THE SHORT-TERM EFFECT ON SHAREHOLDER WEALTH OF BANKING MERGERS AND ACQUISITIONS DURING PERIODS OF REAL ECONOMIC EXPANSION AND CONTRACTION

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DECLARATION

Except for references specifically indicated in the text, this thesis is wholly my own work and has not been submitted to any other Educational Institution for degree purposes.

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ABSTRACT

Controversy currently exists over whether abnormal returns (ARs) are earned by shareholders of bidder and target banks through a Merger and Acquisition (M&A). The state of the economy in which the firms operate is often mentioned as a reason for firms engaging in M&As, however, the extent to which economies influence the ARs of shareholders is unknown. Following MacKinlay (1997), the aim of this study is to determine the average ARs earned or lost by shareholders of several banks around the world during an M&A. The results obtained may indicate that shareholders of bidding firms consider an M&A to be a wealth-destroying event irrespective of the state of the economy. It would seem that target firms' shareholders consider M&As to be wealth-creating events when they occur during a period of real economic expansion. However, during periods of real economic contraction, target firms' shareholders consider M&As to be wealth-destroying events. Thus, the state of an economy during an M&A can affect average ARs considerably.

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This thesis is dedicated to my family who, though faced with obstacles, did their best to bring me up in an environment of love and stability. This thesis is as much a product of all your efforts as it is mine.

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CHAPTER ONE

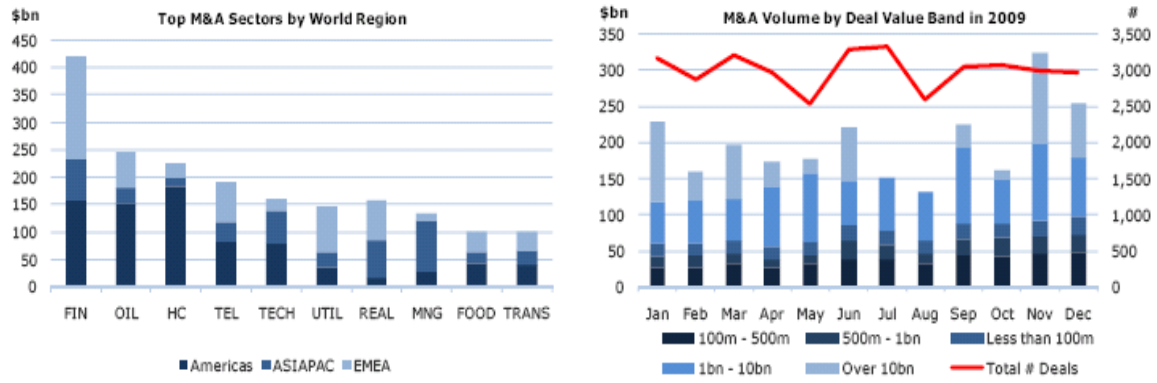
INTRODUCTION

Mergers and acquisitions (M&As) are a popular strategic alternative to outsourcing, investing in financial instruments, leasing assets and internal growth (Lubatkin, 1983). M&As can be interpreted as external growth, while internal growth is considered to be the "integrating of internal resources and the raising of resource efficiency" (Qiusheng, Guanghui & Yunhua, 2006:1). Rhodes-Kropf, Robinson and Viswanathan (2005) state that, during the 1977–1999 period, the mean size (average transaction value in millions of American Dollars [USD]) of M&As increased by 283%, with the number of bidding firms involved increasing considerably – by 3,491%. However, during the last few years, there have been fewer M&As owing to the global recession. In 2009, global M&A volume reached only USD 2.40 trillion, the lowest annual total since 2004 (Deallogic, 2010). This represented a decrease of 24% from the USD 3.17 trillion recorded in 2008. Panel A of Figure 1.1 gives a breakdown of the 2009 figures per industry, with the financial industry contributing the most to the total (USD 418.9 billion). Panel B of Figure 1.1 represents a further breakdown of the 2009 figure showing the volume occurring per month, as well as the number of deals confirmed. Altunbas and Marques (2008) mention deregulation, shareholder activism, continual improvements in the level of information technology, and the globalisation and integration of financial markets, as possible reasons for the increase in the consolidations of financial firms.

In view of the foregoing comments, there is considerable interest in M&As from the point of view that, since M&As occur frequently, there must be substantial gains that arise as there are many alternative investments a firm can undertake to improve performance and cash flow. In addition, such interest in M&As also occurs as such activity often causes short-run losses for bidding firms. Dodds and Quek (1985) mention that in Britain, when firms fail in merging with or acquiring other firms, these firms actually outperform the stock market index for twelve months after the failed attempt. Moeller, Schlingemann and Stulz (2005) found that mergers of American firms during the period 1980 to 2001 had a detrimental effect on the bidders' share price.

Figure 1.1: M&A volumes and values (2009)

Panel A **Panel B**



Source: Deallogic Press Release, 2010

While short-run losses are generally incurred by the shareholders of the bidding firms (including banks), there are exceptions. Bruner (2004) observes that Mattel's share price increased to a significant extent when the company acquired Fisher-Price Toys. Eckbo (1983) interprets gains from M&As in the sense that the "control over the target firm's resources enables the successful bidder to initiate a revaluation of its own (as well as the target's) shares by implementing a higher-valued operating strategy" (Eckbo, 1983:241).

While many authors have studied M&As, more research is needed given the controversy over whether M&As benefit shareholders participating in such deals and whether benefits or losses depend on the state of the economy. To date, research has not focused specifically on M&As in a recessionary economy, although several studies, such as Lanine and Vander Vennet (2007), have implicitly measured the economic gains associated with M&As in an expansionary economy. When examining the effect of M&As on the publicly traded debt and equity instruments of the firms involved, Maquieira, Megginson and Nail (1998) identify an event window during the 1963–1996 period. Thus, their study covers periods of both economic expansion and contraction, but there is no indication of how the state of the economy affected the performance of these mergers. As such, conclusions cannot be drawn as to whether the *a priori* expectation of M&As (negative shareholder value is associated with the bidding firm and positive

shareholder value with target firm) applies to both expansionary and recessionary economies.

In relation to banking M&A, Lanine and Vander Vennet (2007) found that large Western European banks sought relatively large and efficient Central and Eastern European banks (CEEC) with an established presence in their local retail banking markets. Altunbas and Marques (2008) found that bank mergers in the European Union benefitted shareholders of both the bidder and the target banks. Other articles that deal with banking M&As include James and Wier (1987), Delong (2001), Houston, James and Ryngaert (2001), Delong (2003a) and Karceski, Ongena and Smith (2005).

This study analyses the effects on the shareholder wealth of the bidding and the target firms, considering different economic states, with bidding companies proposing mergers with target firms. Target firms are those acquired by bidders who succeed in acquiring the targets. Thus, when reference is made in the literature to a bidder, one cannot assume that the merger occurred, as that firm could have merely tendered or attempted to merge with the firm in a hostile manner via the market. A merger is considered to be a transaction between two juristic entities of similar size (using market capitalisation), whereas an acquisition is the purchase of one smaller entity by a larger entity. An acquisition is considered to be hostile when the target's firm's board of directors rejects the tabled offer from the bidder. This explanation is analogous to the definition used by the *Financial Times* (*FT*) and Goergen and Renneboog (2004). This study considers both bidder and target firms, as the economic results for each are often quite different, as explained by Delong (2001) and Karceski *et al.* (2005). The results of the bidding firm less the results of the target firm (aggregate return), as mentioned in Capron and Mitchell (1997), will not be considered because a large return earned by the target firm's shareholders can offset a small loss for the bidding firm's shareholders, thus distorting the relative effect of the M&A. The M&As that were sampled are split between periods of real economic expansion and contraction determined by the level of real Gross Domestic Product (GDP). In line with McConnell and Brue (2005), real GDP is defined as the total market value of all goods and services produced within a country's borders during a given time

period, deflated by an appropriate price index. Economic contraction is defined as two consecutive quarters of decline in real GDP in the bidder's domicile. The converse applies to real economic expansion. Thus, an M&A is deemed to have occurred during a period of real economic expansion and contraction by determining the state of the economy of the bidder's country, with the target country's economic state being of no significance. Real growth, as opposed to nominal growth, is assessed in order to correct for inflationary effects on GDP.

The study of shareholder gains during M&A activity can be extended to a test of market efficiency. In accordance with the Efficient Market Hypothesis (EMH), "investors should not be able to earn above normal returns in the market , owing to the market operating with all pertinent information taken into account" (Von Gersdorff & Bacon, 2009:2). This study will implicitly test for Semi-Strong Market Efficiency (SSME) for American, French and Indian shares. Studies that test for EMH using the event study method include Samitas and Kenourgios (2004) and Von Gersdorff and Bacon (2009).

The remainder of this study will comprise a discussion of the relevant literature concerning the reasons for M&As, the effect on shareholder wealth of these transactions and the various ways of measuring the effect being discussed. Chapter Three contains a description of the empirical analysis used, while Chapter Four comprises a discussion of the results obtained. Chapter Five concludes the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter contains a discussion of the literature dealing with the effects of M&As on shareholder wealth. The first section deals with relevant opinions on why firms conduct M&A activity, while the second section discusses academic opinions concerning the profitability of M&As. These opinions are split between those who consider M&As to be beneficial and those who consider them detrimental from both the bidder and the target shareholders perspective. The chapter concludes with a review of the various methods used to test for these effects.

2.2 REASONS FOR M&As

The exploitation of synergies between firms is often mentioned as a motive behind a firm's decision to consolidate. Lubatkin (1983) explains this concept by stating that "synergy occurs when two operating units can be run more efficiently and/or more effectively (i.e. with a more appropriate allocation of scarce resources given environmental constraints) together than apart" (Lubatkin, 1983:218). Lubatkin (1983) mentions that three main sources of synergies exist: The first relates to technical economics, specifically the scale economies of a firm's operations. These occur when a firm's functions and processes are modified, causing the same size and quality of inputs to be applied in such as way as to produce a greater or better quality of goods and services. The second is that of diversification economics, which firms achieve by "a firm improving its performance relative to its risk attributes" (Lubatkin, 1983:219). The third source of synergy relates to pecuniary economics and is achieved through the price manipulation a firm with a sizeable market share can exert. Empirically, however, James and Wier (1987) find no significant relation between any gains to the bidding firm and changes in market structure due to an M&A.

When dealing with the opinions of managers whose companies (all North American with the sample period omitted) were currently involved in M&A activity, Walter and Barney (1990) found that the reasons for M&As occurring differed from those mentioned in the literature. Walter and Barney (1990) identify elements such as the diversifying of employment risk, the turnover of bad management through supervision by capital markets and the reflection of managerial hubris in M&As. Walter and Barney (1990) also found that firms may choose to merge with or acquire another firm in order to utilise the other firm's financial strengths, such as a larger capacity to raise funds. These authors (Walter & Barney, 1990) reiterate the market controlling factor as a reason for firms engaging in M&As and state that the increase in competitiveness that comes with growth in a firm's market share in a specific industry can often entice managers to engage in M&As. Thus, by buying competitors out, factors like price undercutting, "customer poaching", or product manipulation are mitigated. Zhang (1995) found that the benefits related to geographical diversification can lead to banks participating in M&A activity. These benefits include the ability of a firm to diversify its revenue base allowing the firm to insure itself against any economic or operating downturn in one particular area.

Akhavein, Berger and Humphrey (1997) found that banks consolidate because of the associated increase in operating profit. This can arise in several ways such as an improvement in cost efficiency related to the reduction in costs of the inputs required to produce a specific set of outputs. Zhang (1995) found that the efficiency gains associated with an M&A are sensitive to bank size characteristics, with shareholder gains being more pronounced after relatively small M&As. Other factors include an improvement in the profit efficiency that deals with the different combination of inputs and outputs associated with the firm's processes or increasing the market power a firm enjoys thus allowing the firm to dictate prices and extract more profit. This advantage is analogous to that mentioned by Lubatkin (1983).

