628	-0.52	-0.3644	-0.41	0.0532	-0.28	1.06	0.15
-3	0.9181	0.95	-0.7447	-0.13	-0.5098	-0.59	-0.4566	-0.49	1.21	0.23
-2	0.6733	1.38	-0.0714	0.33	2.9550	0.29	2.4984	-0.53	0.83	0.34
-1	12.6758	2.05[b]	12.6044	1.55	2.6089	0.96	5.1074	-0.38	0.07	0.75
0	1.8508	-0.08	14.4553	0.95	3.2485	1.37	8.3559	0.36	0.72	0.23
1	-4.1602	-0.73	10.2950	0.78	0.2015	1.29	8.5574	0.67	0.79	0.45
2	-1.7656	-0.96	8.5294	0.42	-1.1082	-1.68[c]	7.4492	0.23	0.42	0.49
3	-1.3097	-2.18[b]	7.2197	-0.13	1.4879	1.91[c]	8.9371	1.29	-2.34[b]	0.98
4	1.6466	0.73	8.8663	0.28	-0.6504	-0.32	8.2866	1.10	1.06	0.68
5	0.3375	1.18	9.2038	0.82	-1.1223	-1.99[b]	7.1643	0.39	1.02	0.04

The US and Japanese AR and CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. The M –W U denotes the Mann–Whitney U test. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

5.7 Market liquidity and the returns of target firms

In Chapter 4, we present that the market liquidity status imposes insignificant effect on the acquirer returns. Although the previous studies (see, e.g., Amihud, 2002; Pastor and Stambaugh, 2003; Bekaert et al., 2007) indicate that the illiquidity compensation may lead to the investors of the high illiquid firms experience more positive returns, the informational effect of illiquidity may be less significant in the cross-border M&As. Since most cross-border M&As are financed by cash, the market liquidity status of acquirers may impose weak influence on the bargaining power.

However, the market liquidity status of the targets may impose a more significant effect on the targets' ARs and CARs. The illiquid stock may increase the difficulty for the acquirers to sell the purchased shares in the future. Thus, the illiquidity of the target share may reduce the targets' bargaining power and result in the wealth shift from target to acquirers. In order to test the effect of the liquidity status of the targets, we compare the ARs and CARs of high illiquid, mid illiquid and low illiquid targets. Following (Amihud, 2002), we use the average ratio of absolute stock return to the trading volume in 250 trading days before the announcement as the proxy of the illiquidity.

Table 5.7.1 presents the ARs and CARs of the high illiquid, mid illiquid and low illiquid targets. Our sample consists of 97 the US targets with low illiquidity, 129 with medium illiquidity, and 97 with high illiquidity; and 45 Japanese targets with low illiquidity, 61 with medium illiquidity and 45 with high illiquidity.

We find that the US targets in all the panels experience significant and positive ARs on the announcement day. The Kruskal Wallis test also shows that the ARs are not significantly different across the three groups on the announcement day. On the other hand, the Kruskal Wallis results on day t=-2, t=-1 and t=1 are significant. This is likely to be contributed by the different AR patterns shown in the low and mid- illiquid panels.

Table 5.7.1 Abnormal returns and cumulative abnormal returns for the US and Japanese low illiquidity, medium illiquidity and high illiquidity targets

The US targets

	Low Illiquidity		Medium Illiquidity		high Illiquidity			Low Illiquidity		Medium Illiquidity		high Illiquidity		
Days	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**Kruskal Wallis**	**CARs**	***adj.*-**	**CARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**Kruskal Wallis**
-5	1.1528	2.62[b]	0.7151	1.22	0.7691	1.84[c]	1.76	1.1528	1.62	0.7151	0.92	0.7691	1.47	1.76
-4	0.5782	1.69[c]	-0.3382	-0.69	0.3539	1.58	3.64	1.7310	2.41[b]	0.3768	0.18	1.1229	2.05[b]	3.50
-3	0.3590	1.65[c]	-0.6301	0.53	0.2825	1.66[c]	0.72	2.0899	2.64[b]	-0.2533	0.50	1.4054	2.72[a]	5.22[c]
-2	0.4566	1.07	0.6158	3.68[a]	0.2729	-0.60	5.83[c]	2.5465	2.88[a]	0.3625	2.00[b]	1.6783	1.68[c]	1.15
-1	1.4350	3.39[a]	1.7608	4.14[a]	0.6466	1.05	6.09[b]	3.9815	3.94[a]	2.1233	3.22[a]	2.3249	1.33	3.18
0	6.5762	4.16[a]	5.9126	5.59[a]	5.4936	6.01[a]	0.40	10.5577	5.78[a]	8.0358	6.02[a]	7.8185	4.41[a]	2.44
1	2.5396	2.78[a]	1.7355	2.82[a]	1.2082	0.88	4.80[c]	13.0972	7.34[a]	9.7714	7.70[a]	9.0267	4.19[a]	3.84
2	-0.2553	-0.65	1.4639	0.54	0.3188	1.16	2.21	12.8420	6.81[a]	11.2352	7.54[a]	9.3455	4.66[a]	2.38
3	-0.6259	-1.40	0.0136	1.04	0.3050	0.78	7.74[b]	12.2161	5.35[a]	11.2488	7.67[a]	9.6505	4.73[a]	1.74
4	0.1687	0.22	-0.2369	0.67	0.2779	0.44	0.00	12.3847	5.68[a]	11.0119	7.69[a]	9.9285	4.56[a]	1.95
5	-0.4358	-0.81	0.0106	-0.26	0.3119	0.94	2.04	11.9489	4.88[a]	11.0225	7.18[a]	10.2403	4.13[a]	1.58

Japanese targets

Days	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**Kruskal Wallis**	**CARs**	***adj.*-**	**CARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**Kruskal Wallis**
-5	0.6598	1.11	0.4338	0.63	0.0841	-0.83	2.26	0.6598	0.46	0.4338	0.45	0.0841	-0.75	2.26
-4	-0.0705	-1.05	0.4387	0.91	0.2915	0.71	2.92	0.5893	-0.46	0.8725	0.98	0.3756	-0.06	0.99
-3	-0.4834	-0.76	0.3653	0.94	0.9079	1.15	3.40	0.1059	-0.68	1.2378	1.08	1.2835	-0.16	1.32
-2	-1.1553	-1.23	0.5122	1.38	0.4405	0.34	2.19	-1.0494	-1.51	1.7500	1.54	1.7240	-0.06	6.37[b]
-1	1.4739	2.36[b]	3.4493	3.32[a]	2.7117	2.53[b]	2.27	0.4244	-0.16	5.1993	2.63[b]	4.4357	0.79	5.17[c]
0	2.8760	3.09[a]	5.7122	2.03[b]	3.8015	2.97[a]	0.79	3.3004	1.56	10.9115	3.42[a]	8.2372	2.10[b]	5.54[c]
1	-0.9460	-1.78[c]	1.2518	0.29	-0.7658	0.82	1.58	2.3544	0.93	12.1633	3.13[a]	7.4713	2.85[a]	8.40[b]
2	-0.1726	-0.54	-0.3596	0.71	-4.3406	-0.87	0.95	2.1818	0.58	11.8037	3.04[a]	3.1307	2.20[b]	7.81[b]
3	-0.2760	-0.86	0.0962	0.19	1.9099	0.33	0.60	1.9058	0.46	11.8999	2.84[a]	5.0406	2.48[b]	8.05[b]
4	-0.2357	-0.64	-0.5522	-0.86	1.8586	0.92	3.57	1.6701	0.26	11.3478	2.55[b]	6.8992	2.69[a]	7.53[b]
5	0.4685	1.64	1.0591	1.07	1.1589	0.94	0.60	2.1386	1.22	12.4069	2.84[a]	8.0580	2.95[a]	6.29[b]

The US and Japanese AR and CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

In both low and mid-illiquid panels, we have observed significant and positive ARs on day t=-1 and day =1, which can be a result of the pre-announcement anticipation and post announcement return continuation. However, the different return patterns impose insignificant effect on the US target CARs. We have observed the pre-announcement anticipation and post-announcement return continuation in all panels. Notice that, although the CAR on day t=-1 is insignificant in the high-illiquid panel, the CAR on day t=-2 is significant and positive. The Kruskal Wallis statistic for the CARs of US targets in the three panels is insignificant.

Unlike the US targets, the ARs of Japanese targets show the same significant pattern across all three panels. Kruskal Wallis test also confirms that the ARs of Japanese targets are insignificantly different. However, surprisingly, we find that the CARs of the low-illiquid targets are insignificant over the announcement period. It leads to the significant Kruskal Wallis results from day t=-2 to day t=5. The insignificant CARs from the announcement day to day t=5 can be influenced by the pre-announcement negative (but insignificant) AR on day t=-2, which is more likely to be a market noise.

Overall, we suggest that the market liquidity status of the targets imposes insignificant effect on the target returns during the announcement period. We observe that the US targets show different AR patterns in the different panels. However, the compensation theory suggested in the previous studies may not be able to explain the different patterns shown in our study. Thus, the liquidity status may be a proxy of other factors, for instance, the industry characteristics. The ARs of the Japanese targets are insignificantly different across the three panels. Although the CARs in the low-liquid panel are insignificant, they are more likely to be influenced by the unrelated market noise.

5.8 The targets' ARs and CARs in different time period

Consistent with Chapter 4, we examine whether the ARs and CARs of targets are stable in different time periods. Since our sample period is over 20 years, the economic and market conditions can change over time. Thus, the interpretation of portfolio and deal characteristics may be inconsistent in different time periods. Thus, this test may show how robust the effect of portfolio and deal characteristics is.

Consistent with Chapter 4, we compare the ARs and CARs for the M&As initiated from 1990 to 1998 with the ones from 2007 to 2015. As we discussed in Chapter 4, the two periods cover important phases of the globalization period and M&A cycles. Table 5.8 presents the pre-1998 and post 2007 ARs and CARs of the US and Japanese targets. Our sample consists of 216 the US targets taken over before 1998 and 87 taken over after 2007; and consists of 39 Japanese targets taken over before 1998 and 81 after 2007.

The ARs and CARs of the US targets are significant on the announcement day in both 1990 to 1998 and 2007 to 2015 periods. Although the significance interval of the targets ARs and CARs reduced in the 2007 to 2015 period, the result of the Mann–Whitney U test is not significant. Notice that, although the CAR on the announcement day in the 2007 to 2015 period is insignificant, the Mann–Whitney U test also do not support that in 2007 to 2015, the US targets experience significantly higher CAR on the announcement day than in 1990 to 1998.

In the 1990 to 1998 period, the US targets experience continuously significant and positive ARs from day t=-3 to day t=1, and the CARs are significant from day t=-5 to day t=5. In contrast, the US targets only experience significant and positive ARs on day t=0 and day t=1 during the 2007 to 2015 period. The CARs are not significant before the announcement day. The Mann–Whitney U test also shows that the US targets experience significantly different ARs on day t=-2 and CARs on day t=-2 and t=-1. Our result shows that the anticipation behaviour becomes less significant in the late period. In addition, it implies the existence of insider trading behaviour in the 1990 to 1998 period.