Another reason for firms seeking consolidation is that a firm may require faster and cheaper growth than would be achieved if they attempted to build the infrastructure themselves. Delaney and Wamurizi (2004) found that corporate growth can be achieved

at a faster rate through the acquisition of, or merger with, another firm, rather than through internal growth in an organisation. In other words, growth in a company can occur more easily and quickly when a target firm is acquired that is already well established in a certain sector or market. This point is reiterated by Walter and Barney (1990) who found that one of the aims of M&As is to "reduce the risk and costs of diversifying products and services to customers within an industry" (Walter & Barney, 1990:80). Delaney and Wamurizi (2004) mention that the scarcity of technological, financial and human resources in a firm is a motivating factor for M&As. If a firm has limited resources, the acquisition of another firm possessing these resources makes more sense in terms of time and cost saved than trying to develop them within the company. Lanine and Vander Vennet (2007) studied European banking M&As and found that a firm merges with or acquires another firm due to the enhanced efficiency and profitability the M&A creates for the acquirer. Lanine and Vander Vennet (2007) also state that a firm merges with or acquires another firm to increase its market power. The enhanced efficiency and greater market power objectives are consistent with Lubatkin (1983), Walter and Barney (1990), Zhang (1995), Pilloff (1996) and Akhavein *et al.* (1997).

A further reason for the occurrence of M&As can be deduced from the merger waves that have occurred throughout history. Kleinert and Klodt (2002:3−4) identify five specific merger waves occurring during the twentieth century and the latter part of the ninetieth century. The first merger wave occurred in America and Europe during the 1897−1904 period, owing to the effects of the Industrial Revolution and advances in technology used by producers. A second wave covered the period 1920–1929 (mention of the countries omitted) as the existence of networks within industries, such as railroads and utilities, created new opportunities for firms to benefit from economies of scale. The third wave can be identified as the period 1965−1975 with countries such as America and Germany being specifically mentioned. During this period, the drive to utilise economies of scale was once again a dominating characteristic along with the diversification of products and penetration of other markets. A fourth wave occurred during 1984 to 1988 and was more prominent in Europe as firms sought the expansion of international rather than domestic operations. A fifth wave ran from 1995 until the 2008 Subprime Crisis. An important

cause of the fifth wave was the greater integration of both domestic and international markets, as well as a trend of deregulation by authorities (mention of the countries is omitted). Kleinert and Klodt (2002) state that the effects of globalisation led to markets expanding and with this the size of the participating firms. When combined with an increase in deregulation markets began to open up, increasing firms' market penetration through cross-border M&As.

Several reasons have been put forward as to why a cluster of M&A activity occurs. Andrade, Mitchell and Stafford (2001) explain that not only do the merger waves share common characteristics of region and time, but also of industry. An example is the wave of banking M&As that followed the Subprime Crisis. Shleifer and Vishny (2003), as cited by Harford (2005), explain merger waves by modelling M&As in terms of stock market misevaluations between firms that merged. The disparity between the bidder's overvalued shares and target's undervalued assets can provide the incentive for a bidder to merge with or acquire the target. Managers with short time horizons are thus quick to accept the bidder's overvalued equity. This conclusion supports the rationale for merger waves that occur during periods of significant economic growth and rising share prices, a situation that was prevalent in most international markets prior to the Subprime Crisis. Harford (2005) proposes that external shocks specific to an industry affect the allocation of resources within an economy. Harford (2005) states that this allocation, combined with sufficient liquidity, can often cause a merger wave. Using this rationale, the 2008 to 2009 increase in M&As among financial firms can thus be explained by the economic shocks of the Subprime Crisis and real economic contraction that followed. This combined with an increase in liquidity to markets via historically low interest rates and government bailout lending for distressed firms, as was seen in Europe and America, resulted in a rise in M&As. Maksimovic, Phillips and Yang (2009) explain that the reason for merger waves lies at either end of a continuum. On the one hand, the occurrence of merger waves is due to investment opportunities occurring in waves, while on the other, they are based on the adjustment of liquidity and investment climates causing certain firms to obtain capital more cheaply. Maksimovic *et al.* (2009) found that public firms engage more in mergers and have greater cyclical characteristics to their M&A decisions than private

firms. In addition, sensitivity to changes in the macroeconomic environment is stronger in public firms. Thus, "public firms are almost twice as likely to buy assets in aggregation wave years than in non-wave years while purchases from private firms are relatively much flatter" (Maksimovic *et al.*, 2009:1).

As explained earlier, M&As tend to occur in waves, as elements that affect their occurrence, such as industry-specific shocks, occur likewise. These shocks are evident in the five merger waves identified by Kleinert and Klodt (2002). Elements such as greater globalisation, the transformation of the European markets into a centralised one, the industrial revolution, or a push by firms towards effective economies of scale have all contributed to greater M&A activity. In line with this, these waves tend to share common characteristics of region, time and industry. As explained above, such shocks can include the current state of the economy (expansion or contraction). Harford (2005) found that merger waves occur during periods of economic contraction, while Shleifer and Vishny (2003) found that M&A waves occur during periods of economic expansion. Indeed, it is often the change in the economic climate in which the businesses operate that provides the impetus for managers of firms to engage in M&As.

2.3 ARGUMENTS FOR AND AGAINST M&As

There is ongoing debate as to whether gains exist from the perspective of the bidder firm's or the target firm's shareholders. The following section contains arguments for whether the bidder or the target shareholders benefit from M&As.

2.3.1 POSITIVE PRICE EFFECTS FOR BIDDING FIRM SHAREHOLDERS

James and Wier (1987) found that mergers are wealth creating for the bidding firm's shareholders. This study assessed American bank M&As during the 1972−1983 period and reviewed the extent to which competition in the market for bank acquisitions affects the returns attributable to the acquirer's share price. Bradley, Desai and Kim (1988) found a positive outcome when assessing the synergistic gains from American M&As during the 1963−1984 period. Jarrell and Poulson (1989) found that bidding firms' shareholders earn a cumulative abnormal return (CAR) of 2.15%, measured ten days before and thirty

days after an M&A. The sample in this study contained tender offers from the 1963−1986 period where either the bidder or the target was listed on New York or American Stock Exchange. Healy, Palepu and Ruback (1992) support this finding, identifying a positive outcome for the bidding firm's shareholders using a pre-tax operating cash flow performance measure for M&As of non-financial companies. All these deals involved an American bidder for the period 1979−1983. Betzer, Goergen and Metzger (2009) found inconclusive results for bidding firms when investigating the use of M&A motives to determine abnormal share performance for American M&As during the 1989−2003 period. Kang (1993) and Becher (2000) support this finding.

Houston and Ryngaert (1994) mention several characteristics of M&A deals that can lead to both the bidder and the target firms' share prices appreciating. These include bidder profitability prior to the M&A, the method of financing, as explained by Asquith, Bruner and Mullins (1990), or the degree of operational overlap between the bidding and the target firms. As such, the degree to which an M&A is wealth creating or destroying can be related to the extent that the participating firms have the above characteristics. The previous section contained a discussion of several reasons for firms engaging in M&A activity. These can be used to describe the theoretical proposition that the bidding firm's shareholders gain from M&As. However, one must note that these opinions tend to be long term in nature, such as the benefit associated with technical, pecuniary and synergic advantages discussed by Lubatkin (1983). To consider the bidding firm as benefitting from an increase in earnings and share price, one would need a longer time horizon since these advantages develop much later and can be extremely complex in nature. As such, evidence is lacking on the short-term profitability of M&As from the point of view of shareholder wealth in the bidding firm.

2.3.2 NEGATIVE PRICE EFFECTS FOR BIDDING FIRM SHAREHOLDERS

M&As can be detrimental to the bidding firm's share price. Dodds and Quek (1985) explain that when firms fail in merging with or acquiring another firm, the rate of change in the same firm's share price is greater than that of the stock market index twelve months after the failed attempt. Houston and Ryngaert (1994) found mergers to be a

wealth-destroying event for bidders' shareholders when assessing American banking M&As during the 1985−1991 period. Rau and Vermaelen (1998) found that, during the 1980−1991 period, American bidders under-performed the market index for three years after an M&A. Lanine and Vander Vennet (2007) support the opinion that M&As are detrimental by mentioning that there is no significant improvement after cross-border banking M&As for participating firms. Lorenz and Schiereck (2007) found in their study of European banking M&As during 1990 to 2002 that acquiring firm shareholders incur a negative CAR of 1%, measured one day before and after the event. Thus, M&As are not necessarily profitable and can be very detrimental to the bidding firm.

Jensen and Meckling (1976) propose that certain M&As are pursued by managers in order to enhance their remuneration or status within an industry. Accordingly, such managers may seek an M&A, which may result in the bidding firm shareholders incurring losses. This theory is referred to as the agency motive and is based primarily on the assumption that a firm's managers do not act in the best interest of the firms' shareholders. This theory is mentioned in articles such as Goergen and Renneboog (2004).

Lubatkin (1983) discusses several elements that affect the profitability of M&As, such as the competitive strength of the bidder or target, the growth rate of the bidder's markets and the degree to which these fit with the strengths and market growth rates of the target firm. Mahoney and Weinstein (1999) state that appraisal remedies afford corporate shareholders the option to redeem their shares for cash in the event of certain transactions, including M&As. Thus, creation of certain loopholes allowing shareholders to sell their shares adds to the incentive for them to liquidate their holding in a company rather than take the risk of losing money as a result of a decline in the share price.

Altunbas and Marques Ibáñez (2004) state that M&As in the banking sector tend to benefit shareholders when both banks have geographical or product relatedness. These authors (Altunbas & Marques Ibáñez, 2004) explain that when differences exist among these elements, the decline in overall shareholder value is quite conspicuous. Antoniou,

Arbour and Zhoa (2006) state that the shares of potential target firms often carry a takeover premium. Thus, bidding firms can often pay a premium over and above an already excessive share price. A bidding firm's shareholders may feel that this premium is too high and will sell shares, causing a drop in the share price and a loss for the bidding company's remaining shareholders. Intuitively, this is a result of shareholders perceiving the costs of the M&A (e.g. the premium paid and the uncertainty involved in the M&A) as exceeding the benefits (Dodds & Quek, 1985). The concept of bidders paying in excess of the target company's equity is referred to as the "hubris hypothesis" (Roll, 1986). Well (2006) explains this theory by stating that bidders often overestimate the value or potential of the perceived synergies between firms. This leads to a negative price effect on the equity of the bidding firm, as the share is purchased at an inflated price in relation to fair value.

The question still remains as to why opinions differ with respect to the outcome of M&As. A possible answer is provided by Franks, Harris and Titman (1991) who explain that the choice of market index used played a significant role in determining whether American M&As during the 1975−1984 period was profitable for the acquirer. Franks *et al.* (1991) found that using an equally weighted market index caused the acquirer to lose, while a value-weighted benchmark yielded a gain. Thus, the use of an eight-portfolio benchmark is recommended as there was no statistically significant abnormal performance for the overall sample of bidders. These results are, however, refuted by Agrawal, Jaffe and Mandelker (1992) who explain that the conclusions were specific to the time period of the study as well as to the mixing of tender offers with mergers.

Consistent with the above literature, the conclusion as to whether an M&A will benefit bidding shareholders is inconclusive. However, the literature does indicate that the consolidation between two firms tends to be negative for the bidding firm's shareholders.

2.3.3 POSITIVE PRICE EFFECTS FOR TARGET FIRM SHAREHOLDERS

Target firms' shareholders often benefit from an increase in the share price of the company when an M&A deal is announced. When comparing empirical studies, Lubatkin

(1983) found that almost all gains are conceded to the target firm's shareholders when using a performance measure developed from the Capital Asset Pricing Model (CAPM). Dennis and McConnell (1986) found that target shareholders of American firms during the 1962−1980 period earned a CAR of 13.74% measured six days before and after the event. Maquieira *et al.* (1998) measured a CAR of 41.65% for target shareholders for a period of sixty days before and after the announcement. Maquieira *et al.* (1998) made use of M&As involving American firms during the 1963−1996 period. Ramakrishnan (2010) found that target shareholders of Indian firms from 1996 to 2002 earned a CAR of 11.6%, measured ten days before and after the announcement.

Choi (1991) calculated the abnormal returns (ARs) for American mergers for the 1982−1985 period by determining a cumulative prediction error which is dependent on the continuously compounded rates of return to the specific share and market index. Choi (1991) found that target shareholders earn positive ARs when the investment made in these companies is of a toehold nature. Toehold investments are "an accumulated position of five percent or more of common stock of a firm" (Choi, 1991:391). A possible interpretation is provided by Mikkelson and Ruback (1985) who explain that a toehold investment can entice the bidder firm to engage in specific activities with the target firm, such as M&As. Shareholders of target firms who engage in these activities tend to earn positive AR. In essence, the purchase of a toehold investment by a firm increases the chances that a future merger may occur. De Long (2001) supports this view in finding a 16.61% CAR for target shareholders during a time period spanning ten days before and one day after the announcement. The sample comprised American M&As during the 1988−1995 period. Houston *et al.* (2001) performed a cross-sectional regression relating bidder and target ARs to merger-related revenue gains and valuation estimates of merger gains. Houston *et al.* (2001) found a CAR of 20.80% for target shareholders from a sample of sixty-four banking M&As. The event window was measured for a period of four days before and one day after the announcement period and was applied to American mergers occurring during the 1985−1996 period. Campa and Hernando (2004) explain that target shareholders of European firms during the 1998−2000 period earn on average

a CAR of 9% in a month's time interval around the announcement date. This finding is supported by De Long (2003), Goergen and Renneboog (2004) and Well (2006).

Several reasons are proposed as to why an appreciation in the target firm's share price occurs as a result of an M&A. The intuitive explanation is the greater perceived profitability of a company once it has been acquired by the bidder. Choi (1991) notes that target firms tend to observe an appreciation in their share price after takeovers, proxy fights and management turnovers, while target firms not encountering such control transfers incur losses. The existence of an increase in share prices when toehold investments are disclosed suggests that investors view the conclusion of M&A deals as a positive factor in the target firm's ability to generate revenue. Brealey, Meyers and Allen (2006) offer two views on why target shareholders benefit from a greater return on the value of their equity than bidding firms. The first relates to the target shareholders earning higher ARs when merger gains are measured in absolute USD terms. This is due to the size differential between large bidders and smaller targets. The second relates to the increase in the target's share price as two or more companies bid for the firm.

The appreciation in the target's share price is naturally linked to the perceived increase in profitability that an M&A will have on a company, but the question still remains as to why an M&A will increase the revenue of a firm. Several factors that can lead to a greater profitability due to mergers and include the increase in corporate growth and development, suggested by Delaney and Wamurizi (2004), or the increase in the firm's market power as mentioned in Lubatkin (1983), Akhavein *et al.* (1997) and Lanine and Vander Vennet (2007). Given the foregoing opinions the consolidation between two firms tends to be positive for the target firm's shareholders.

2.3.4 NEGATIVE PRICE EFFECTS FOR TARGET FIRM SHAREHOLDERS

Few examples exist of losses being incurred by target shareholders after the announcement of an M&A. Karceski *et al.* (2005) found that, during the 1983–2000 period, target shareholders of Norwegian banks incurred a negative CAR of 1.52% during a time interval of one to seven months after the merger announcement. Fuller, Netter and Stegemoller (2002) found a negative CAR of 1% for target firms during a time interval of

two days before and after an M&A involving an American bidder during the 1990−2000 period.

A possible explanation for the negative effects, as described by Campa and Hernando (2004), can be the occurrence of cultural, legal and transactional barriers that cause the proposed M&A to be unsuccessful. These obstacles can have substantial effects on the purported value of the transaction and can lead to a reversal of the appreciation in the share price that target shareholders benefited from when the M&A was announced. Share prices can often increase well above fundamental levels, thus possible barriers encountered can lead to a revision of the price. In short, there are only a few examples of shareholder losses for the target firm.

2.4 METHODS USED IN DETERMING PROFITABLITY

Several methods exist for determining the effects of M&As. Delaney and Wamurizi (2004) consider the determination of profitability from the point of view of the dataset used, namely accounting and market.

In relation to market data, Delaney and Wamurizi (2004) state that the primary difference from accounting is that share prices represent all available information in relation to the company. Share prices are also determined by outside individuals. This data is harder to manipulate when compared to accounting data. A firm's share price depends on the future expected earnings of the firm. Thus, by analysing the share price of a firm rather than the earnings, one is merely analysing the end result of the M&A, and that which determines the returns that shareholders either earn or lose. Antoniou *et al.* (2006) advocates that the mere use of market data does not yield a precise calculation of the economic value generated by M&As. Antoniou *et al.* (2006) found that analysing short-term changes in the share price can lead to poor estimates of the effects on shareholder wealth. Antoniou *et al.* (2006) states that investors can over- or under-react to changes in situations or sudden news that can cause the share price of a firm to deviate from fundamental levels. This irrational behaviour impugns the assumption that a financial market is semi strong market efficient (SSME) and can impair the ability to distinguish

real economic gains from gains made via short-term investor speculation. Antoniou *et al.* (2006) make use of the Dot.com bubble as an example where investor speculation affected shareholder wealth independently of economic fundamentals. Studies that make use of market data include Eckbo (1983), Barnes (1984), Bradley *et al.* (1988), Delong (2003a), Well (2006), Lorenz and Schiereck (2007), Von Gersdorff and Bacon (2009), Ramakrishnan (2010) and Spyrou and Siougle (2010).

A technique which is becoming more popular for evaluating M&As and makes use of market data is event studies. MacKinlay (1997) states that event studies can assess the impact of an event on the value of a firm. As early as 1933, James Dolley applied the event study method to determine the price effects of stock splits, while Fama, Fisher, Jensen and Roll (1969) used this technique to test whether the process of stock splitting is generally focused on a specific kind of return behaviour. The use of the event study method is advantageous in two important ways. Firstly, it is well suited to studies with a short-term horizon, as the shorter the event window, the less other events contaminate the share price (MacKinlay, 1997). The second advantage is that event studies can be used to validate the assumption of SSME when analysing market data. By providing a simultaneous measure of both the return for the bidding and the target shareholders, as well as an implicit test of SSME, more credibility can be given to these results.

Several criticisms have arisen from event studies, particularly those which relate to the data used. Brown and Warner (1985) found that results based on returns with a daily frequency can be affected by non-normal returns, bias in Ordinary Least Squares (OLS) estimates of market model parameters in the presence of non-synchronous trading, as well as issues of variance increases on the days surrounding the event date. The non-synchronous trading issue relates to prices being recorded during varying time intervals thus posing a possible bias (MacKinlay, 1997). However, Brown and Warner (1985) found that, using simulation procedures, the characteristics of daily data generally present few difficulties in the context of the event study method. Another area of debate for event studies is the technique to determine the ARs attributable to a firm's shareholders. MacKinlay (1997) mentions that the two most common techniques remain the constant

mean return model and the market model, which measure a mean return by simply determining the rate of change in an economic index. MacKinlay (1997) describes two more ways in which to estimate the market return. The first is factor models and multifactor models such as that used in the study done by Flannery and James (1984) on bank returns, where the second factor incorporated was the yields on long-term US government bonds. MacKinlay (1997), however, describes the benefits of using these models to determine ARs as being limited. The reason for this is "the empirical fact that the marginal explanatory power of additional factors [above] the market factor is small, and thus, there is little reduction in the variance of the abnormal returns" (MacKinlay, 1997:18). The other class of model described by MacKinlay (1997) to estimate market returns is economic models and include the CAPM. MacKinlay (1997) states that the CAPM was a popular choice during the 1970s and 1980s, however, it has virtually ceased being used owing to criticisms of the restrictions that it imposes and the sensitivity of the results obtained in terms of these restrictions.

Turning to the data used, Delaney and Wamurizi (2004) state that another source of data is accounting, which measures the performance of the bidder and the target firms in terms of their ability to generate profit and cash flow, as well as the value of their net assets. Articles that make use of this method include Pilloff (1996) who determines the financial impact of an M&A by comparing the pre-merger and post-merger status of three elements which include profitability, efficiency and specific line items of a firm's balance sheet. Pilloff (1996) makes use of 48 banking M&As for the 1982−1991 period and compares a firm's return relative to an industry benchmark. Pilloff (1996) establishes this benchmark by determining the performance of banks of similar size and geographic location. This author mentions that the profitability of a firm can be measured by net profit as this represents the bottom-line performance of a firm and by operating income, as any changes in this figure can be directly attributed to changes in a firm's operating performance. All profits that are represented in Pilloff's (1996) study are relative to both a firm's total assets and total equity.

As stated in the previous section, an increase in operating efficiency is often mentioned by authors as a reason for banking M&As. Pilloff (1996) explains that the accounting method provides a useful technique for determining this form of gain, as it assesses the behaviour of a firm's expenses. A decrease in expenditure during the post-merger period should be informative in terms of the operating efficiency of a firm. Pilloff (1996) estimates a firm's costs by determining the sum of its interest and non-interest costs. This cost is scaled by the average value of total assets, net and operating income. Pilloff (1996) does concede, however, that efficiency gains caused by the M&A may be better represented by movements in the individual expense items that should be affected the most by the M&A. These items include employee costs, fixed asset expenses and total non-interest expenses. In relation to specific line items of a firm's balance sheet, Pilloff (1996) notes that accounting ratios such as capital to assets, loans to assets and deposits to assets indicate the financial performance of a firm. When these ratios are compared during the pre-merger and post-merger periods, the effect of the M&A on a bank's financial position can be better assessed.

Another article which makes use of accounting data is Healy *et al.* (1992), who assess the operating performance of fifty M&As involving an American bidder during the 1979−1983 period. Healy *et al.* (1992) define a pre-tax operating cash flow model to assess whether a firm's operating performance has improved. In Healy *et al.*'s (1992) study, cash flows are defined as the net profit from the sales of goods, less the administrative and selling expenses, plus a firm's depreciation and goodwill expenses. This return metric is adjusted by each firm's market value in order to provide a benchmark according to which a firm's performance can be measured. Healy *et al.* (1992) state that this measure provides a better estimate of a firm's operating performance than earnings, as it unaffected by different accounting measures that firms may use. Healy *et al.* (1992) notes that this factor can restrict the degree to which a firm's operating performance can be assessed, particularly if the firms being compared are domiciled in different countries with different accounting standards. Healy *et al.* (1992) found that firms report significant post-merger improvements in their operating cash flow. Antoniou *et al.* (2006) advocate the use of accounting data by stating that a return to analysing the

fundamentals of whether a merger is successful is necessary for a credible estimate of the generation of economic wealth. These fundamentals include the leverage of the company and its future profitability or quality of management. However, Delaney and Wamurizi (2004) note that accounting data can have flaws if companies make use of creative accounting techniques in order to conceal the true state of the company's financial position. Antoniou *et al.* (2006) counter this by saying that in spite of the argued flexibility in Generally Accepted Accounting Principles (GAAP), accounting data remain the best indicator of a company's economic performance. In addition, Betzer *et al.* (2009) find that, besides the article by Healy *et al.* (1992) discussed earlier, studies that measure the returns that shareholders gain or lose from an M&A by using accounting data are measured during a much longer time period. As such the ability to measure short-term gains by shareholders is often limited when making use of accounting data. A possible explanation is that firms only produce financial statements quarterly or bi-annually during a financial year. Consequently, changes in merger performance can only be measured at the intervals when these results are released. The frequency of accounting data is a contrasting characteristic to market data where a change in a firm's share price and thus the benefit of the merger can be measured on the days before, during and after the M&A.