Table 5.8 ARs and CARs of the US and Japanese targets of different period of time

	The US Targets in 1990 to 1998				The US Targets in 2007 to 2015				ARs	CARs
DAYs	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**M-W U**	**M –W U**
-5	0.8462	2.87[a]	0.8462	2.03[b]	0.3794	0.38	0.3794	-0.45	0.40	0.40
-4	0.2736	1.53	1.1198	2.09[b]	0.3556	0.84	0.7349	0.64	0.38	0.43
-3	-0.0881	1.67[c]	1.0317	2.72[a]	-0.0781	0.29	0.6569	0.62	0.55	1.21
-2	0.6628	3.03[a]	1.6945	3.78[a]	-0.3133	-0.25	0.3435	-0.21	1.97[b]	1.90[c]
-1	1.3186	5.23[a]	3.0131	5.14[a]	1.2318	1.18	1.5753	-0.25	1.47	2.31[b]
0	5.3414	7.11[a]	8.3545	8.13[a]	8.1757	6.10[a]	9.7509	3.51[a]	1.09	0.69
1	1.8309	3.11[a]	10.1854	9.72[a]	1.9993	2.23[b]	11.7503	3.94[a]	0.40	0.26
2	0.0986	0.11	10.2841	9.83[a]	1.0842	-0.23	12.8345	3.68[a]	0.02	0.05
3	-0.0745	0.73	10.2096	9.19[a]	-0.0604	-0.29	12.7741	3.52[a]	0.56	0.25
4	0.2306	0.68	10.4402	9.26[a]	0.1321	1.47	12.9062	3.83[a]	0.65	0.08
5	0.0039	0.32	10.4440	8.62[a]	-0.0541	-0.31	12.8521	3.28[a]	0.87	0.06
	Japanese Targets in 1990 to 1998				**Japanese Targets in 2007 to 2015**				**ARs**	**CARs**
-5	0.6553	0.24	0.6553	0.13	-0.0021	-0.12	-0.0021	-0.12	0.09	0.75
-4	0.0962	0.20	0.7515	0.29	0.1244	-0.19	0.1223	-0.21	1.75[c]	1.08
-3	0.5654	1.18	1.3169	0.24	0.1355	-0.21	0.2578	-0.30	0.24	1.60
-2	-0.7492	-0.47	0.5677	0.16	-0.4069	-0.65	-0.1492	-0.59	1.79[c]	1.23
-1	3.0543	2.54[b]	3.6220	2.08[b]	1.6414	2.79[a]	1.4923	1.23	0.53	1.54
0	3.0167	2.55[b]	6.6387	4.23[a]	2.7293	2.57[b]	4.2216	2.65[a]	0.41	1.23
1	0.6843	0.15	7.3229	4.12[a]	0.2254	-0.22	4.4470	2.36[a]	1.40	1.42
2	-0.5730	-0.21	6.7500	3.43[a]	0.7504	0.18	5.1973	2.23[b]	0.38	1.25
3	0.2247	-0.16	6.9747	3.33[a]	0.1239	-0.41	5.3213	2.00[b]	0.17	1.28
4	0.2718	0.17	7.2465	3.18[a]	-0.0115	-0.45	5.3097	1.86[c]	0.91	1.53
5	0.5734	1.08	7.8199	4.11[a]	0.9572	1.91	6.2669	2.40[a]	0.20	1.51

The AR and CAR measures are in percentage. *adj*-BMP denotes the adjusted BMP *t*-statistic. The M –W U denotes the Mann–Whitney U test. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively.

For Japanese targets, the ARs and CARs in both periods are significant and positive on day t=0. The Mann–Whitney U test also shows that the ARs and CARs are insignificantly different in the two periods. The result might suggest that the insider trading behaviour is still significant in the 2007 to 2015. The result may also be interpreted as the Japanese stock market being more efficient than the US market. However, Otsubo (2014) find that the stock market in Japan do not incorporate the information as efficient as the US market. Thus, it may be less possible that the different ARs and CARs pattern of the US and Japanese targets in the 2007 to 2015 period are contributed by the difference in market efficiency.

5.9 Conclusion and evaluation

This chapter presents the ARs and CARs of the US and Japanese target firms. Our result is consistent with the previous studies, which indicate that target firms experience substantially positive returns during the announcement period. We also try to explain the ARs and CARs. Following the previous studies, we test i) the ARs and CARs in different time periods; ii) acquirers and target industry relationship, iii) listed and unlisted bidders, iv) industry of the targets, v) liquidity status of the targets. Notice that, we find that most public targets are purely financed by cash. Even though many previous studies indicate that the method of payment can influence the resistance of the target and thereby change the bargaining power, we cannot test the information effect of the payment method in this study.

Overall, we find that merger relationship, public status of bidders, industry characteristics have an impact on the magnitude of target ARs and CARs. Our test results imply that the synergy related factors determine the investor behaviour during the announcement period. Our test results may also provide some inspirations for explaining the acquirer returns. We suggest that the insignificant ARs and CARs observed in Chapter 4 should be resulted by the weak synergistic effect instead of high premium considerations.

We also notice that this chapter has several weaknesses. Firstly, due to the sample size of listed targets, we cannot test the corresponding acquirer AR in each of our test. This weakens the power of our test in explaining the investor behaviour associated with acquirer AR. Secondly, this chapter only uses an indirect proxy (the covariance between acquirer and target AR) to measure the premiums paid by the acquirers. This is because in our sample events, most cross-border M&A announcements do not report the proposed transaction value.

Chapter Six

The financial characteristics and acquirer returns

6.0 Introduction

In Chapter 4 and Chapter 5, we have systematically examined whether the market efficiently incorporates the risks and synergetic value into the cross-border M&A announcement returns. Following previous studies, we have tested the explanatory power of the acquirer and target characteristics (e.g. industry characteristics, R&D intensity) and M&A deal characteristics (e.g. merger relationship, public status of acquirers and targets). We find that investor behaviour can be influenced by their perception of the degree of synergy and risks in the M&As. However, our study may over-simplify the investor behaviour, as investors may anticipate the success of M&A based not only on potential synergy creation, but on the capability of acquirers to deliver such synergistic effect. Thus, we should be able to assume that the market behaviour during the announcement period, at least partially, influenced by the previous performance of both acquirers and targets. Failed to capture effect of acquirers' previous performance may lead to some of our earlier tests lack of power to explain ARs. In order to overcome this weakness, this chapter tests the effect of financial characteristics of acquirers and targets on acquirer's returns.

We use financial ratios as proxies of financial characteristics. The M&A literature suggest that a firms' financial characteristics explain the acquirers' announcement returns in two ways. Firstly, some financial ratios (e.g. the capital structure) can be used as an indicator of the management entrenchment. When investors assess the agency motive from the financial information, the M&A announcement may result in negative stock returns as agency costs are likely to increase on account of the M&A (Jensen, 1986). Secondly, financial characteristics indicate the acquirers' capability to create

values from synergistic effects and market for corporate control. The M&A between profitable acquirers and growth targets can create more financial synergy by reducing the funding cost and financial contains in the targets. In addition, M&As increase the target value by replacing less efficient target management with more efficient management from the acquirers, and thereby benefit acquirers by market for corporate control. Denis et al. (2003) suggest that high profitable firms tend to have more efficient management. In addition, Gompers et al. (2003) and Bebchuk et al. (2004) find that Tobin's Q has significant correlation with corporate governance quality.

Although the relation between firm's financial characteristics and M&A announcement returns has been studied for decades, there is still a knowledge gap in our understanding of the role that a firm's financial characteristics play in investor's pricing behaviour. Firstly, previous M&A studies show inconsistent results for the correlations between financial ratios and announcement returns (see, e.g. Mantecon, 2008; Dong et al., 2006). Hence the empirical support provided by previous studies is still ambiguous. Secondly, some previous M&A studies tend to bind each financial ratio with only one theory (see, e.g. Jensen, 1986). The more recent corporate finance studies show that financial ratios should be assessed in a more dynamic model (see, e.g. McConnell and Servaes, 1995).[57] In addition, previous studies do not show a consistent interpretation of ratios. For instance, Tobin's Q has been interpreted as a proxy of growth opportunity by Bessembinder and Zhang (2013), whereas Masulis et al. (2007) use Tobin's Q as a sign of stock overvaluation. Thirdly, the effect of financial characteristics is rarely tested in the context of the cross-border M&A. When cross-border M&As involve higher information asymmetry and potential synergy, we do not know whether the effect of financial characteristics in the cross-border M&As is still consistent with that in the domestic M&As. In order to address the knowledge gap, this chapter is also designed to answer the following questions: i) whether investors use financial ratios to price the

[57] For instance, Jensen (1986) the free cash flow explains the agency motive in the M&As. However, the later capital structure studies (e.g. McConnell and Servaes, 1995) show that the growth opportunity influences the investors' interpretation of free cash flow.

acquirers shares for cross-border M&A announcements; ii) whether the effect of financial ratios is consistent when acquirers and M&As show different characteristics; iii) whether the effect of financial ratios is consistent across different countries.[58] This chapter is organised as follow: Section 6.1 introduces the explanatory variables employed in this chapter. Section 6.2 introduces the control variables. Section 6.3 presents the test model. Section 6.4 specifies the data used in this chapter. Section 6.5 presents the statistical summary. Section 6.6 presents the empirical results associated with the US acquirers. Section 6.7 presents the empirical results associated with Japanese acquirers. Section 6.8 presents the empirical results associated with the US and Japanese targets. Section 6.9 analyses the effect from Sarbanes-Oxley act.

6.1 Determinants of financial characteristics

In this section, we discuss the explanatory variables we employ in the following empirical tests. Following the previous studies, we measure the financial characteristics by using profitability ratios, growth opportunity ratios, leverage ratio, and dividend ratio. Through the discussion of the theories and test methods used in the previous studies, we justify our choices of the financial ratios.

6.1.2 Profitability ratios

The previous studies interpret the profitability ratios from two perspectives. Firstly, the profitability tends to be used as a measure of management efficiency (see, e.g. Denis et

[58] Gorton et al. (2009) indicate that the bad performance firms tend to be the potential target in M&As. Once market captures this information, these firms can experience positive ARs. Thus, as a target, the influence of its financial performance can be ambiguous. A good performance target can create high synergy with acquirers. A bad performance target can have high potential for the value creation though the market for corporate control. Thus, we only test the acquirers' announcement returns in this chapter.

al., 2003). Considering market for corporate control suggests that acquirers can benefit from replacing inefficient management in targets (see, e.g. Wang and Xie, 2009), high profitability acquirers should experience more positive announcement returns.

Secondly, previous studies use profitability as one of the indicators of free cash flow (see, e.g. Golubov et al., 2015).[59] As free cash flow can help management empire building, (see, e.g. Jensen, 1986), the profitability ratio can be negatively correlated with announcement return. It is worth noting that when Golubov et al. (2015) use net profit after tax as the proxy of free cash flow, the study does not find significant correlation between free cash flow and CARs.[60] In addition, the leverage ratio, as another free cash flow indicator, is commonly observed to have a positive correlation with CARs (see, e.g. Jensen, 1986; Masulis et al., 2007).[61] Thus, compare with leverage ratio, profitability is a less effective proxy for the management entrenchment.

There are two common ratios are used in previous studies to measure the profitability: earnings per-share (EPS here after) and gross profit-to-assets (or called return on assets in some previous studies). Even though EPS is a common corporate efficient estimator (e.g. Huang et al., 2014), it is known to contain several weaknesses as a profitability indicator. The numerator of EPS is net income after preferred dividend. Novy-Marx (2013) argue that the items lower down in the income statement are "polluted" by unrelated accounting information such that EPS has less predicative power to the stock returns. He finds that the gross profit shows more significant explanatory power to the stock returns.[62] However, Ball et al. (2015) suggests that the lower items in the income

[59] We will further discuss the indicator of free cash flow in the following sections.

[60] The profit tends to be the numerator of profitability. As the profit is correlated with free cash flow, the profitability should also be correlated with free cash flow.