Betzer *et al.* (2009) states that a significant flaw of accounting data is that the post-acquisition performance of returns can be influenced by the method of financing used. For instance net profit attributable to a firm takes into account interest expenses. As such, if an M&A is financed by debt its net profit is lower than if the M&A is financed by stock. Thus, to compare the net profit across firms can often be misleading when different forms of financing are used. Betzer *et al.* (2009) found that studies that use either method yield contrasting results. Studies that make use of market data, such as an event study, find on average that M&As have a overall positive effect for shareholders while studies that focus on accounting performance to measure the effect of an M&A find that overall results are on average negative. Thus, two possible situations can be observed – one where the use of market data yields a positive outcome for the firm's shareholders and the use of accounting data produces a negative outcome for firm's shareholders (Situation I), or where a negative outcome is produced by the use of market data and a positive

outcome is produced by using accounting data (Situation II). Betzer *et al.* (2009) find that both situations can be explained by analysing the acquirer's motive for pursuing the M&A.

In relation to M&As occurring in Situation I, the prevention of negative events external to a firm is a possible explanation. Specific mention of this is made in Fridolfsson and Stennek (2005), who found that it is often better for a firm to merge with another firm, thereby pre-empting rival firms from doing so. Thus, it is often advisable to participate in a merger to prevent the losses that may be incurred if a rival firm were to buy the company. Fridolfsson and Stennek (2005) refer to this as the pre-emptive motive. Fridolfsson and Stennek (2005) use the failed merger of Volvo and Scania in 1999 as an example. At the time, Volvo stated that the motivation for acquiring Scania was to prevent another firm from doing so. Thus, when an M&A is initiated by the acquirer to prevent a rival firm's merger it can affect the accounting performance of the firm owing to the cost of the merger, but lead to a share price increase owing to the unprofitable effects of a rival firm's merger being avoided.

In relation to M&As resulting in Situation II, the mispricing of the acquiring firm's shareholdings is a possible explanation. Betzer *et al.* (2009) notes that if a firm's share price is overvalued at some point in time, in the long run shareholders will eventually buy and sell the share to a point where the share price reflects the firm's fundamental value. Thus, if a firm has overvalued shares, managers may use them to purchase the undervalued shares of the target company. Betzer *et al.* (2009) state that through this mechanism a rational firm that realises the overvaluation of its shares can lock in the value of real assets by using them to purchase another firm. The result of this is a sudden decline in a firm's market price in order to reduce it to the fundamental value of the combined firm. Betzer *et al.* (2009) state that if one assumes that a firm's managers act in the best interests of its shareholders, the merger would only be done if the financial performance of the company were to improve, thus compensating shareholders for the drop in share prices. The above example shows that when an M&A is initiated in order to take advantage of mispricing between the bidder and target firms' share prices, it can

often result in a negative effect on the accounting performance of a firm owing to the cost of the merger, but a positive effect on the share price owing to the unprofitable effects of a rival firm's merger being avoided.

To assess the validity of the reasoning used to justify Situation I and Situation II, Betzer *et al.* (2009) used 927 acquisitions involving US companies during the 1989−2003 period. In line with Healy *et al.* (1992), the accounting performance of a firm is measured using a ratio of operating cash flow to the book value of its assets. In order to assess the impact of a merger on the accounting performance of a firm two benchmarks are used. The first comprises a portfolio of firms that are of similar size to acquirers and had an operating cash flow ratio for one year before the merger announcement. The second portfolio differs from the first in that the firms comprising the benchmark are from different industries to the acquirer. Mention of the specific industries is omitted, however, the authors state that banks and insurance companies are excluded. To determine the performance of the merger with market data the event study method is applied where ARs are measured with a market model. Betzer *et al.* (2009) find that the empirical study conducted supports the claim that both situations can be explained when analysing the acquirer's motive for pursuing the M&A.

Both methods of estimating the economic value of M&As are, however, still criticised. Several authors have proposed that the use of more qualitative methods to assess whether an M&A is profitable for the bidder's and target firm's shareholders may be appropriate given the above criticisms. An example is provided by Capron and Mitchell (1997). Capron and Mitchell (1997) assessed four cross-border M&As in America and Europe. These firms formed part of the telecommunication equipment manufacturing industry and were sampled during the 1988−1992 period. In order to determine whether the M&A was a success, the authors interviewed the executive managers from the bidder and target firms, as well as those of the new entity created in cases where the target ceased operating independently. The primary conclusion across all M&As is that a firm's capabilities received at least some level of improved performance. Capron and Mitchell (1997) state that the combined entity operated in a more geographically distinct market than the

individual firms had done before the merger. In addition, the managers of the bidder and target firms described a positive effect on each firm's research and development (R&D), owing to an increase in a firm's ability to share knowledge and resources in the design of new products. Capron and Mitchell (1997) support the above findings by analysing the post-merger profitability and sales of the firms under study. Capron and Mitchell (1997) concluded that the M&A had a positive effect in relation to the operating performance of the acquiring and target firms.

Brouthers, Hastenburg and Van der Ven (1998) make use of a qualitative approach by interviewing seventeen managers of bidding Dutch firms and asking them to rate personal, economic and strategic motives for pursuing an M&A with another firm. After the M&A the authors assessed whether the most important motives had been accomplished. Thus, the performance of the bidder and target should be measured against the goals set by management rather than the financial results. For example, if management's goal was to cut the debt of the target firm then the acquirer's financial performance may have been poor from a shareholders perspective, since most of the profits were used to settle debt and were not distributed as dividends. The qualitative approach provides a useful technique for avoiding the deficiency inherent in the market and accounting data approaches. However, it has seldom been used in recent articles that assess whether an M&A is profitable for the bidder and target firm's shareholders.

To conclude, there are two primary methods for determining the profitability of an M&A. The first is to assess if an M&A has a profitable affect by assessing the movement in the bidder and target firms' share prices. The second is to assess if an M&A has a profitable affect by assessing the change in a firm's operating performance. However, both methods contain flaws and thus a third method has been developed. This method makes use of a qualitative approach to assess whether an M&A is profitable for the bidder and target firms' shareholders.

CHAPTER THREE

EMPIRICAL ANALYSIS

3.1 INTRODUCTION

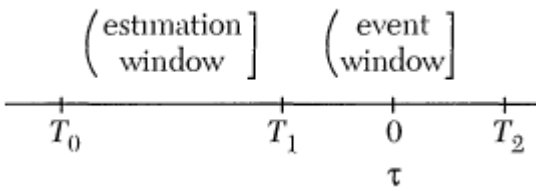
This chapter contains details of the empirical analysis to be applied in the study. The first section describes the method used in analysing the data. The second section contains details of the firms included in the study, as well as the descriptive statistics.

3.2 METHOD

In order to determine whether bidder and target banks earn ARs from M&As during real economic expansion and contraction, the study follows MacKinlay (1997). If the presence of ARs is observed around the event day then it is assumed that the event had an effect on the value of the firm. While the current study considers M&As as the event under study, Yip (2009) states that several events besides M&As can be used to assess the ARs attributable to shareholders and includes earning announcements, dividend announcements, debt or equity issues and corporate reorganisation.

Let $\tau = 0$ be the event date (which is the earliest date that news of the event becomes known to the public), $\tau = T_1 + 1$ to $\tau = T_2$ represents the event window, with $L_1 = T_2 - T_1$ representing the window length, and $\tau = T_0 + 1$ to $\tau = T_1$ constitutes the estimation window with the length being represented by $L_2 = T_1 - T_0$.

Figure 3.1: Estimation and event window timeline



Source: MacKinlay (1997:20)

Figure 3.1 shows that an event study incorporates two separate, yet equally important, time periods in order to assess whether an event has a statistically significant effect on a firm's share price. The first period is referred to as the event window and incorporates what is known as the event day. This is seen as the day on which the event under study occurred. MacKinlay (1997) notes that the challenge in identifying the event day depends on the type of event under study. For instance, the event date of a natural disaster or mining accident can be identified easily. Accordingly, the ARs earned or lost by shareholders on the event day are specifically attributed to the event and any ARs that shareholders earned or lost on the days prior to the event are identified as being caused by other factors. However, the event date for an M&A or earnings announcement can be harder to determine. The easiest way to determine when the event occurred is to use the announcement date. However, elements such as insider trading or the release of information about the event prior to the official announcement date can result in shareholders gaining or losing statistically significant ARs prior to the event day. This issue is referred to as information leakage. Thus, the ARs of shareholders on the day of the announcement may not be an accurate measure of the full effect of the event on the share price of the firm. As such, the event window is not made up of the event day only, but often of several days before and after the event. By incorporating the days before and after the event, the cumulative abnormal returns (CARs) for shareholders can be measured, completely quantifying the effects of the M&A. As the above shows when applying the event study method, the concept of ARs is crucial.

The second time period is referred to as the estimation window and is seen as the non-event time period. During this period, the ARs earned or lost by shareholders in the absence of the event can be assessed. As such, this window is vital in order to assess if the ARs that investors earned or lost during the event window differs from those earned or lost in the absence of the event. By making this comparison, one can make inferences as to the affect the event had on the share price of the firm.

Four estimation and event windows are used to assess the ARs earned by bidder and target shareholders (see Table 3.1). These follow Well (2006) and Lorenz and Schierick

(2007), who study the effect of M&As on target and bidder shareholder wealth during banking M&As, as well as, studies by Brown and Warner (1985) and MacKinlay (1997), whose articles guide the market return-generating process and method to be used in this study. The use of multiple event and estimation windows results from the lack of consensus on the identification of an appropriate start date from which returns can be measured. Goergen and Renneborg (2004) explain that too narrow an event window may cause substantial measurement error, particularly if information leakage occurred. On the other hand, a very wide event window will overstate movements in the share price and incorporate other variables, causing contamination. In addition, event windows are often chosen that limit the degree of overlap between them. This helps to validate the assumption of cross-sectional independence and zero covariance between share returns. This is, however, only possible for events where event date clustering is not observed.

Table 3.1: Estimation and event window lengths

Author	Date	Estimation window (days)	Event window (days)
BROWN & WARNER	1985	(−244, −6)	(−5,+5)
WELL	2006	(−104, −6)	(−5,+24)
LORENZ & SCHIERECK	2007	(−250, −21)	(−10,+10)
MACKINLAY	1997	(−229, −21)	(−20,+20)

Brown and Warner (1980) state that a firm's share returns can only be considered abnormal if measured against the returns of a specified benchmark. Various methods exist for determining the benchmark returns of a security. The study makes use of the three most popular methods in the event study literature, henceforth to be denoted as Models 1, Model 2 and Model 3. Model 1 is the market-adjusted return model described by Brown and Warner (1985):

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad [3.1]$$

The AR of share *i* at day *t* is equal to the continuously compounded return for share *i* at day *t* less the continuously compounded return for a market index ($R_{m,t}$). Brown and Warner (1980) state that Model 1 assumes returns are equal across all shares, but not constant for any particular share. This technique is useful when events occur in close proximity to one another, as the estimation window is only used to estimate the variance of the average abnormal returns (AAR) attributable to shareholders. Thus, the possibility of estimation window overlap and cross-sectional dependence of share returns is mitigated. One possible drawback to Model 1 is that the firms analysed are not represented in the market index chosen. Thus, the market return measured can often incorporate fluctuations that are not specific to the shares under study and thus increases the degree of measurement error in the AR estimated. Articles that make use of this model include Von Gersdorff and Bacon (2009) and Spyrou and Siougle (2010).

Model 2 is the mean-adjusted return model described by Brown and Warner (1985):

$$AR_{i,t} = R_{i,t} - \bar{R}_i \quad [3.2]$$

the AR of share *i* at day *t* is equal to the continuously compounded return for share *i* at day *t*, less the arithmetic mean of share *i*'s daily returns in the estimation window ($\bar{R}_i$). Thus a shareholder's return is defined as abnormal if it differs from the return observed during a period preceding the event window; therefore the model unrealistically assumes that the expected return of a share is constant.