[61] We will further discuss the effect of leverage ratio in section 6.1.4.

[62] This study also reviewed the regression analysis of Fama and French (2006), which finds insignificant correlation between net profit and ARs. However, Novy-Marx (2013) argues that the insignificant correlation is resulted miss-using the "polluted" net profit. In his study, he re-tested the Fama-French regression with gross profit and find significant correlation with ARs.

statement are not pure noise to the stock returns but contain explanatory power. In order to capture the explanatory power from the gross profit and net profit (the lower item in the income statement), we employ both EPS and gross profit-to-assets in our study. A second weakness of the ESP measure is that the denominator of EPS is number of shares outstanding, which does scale net income by firm size. This identity leads the EPS to be a less appropriate profitability indictor in the cross-sectional test. On the other hand, the EPS may provide a better indication to the stock return compare with gross profit-to-assets. This also justify the reason for using both gross profit-to-asset and EPS to explain the announcement returns.

6.1.3 Growth opportunity

Arikan and Stulz (2016) find that firms' growth opportunities are positively correlated with announcement returns. They suggest that firms with less growth opportunity tend to have higher agency cost and firms with low growth opportunity are more likely to initiate M&As motivated by management entrenchment. However, Dong et al. (2006) and Margisr et al. (2008) suggest that the options of internal growth and M&A tend to be exclusive. Both studies interpret the growth opportunity as the opportunity cost of M&As. Margsiri et al. (2008) find that high growth firms are more likely to choose internal investment instead of M&As. Dong et al. (2006) show that high growth acquires tend to experience lower ARs after the M&A announcement. Even though the previous studies show inconsistent evidence on the relationship between the acquirers' growth opportunity and the announcement returns, we should expect that the growth opportunity influence the investor's interpretation to the M&A announcement.

Bessembinder and Zhang (2013) use Tobin's Q as the proxy of growth opportunity.

They find that acquirers' Tobin's Q is positively associated with their ARs.[63] However, Chan et al. (2003) find that investors are more likely to be over optimistic, and the market value of firms show weak predictability to the earning's growth. In addition, Dong et al. (2006) indicate that Tobin's Q also contains potential market misevaluation before the announcement and acquires' stock prices tend to be revalued afterwards. Thus, the Tobin's Q can be negatively correlated with announcement return if acquirers have been overvalued before the announcement.

Following the previous studies (see, e.g. Almazan et al., 2010; Arikan and Stulz, 2016; Chan et al., 2003; Mantecon, 2008), we use Tobin's Q as the proxies of growth opportunities. In addition, in order to overcome the weakness of Tobin's Q (e.g. the inconsistent interpretation of Tobin's Q), we also employ earning's growth as second proxy of growth rate. [64] We adjust the inflation based on the sample company's financial year when we estimate its earning's growth. Compared to Tobin's Q, earning's growth has weaker correlation with firms' market value. Thus, as a growth opportunity indicator, the earning's growth may overcome the bias from market misevaluation.

6.1.4 Leverage ratio

In the previous studies, interpretations of the leverage ratio have been from two perspectives: free cash flow and defensive mechanism. The low debt usage (low leverage ratio) tends to be positively associated with free cash flow (see, e.g. Almazan et al., 2010) and target firms can use high leverage ratio to reduce the threat from hostile takeover (see, e.g. Garvey and Hanka, 1999).

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[63] The study tests the relationship between book to market ratio (BM) and ARs and find negative and a significant correlation. BM is likely to be negatively correlated with Tobin's Q. Since we use Tobin's Q, this implies a positive correlation between Tobin's Q and acquirers' ARs.

[64] We notice that some studies (see, e.g. Gorton et al., 2008) use asset growth as a proxy of growth rate. However, we suggest that the asset growth may also be influenced by retention rate and leverage. Thus, we suggest that the earning's growth is a more valid proxy for the growth rate.

A large number of previous studies interpret acquirer's leverage ratio from the free cash flow perspective. For instance, Jensen (1986) suggests that by issuing debt, managers are bonding their promise to pay-out future cash flows and thereby reduce the free cash available for spending on negative NPV projects. Masulis et al. (2007) apply the concept put forward by Jensen (1986) in the context of M&A and suggest that the cash flow slack depicted by low leverage ratio can incentivise managerial power and thereby increase the agency cost or hubris in the M&A. Edmans et al. (2012) also suggest that the high leverage ratio can reduce acquirers' agency cost, and thereby reduce the share value discount in the M&A. McConnell and Servaes (1995), however, indicate that investors' reaction to the leverage ratio should follow a dynamic model, which is determined by the growth opportunity of a firm. If a firm has low growth opportunity, in order to prevent the overinvestment, investors tend to appreciate high leverage structure. If firms have high growth opportunity, investors tend to appreciate low leverage to reduce the possibility of underinvestment. Applying this theory in the context of M&As, we may observe the negative effect of leverage ratio on announcement returns when investors expect high synergy or growth opportunities created by the M&As.

Previous studies interpret the target leverage ratio from both defensive mechanism and agency cost perspectives. Chung et al. (2013) find that firms fail to take advantage from tax deductibility of interest expense with low leverage ratio tend to have strong agency costs. Thus, these firms are more likely to be the targets for takeovers. Garvey and Hanka (1999) indicate that firms can increase their leverage to reduce the threat from hostile takeover. Israel (1991) also indicates the target firms can increase their leverage to boost their bargaining power in the M&As. Even though target leverage ratio can be interpreted from two perspectives, both interpretations predict a negative correlation between target's leverage ratio and acquirers' return.

6.1.5 Dividend pay-out ratio

Dividend payment can be interpreted from two perspectives. DeAngelo et al. (2004) and Floyd et al. (2015) indicate that dividend payments are often used as a more explicit signal showing the confidence in the future growth. Khatami et al. (2015) interpret dividend as a proxy of free cash flow. Edmans et al. (2012) further indicate that dividend payment ratio should mitigate the agency problems from the free cash flow perspective. Thus, investors should expect less agency cost in the M&As when acquirers have high dividend payment in the past.

Following the previous studies, we employ the dividend pay-out ratio as the proxy of dividend payment. Notice that some previous studies (see, e.g. Lewellen, 2004) employ dividend yield to explain the stock returns. However, in our sample, we find that the dividend pay-out ratio and dividend yield have strong correlation.[65] In order to maintain the stability of our regression analysis, we only employ dividend pay-out ratio as the proxy of dividend payment. In addition, since the dividend yield and dividend pay-out ratio are highly correlated, excluding dividend yield should not lead to a significant decrease in the explanatory power of our regression.

Notice that, as a financial characteristic indicator, dividend payment and its effect on announcement return tends to be ambiguous (see, e.g. Bessembinder and Zhang, 2013; Floyd et al., 2015). Firstly, there is still controversy on the reason why firms pay dividends. Secondly, the dividend change tends to be rather insensitive compared with other financial indicators.[66] Thus, investors may prefer to use other ratios when they interpret the M&A announcements.

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[65] In an unreported test, we find that the correlation between dividend pay-out ratio and dividend yield is 0.76 for the US acquirers and 0.75 for the Japanese acquirers.

[66] For instance, Floyd et al. (2015) show that dividend per share tends to be insensitive to the change in the profitability of firms.

6.2 Control variables

In section 6.1, we introduce the explanatory variables that we use in this chapter. In addition, we also point out that these variables can be interpreted from various perspectives. Thus, the relationship between our dependent variable and explanatory variables can be influenced by factors that can inspire investors to interpret the financial ratios from a certain perspective. In order to capture these factors, we employ acquirer-target merger relationship, the relative size of the deal and the R&D expense as our control variables.

6.2.1 Merger relationship with targets

Doukas and Kan (2008) find that the profit reduction in core business encourages firm to acquire targets from unrelated industries to develop their business model. In contrast, if a firm experiences high profit and growth in its core business, they tend to initiate horizontal M&As to apply their competitive advantage in a larger scale. In the former scenario, the profitability and growth opportunity ratios tend to be interpreted as a threshold of initiating M&As and show negative correlation with announcement returns. In the later scenario, the profitability and growth ratios are more likely to be interpreted as the management efficiency and thereby positively correlated with announcement returns.

Different to the horizontal and conglomerate M&As that motivated by business development, vertical M&As tend to be motivated by reducing the contract cost and cash flow uncertainty (Acemoglu et al., 2009; Beladi et al., 2013). Thus, firms with higher financial constraints may potentially experience higher benefit from vertical M&As. When investors price the vertical M&A announcements, they may use the free cash flow indicators (e.g. leverage or dividend pay-out ratio) to explain the motive of vertical M&As. Beladi et al. (2013) further suggest that the vertical M&As can benefit

the future expansion, and acquirers tend to experience more positive announcement returns after they initiate a vertical M&A. Thus, the vertical M&As may also influence the interpretation of the growth opportunity ratios.

Consistent with our Chapter 4 and Chapter 5, we classify our M&A events into horizontal, vertical, conglomerate and increase of corporate control (ICC).

6.2.2 Size effect

Previous studies find that the size of acquirers and targets can be used to determine the bargaining power, agency cost and financial synergy. Thus, the size should also be able to influence the interpretation of the financial characteristics.

As size can indicate the motives and risks for M&As (see, e.g. Humphery-Jenner and Powell, 2011; Alexandridis et al., 2013), we expect that investors may interpret the financial characteristic indicators in different ways. Following Fuller et al. (2002), we employ the relative size (deal value to acquirer's total assets) as a control variable. The reason we use deal value instead of target asset value is because the majority of targets are not 100% acquired in our sample events. However, we notice that the relative size may not capture the potential agency cost and cost of restructuring as suggested by Moeller et al. (2004). Thus, we also employ acquirers' total asset value and deal size as alternative measures of the size effect. We define the highest and lowest 30 percentiles as the high and low size.

6.2.3 R&D spending of acquirers

Higgins and Rodriguez (2006) find that acquirers' pre-announcement R&D expense can help investors to determine the motive of M&As. They find that investors tend to

appreciate the M&A announcements when acquirers are lack of R&D resources and use M&As as a method of R&D outsourcing. Bena and Li (2014) and Phillips and Zhdanov (2012) also find that the large and mature firms tend to acquire high R&D spending targets to reduce their risk in the R&D competition. However, Eun et al. (1996) find that Japanese acquirers in R&D intensive environment experience significantly higher returns than acquirers from other countries. They suggest that the high R&D spending help Japanese firms to efficiently internalize the targets' R&D assets.

If we assume that the R&D expense of acquirers is not only influenced by their intention but their capability and industry environment, the R&D spending may also influence investors' interpretation of acquirers' financial characteristics. When acquirers are not capable to invest in R&D to redevelop their existing business, the low profitability and growth rate may be interpreted as a low cost of capital. Investors may expect the low-profit firms to initiate M&As to seek the opportunity to redevelop their business. On the other hand, if a firm is capable to invest in R&D, its high profitability and growth rate may be interpreted as the outcomes of the successful R&D investments. In which case, investors may expect acquirers to transfer the R&D resources to targets. Thus, when acquirers have high R&D expense, their profitability ratio should have a positive correlation with their announcement returns.

In this study, we measure the R&D by using two methods. The first method is to scale the acquirer's R&D expense by their total revenue. We suggest that the revenue may be a better proxy of the size of the current business than total assets. Thus, the R&D expense to total revenue can show the scale of R&D input in the acquirers' current business.[67] The second method is to scale the acquirer's R&D expense by deal value.