Brown and Warner (1985) find that Model 2 often yields results similar to more sophisticated models, such as Model 3. MacKinlay (1997) explains this by stating that the variance of the ARs in Model 2 is not reduced when ARs are calculated in more sophisticated models. Thus, Model 2's primary benefit is its simplicity, ease of

calculation and consistent performance when compared to other models. Articles in which this model is applied include Ramakrishnan (2010).

Model 3 is the market model described by MacKinlay (1997).

$$AR_{i,t} = R_{i,t} - \alpha_i - \beta_i R_{m,t} \quad [3.3]$$

The AR of the share is given by the continuously compounded return for share *i* at day *t* less α_i and β_i determined during the estimation window. α_i represents the intercept of the securities market line (SML) while β_i represents the slope and is calculated as the ratio of the covariance between returns to the individual share and market index divided by the variance of the returns to the market index. Brown and Warner (1980) state that this model takes into account the systematic risk of each share return and the market-wide factors affecting all shares in the given study. Articles that make use of this model include Barnes (1984), Bradley *et al.* (1988) and Delong (2003a). For all three models under the null, the AR is described as jointly normally distributed with a zero conditional mean and conditional variance.

$$\sigma^2(AR_{i,\tau}) = \sigma_{\varepsilon_i}^2 + \frac{1}{L_1}\left[1 + \frac{(R_{m,\tau} - \hat{\mu}_m)^2}{\hat{\sigma}_m^2}\right] \quad [3.4]$$

It is important to note that a multifactor model is not considered owing to the theoretical deficiencies as noted by Campbell, Lo and MacKinlay (1997) and Campbell (2000).

In order to provide a cross-sectional view of the abnormal performance of firms' shares, the arithmetic mean or AAR is computed, where the AAR across all shares during period τ is

$$AAR = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \quad [3.5]$$

with variance

$$var(AAR_\tau) = \frac{1}{N^2}\sum_{i=1}^{N}\sigma_\epsilon^2 \quad [3.6]$$

Since σ_ϵ^2 is unknown in practice, it is estimated from the time series of AAR during the estimation window. Since the AAR is assessed during a specific period, it is necessary to determine the cumulative average abnormal return (CAAR). The CAAR is calculated as the sum of AAR

$$CAAR(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AAR_\tau \quad [3.7]$$

with variance

$$var\big(CAAR(\tau_1, \tau_2)\big) = \sum_{\tau=\tau_1}^{\tau_2} var(AAR_\tau) \quad [3.8]$$

Thus, the CAARs that shareholders earn are attributable to a shareholder who bought the share on the first day of the event window and sold it after the last day.

The test statistic for all models is taken from MacKinlay (1997):

$$\theta_1 = \frac{CAAR(\tau_1,\tau_2)}{var(CAAR(\tau_1,\tau_2))^{1/2}} \sim \mathcal{N}(0,1) \quad [3.9]$$

If the CAARs are independently identically distributed with a mean of zero and a standard deviation of one, the statistic follows a Student's *t* distribution with n – 2 degrees of freedom (df) for Model 3 and n – 1 for Models 1 and Model 2. The df is determined by the number of parameters comprising each return-generating process. This statistic describes the ratio of each day's CAAR against its estimated standard deviation. The null hypothesis describes a situation where the banking M&A has no effect on the behaviour of a bank's share returns (H_0: CAAR = 0). MacKinlay (1997) states that the results derived from the statistic are asymptotic with respect to the number of shares N and L_1. Thus, changes in the sample of firms or event windows will proportionately and directly affect the value of the test statistic. Kothari and Warner (2004) state that the test statistic measured is a random variable owing to the measurement error apparent in its

estimation. This error is attributed to two elements of a firm's AR. Firstly, estimates of a firm's expected returns are imprecise, owing to the non-event expected return (measured during the estimation window) never yielding an exact estimate of what the ARs for shareholders would have been had the M&A not occurred. The second element is that, in the shareholders' ARs of each firm there exists a portion which is not attributable to the event. Thus, the total ARs shareholders earn on an event may not be fully attributable to the M&A, and are possibly related to unobserved influences. Kothari and Warner (2004) state that when ARs are aggregated over a number of firms this element does not average to zero, thus supporting the random variable nature of the test statistic. Kothari and Warner (2004) state that the CAAR test statistic is well specified provided that the variance is estimated correctly. Kothari and Warner (2004) explain that elements such as the cross-sectional dependence of share returns would create downward bias in the estimated standard deviation, causing upward bias in the test statistic. The implication of this is an increase in the test statistic yielding a Type I error where the null hypothesis is erroneously rejected. Thus, the statistical significance of the CAARs that shareholders gain or lose during the event period can be overestimated.

Kothari and Warner (2004) state that in cases of event period uncertainty the use of a non-parametric test statistic might also be effective in helping to generate a test statistic that is well specified. Serra (2002) provides two examples of these forms of test. The first is a Generalise Sign test, which tests whether the frequency of positive ARs attributable to shareholders equals 50%. In order to determine this, one determines the level of shares whose ARs are non-negative under the null hypothesis of the M&A having no effect on shareholder returns. The value of the null is determined as the percentage of shares with non-negative abnormal returns during the estimation window. Serra (2002) states that under the null hypothesis ARs which are non-negative in value should follow a binomial distribution with parameter p if ARs are independent across all securities. Given this, the test statistic that follows is proposed:

$$GS = \frac{|p_0 - p|}{\sqrt{p(1-p)/N}} \qquad [3.10]$$

where p_0 is the observed percentage of firms with non-negative ARs.

The second is a Wilcoxon Signed-Rank Test, with the test statistic given by

$$S_N = \sum_i r_i^+ \qquad [3.11]$$

The above test assumes that all of the ARs are non-zero, with the test statistic determined as the sum of all ARs which are greater than zero, with the null hypothesis of equally likely positive and negative ARs. Serra (2002) states that, given a large sample size of firms, the test statistic under the null follows a normal distribution.

Given the above comments, this study omits non-parametric test statistics owing to the relative certainty of the event date and their lack of use in recent articles that make use of the event study method to determine whether an M&A had a statistically significant affect on a firm's share price. These include Well (2006), Ramakrishnan (2010) and Spyrou and Siougle (2010).

3.3 DATA

In this study, the share returns[1] of 27 completed banking M&A deals were analysed. All deals were completed during the 2001−2010 period with details of each deal appearing in Table 3.2. The years 2004 and 2008 contain the most M&A activity with no deals sampled from 2009. All banks considered in this study take deposits from individuals, businesses and public entities. Thus, financial services firms that provide investment banking and advisory functions only are excluded. All but one deal comprised both parties (bidder and target) being a bank. The exception is the deal involving the American Government and Capital One Corp, which formed part of the Capital Purchase Program (CPP) initiative conducted by the United States Treasury (UST). The deal involved UST purchasing preferred stock and equity warrants of the company, thus providing funding to troubled firms. It formed part of the wider Troubled Asset Relief Program (TARP) and is

[1] All banks share prices were extracted from Bloomberg Database.

reported separately. To mitigate the issue of contamination, firms with share prices containing share-specific events (besides the merger), either during the estimation or event window, were excluded. In addition, certain mergers were removed in order to prevent event date clustering and the possibility of event window overlap. It is important to note that if event window overlap is present and the bidder and target of one M&A had a different domicile to the other bidder and target, then cross-sectional independence of share returns is assumed. Two-fifths of all deals assessed were in the form of a cash purchase, while stock-for-stock deals comprised less than one-third (Table 3.2).

Table 3.2: M&A deals

Event Date	Bidder/Acquirer Firm	Domicile	Target Firm	Domicile	Means by which M&A occured (0 cash, 1 shares)
4 December 2001	Overseas-Chinese Banking Corporation Ltd	Singapore	**Keppel Tatlee Bank**	Indonesia	0
26 September 2002	M&T Bank	USA	Allied Irish Banks	UK	0,1
01 November 2002	Canadian Imperial Bank of Commerce	Canada	**FirstCaribbean International Bank**	Barbados	0
16 December 2002	Credit Agricole	France	Credit Lyonnais	France	0,1
7 March 2003	Société Générale	France	**Social Secutrity Bank**	Ghana	0
27 October 2003	Bank of America	USA	**FleetBoston Financial**	USA	1
15 January 2004	JP Morgan Chase	USA	**Bank One Corporation**	USA	1
1 March2004	Fubon Bank Hong Kong (Fubon Financial holding)	Hong Kong	**IBA**	Hong Kong	0
16 July 2004	PNC Financial Services	USA	Riggs Bank	USA	0,1
27 July 2004	**Global Trust Bank**	Indian	Oriental Bank of Commerce	Indian	0
12 August 2004	Wing Hang Bank	Hong Kong	**Chekiang First Bank**	Hong Kong	0
5 March 2005	Capital one fianacial corporation	USA	Hibernia Bank	USA	0,1
30 June 2005	Bank of America	USA	MBNA Corporation	USA	0,1
13 June 2005	Barclays Bank	UK	ABSA	South Africa	0
13 May 2006	BNP Paribus	France	Banca Nazionale del Lavoro	Italy	1
25 May 2006	Regions Financial corporation	USA	Am South Bancorporation	USA	1
9 December 2006	ICICI Bank	India	**Sangli Bank**	India	1
16 February 2007	Banco Bilbao Vizcaya Argentaria	Spain	Compass Bancshares	USA	0,1
16 August 2007	Fifth Third Bank	USA	First Charter Bank	USA	0,1
18 September 2007	Standard Chartered Bank	UK	**American Express Bank Ltd**	USA	0
25 February 2008	HDFC Bank	India	Centurion Bank of Punjab	India	1
26 March 2008	Royal Bank of Canada	Canada	**Royal Bank of Trinidad and Tabago**	Trinidad and Tabago	0,1
31 August 2008	Commerzbank	Germany	**Dresdner**	Germany	0,1
24 October 2008	PNC Financial Services	USA	National City Corp	USA	1
14 November 2008	**USA Government**	USA	Capital one	USA	0
20 November 2008	Banco do Brasil	Brazil	Banco Nossa Caixa	Brazil	0
15 March 2010	Thanachart Bank	Thialand	Siam City Bank	Thialand	0

Note: Firm's names in bold are omitted from the study

Most bidding banks are American and French while most target banks are American and Indian (Table 3.3). In the case of American and European banks, an explanation is provided by Hagendorff, Collins and Keasey (2007), who state that the promotion by regulators of a more integrated banking sector in America and Europe has led to a significant increase in banking M&As. These were enacted as a result of the significant deregulation of the financial sector, involving the removal of geographical restrictions and demarcation lines between different types of financial services. The promotion of the European Monetary union is an example of the removal of domestic barriers in a European context. Hagendorff *et al*. (2007) confirm this explanation, using America as an example. Hagendorff *et al*. (2007) state that until the late twentieth century, two key restrictions were placed on American financial institutions.[2] The first imposed the separation of retail and investment banking operations. Thus, investment and retail banks were prohibited from merging with one another or from owning companies that operated in the other industry. The second restriction related to geographical scope: branching regulations were transferred from national to state level with interstate branching being forbidden. Thus, the American financial services industry consisted of many institutions; a structure which remained largely intact until legislation was passed rescinding these restrictions.[3] This resulted in an increase in banking M&As as the market's structure changed from a fragmented one to a national banking system.

In relation to the question as to why the second greatest number of targets was Indian, the explanation relates to the restructuring of Indian institutions. Ramakrishnan (2010) states that an ease in Indian regulations, the restructuring of family-owned conglomerates and the sale of state-owned companies enticed other firms to merge with or acquire Indian firms. Delong (2003b) explains that many of these reforms started in 1991 in response to the bankruptcy of the government of the era. Thus, a significant movement away from a centrally planned to a more liberal and capitalist economy occurred. Delong (2003b) states that encouraging capital imports and commodity exports, industrial deregulation and tax system rationalisation were examples of the apparent reform which ensured that

[2]Restrictions existed as a result of the Banking Act of 1933.
[3]The Riegle-Neal Interstate Banking and Efficiency Act of 1994 and the Gramm-Leach-Biley Financial Modernisation Act of 1999.

foreign firms could access the Indian market more easily thereby leading to greater M&A activity.