[67] Due to the fact that R&D intensity varies across different industries, we should expect that firms in different industries have different R&D expenses. In addition, in R&D intensive industries, a less R&D intensive firm may still show a higher amount of R&D spending compared to firms in the less R&D intensive industries. However, as we cannot find the average R&D expenses for each industry, we are not able to classify the relative high and low R&D expense based on the industry average. In the absence of industry characteristics, our classification of high and low R&D spending may contain

If we assume that acquirers can transfer their R&D results to targets' business, this measurement of R&D may show the potential synergy created by acquirers' R&D. We use 30 percentiles to define the high and low R&D cost.

6.3 Measurement of announcement returns and regression model

Following Eun et al. (1996), we measure the announcement returns by SCARs over a 3-day window (i.e. from -1 day to the announcement to 1 day after the announcement).[68] The 3-day window can capture the pre-announcement anticipations and the delayed responses. Notice that, in Chapter 4, we show that ARs outside the -1 and +1 day range can still be significant. Consistent with the previous chapters, our SCARs are estimated using F-F-C four-factor CAPM, and standardized by the standard deviation of ARs over the estimation period.

We employ the following regression model for coefficient estimation:

$$\mathrm{SCAR}_{(-1.1)} = \alpha + \beta_1(EPS) + \beta_2(Gross\ profit - to - assets) + \beta_3\left(Tobins\ ´\ Q\right) + \beta_4\left(earning\ ´\ s\ growth\right) + \beta_5(leverage) + \beta_6(dividend\ payout\ ratio) + \mu \quad (6.1)$$

The explanatory variables in Eq. (6.1) are the important ratios that investors commonly use in assessing firm performance (see, e.g. Bessembinder and Zhang, 2013; Floyd et al., 2015; Huang et al., 2014). The regression analysis is performed under least square

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weaknesses. However, we also suggest that to employ the industry average R&D may also contain weaknesses. In Chapter 4, we find that acquirers in the high technology industries tend to experience higher ARs during the announcement period. Thus, investor response to the industry characteristics can also be a proxy of the R&D spending. For this reason, we cannot justify whether the relative R&D spending (based on industry average) is better than our method.

[68] Although some studies (see, e.g. Masulis et al., 2007) use -2 to +2 window to capture the announcement effect, the majority of studies (see, e.g. Mantecon, 2009) tend to use -1 to +1 window that may reduce biasness due to market noise.

method. In order to address the potential autocorrelation and heteroskedasticity in the error terms, we have employed Newey-West procedure for our OLS models.

6.4 Data

The financial data of acquirers and targets are captured from DataStream. Following the previous studies, the financial characteristics are measured based on yearly data.[69] In order to explain the investor behaviour during the announcement period, we use a lag of one year of the financial ratios.[70] We find that some firms in our sample initiate multiple M&As in a single financial year. In order to avoid the duplication of explanatory variables, we only include the first M&A of any given year in our sample. As a result, we have 363 listed US firms acquiring the Japanese targets during 1990 to 2015, of which 54 Japanese targets are listed. We have 617 listed Japanese firms acquiring the US targets during 1991 to 2013 where 102 US targets are listed.

As our M&A samples are across 1990 to 2015, we notice that the EPS can be significantly affected by inflation. Thus, we adjust the EPS by using the local consumer price index (CPI) to the base year. In addition, as our test is designed to explain how investors' perception of synergy is influenced by pre-announcement financial characteristics, we assume that investors in acquirer's country are less likely to measure the profitability of acquirer based on target country's currency. We also convert the targets' EPS to the acquirers' local currency to tolerate the influence from the short-run volatility of currency market. Following Danbolt and Maciver (2012), we use 12-month average exchange rate prior to date of the M&A announcement as our exchange rate

[69] In the DataStream, most financial data is obtained from annual reports. However, EPS is computed based on the quarterly period and dividend is based on half-yearly period. In this case, we will convert the quarterly and half-yearly data to annually base on the financial year end of each company.

[70] We assume that the announcement return should not be affected by the financial information published after the M&A announcement. In other words, we expect that corporate insiders cannot determine the announcement returns.

measurement period.

6.5 Summary statistics and correlation matrix

Table 6.5.1 provides the descriptive statistics of the samples of the US and Japanese acquirers and targets. Notice that, due to the data missing in the DataStream, we cannot report the Japanese targets' leverage ratios and dividend pay-out ratios in our test.[71]

Panel A and B show the CARs and SCARs of the US and Japanese acquirers. We find that the SCARs are significant and positive in Panel A and Panel B. Even though Kolari and Pynnonen (2010) suggest that SCARs should show a better statistical property over CARs, our results are mixed. We find that the Jarque-Bera test of SCARs is insignificant for Japanese acquirers, and it is significant for the US acquirers.[72] Panel C to F show the firm characteristics of the US and Japanese bidders and targets. We find that the Jarque-Bera statistic is significant for most measures.

[71] This sample size is smaller than the ones used in the previous chapters. There are two reasons lead to reduce the sample size. Firstly, to match the annual financial data we employed, we only include the first M&A if the acquirers initiate multiple M&As in a year. Secondly, we find that some financial data of the acquirers are not available from DataStream.

[72] Notice that the significance test is only based on the t-statistic of the SCARs, which is the standard BMP *t*-statistic test. As is indicated by Kolari and Pynnonen (2010), the BMP *t*-statistic can over reject the null hypothesis due to presence of cross-sectional correlation. Jarque-Bera confirms that the observations are not normally distributed. This means that *t*-statistic can be biased. However, the study in this Chapter is mainly focusing on the relationship between the financial characteristics and SCARs.

Table 6.5.1 Summery statistics

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Jarque-Bera
Panel A: The US Acquirer CARs						
$CARS_{-1,1}$	0.1901[c]	0.1348	11.0649	-16.3899	2.1131	2506.859[a]
$SCARS_{-1,1}$	0.0918[b]	0.0905	3.0566	-4.4821	0.8357	353.9963[a]
Panel B: The Japanese Acquirer CARs						
$CARs_{-1,1}$	0.2307[a]	0.1844	9.2724	-11.2068	1.7552	830.863[a]
$SCARs_{-1,1}$	0.1130[a]	0.1165	2.0867	-2.0654	0.6413	1.535
Panel C: The US Acquirers Characteristics						
EPS ($)	1.167	1.095	4.536	-3.908	1.285	16.399[a]
Gross profit-to-assets	0.256	0.247	0.757	-0.353	0.157	16.792[a]
Tobin's Q	1.115	1.090	5.387	-0.217	0.631	478.656[a]
Earning's growth	-0.084	-0.068	1.025	-1.150	0.206	1052.263[a]
LEVERAGE	0.319	0.344	0.813	0.000	0.177	4.059
Dividend pay-out	0.243	0.160	0.933	0.000	0.267	39.461[a]
Panel D: The Japanese Acquirers Characteristics						
EPS (¥)	333.016	118.066	0.029ml	0.228	1552.103	2.061ml
Gross profit-to-assets	0.252	0.218	1.133	0.003	0.169	713.298[a]
Tobin's Q	2.207	1.562	44.564	0.350	2.995	0.224ml[a]
Earning's growth	0.001	0.000	0.260	-0.019	0.011	6.10ml[a]
LEVERAGE	0.427	0.450	0.968	0.000	0.256	21.010[a]
Dividend pay-out	0.280	0.249	0.982	0.000	0.210	73.232[a]
Panel E: The US Targets Characteristics						
EPS (¥)	335.411	248.311	8155.627	0.557	849.689	23710[a]
Gross profit-to-assets	0.304	0.266	1.004	-0.467	0.216	30.504[a]
Tobin's Q	1.206	1.564	18.378	0.525	11.218	23970[a]
Earning's growth	0.051	0.000	1.592	-0.571	0.307	442.179[a]
LEVERAGE	0.363	0.311	4.171	0.000	0.462	9631.681[a]
Dividend pay-out	0.140	0.000	0.761	0.000	0.226	27.367[a]
Panel F: The Japanese Targets Characteristics						
EPS ($)	3.054	0.705	110.912	0.032	15.274	5463.280[a]
Gross profit-to-assets	0.293	0.247	1.277	-0.004	0.198	306.004[a]
Tobin's Q	3.878	1.719	79.470	0.323	10.969	4457.408[a]
Earning's growth	0.000	0.000	0.011	-0.013	0.004	3220.193[a]

The sample consists of 363 US-JP M&As (US acquirers bid Japanese targets) and 617 JP-US M&As. All the M&As are initiated between 1990 and 2015 and covered by DataStream database. ml denotes million.

In panel C to F, EPS tends to have larger standard deviation than other ratios, perhaps because the EPS is not scaled by firm size. Note that EPS for Japanese acquirers is higher than EPS for US targets is because the measures are not in the same currency.

Table 6.5.2 presents the shows the Spearman ranked-order correlations. EPS and gross profit-to-assets are negatively correlation in (see, Panels A, C and D). This result may be due to the clean nature of gross profit-to-assets relative to EPS as it is based on a residual measure.

In theory, the profitability ratios should be negatively correlated with leverage, as high profitable firms have higher cash flows and have less need for external financing. In Panels A and C, however, we find that the EPS has a positive correlation with the leverage ratio, whereas the gross profit-to-assets has a negative correlation with the leverage. The inconsistent relationship between profitability and leverage ratio should also be resulted by the noise in EPS and/or the effects of discretionary items on some of the measures.

The earning's growth is negatively correlated with gross profit-to-assets in Panel A, but positively correlated with gross profit-to-assets in Panel C. The inconsistent correlation may show the different retained profit of the US and Japanese acquirers in the year before the announcement. The result may imply that the US acquirers are more likely to use their profit to increase their total assets, whereas Japanese acquirers tend to distribute their earnings to shareholders.

The Tobin's Q in Panel A shows significant correlation with gross profit-to-assets but insignificant correlation with earning's growth. The result may imply that the US investors tend to use current profitability ratios instead of the earning's growth ratio to anticipate the growth opportunities. In Panel B, we find that the Tobin's Q is significantly correlated with both gross profit-to-assets and earning's growth ratios. The result suggests that Japanese investors have different interpretation of the earning's growth.

Table 6.5.2 Spearman rank correlation estimates for measures

Panel A: The US acquirers

	EPS	Gross profit-to-assets	Tobin's Q	Earning's growth	Leverage
Gross profit-to-assets	-0.350[a]				
	(-7.08)				
Tobin's Q	0.018	0.310[a]			
	(0.34)	(6.19)			
Earning's growth	0.222[a]	-0.187[a]	-0.068		
	(4.33)	(-3.61)	(-1.29)		
Leverage	0.263[a]	-0.502[a]	0.062	0.148[a]	
	(5.18)	(-11.02)	(1.17)	(2.85)	
Dividend pay-out ratio	0.178[a]	-0.068	-0.032	-0.012	0.175[a]
	(3.43)	(-1.29)	(-0.61)	(-0.23)	(3.37)

Panel B: Japanese acquirers

	EPS	Gross profit-to-assets	Tobin's Q	Earning's growth	Leverage
Gross profit-to-assets	0.150[a]				
	(3.77)				
Tobin's Q	0.019	0.148[a]			
	(0.46)	(3.71)			
Earning's growth	-0.002	0.130[a]	0.108[a]		
	(-0.05)	(3.24)	(2.70)		
Leverage	-0.279[a]	-0.524[a]	0.032	-0.055	
	(-7.21)	(-15.24)	(0.81)	(-1.36)	
Dividend pay-out ratio	-0.032	0.080[b]	-0.100[a]	-0.090[b]	-0.074[c]
	(-0.79)	(2.00)	(-2.49)	(-2.25)	(-1.83)

Panel C: The US targets

	EPS	Gross profit-to-assets	Tobin's Q	Earning's growth	Leverage
Gross profit-to-assets	-0.164				
	(-1.58)				
Tobin's Q	0.229[b]	0.047			
	(2.24)	(0.44)			
Earning's growth	0.188[c]	-0.064	0.162		
	(1.82)	(-0.60)	(1.56)		
Leverage	0.239[a]	-0.155	-0.156	0.127	
	(2.34)	(-1.49)	(-1.50)	(1.21)	
Dividend pay-out ratio	0.294[a]	0.292[a]	0.272[a]	0.165	0.162
	(2.91)	(2.90)	(2.68)	(1.59)	(1.55)

Panel D: Japanese targets

	EPS	Gross profit-to-assets	Tobin's Q	Earning's growth	Leverage
Gross profit-to-assets	-0.302[b]				
	(-2.24)				
Tobin's Q	0.116	-0.062			
	(0.83)	(-0.44)			
Earning's growth	0.118	0.054	-0.220		
	(0.84)	(0.38)	(-1.60)		
Leverage	n.a.	n.a.	n.a.	n.a.	
	n.a.	n.a.	n.a.	n.a.	
Dividend pay-out ratio	n.a.	n.a.	n.a.	n.a.	n.a.
	n.a.	n.a.	n.a.	n.a.	n.a.

The sample consists of 363 US acquirers and 53 Japanese targets in the US-JP M&As (US acquirers bid Japanese targets), and 617 Japanese acquirers and 93 US targets in the JP-US M&As. *t*-statistic are shown in parentheses. a, b, and c stand for statistical significance at the 1%, 5% and 10% level, respectively. Variable definitions are in the appendix.

The dividend pay-out ratio in Panel A is positively correlated with the leverage ratio, which is against the theory that the dividend pay-out ratio may be related with the free cash flow status of a firm (see, e.g. Edmas et al., 2012; Khatami et al., 2015). This result may explain the reason why dividend pay-out ratio of the US acquirers show insignificant explanatory power to the announcement returns.

6.6 The US acquirers' financial characteristics and announcement returns

In this section, we test the correlation between the US acquirer's financial ratios and their announcement returns. Table 6.6.1 reports the regressions results associated with the US acquirers. The dependent variable is the 3 days SCARs from day t=-1 to day t=1 (day 0 is the announcement day). In the regression model (1), we report the coefficients based on full sample size. We report the coefficients separately controlling for the low and high R&D expense to earning in model (2) and model (3), respectively. We report the coefficients separately for the low and high R&D expense to the deal values in model (4) and model (5), respectively. The Jarque-Bera statistic is significant across all five models. This indicates that the parameter estimates are not efficient although they are BLUE.

In model 1, the coefficient of Tobin's Q is positive and significant. The result suggests that the US acquirers with high growth opportunities tend to experience positive announcement returns. Our result is consistent with early M&A studies (see, e.g. Lang et al., 1989; Servaes, 1991) showing that the high Tobin's Q acquirers tend to experience high announcement returns. In contrast, our result is inconsistent with more recent studies (see, e.g. Bhagat et al., 2005; Masulis et al., 2007) which suggest the insignificant or even negative correlation between Tobin's Q and CARs. It might be because in later domestic M&As, more acquirers can finance the M&A with their overvalued stocks. Thus, the M&A announcement can lead the investors to justify acquirers' stock prices. As we find that most cross-border M&As are financed by cash, investors are less likely to analyse the overvaluation of acquirers' stock price when they

analyse the M&A announcements. This might be the reason why our result is more consistent with earlier M&A studies.

Surprisingly, we find that the coefficients for the two profitability ratios are insignificant. Our result is in line with Golubov et al. (2015), who find the profit of acquirers is insignificantly correlated with CARs. The result can be explained by its joint information signalling of management efficiency and the free cash flow holding.

Table 6.6.1 Regression controlling for R&D expense

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
	Overall sample	Low R&D to revenue	High R&D to revenue	Low R&D to deal value	High R&D to deal value
EPS	-0.110	-0.766	-0.007	-0.004	0.070
	(0.12)	(0.46)	(0.01)	(0.00)	(0.05)
Gross profit-to-assets	-0.091	0.513	0.005[c]	0.289	0.543
	(1.60)	(0.67)	(0.00)	(0.75)	(0.94)
Tobin's Q	0.368[b]	0.086	-0.003[c]	0.143	0.097
	(0.17)	(0.13)	(0.00)	(0.11)	(0.07)
Earning's growth	-0.071	-0.576[c]	0.005	0.285	-1.245
	(0.49)	(0.33)	(0.00)	(0.48)	(1.36)
Leverage	0.026	1.095[b]	0.004	0.827[c]	0.793
	(0.65)	(0.43)	(0.00)	(0.49)	(0.87)
Dividend pay-out	-0.543	0.134	0.000	-0.282	0.448
	(0.53)	(0.28)	(0.00)	(0.67)	(0.44)
Intercept	-0.046	-0.603[b]	-0.267	-0.875	-1.430[b]
	(0.63)	(0.30)	(0.20)	(0.53)	(0.70)
Observations	363	90	90	40	40
Adjusted R^2	0.296	0.019	0.000	0.000	0.000
Jarque-Bera	1058.75[a]	171.62[a]	170.51[a]	10.44[a]	111.94[a]

The table shows the coefficients and standard errors (shown in parentheses) of the regression 6.1. The sample consists of 363 US-JP M&As between 1990 to 2015. The dependent variable is the bidder's 3 days SCARs as a percentage. [a], [b], and [c] stand for statistical significance at the 1%, 5% and 10% level, respectively.

Model 2 shows that the coefficients for the two profitability ratios are not significant. As Bena and Li (2014) and Phillips and Zhdanov (2013) find that the low R&D intensive firms tend to be mature and large firms, the free cash flow is more likely to be interpreted as agency cost instead of a provision of underinvestment. This may

explain why profitability ratios show insignificant coefficients. The significant and positive coefficient of leverage ratio may also confirm this point of view. Model 3 shows that the gross profit-to-assets ratio is positively correlated with SCARs. It may suggest that when high R&D spending firms initiate M&As, investors interpret the existing level of profitability as a positive performance indicator. the insignificant coefficients for leverage and dividend pay-out ratio indicate that investors do not consider free cash flow to impact on the M&A value.

Surprisingly, we find that the growth opportunity ratios show significant and negative effect in both model 2 and model 3. The result implies that the growth opportunity is more likely to be interpreted as a substitute of M&A regardless of the R&D intensity of acquirers. However, this result is against the threshold hypothesis proposed by Doukas and Kan (2008). When low R&D acquirers experience low growth, investors should appreciate M&A as a method of R&D outsourcing. Alternatively, when acquirers have high R&D expense, their growth opportunity may be resulted from their R&D output and should be positively correlated with the value creation from the M&As. Thus, the coefficients of growth opportunity ratios for high R&D acquirers should either be positive or insignificant. One of the possible explanations is that investors may overvalue the high R&D acquirers. Thus, the premium of their stock value reduces when acquirers announce the M&A.

In model 4 and 5, we find that the coefficients of most financial ratios are insignificant. The only significant coefficient is the leverage ratio in model 4. Consistent with model 2, the significant and positive coefficient of leverage ratio may suggest that investors expect low R&D acquirers to have strong agency motives. Overall, the insignificant results imply that R&D to deal value cannot determine the potential synergistic effect of the M&As.

Table 6.6.2 reports the coefficients of financial ratios by controlling the size effect. Table 6.6.2 reports the regression coefficients separately for the high and low relative

size between acquirers' total assets and deal value, high and low acquirer's asset value and high and low deal value in model (1) to model (6), respectively.[73]

In model 1, we find that all coefficients are insignificant. In model 2, the coefficient EPS is significant and positive. This result is in line with Alexandridis et al. (2013), who indicate that the small target size can reduce post-acquisition restructuring costs and allow acquirers to transfer their corporate resources to targets more easily. Thus, high profitable acquirers can experience higher value increases after the integration. In addition, we find the earning's growth in model 2 shows significant and negative effect on SCARs. When the relative size of a target is small, the M&A may be interpreted as an alternative choice of internal growth. Thus, the earning's growth can be a threshold of initiating M&As.

In both model 1 and model 2, the coefficients of the leverage ratio and dividend pay-out ratio are insignificant. The result implies that the relative size can only capture the size effect that associates with synergy but cannot capture the size effect associates with management entrenchment. In order to test the relationship between size effect and investor's interpretation of management entrenchment, we further employ acquirers' asset values and deal values to separate our sample group.

In model 3, we find that the coefficient of EPS is significant and positive, but the coefficient of gross profit-to-assets is negative. Thus, the significant coefficient of EPS can be partially affected by the noise exists in EPS.

[73] Model 1 and 2 have more observations than model 3 and 4. It is because some M&As do not announce the deal value but we still can find the acquirers' total asset value.

Table 6.6.2 Regression controlling for size effect

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	High Rev. value	Low Rev. value	High asset value	Low asset value	High deal value	Low deal value
EPS	0.000	0.016[a]	0.005[a]	0.014[a]	0.005	0.029[b]
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Gross profit-to-assets	0.124	1.042	-0.189	0.804[a]	0.200	0.725
	(0.66)	(0.71)	(0.42)	(0.16)	(0.86)	(0.59)
Tobin's Q	0.183	-0.066	0.083[a]	0.034[b]	0.068	0.011
	(0.19)	(0.21)	(0.03)	(0.01)	(0.04)	(0.06)
Earning's growth	0.205	-1.637[a]	0.839	0.774[a]	0.004	0.729
	(0.41)	(0.45)	(0.85)	(0.07)	(0.44)	(0.51)
Leverage	0.354	0.282	1.032[b]	0.191	0.586	0.323
	(0.44)	(0.48)	(0.43)	(0.13)	(0.73)	(0.38)
Dividend pay-out	0.111	0.148	0.153	-0.380[c]	-0.053	0.182
	(0.46)	(0.25)	(0.21)	(0.22)	(0.39)	(0.32)
Intercept	-0.489	-0.578[c]	-1.023[a]	-0.375[a]	-0.677	-0.352
	(0.40)	(0.35)	(0.28)	(0.09)	(0.47)	(0.39)
Observations	72	72	121	121	72	72
Adjusted R^2	0.000	0.181	0.000	0.000	0.000	0.000
Jarque-Bera	118.22[a]	1.59	0.73	188.88[a]	31.28[a]	173.26[a]

The table shows the coefficients and standard errors (shown in parentheses) of the regression 6.1. The sample consists of US-JP M&As between 1990 and 2015. The dependent variable is bidder's 3 days SCARs as a percentage. [a], [b], and [c] stand for statistical significance at the 1%, 5% and 10% level, respectively.

In Model 4, the coefficients of both the EPS and gross profit-to-assets are significant and positive. The result is consistent with the size effect shown in the study of Moeller et al. (2004), who indicate that M&As initiated by small firms are more likely to gain synergistic effect and the acquirers are less likely to suffer from management hubris. In model 3, we find that the coefficient of leverage ratio is significant and positive. In addition, in model 4, we find that the coefficient of dividend pay-out ratio is significant and negative. If we assume both leverage ratio and dividend pay-out ratio are associated with free cash flow (see, Jensen, 1986), the two results are also in line with size effect hypothesis.[74] When acquirers have large asset value, the M&A announcement returns

[74] We notice that our interpretation has a weakness. If both leverage and dividend pay-out ratio are the proxy of free cash flow, then we should see two ratios have significant coefficients in model 3 and model 4. Our results might imply that the leverage ratio and dividend pay-out ratio have different explanatory power when firms are of different sizes. In this case, when a firm is large, the leverage

may be reduced with the potential cost of over-investments. Thus, the acquirers with low free cash flow (high leverage ratio) tend to experience higher SCARs. When acquirers have small asset values, where acquirers can be benefit from less management hubris and high synergy, investors may require acquirers to hold more free cash flow to prevent under-investment. The coefficients of Tobin's Q are significant and positive in both model 3 and model 4. This result indicates that investors always give positive response to the high growth opportunity US acquirers regardless their size.