Table 3.3: Geographical origins of bidder and target firms

Country	Proportion of Bidders (%)	Country	Proportion of Target (%)
USA	36	USA	50
France	12	India	12.5
India	8	France	6.25
UK	8	UK	6.25
Canada	8	Brazil	6.25
Hong Kong	8	Thailand	6.25
Brazil	4	South Africa	6.25
Germany	4	Italy	6.25
Singapore	4	Germany	0
Spain	4	Hong Kong	0
Thailand	4	Canada	0
South Africa	0	Singapore	0
Italy	0	Spain	0
Total	**100**	**Total**	**100**

Source: Bloomberg (2010) & own calculation

Table 3.4 contains descriptive statistics for each share return during two sampling periods. The first period consists of returns sampled 270 days before (− 270) and 20 days after (+20) the event date. It thus takes into account the estimation and event window and represents a period were the banks sampled were involved in M&A activity. This is referred to as the merger period and is reported in Panel A. The second period consists of share returns sampled from 2005/10/28 to 2006/11/304, representing a period were the banks sampled were not involved in any M&A activity. This is referred to as the non-merger period and is reported in Panel B. By splitting the share returns one is able observe the share price behaviour when the banks undertake M&A activity and when they do not. It is important to note that, during the discussion of the descriptive statistics, no distinction is made between bidder and target banks. This analysis is undertaken in the next chapter.

Turning to the merger period, two-thirds of all share returns have a mean value that is greater than one. Thus, shareholders tend to gain by holding bank shares. In relation to skewness, two-thirds of all share returns are positively skewed. The maximum skewness observed was 8.01 while the minimum was −3.35. Thus, while shareholders tend to gain from holding bank shares during this period, a shareholder can also lose. In relation to kurtosis, more than two-fifths of share returns have a value greater than three, indicating that share returns are leptokurtic. The minimum kurtosis observed was 0.39 while the maximum is 102.95. Thus, shareholders tend to gain or lose substantial amounts.

The merger period can be split further into those M&As that occurred during periods of real economic expansion and contraction. For periods of economic expansion, almost three-fifths of all share returns have a mean value that is greater than one, meaning that shareholders tend to gain during this period on average. Two-thirds of all share returns are positively skewed, with the maximum being 8.01 and minimum −2, which is consistent with the observation that shareholders tend to gain during this period on average. Half of all share returns have a kurtosis value greater than three, indicating again

[4]Owing to a lack of data, the following firm's returns were sampled over different non-merger periods: Credit Lyonnias 2002/07/02 to 2003/07/01, Riggs Bank, Hibernia Bank, MBNA Corporation, 2003/12/01 to 2004/12/01, Banca Nazionale del Lavoro 2005/10/28 to 2006/07/25.

that shareholders tend to gain or lose substantial amounts. For periods of economic contraction the results are very different. Four-fifths of all share returns have a mean value that is less than one. Thus, shareholders during this period tend to lose on average. The degree of skewness in the share returns supports this finding with more than half of all share returns being negatively skewed. A greater portion of share returns are leptokurtic when compared with the economic expansion sample, with three-fifths of share returns having a kurtosis value greater than three, indicating that shareholders tend to gain or lose substantial amounts. The minimum value observed is 1.85 while the maximum is 35.6, meaning that shareholders tend to confront extreme values in share returns more often on average when compared to the expansion period.

For the non-merger period (Panel B) the level of skewness among firms is similar to that in the merger period, with two-thirds of all share returns being positively skewed, meaning that shareholders tend to gain on average. The minimum value is, however, less at −0.41, while the maximum of 15.74 indicates that more shareholders who held bank shares during the non-merger period tended to lose less or gain to a greater extent. This finding is supported by nearly nine out of ten firms' mean share returns being positive. The above can be explained by the fact that no country experienced an economic contraction during the non-merger period. It is intuitive that as the economy grew so did firms (and bank's) earnings resulting in an appreciation of their respective share price. Kurtosis is different during the two periods with less than one-fifth of share returns following a leptokurtic distribution in the non-merger period. More than two-thirds of share returns tend to have kurtosis between 0 and 3, implying that most share returns are mesokurtic in the non-merger period. The minimum kurtosis observed was 0.02 while the maximum was 15.74, thus shareholders who held bank shares during the second period confronted extremes values less frequently than in the case of the merger period.

In order to ascertain whether daily share returns are serially correlated at lag 1, the Ljung-Box Q statistic is computed. To calculate the Q statistic, the autocorrelation coefficient (AC) of share returns at lag 1 is

$$AC_1 = \frac{\sum_{t=2}^{T}(R_t - \bar{R})(R_{t-1} - \bar{R})}{\sum_{t=1}^{T}((R_t - \bar{R})} \quad [3.12]$$

where $\bar{R}$ is the sample mean of R and $-1 \leq AC \leq 1$. If AC_1 is non-zero, first-order correlation is present. More than half of the shares in the merger period have a positive correlation in daily share returns. For shareholders of banks, one can expect that share returns on a certain trading day will positively affect share returns a period later. If this period is broken down per economic state, just more than half of all banks have a positive correlation when the mergers occurred during an expansion. For those that occurred during a contraction, three-fifths of share returns tend to have a negative correlation in daily share returns. Thus, during periods of real economic contraction, one can expect that share returns on a certain trading day negatively affect share returns a period later. For the non-merger period, half of the share returns have an AC greater than zero. Thus, shareholders during this period are evenly split between those that can expect that share returns on a certain trading day will positively affect share returns a period later, and those that can expect share returns on a certain trading day to negatively affect share returns a period later.

The null hypothesis for the Q-statistic test of serial independence in share returns up to order 1 lag is used with

$$Q_{LB} = T(T+2)\sum_{j=1}^{k}\frac{AC_1^2}{T-1} \quad [3.13]$$

where AC_1 is the 1st order autocorrelation and *T* is the number of observations. For the merger period, the findings are that 37, 34 and 29 of 41 firms' returns are serially correlated at the 1%, 5% and 10% level respectively. Shareholders can thus expect a statistically significant relationship between previous daily share returns and the share returns day on day for at least seven out of ten banks. When broken down per economic state, shareholders can expect a statistically significant relationship between previous daily share returns and the share returns day on day for at least three quarters of all banks, while for periods of real economic contraction this can be expected for eight out of ten firms. For the non-merger sample, the findings are that 34, 31 and 24 out of the 38 firms'

returns assessed are serially correlated at the 1%, 5% and 10% level. In line with the merger sample, shareholders can thus expect a statistically significant relationship between previous daily share returns and the share returns day on day for at least seven out of ten banks.

Real economic growth, for the bidding firms' countries is given in Table 3.5, where red represents quarters of negative real GDP growth and green shows quarters of positive growth. For all countries except Canada, quarterly real GDP growth rates were available on Bloomberg. Table 3.6 contains details of the economic performance of bidding firms' countries measured from the final quarter of 2000 through to the first quarter of 2010. The Indian economy grew the most in real terms during this period, while the German economy grew the least. This represents a 6.72% point difference between their respective arithmetic mean growth rates, with the factors contributing to India's high growth rate having already been mentioned above. Additional factors accounting for the substantial growth in the Indian economy since 2003/2004 are mentioned by Mohan (2008) and include low interest rates, a climate conducive to investing, strong global demand, and stringent fiscal policy.

In relation to Germany, Carlin and Soskice (2009) found that the low economic growth can be attributed to two key structural elements. The first is the wage restraint policies urged by the government. Suppressed wages weakened aggregate demand and affected economic output. The second factor relates to the pro-cyclical fiscal policy implemented by the government. This, along with the wage restraint policies, amplified the effects of external macroeconomic shocks such as the Dot.com bubble and Subprime Crisis of 2007−2008, causing a significant slowdown in economic growth and high levels of unemployment. A contributing factor to the large difference in real GDP growth rates between the Indian and German economies is related to the developed and developing state of Germany and India respectively. Todaro and Smith (2006) note that two factors play an important role in explaining why developing countries' GDP growth rates are often larger when compared to those of developed countries. The first relates to the fact that developing countries often have access to technology that developed countries did

not have in their initial stages of growth. As such, developing countries are able to employ more productive techniques of production and bypass the initial stages of technological development pioneered by developing countries. The second factor is the smaller amounts of capital and the lower levels of profitability in developing countries. In such cases, the marginal increase in the product of capital and returns on investments would be expected to be higher in developing countries. Thus, output would grow at a much faster rate in developing countries, albeit off a lower base than developed countries.

Table 3.4: Descriptive statistics

Panel A: Merger Period

	Overseas-Chinese Banking Corporation Ltd	M&T Bank	Allied Irish Banks	Canadian Imperial Bank of Commerce	Credit Agricole	Credit Lyonnais	Société Générale	Bank of America	JP Morgan Chase	Fubon Bank (Fubon Financial Holding)	PNC Financial Services
Mean (%)	0.00	0.01	0.05	-0.03	-0.02	0.07	0.00	0.01	0.06	0.03	0.01
Standard Deviation (%)	1.01	0.76	1.09	0.83	1.20	1.12	1.34	0.58	0.75	0.79	0.41
Skewness	-0.42	0.09	-1.18	0.03	-0.18	1.10	0.23	-2.00	-0.16	1.41	0.06
Kurtosis	1.85	3.76	12.27	1.70	1.54	10.05	1.84	14.31	0.89	9.21	1.08
Autocorrelation (Lag 1)	-0.02	-0.09	-0.02	0.00	-0.07	0.10	0.09	-0.08	-0.06	-0.18	0.02
Ljung-Box Q	0.13	1.98	0.11	0.00	1.24	2.75	2.19	1.59	0.84	8.93	0.12
p-Value	0.71	0.16	0.74	0.95	0.27	0.10	0.14	0.21	0.36	0.00	0.73

	Riggs Bank	Oriental Bank of Commerce	Wing Hang Bank	Capital One Financial Corporation	Hibernia Bank	Barclays Bank	ABSA	Bank of America	MBNA Corporation	BNP Paribus	Banca Nazionale del Lavoro
Mean (%)	0.06	0.04	0.08	0.00	0.05	0.02	0.09	0.01	-0.01	0.04	0.01
Standard Deviation (%)	0.91	1.79	0.94	0.60	0.70	0.54	0.51	0.36	0.90	0.54	0.37
Skewness	1.96	-0.95	0.24	0.14	6.36	-0.27	0.25	-0.39	1.71	-0.27	0.31
Kurtosis	13.77	7.83	2.03	0.84	75.47	0.98	0.43	0.39	63.11	0.77	10.16
Autocorrelation (Lag 1)	-0.09	0.18	0.10	-0.02	0.06	-0.05	0.06	-0.02	0.03	-0.11	0.10
Ljung-Box Q	2.37	9.22	2.49	0.10	1.03	0.60	1.06	0.10	0.26	3.58	2.64
p-Value	0.12	0.00	0.12	0.75	0.31	0.44	0.30	0.75	0.61	0.06	0.10

	Regions Financial Corporation	Am South Bancorporation	ICICI Bank	Banco Bilbao Vizcaya Argentaria	Compass Bancshares	Fifth Third Bank	First Charter Bank	Standard Chartered Bank	HDFC Bank	Centurion Bank of Punjab	Royal Bank of Canada
Mean (%)	0.00	0.00	0.15	0.01	0.03	-0.02	0.04	0.03	0.08	0.05	-0.03
Standard Deviation (%)	0.43	0.43	2.08	0.50	0.46	0.56	1.08	0.73	1.20	1.46	0.63
Skewness	0.93	0.08	0.16	-0.37	1.82	0.37	8.01	0.09	-0.08	-0.42	0.48
Kurtosis	8.52	0.70	1.35	1.16	11.20	4.88	102.95	3.73	1.74	8.15	1.86
Autocorrelation (Lag 1)	-0.08	-0.05	0.12	0.10	0.18	-0.29	0.04	-0.06	0.13	0.11	-0.04
Ljung-Box Q	1.67	0.55	3.95	2.52	8.44	22.25	0.44	0.83	4.47	3.20	0.47
p-Value	0.20	0.46	0.05	0.11	0.00	0.00	0.51	0.36	0.04	0.07	0.49