Table 6.6.3 reports the regression results controlling for the type of bidder-targets merger relationship. It reports the regression coefficients separately for the horizontal M&As, vertical M&As, conglomerate M&As and increase of corporate control (ICC) in model 1 to model 4, respectively.

We find that the financial ratios cannot explain the acquirer returns in the horizontal and ICC acquisitions. It may be because in horizontal and ICC M&As, synergy may be a more important determinant than the potential agency cost, and thereby investors do not use financial ratios to anticipate the M&A outcomes.

The coefficient of Tobin's Q is positive and significant in model 2. The coefficient of dividend pay-out ratio is also significant but negative. The two results are in line with the empirical evidence of Acemoglu et al. (2009) and Beladi et al. (2013) suggesting that the vertical M&A reduces cash flow uncertainty and lower the barrier for future investments in the target country. Thus, vertical M&As may create more value for the acquirers with higher growth opportunities and investors may support acquirers to retain more cash for the future investments.

Model 3 shows that the coefficient of Tobin's Q is significant and negative. This result

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ratio is a better proxy for free cash flow than dividend pay-out ratio, and vice versa. However, to the best of our knowledge, there is no study that discusses the explanatory power of free cash flow proxies when firms have different sizes.

is in line with Doukas and Kan (2008), who indicate that the reduction in growth opportunity encourages firms to initiate conglomerate M&As. In addition, we find that the leverage ratio shows positive and significant effect in the conglomerate M&As. As Moeller, et al. (2005) suggest that conglomerate M&As can be motivated by empire building, our result may suggest that investors use leverage ratio to identify the agency cost of acquirers on conglomerate M&As. We suggest that the joint effect of conglomerate M&A announcement explains the inconsistent empirical evidence in the studies of Moeller et al. (2005) and Villalonga (2004) as both studies have not controlled the financial characteristics of acquirers.[75]

Table 6.6.3 Regression controlling for acquirers-targets relationship

	Model (1)	Model (2)	Model (3)	Model (4)
	Horizontal	Vertical	Conglomerate	ICC
EPS	0.001	-0.081	-0.003	-0.001
	(0.00)	(0.10)	(0.01)	(0.01)
Gross profit-to-asset	0.084	2.066	0.231	0.036
	(0.53)	(1.44)	(0.65)	(0.47)
Tobin's Q	-0.007	1.097[b]	-0.005[a]	0.011
	(0.02)	(0.54)	(0.00)	(0.04)
Earning's growth	0.067	-0.725	-0.482	0.272
	(0.50)	(0.98)	(0.61)	(0.35)
Leverage	0.517	-0.927	0.938[c]	0.178
	(0.43)	(1.22)	(0.54)	(0.35)
Dividend pay-out	0.120	-5.277[a]	-0.151	0.108
	(0.28)	(1.11)	(0.22)	(0.21)
Intercept	-0.249	-1.922	-0.218	0.010
	(0.27)	(1.55)	(0.31)	(0.29)
Observations	70	115	88	90
Adjusted R^2	0.000	0.000	0.009	0.000
Jarque-Bera	29.91[a]	286.45[a]	6.45[b]	0.46

The table shows the coefficients and standard errors (shown in parentheses) of the regression 6.1. The sample consists of 363 US-JP M&As between 1990 and 2015. The dependent variable is the bidder's 3 days SCARs as a percentage. [a], [b], and [c] stand for statistical significance at the 1%, 5% and 10% level, respectively.

[75] Moeller et al. (2005) find that the cross-border M&As with industry diversifications destroy acquirers' values whereas Villalonga (2004) find that acquirers' stock values change insignificantly after the diversification M&As.

6.7 Japanese acquirers' characteristics and announcement returns

In this section, we test how Japanese acquirers' financial ratios can explain their announcement returns. Consistent with the tests in section 6.6, we use a similar research design as in the case of US acquirers. Table 6.7.1 reports the regressions results separately for overall sample, firms with low and high R&D expense to revenue and firms with low and high R&D expense to deal value in model (1) to model (5), respectively.

Table 6.7.1 Regression controlling for R&D expense

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
	Overall sample	Low R&D to revenue	High R&D to revenue	Low R&D to deal value	High R&D to deal value
EPS	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gross profit-to-asset	-0.198[b]	0.249	0.481	0.121	-0.587
	(0.08)	(1.93)	(1.44)	(0.51)	(0.58)
Tobin's Q	0.000	-0.029	0.080[c]	0.020	0.037
	(0.00)	(0.16)	(0.04)	(0.02)	(0.05)
Earning's growth	-1.727[b]	-30.67[b]	36.77	-1.032	4.759
	(0.79)	(12.33)	(22.91)	(9.89)	(5.36)
Leverage	-0.045	2.122[c]	0.749	-0.119	-0.644[c]
	(0.08)	(1.21)	(0.70)	(0.35)	(0.34)
Dividend pay-out	-0.251[a]	-0.643	-0.628[a]	-0.267	-0.013
	(0.08)	(0.55)	(0.15)	(0.47)	(0.38)
Intercept	0.255[a]	-0.554	-0.303	0.239	0.501[c]
	(0.06)	(0.81)	(0.49)	(0.27)	(0.27)
Observations	617	144	144	160	160
Adjusted R^2	0.000	0.000	0.033	0.000	0.170
Jarque-Bera	1.79	152.79[a]	57.23[a]	0.59	0.53

The table shows the coefficients and standard errors (shown in parentheses) of the regression 6.1. The sample consists of 617 JP-US M&As between 1990 to 2015. The dependent variable is Japanese acquirers 's 3 days SCARs in percentage. [a], [b], and [c] stand for statistical significance at the 1%, 5% and 10% level, respectively.

The coefficients of gross profit-to-assets and earning's growth reported in model 1 are significant and negative. This result is consistent with the US acquirers (see, table 6.6.1) and suggests that the profitability and growth opportunity are likely to be interpreted as

thresholds for the Japanese acquirers. The coefficient of the dividend pay-out ratio is also negative and significant. The result may suggest that investors show more positive response to the Japanese acquirers who hold higher amount of free cash. Compare with the insignificant coefficients of the leverage ratio and dividend pay-out ratio in table 6.6.1, the result implies that cross-border M&A can create higher growth opportunity for Japanese acquirers than the US acquirers.

In model 2, the coefficient of earning's growth is significant and negative. In addition, the coefficient of leverage ratio is significant and positive. This result is consistent with the coefficients in model 2 of table 6.6.1. The significant and negative coefficient of the earning's growth may imply that investors appreciate low R&D acquirers to initiate M&As to realize further growth. In addition, the positive and significant coefficient of leverage ratio suggests that the low R&D acquirers may have high agency cost.

In model 3, the coefficient of Tobin's Q is significant and positive. The negative coefficient of earning's growth in model 2 and the positive coefficient of Tobin's Q in model 3 can be explained by the threshold hypothesis (see, Doukas and Kan, 2008). When firms have high R&D costs, their growth opportunities are no longer interpreted as a threshold of the M&A but the outcome of their R&D expenses and the increase in the synergy effect. In model 3, the coefficient of dividend pay-out ratio is negative and significant. The result suggests that investors may believe high R&D firms have low agency costs and low R&D firms have high agency costs (i.e. the positive and significant coefficient of leverage ratio in model 2). Notice that, the R&D intensity should not be a proxy of firm size (as some studies may assume that large and mature firms may not want to participate in R&D competition). It is because in the following section, we show that Japanese investors are less likely to anticipate the agency costs based on the size effect.

In model 4 and model 5, when we measure the R&D expense by R&D to deal size instead of R&D to total revenue, the explanatory variables become less effective to

explain SCARs. This result is consistent with the result in model 4 and model 5 in table 6.6.1.

Table 6.7.2 reports the regression results controlled by the size effect. The table reports the regression coefficients separately for the high and low relative size between acquirers' total assets and deal value, high and low acquirer's asset value and high and low deal value in model (1) to model (6), respectively.

Table 6.7.2 Regression controlling for size effect

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	High Rev. value	Low Rev. value	High asset value	Low asset value	High deal value	Low deal value
EPS	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gross profit-to-assets	-0.676	-0.521	-1.014	0.166	-0.676	-0.244
	(0.42)	(0.39)	(1.05)	(1.00)	(0.42)	(0.52)
Tobin's Q	0.022	-0.019	0.090[b]	0.072[a]	0.022	-0.021
	(0.03)	(0.02)	(0.04)	(0.02)	(0.03)	(0.03)
Earning's growth	6.880	2.562	-1.683	-1.759	6.880	2.899
	(17.26)	(4.41)	(7.43)	(23.75)	(17.26)	(4.57)
Leverage	-0.325	-0.140	0.355	-0.467	-0.325	0.001
	(0.31)	(0.21)	(0.66)	(1.18)	(0.31)	(0.25)
Dividend pay-out	-0.340	-0.304	-1.012[a]	0.465	-0.340	0.306
	(0.32)	(0.25)	(0.30)	(0.34)	(0.32)	(0.28)
Intercept	0.582[c]	0.447[b]	0.162	-0.163	0.582[c]	0.157
	(0.31)	(0.19)	(0.47)	(0.59)	(0.31)	(0.22)
Observations	108	108	206	206	108	108
Adjusted R^2	0.008	0.000	0.058	0.000	0.008	0.000
Jarque-Bera	2.86	0.94	6.51[b]	704.62[a]	2.86	0.30

The table reports the coefficients and standard errors (shown in parentheses) of the regression 6.1. The sample consists of 617 JP-US M&As between 1990 and 2015. The dependent variable is the bidder's 3 days SCARs as a percentage. [a], [b], and [c] stand for statistical significance at the 1%, 5% and 10% level, respectively.

The coefficients of Tobin's Q are significant in both model 3 and model 4. The result suggests that acquirer's size does not influence investor's interpretation of the growth opportunity. This finding is consistent with the results of table 6.6.2. In model 3, the coefficient of dividend pay-out ratio is negative and significant. In model 4, both

coefficients of leverage and dividend pay-out ratio are insignificant. The result suggests that Japanese investors may think the large acquirers have low agency cost. The result is opposite with table 6.6.2. This may be because the close interaction between large Japanese firms and their banks (the main bank system) lead to investor's confidence to the large Japanese firms (see, e.g. Pinkowitz and Williamson, 2001; Kand et al., 2000).

Table 6.7.3 reports the regression results controlling for the type of bidder-target merger relationship. It reports the regression coefficients separately for the horizontal, vertical, conglomerate and increase corporate control in Model 1 to Model 4.