	Commerzbank	PNC Financial Services	National City Corp	Capital One Financial Corporation	Banco do Brasil	Banco Nossa Caixa	Thanachart Bank	Siam City Bank
Mean (%)	-0.11	-0.03	-0.44	-0.11	-0.10	0.14	0.17	0.23
Standard Deviation (%)	1.45	1.44	4.52	2.34	1.89	1.95	1.05	1.32
Skewness	0.29	0.63	-3.35	-0.03	0.30	1.29	0.43	2.65
Kurtosis	4.25	3.88	35.60	2.47	2.52	7.86	2.48	19.99
Autocorrelation (Lag 1)	0.01	-0.15	0.06	-0.08	0.01	0.12	0.05	0.06
Ljung-Box Q	0.01	5.95	1.11	1.93	0.04	4.05	0.75	0.85
p-Value	0.92	0.02	0.29	0.17	0.85	0.04	0.39	0.36

Panel B: Non-Merger Period

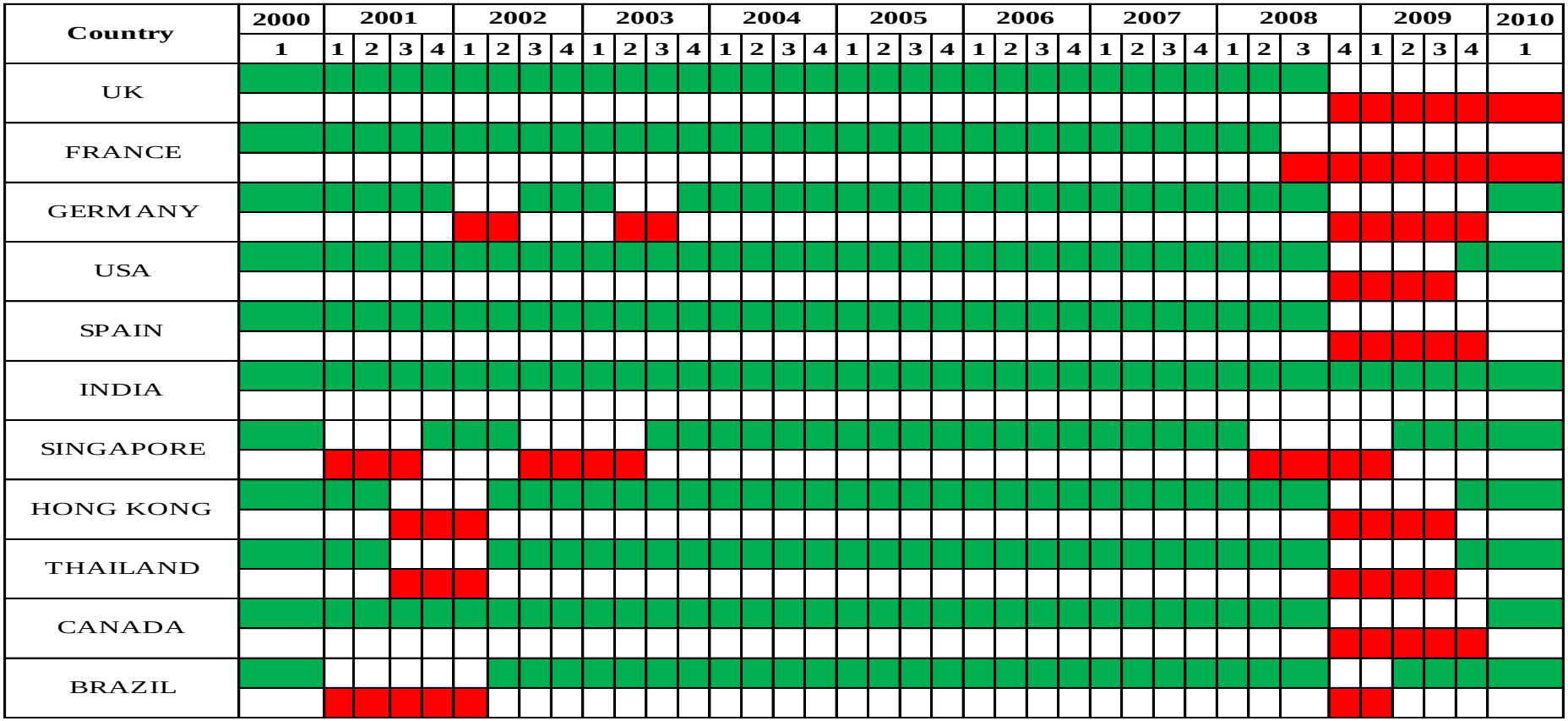
	Overseas-Chinese Banking Corporation Ltd	M&T Bank	Allied Irish Banks	Canadian Imperial Bank of Commerce	Credit Agricole	Credit Lyonnais	Société Générale	Bank of America	JP Morgan Chase	Fubon Bank (Fubon Financial Holding)	PNC Financial Services
Mean (%)	0.02	0.02	0.03	0.04	0.06	0.04	0.06	0.03	0.04	0.03	0.02
Standard Deviation (%)	0.44	0.39	0.57	0.39	0.66	1.08	0.60	0.35	0.46	0.54	0.46
Skewness	0.02	0.14	0.17	-0.07	-0.41	1.42	-0.16	0.16	0.71	1.41	0.34
Kurtosis	0.60	0.71	1.82	0.23	2.19	13.57	2.05	1.43	3.10	8.84	2.14
Autocorrelation (Lag 1)	-0.18	-0.04	-0.03	0.06	-0.10	0.11	0.01	0.06	0.04	-0.17	-0.05
Ljung-Box Q	8.53	0.50	0.27	0.82	2.44	3.09	0.03	0.90	0.35	7.22	0.67
p-Value	0.00	0.48	0.61	0.37	0.12	0.08	0.87	0.34	0.55	0.01	0.41

	Riggs Bank	Oriental Bank of Commerce	Wing Hang Bank	Capital One Financial Corporation	Hibernia Bank	Barclays Bank	ABSA	MBNA Corporation	BNP Paribus	Banca Nazionale del Lavoro	Regions Financial Corporation
Mean (%)	0.04	0.02	0.06	0.00	0.04	0.04	0.04	0.01	0.05	0.01	0.02
Standard Deviation (%)	0.90	1.09	0.79	0.66	0.48	0.54	0.91	0.64	0.59	0.35	0.40
Skewness	2.29	0.06	0.03	-1.44	-0.09	-0.01	0.30	-0.40	-0.08	0.74	0.50
Kurtosis	15.74	1.81	2.29	10.95	0.02	1.00	2.67	0.50	0.35	14.15	4.35
Autocorrelation (Lag 1)	-0.07	0.14	0.06	-0.08	-0.11	-0.10	0.03	0.02	-0.09	0.23	-0.01
Ljung-Box Q	1.40	5.12	0.93	1.60	2.89	2.74	0.16	0.10	2.00	10.23	0.04
p-Value	0.24	0.02	0.33	0.21	0.09	0.10	0.69	0.75	0.16	0.00	0.85

	Am South Bancorporation	ICICI Bank	Banco Bilbao Vizcaya Argentaria	Compass Bancshares	Fifth Third Bank	First Charter Bank	Standard Chartered Bank	HDFC Bank	Centurion Bank of Punjab	Royal Bank of Canada	Commerzbank
Mean (%)	0.03	0.08	0.05	0.04	0.00	0.01	0.04	0.08	-0.03	0.04	0.05
Standard Deviation (%)	0.43	0.94	0.47	0.43	0.49	0.67	0.67	1.08	0.82	0.42	0.81
Skewness	0.37	0.11	0.06	0.15	0.42	0.23	0.01	-0.14	-0.20	0.41	-0.42
Kurtosis	2.10	1.00	0.33	1.28	0.95	0.26	0.33	1.84	1.22	0.73	2.11
Autocorrelation (Lag 1)	0.04	0.12	0.09	-0.03	-0.11	-0.14	-0.08	0.00	0.05	0.01	-0.01
Ljung-Box Q	0.42	3.46	2.11	0.28	3.24	4.75	1.76	0.00	0.73	0.04	0.02
p-Value	0.52	0.06	0.15	0.60	0.07	0.03	0.19	0.96	0.39	0.85	0.90

	National City Corp	Banco do Brasil	Banco Nossa Caixa	Thanachart Bank	Siam City Bank
Mean (%)	0.02	0.05	0.00	0.03	-0.03
Standard Deviation (%)	0.47	1.27	1.13	0.81	0.82
Skewness	-0.16	0.70	0.03	0.41	-0.20
Kurtosis	1.19	3.20	0.42	1.56	1.22
Autocorrelation (Lag 1)	-0.10	0.11	0.18	0.03	0.05
Ljung-Box Q	2.77	2.83	8.12	0.22	0.73
p-Value	0.10	0.09	0.00	0.64	0.39

Table 3.5: Periods of economic expansion and contraction in the respective bidders' countries



Note: India's real GDP is measured from 2000Q4–2004Q4 in the 1994 base year prices while 2005Q1–2010Q1 is measured in 1999/2000 prices. Singapore's real GDP is measured from 2000Q1 with 2005 as a base year. All other country's real GDP measured during the same period is done so with the same base year. In respect to Canada, a three-month arithmetic mean was used to proxy for quarterly growth due to Canadian real GDP measured at a monthly frequency.

Source: Bloomberg (2010) & own calculation

Table 3.6: Rate of change in real GDP (2000Q1–2010Q1)

Country	Arithmetic mean (%)	Standard deviation (%)	Skewness	Kurtosis
UK	1.50	2.49	-2.18	3.63
FRANCE	1.21	1.68	-1.66	2.45
GERMANY	0.63	2.36	-1.53	2.92
USA	1.70	1.90	-1.54	2.13
BRAZIL	0.81	3.13	0.12	-0.56
SPAIN	2.30	2.41	-1.81	2.02
INDIA	7.35	2.31	-0.72	0.01
SINGAPORE	5.16	11.69	0.84	2.67
HONG KONG	3.94	4.20	-0.77	0.30
CANADA	1.80	1.91	-1.73	2.54
THAILAND	4.22	3.64	-1.49	3.09

Source: Bloomberg (2010) & own calculation

Growth rates of more than four-fifths of all countries tend to be negatively skewed. A possible explanation for this is the two economic shocks that occurred during the early and latter part of the decade. The first was the Dot.com bubble of 1998 to 2000 and the subsequent market crash of 2000 to 2002. Ofek and Richardson (2003) state that, in 2000, internet companies comprised approximately 6% of the total market capitalisation of all American publicly listed companies. These authors (Ofek & Richardson, 2003) show that short sale restrictions on such shares prevented prices from dropping to fundamental levels, which caused substantial price increase appreciation for technology companies. However, Ofek and Richardson (2003) state that real economic factors such as rising interest rates and a general slowdown in business demand after the Y2K switchover resulted in the demand for technology shares to diminish. On 10 March 2010, the simultaneous processing of large sell orders on technology company's shares caused mass sales, which over time eroded all gains that shareholders had earned. Ofek and Richardson (2003) state that several large telecommunications and technology companies filed for bankruptcy destroying investor confidence and exacerbating the economic slowdown that the rising interest rates had caused.