Table 6.7.3 Japanese acquirers' return controlled by type of relationship

	Model (1)	Model (2)	Model (3)	Model (4)
	Horizontal	Vertical	Conglomerate	Increase control
EPS	0.000	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Gross profit-to-assets	-0.376	0.172[b]	-1.544	0.066
	(0.30)	(0.08)	(1.62)	(1.15)
Tobin's Q	-0.014	0.024[a]	-0.053	-0.072
	(0.01)	(0.01)	(0.05)	(0.07)
Earning's growth	13.70	6.465[b]	-15.67[c]	-14.28
	(16.13)	(3.00)	(8.06)	(71.04)
Leverage	0.083	0.150	0.090	-0.040
	(0.23)	(0.10)	(0.72)	(0.59)
Dividend pay-out	-0.254	-0.235[c]	-1.039[a]	-0.560
	(0.27)	(0.13)	(0.27)	(0.46)
Intercept	0.386[c]	-0.000	0.915	0.368
	(0.21)	(0.07)	(0.64)	(0.53)
Observations	99	221	250	47
Adjusted R^2	0.000	0.001	0.089	0.000
Jarque-Bera	8.84[a]	0.05	133.72[a]	0.13

The table shows the coefficients and standard errors (shown in parentheses) of the regression 6.1. The sample consists of 617 JP-US M&As between 1990 and 2015. The dependent variable is the bidder's 3 days SCARs as a percentage. [a], [b], and [c] stand for statistical significance at the 1%, 5% and 10% level, respectively.

All coefficients in model 1 and model 4 are insignificant. This result is consistent with the results in table 6.6.3, and indicates that the financial characteristics of acquirers cannot explain their SCARs in the horizontal and ICC M&As.

In model 2, the coefficients of gross profit-to-assets, Tobin's Q and earning's growth are significant and positive. In addition, we find that the coefficient of dividend pay-out ratio is significant and negative. This result is consistent with the result in table 6.63 suggesting that investors give more positive response to the acquirers with high profitability and growth opportunity when they initiate vertical M&As. As Acemoglu et al. (2009) and Beladi et al. (2013) suggested in their studies, vertical M&As can reduce the cash flow uncertainty and increase future investment opportunities. Thus, this type of M&As can create highest value for acquirers with high cash flow (profitability) and growth opportunities.

In model 3, we find that the coefficient of earning's growth is significant and negative. This result is in line with Doukas and Kan (2008) who suggest that the profit reduction encourages acquirers to initiate conglomerate M&As. We also find that the coefficient of dividend pay-out ratio is significant and negative. This result matches the implication of the negative earning's growth coefficient, and implies that investors encourage conglomerate acquirers to hold more cash for the future investments. On the other hand, the coefficient of dividend pay-out ratio has an opposite implication to that of the US investor's behaviour, where the leverage ratio of the US conglomerate acquirers has significant and negative coefficient (see, table 6.6.3). The result may suggest that Japanese investors have higher risk tolerance, and are more likely to accept low growth acquirers to make conglomerate investments. This result may also explain the higher ARs experienced by the Japanese conglomerate acquirers during the announcement period (see, table 4.2.1).

Overall, we find that the merger relationship can influence the investors' interpretations to the financial characteristic indicators. As the financial ratios can often be interpreted in multiple ways, the merger relationship can inspire investors to use a particular theory to interpret the ratio. Interestingly, we find that if we employ full M&A samples, the interpretation of financial ratios tends to be inconsistent across countries. However, if

we control for the type of acquirer-target relationship, the interpretation of the financial ratios tends to be more consistent across the US and Japan.

6.8 Targets' financial characteristics and acquirers' returns

In this section, we test whether the financial characteristics of targets will influence acquirers' announcement returns. If the market for corporate control explains the investor behaviour, we should observe the targets with low profitability or high free cash flow leading to higher acquirers' SCARs. In addition, in order to capture the relative difference in the financial characteristics, we follow Bris et al. (2008) and employ the absolute ratio differences (numerical difference) between the acquirers and targets to estimate the financial characteristics differentiation.

In this section, we still use the acquirer's SCARs as the dependent variable and target's financial ratios as independent variables (see, regression model 6.1). As we indicate in section 6.5, we convert the targets EPS to the acquirers' local currency.

Table 6.8.1 reports the regression estimates of targets' financial ratios against the acquirers' SCARs. The table reports the regression coefficients separately for the Japanese targets' financial ratios against the US acquirers in model 1, the absolute difference of US-JP (the US acquirer minus Japanese target) against the US acquirers in model 2, the coefficients of the US targets' financial ratios against Japanese acquirers in model 3 and coefficients of the absolute difference (Japanese acquirers minus the US targets) of the financial ratios against the Japanese acquirers in model 4.

Model 1 shows that the coefficient of target's EPS is significant and negative. If the earning is associated with management efficiency, the negative coefficient is consistent with the theory of market for corporate control. If investors anticipate the replacement of the less efficient management in targets, they will show positive response to acquirers'

M&A announcements. In model 2, we find that the coefficient of EPS difference between the acquirers and targets is significant and. This result also provides a consistent implication, where investors show positive response when acquirers have higher profitability than targets.

In model 1, the coefficient of target's Tobin's Q is significant and positive. In addition, model 2 shows that when the target has a higher Tobin's Q (i.e. when the US acquirer's Tobin's Q minus Japanese targets' Tobin's Q is negative), acquirers tend to experience more positive SCARs. This result is consistent with the previous studies (see, e.g. Rhodes–Kropf et al., 2005; Chung et al., 2013) suggesting that M&As are motivated by internalizing target's growth opportunities.

In model 3 and model 4, we find that the coefficients of US targets' profitability ratios are negative but insignificant. Compared with model 1 and model 2, the insignificant result may imply that Japanese acquirers are less likely to be benefit from market for corporate control.

The coefficient of Tobin's Q is significant and positive in model 3. In model 4, the coefficient of Tobin's Q difference (i.e. the Japanese acquirers' Tobin's Q minus the US target's Tobin's Q) is also significant and positive. The results in model 3 and model 4 are consistent with the results in model 1 and model 2, and suggest that acquirers may use M&As as a method to develop their business.

Surprisingly, we find that the coefficients of leverage and dividend pay-out ratios are insignificant across all four models. The result implies that the free cash flow of targets has an insignificant effect on the acquirers' SCARs. It may be because the co-existence of agency and defensive signal effect (see, Chung et al., 2013; Garvey and Hanka, 1999; Israel, 1991) reduce the explanatory power of the two ratios.

Table 6.8.1 Targets financial characteristics and the acquirers' announcement returns

	Model (1)	Model (2)	Model (3)	Model (4)
	Japanese targets	US-JP difference	The US targets	JP-US difference
EPS	-0.008[a]	0.007[a]	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Gross profit-to-assets	-0.714	0.355	-0.134	-0.268
	(0.60)	(0.44)	(0.30)	(0.29)
Tobin's Q	0.010[b]	-0.008[b]	0.013[a]	-0.011[a]
	(0.00)	(0.00)	(0.00)	(0.00)
Earning's growth	30.490	0.135	0.035	0.022
	(20.13)	(0.27)	(0.21)	(0.20)
Leverage	n.a.	n.a.	-0.010	0.010
	n.a.	n.a.	(0.11)	(0.10)
Dividend pay-out	n.a.	n.a.	-0.287	0.409
	n.a.	n.a.	(0.30)	(0.21)
Intercept	0.257	0.023	0.185	0.044
	(0.38)	(0.08)	(0.14)	(0.08)
Observations	53	53	102	102
Adjusted R^2	0.065	0.000	0.011	0.037
Jarque-Bera	1.38	0.35	2.53	1.66

The table shows the coefficients and standard errors (shown in parentheses) of the regression 6.1. The sample consists of 52 US-JP and 93 JP-US M&As between 1990 and 2013. The dependent variable is the bidder's 3 days SCARs as a percentage. [a], [b], and [c] stand for statistical significance at the 1%, 5% and 10% level, respectively. EPS are converted to acquirers' local currency.

6.9 The effect from Sarbanes-Oxley Act

In this section, we test whether our results are affected by the information transparency, for the periods before and after the Sarbanes-Oxley act (SOX) implementation.

The SOX is a most widely studied event in finance and accounting. By imposing the requirement of additional internal monitoring by the audit committee, disclosures on internal-control practices, and restrictions for insider misconduct, SOX improves the accuracy and reliability of corporate disclosures. In addition, with the change of the board structure, SOX is expected to reduce agency costs and correspondingly, the cost of capital of firms (see, Cicero et al., 2013). Thus, in the context of M&As, if the financial ratios show inconsistent effect in the pre-and post- SOX periods, we will argue that the investors' interpretation is more likely to be influenced by the information

transparency associated with SOX.

In the US, SOX act was passed in 2002, whereas a version of SOX (some refer to it as J-SOX) was passed in 2006. Considering that firms tend to experience frequent board structure changes before SOX (Cicero et al., 2013) and significant short-term costs after implementing SOX (Anwer et al., 2010), we set a two years gap just before the SOX act in each country and a further two-year gap after its passing. In this case, we define the US pre- SOX period as 1990 to 2000, and post-SOX period as 2003 to 2015 and Japanese pre- SOX period as 1990 to 2004, and post- SOX period as 2007 to 2015. As a result, we still retain 181 US-JP M&As announced before the SOX and 157 announced after the SOX, and 286 JP-US M&As announced before J-SOX, and 275 announced after J-SOX.

Table 6.9.1 reports the US and Japanese acquirers' ARs and CARs of M&As announced pre- and post- SOX. Consistent with the methods in Chapter4 and Chapter 5, we employ *adj*.BMP to identify the significance level of the ARs and CARs. We also employ Mann-Whitney U test to identify the different ARs and CARs in the pre- and post- SOX periods.

We find that acquirers in the pre-SOX period experience significantly higher ARs and CARs during the announcement period. In Panel A, we find that the US acquirers experience significant and positive AR on day t=-1 in the pre-SOX, and experience significant and negative AR on day t=-1 in the post-SOX period. The CARs in the pre-SOX are significant from day t=-1 to day t=5, and become insignificant in the post-SOX period. The Mann-Whitney U test also shows that the ARs and CARs in the pre-SOX period are significantly higher than post-SOX period. Consistent with the US acquirers, in Panel B, we find that the Japanese acquirers only experience significant and positive ARs and CARs on the announcement day in the pre-J-SOX period and experience insignificant ARs and CARs in the post-J-SOX period.

One of the possible explanation for this result is that as information transparency increases under the SOX, firms may disclose more risks in the cross-border M&As. Thus, even though the SOX can reduce agency cost in the acquiring firms, the cross-border M&As may still result in negative ARs. This result may be in line with Hammersley et al. (2008), who find the increase in information transparency by SOX leads to negative price reaction to firms with internal control weaknesses.

Table 6.9.1 Acquirer ARs and CARs in the pre- and post- SOX period

	Pre-SOX		Post-SOX			Pre-SOX		Post-SOX		
DAYs	**ARs**	***adj.*-BMP**	**ARs**	***adj.*-BMP**	**M-W**	**CARs**	***adj.*-BMP**	**CARs**	***adj.*-BMP**	**M-W U**
Panel A: The US acquirers										
-5	0.5155	0.74	0.0952	1.25	1.25	0.5155	0.74	0.0952	1.25	1.25
-4	-0.1743	-0.76	0.1393	-0.68	0.53	0.3412	0.31	0.2345	1.08	0.46
-3	0.2690	0.94	-0.1605	-0.24	2.25[b]	0.6102	0.94	0.0740	0.51	1.65[c]
-2	0.3004	1.12	-0.1940	0.41	1.63	0.9106	1.27	-0.1200	0.54	2.38[b]
-1	0.8433	1.95[c]	-0.6088	-1.72[c]	2.98[a]	1.7539	2.08[b]	-0.7288	-0.62	2.98[a]
0	0.3726	0.57	-0.0750	-0.41	0.42	2.1265	2.11[b]	-0.8038	-0.74	2.38[b]
1	0.1019	1.15	0.3494	0.95	0.56	2.2285	2.80[a]	-0.4544	-0.22	2.42[b]
2	-0.0402	-0.73	0.4220	1.39	0.86	2.1882	2.29[b]	-0.0324	0.38	1.82[c]
3	0.2383	-0.06	0.1908	1.49	0.08	2.4265	2.16[b]	0.1584	0.62	1.78[c]
4	0.0688	0.49	-0.2953	-1.51	0.13	2.4953	2.25[b]	-0.1369	0.18	1.86[c]
5	-0.0232	-0.41	0.2203	1.21	0.46	2.4721	1.85[c]	0.0834	0.51	1.82[c]
Panel B: Japanese acquirers										
-5	-0.0270	0.14	0.1252	1.42	1.45	-0.0270	0.14	0.1252	1.42	1.45
-4	-0.1700	-1.39	-0.1534	-1.66	0.34	-0.1970	-0.79	-0.0283	-0.13	0.81
-3	0.2210	1.65[c]	0.0059	-0.61	1.35	0.0240	0.24	-0.0224	-0.45	0.16
-2	0.0051	0.14	-0.1153	-1.35	1.04	0.0291	0.27	-0.1377	-0.98	0.89
-1	0.2851	1.60	-0.0968	-0.86	0.95	0.3142	1.00	-0.2345	-1.21	1.43
0	0.5691	2.78[a]	0.0500	0.29	1.86[c]	0.8833	2.10[b]	-0.1846	-0.92	1.87[c]
1	0.1753	1.32	0.3795	3.04[a]	0.92	1.0586	2.46[a]	0.1949	0.20	1.17
2	0.0332	0.50	0.2508	1.94[c]	0.67	1.0918	2.42[a]	0.4458	0.81	0.81
3	-0.1510	-0.70	-0.0459	-0.35	0.09	0.9409	1.97[b]	0.3999	0.67	0.81
4	0.0429	0.22	0.2338	1.41	1.44	0.9837	1.92[c]	0.6338	0.99	0.51
5	-0.0920	-0.46	-0.2064	-1.53	0.11	0.8917	1.64	0.4274	0.51	0.72

The AR and CAR are measured in percentage. *adj*-BMP denotes the adjusted BMP t-statistic. [a], [b] and [c] denote statistical significance at 1%, 5% and 10% level, respectively. M-W U denotes Mann-Whitney u test.

In table 6.9.2, we report the regression estimation of the acquirers' financial ratios against their SCARs. The table reports the regression coefficients of the US acquirers' financial ratios for the M&As announced in the pre-SOX period in Model 1, reports the coefficients of the US acquirers' financial ratios for the M&As announced in the post-SOX period in model 2. Model 3 reports the coefficients of Japanese acquirers' financial ratios for the M&As announced in the pre-J-SOX period, and model 4 reports the coefficients in the post-J-SOX period.

Table 6.9.2. The acquirer's financial characteristics in pre- and post- SOX period

	Model (1)	Model (2)	Model (3)	Model (4)
	The US pre-SOX	The US post-SOX	Japanese pre-SOX	Japanese post-SOX
EPS	0.033[c]	0.053[a]	0.000	0.000
	(0.02)	(0.02)	0.00	0.00
Gross profit-to-assets	1.701	3.970[a]	-2.064[c]	3.148[b]
	(2.44)	(0.81)	(1.22)	(1.53)
Tobin's Q	0.125	-0.153[c]	-0.058[a]	-0.061
	(0.09)	(0.08)	(0.02)	(0.07)
Earning's growth	1.683	-0.759	-1.061	5.033
	(1.03)	(0.82)	(5.21)	(34.47)
Leverage	1.467	-1.198	-0.410	1.384
	(2.14)	(1.14)	(0.34)	(0.88)
Dividend pay-out	-0.574	-0.240	-0.917[a]	-0.472
	(0.89)	(0.27)	(0.34)	(0.31)
Intercept	-1.476	-0.684	1.244[a]	-1.275[b]
	(1.78)	(0.65)	(0.36)	(0.64)
Observations	181	157	286	275
Adjusted R^2	0.071	0.512	0.073	0.141
Jarque-Bera	549.84[a]	698.61[a]	116.94[a]	79.31[a]

The table shows the coefficients and standard errors (shown in parentheses) of the regression 6.1. The sample consists of 363 US-JP and 617 JP-US M&As between 1990 to 2015. The dependent variable is the bidder's 3 days SCARs as a percentage. [a], [b], and [c] stand for statistical significance at the 1%, 5% and 10% level, respectively.

When we compare four models, we find that the coefficients of profitability ratios in the post-SOX period are more positive than the coefficients in the pre-SOX period. In model 1 and model 2, we find that the coefficient of gross profit-to-assets is

insignificant in model 1 but significant and positive in model 2.[76] In model 3 and model 4, we find that the coefficient of gross profit-to-assets is significant and negative in the Japanese pre-SOX period and is significant and positive in the Japanese post-SOX period. The result implies that investors may adjust their pricing strategy after SOX due to better accessibility to the corporate information. Considering the investor behaviour reported in table 6.9.1, we suggest that market become more efficient after the SOX. The higher synergy and lower agency cost is anticipated in the cross-border M&As initiated by more profitable firms.

In model 1 and model 2, we find that the coefficient Tobin's Q is more negative in the post-SOX period, and in model 3 and model 4, the coefficient Tobin's Q is more negative in the pre- SOX period. Tobin's Q can be interpreted as acquirers' growth opportunities, and suggest that the investors show inconsistent interpretation to the growth opportunities in the pre- and post- SOX periods across different countries. A more possible explanation is that the stock price premium is inconsistent in different time periods, and the market may adjust the premium after analysing the announcement. Thus, the inconsistent market response to the Tobin's Q in the pre- and post- SOX periods across different countries can be a coincidence resulted by the stock price premium.

6.10 Conclusion and discussion

In this chapter, we have analysed the investor behaviour associated with financial characteristics. We find that the interpretation of the financial ratios can change when we control for the acquirers' deal conditions (e.g. R&D intensity, size effect and merger relationship with targets). Therefore, financial characteristics can affect the extent of value creations and potential risks. It is because when we control for such variables, it

[76] Although both models show significant and positive EPS coefficients, the gross profit-to-assets may be a better proxy of profitability than EPS.

allows us to get better insights into the attributes of returns around the announcement dates.

We find that in general, the financial characteristics are interpreted inconsistently between the US and Japan. However, when we control for the deal characteristics, the interpretations of financial characteristics become more consistent. In addition, we find that investors tend to show positive response to the high free cash flow holding for Japanese acquirers. It may be because the main bank system makes the Japanese investors more optimistic than the US investors.

We have also tested the investor behaviour and the interpretation of financial characteristics during the pre- and post- SOX periods. We find that the existence of SOX does not lead to higher ARs for the acquirers. On the contrary, the prices tend to be more efficient after the SOX, and the returns are more strongly associated with the acquirers' profitability ratios in cross-border M&A announcements.

Overall, this chapter suggests that investors tend to interpret financial ratios from different perspectives according to their expectation to the M&A value creation. This result is against the assumptions from many previous studies, which employ financial ratios to represent one specific financial characteristic of the acquirers (e.g. use Tobin's Q as the quality of performance). Our findings may also explain the inconsistent results in the previous empirical studies.

Chapter Seven

Conclusion and Evaluation

7.1 Summary and Conclusion

This study presents the empirical tests on the ARs of acquirers and targets associated with the cross-border M&A announcements. We find that the US acquirers do not experience significant ARs during the announcement period, whereas Japanese acquirers experience significant and positive ARs. Our test result is inconsistent with previous cross-border M&A studies. We suggest that the less significant ARs we find in our study is mainly resulted by our test method. We employ F-F-C four-factor CAPM with GJR-GARCH in estimating the ARs. We also employ *adj*.BMP-*t*. statistic to measure the significance level of the ARs. As our test method can overcome the potential upward bias introduced by single-factor CAPM and standard *t*-statistics, our test can provide more reliable evidence to the wealth effect of the cross-border M&A announcements.

Consistent with previous studies, we find that both the US and Japanese targets experience significant and positive ARs during the announcement period.

This study also tests the explanatory factors of ARs associated with cross-border M&A announcements. We find the explanatory factors such as method of payment and illiquidity proposed by domestic M&A studies cannot explain the ARs in the cross-border M&As. We suggest that the factors associated with synergistic effect have higher explanatory power in the cross-border context. By comparing the ARs of acquirers and targets, we suggest that the positive target AR is mainly resulted from the synergistic effect instead of bidding premium.

We also find inconsistent investor behaviour associated with M&As initiated by acquirers from different countries. We find that country specific economic and market environment (e.g. main bank system, R&D intensity) can explain the inconsistent across the US and Japan. However, more importantly, we also find that the inconsistent investor behaviour is mainly resulted by the choice of targets (i.e. merger relationship) and industry specific factors (e.g. R&D intensity). When we control for these factors, we show that investor behaviours become consistent across two countries.

7.2 Limitations of this study

This study contains several limitations. Even though we argue that the limitations of this study do not deny the contribution of this study, further improvement may be considered in the future works.

Firstly, the limited sample size and data availability may cause problems in this study. For instance, in Chapter 5, our sample size of the Japanese targets in the finance industry does not meet statistical requirements to perform the test. As a result, we are not able to compare the ARs the US and Japanese targets. The limited sample size may also explain our weak evidence in Chapter 4. In Chapter 6, due to the data missing, we cannot test the explanatory power of the dividend pay-out ratio and leverage of Japanese targets to the US acquirers. Indeed, this problem seems unavoidable in the event study. The sample size may increase if we extend our event period. However, this may also reduce the power of the test as we have shown that average ARs are inconsistent in different period. Moreover, we can increase the sample size by incorporating more cross-border M&As initiated outside the US and Japan. However, the data may still be influenced by various country and market specific factors. Thus, the test result can be less robust.

Secondly, more recent M&A studies (see, e.g. Mantecon, 2009; Shahrur, 2005) tend to

use the single factor CAPM to generate ARs. The use of single factor CAPM is against the widely perceived equilibrium concept proposed by Fama and French (1992). In this study, we have citied the evidence from Carhart (1997), Fama and French (1993) to justify the choice of F-F-C CAPM. However, it can be important to compare the estimation results from F-F-C CAPM and single factor CAPM in the M&A study.

Thirdly, in Chapter 6, we employ the least square method to perform the regression analysis. Although in theory, the scaled cumulative abnormal returns (SCARs) has not causality to the financial characteristics, the financial characteristics may be correlated with omitted variables (e.g. corporate governance structure, firm's fixed effect) and thereby cause endogeneity bias (see, e.g. Cunat et al., 2012; Fahlenbrach and Stulz, 2009). However, despite introducing more control variables (see, e.g. Wang and Xie, 2009), previous studies have not provided widely accepted instrument variables (IV) to solve the endogeneity problem.

Finally, although this study has tested the effect of Sarbanes-Oxley Act, we are not yet able to test to which extent the corporate governance quality can influence investor interpretations to the cross-border M&A announcements.

7.3 Recommendations for future research

There are serval ways to extend our study. Firstly, the effect of corporate governance quality can be used to further analyse the investor behaviour associated with cross-border M&As. Secondly, a further comparative studies for contrasting different cross-border M&A pairs can give more insight for the investor behaviour. For instance, by comparing the abnormal returns of the US acquirers when they acquire targets from the Europe and Asia, researchers can identify the influence of information asymmetry from geographical and cultural distance.

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