The second shock was the Subprime Crisis of the late 2000s. Taylor (2009) explains the causes by referring to the American housing market boom and bust of 2006 - 2007, which resulted in a diminution of credit extension. The combined effect of increasing oil prices and high interest rates caused developed economies to contract during this period. The Subprime Crises is dealt with in more detail in the following chapter. The growth of the Singaporean economy in real terms was the most volatile during this period, while French real economic growth was the most stable. The difference observed between the volatility of the country's economic growth rates is substantial at a 10.01 percentage point difference.

The British economy grew at a fairly volatile rate during the period as indicated by kurtosis exceeding 3. The British economy contracted in real terms by 4.9% during 2009 and was affected more by the Subprime Crises than other developed nations such as America, France and Canada, which contracted in real terms in the same year by 2.4%, 2.5% and 2.8% respectively. According to Hay (2009), the reason for this inferior British economic performance is that in Britain, as in America, housing prices dropped considerably prior to 2009. Hay (2009) adds that large levels of debt for British businesses and consumers were also apparent. The performance of this debt[5] thus began to decrease as domestic interest rates increased, much the same way as in America. With new credit becoming more expensive to obtain and difficult to service, British aggregate demand and thus economic output were suppressed causing an increase in bankruptcies and employee retrenchments and deteriorating investor confidence. Hay (2009) describes a second factor as being the pro-cyclical nature of governmental policies together with labour market inflexibility. This prevented the retrenchment of additional workers when the possibility of real economic contraction loomed. Once GDP had decreased in real terms, more employees were retrenched leading to a rise in debt defaults and a drop in consumption thereby aggravating the decrease in output.

[5]"The performance of debt" is a term used by lenders to describe the state of a loan. If a debt is performing, the borrowers are paying the monthly instalments, meaning the debt is providing a return to the lender (bank) and thus is a performing asset. The converse would be a non-performing loan.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

This chapter contains the results of the empirical analysis. The first section consists of a comparison of the returns earned by bidder and target shareholders confronted by different economic states. The second section comprises an assessment of whether an M&A deal affected the bidder or target share price on the event day. The issue of SSME is considered in the third section, with a discussion relating to the deficiencies of the study concluding the chapter.

4.2 BIDDER AND TARGET SHAREHOLDER RETURNS

In this section, the effects of M&As on shareholder wealth for bidder and target firms are assessed. Table 4.1 shows the difference between share market reactions towards the bidding bank's share returns for periods of real economic expansion and contraction in the bidder's country of domicile. M&As are considered wealth-destroying events for bidder banks' shareholders when measured during real economic expansions and contractions. When assessed per economic state, bidder banks' M&As that occurred during real economic expansions gain a CAAR of 0.11% during the (−5,+5) window and 0.13% during the (−5,+24) window in Model 1. However, this is not consistent with Model 2 and Model 3, which both imply the wealth-destroying nature of M&As for bidder banks' shareholders. During periods of real economic contractions, bidder banks' shareholders incurred a loss as a result of the M&A. Thus, M&As are considered, on average, to be a wealth-destroying event for shareholders of the bidding bank, irrespective of the economy's state, which is consistent with *a priori* expectations.

For Model 1 and Model 2, shareholders of bidder banks, whose M&As occurred during real economic contractions, incurred a negative CAAR measured for all windows, that is, greater than the CAAR for bidder banks' M&As occurring in real economic expansions. For Model 1 there is a 10.87% point difference between the greatest gain during real

economic expansions and the greatest loss during real economic contractions, measured during the (−5,+24) window. In relation to Model 2, there is an 2.64% point difference between the greatest loss during real economic expansions and contractions, measured during the (−5,+24) window. Thus, the market considered the M&A as being more detrimental to the company's future earning prospects when the M&A occurred during a contraction as opposed to an expansion. The explanation for this phenomenon relates to two out of the three bidders sampled had acquired targets that were affected by the Subprime Crisis of 2008−2009[6]. Taylor (2009) explains that the American housing market crash that occurred subsequent to the M&As led to a rise in foreclosures and delinquencies, owing to rising interest rates and declining house prices. Thus, lenders' income statements were affected by the large volume of non-performing loans and the drop in value of the collateral attached to such loans. Along with this problem, various adjustable subprime mortgages were offered. Taylor (2009) adds that these mortgages were securitised in such a way that the risk associated with them was underestimated to a significant extent and the high yield, minimal risk nature of such securities was attractive to financial institutions. In addition, Taylor (2009) notes that, there was considerable uncertainty about each bank's exposure to the securities and the extent to which possible losses would affect the bank's future operating performance. The pressure on banks' income statements, as well as the uncertainty concerning the extent of future operating losses, made the shares unattractive investments. Thus, the M&A was considered to be adding the target bank's sub-prime securities and unprofitable assets onto the bidding bank's already underperforming balance sheet, further adding to the uncertainty of future operating performance.

For the bidder's shareholders, the least negative CAAR was observed for the (−5, +5) window in Model 1 and was not statistically significant when measured using MacKinlay's (1997) normally distributed CAAR *t* statistic. It should be noted that all mentioned made of statistical significance going forward is in reference to the test statistic specified in Chapter Three. Turning to the bidder banks' CAAR measure during

[6] PNC Financial Services acquisition of National City Corp (October 2008) and Commerzbank's merger with Dresdner Bank (October 2008).

periods of real economic contraction, the greatest negative CAAR is measured for the (−5,+24) window in Model 3, and is statistically significant at the 1% level. Such results are similar to the CAAR associated with bidder banks' M&As occurring during real economic expansions and contractions.

Table 4.1: CAAR for bidding banks' shareholders: total period and economic states

Event Period	Metric	Model 1	Model 2	Model 3
Panel A: Total Period, Bidder				
(-5,+5)	CAAR (%)	-0.34**	-0.50**	-10.06*
	t-stat	(-2.29)	(-2.62)	(-53.06)
(-5,+24)	CAAR (%)	-1.18*	-1.66*	-31.57*
	t-stat	(-7.70)	(-9.02)	(-171.66)
(-10,+10)	CAAR (%)	-0.99	-1.27*	-21.16*
	t-stat	(-7.13)	(-6.68)	(-111.04)
Panel B: Expansion, Bidder				
(-5,+5)	CAAR (%)	0.11	-0.36	-10.35*
	t-stat	(0.72)	(-1.80)	(-51.17)
(-5,+24)	CAAR (%)	0.13	-0.36***	-31.25*
	t-stat	(0.80)	(-1.82)	(-158.44)
(-10,+10)	CAAR (%)	-0.42	-0.96*	-21.34*
	t-stat	(-2.92)	(-4.72)	(-105.07)
Panel C: Recession, Bidder				
(-5,+5)	CAAR (%)	-3.59*	-1.46***	-7.97*
	t-stat	(-5.98)	(-2.21)	(-12.06)
(-5,+24)	CAAR (%)	-10.74*	-11.19*	-33.89*
	t-stat	(-15.19)	-15.48	(-46.86)
(-10,+10)	CAAR (%)	-5.18*	-3.58*	-19.86*
	t-stat	(-9.01)	(-5.43)	(-30.09)

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

For periods of real economic expansion and contraction, Table 4.2 contains the difference between stock market reactions towards the target bank's CAARs. For Model 1 and Model 2, M&As create wealth for the target banks' shareholders when measured during real economic expansions and contractions. For Model 3, however, M&As destroy wealth for the target banks' shareholders. The worst loss incurred by shareholders, measured in Model 3 during the (−5,+24) window, represents an 24.47% point difference between the greatest gain measured in Model 1 during the (−5,+24) window and a 24.84% point difference between the greatest gain measured in Model 2 during the (−5,+24) window.

Research that makes use of Model 3 to determine the CAARs attributable to target shareholders is discussed in Eckbo (1983), Jarrell and Poulson (1989) and Houston and Ryngaert (1994). In their study on European acquisitions from 1993 to 2000, Goergen and Renneboog (2004) made use of Model 3 in research that involved firms from multiple industries. However, this research differs from that mentioned above, as Goergen and Renneboog (2004) adjust the beta estimates by adjusting the share and market returns to ensure that they are measured between the time of last trade in the respective firms, as done in Dimson and Marsh (1983). This adjustment is made to control for thin trading in share returns which often biases the beta downwards. Bradfield (2003) explains this phenomenon, stating that thin trading may cause the closing price of a stock on a specific day to not be determined by a trade on that specific day, but rather by a trade occurring on previous days. Thus, the market index value may not be matched to the trade for a share on that day but rather to trades on various other days. This mismatch impacts on the covariance estimate between the share returns and the market returns, causing a downward bias in the covariance estimate and thus impacting on the beta estimate. The depth of trading volumes was not taken into account in this study and may provide possible insights into the difference observed with regards to shareholder's CAARs and the levels of their statistical significance in Model 3 when compared to Model 1 and Model 2. Given the problems of Model 3 mentioned in the previous chapter, as well the ease of computation of Models 1 and Model 2, recent event study articles rarely use Model 3 in the calculation of ARs, as shown by Spyrou and Siougle (2010)

who make use of Model 1, and Ramakrishnan (2010), who makes use of Model 2 to determine the CAARs attributable to bidder and target firms during M&A.

Turning to M&As occurring during an economic expansion, shareholders of target banks gain when the CAAR is measured in Model 1 and Model 2. This is again consistent with *a priori* expectations. For Model 3, the M&A destroys wealth for the target banks' shareholders. The worst loss incurred by shareholders, measured in Model 3 during the (−5,+24) window, represents a 22.12% point difference between the greatest gain measured in Model 1 and a 22.10% point difference between the greatest gain measured in Model 2. For Model 2, the CAAR is greater for the (−5, +24) window by 1.04% when compared to the (+10,-10) window and 1.01% when compared to the (+10, −10) window. M&As destroy wealth for a target bank's shareholders whose M&As occurred during real economic contractions. This result is consistent across all models and differs from a target bank's M&A that occurred during a period of real economic expansion. This phenomenon can be explained by analysing the real economic contraction of the American economy while these M&As were being concluded and is described in Taylor (2009). With lenders still affected by non-performing loans, the issuance of risky securitised assets and high interest rates, credit became more expensive for consumers and businesses. Taylor (2009) notes that this caused a contraction in American aggregate demand and when combined with increasing oil prices and the decrease in American house prices, allowed the Subprime Crisis to affect the American economy. A market-wide drop in share prices occurred, with the S&P 500 index losing more than one-third of its value between New Year's Day 2007 and the end of 2008. Taylor (2009) notes that the financial sector shares led the general drop in share prices due to the sub-prime securities and poorly performing assets on their balance sheet. Banking targets were merged with bidder banks that incurred the same drop in earnings and default on their assets.[7] Thus, the shareholders considered such M&As as having a negative effect on the future earnings prospects of the new entity, and sold their shares in the target bank causing a drop in its share price. The decrease in share prices of financial firms affected the share

[7]For lenders, a loan is viewed as an income-generating asset based on a contract. Thus, if borrowers are unable to repay the loan the contract is breached and the income is lost, thus, a default on a bank's assets (loans) occurs resulting in a drop in income.

prices of companies belonging to other sectors, causing a market-wide decrease. This result should be similar to the share price decrease in technology companies during the during the Dot.com bubble. In addition, these results should be consistent with the decrease in share prices of companies deriving a significant portion of revenue from emerging markets during the South East Asian crisis of the late 1990s.

Turning to target banks' CAAR during periods of real economic contraction, the greatest positive CAAR is measured in Model 1 during the (−10,+10) window and is statistically significant at the 5% level. The greatest negative CAAR is measured in Model 3 during the (−5, +24) window, and is statistically significant at the 1% level.

Table 4.2:CAAR for target banks' shareholders: total period and economic states

Event Period	Metric	Model 1	Model 2	Model 3
Panel A: Total Period, Target				
(-5,+5)	CAAR (%)	2.89*	2.61**	-6.47*
	t-stat	(7.56)	(-5.94)	(-14.74)
(-5,+24)	CAAR (%)	3.1*	3.47*	-21.37*
	t-stat	(-6.37)	(6.14)	(-37.83)
(-10,+10)	CAAR (%)	3.81*	3.33*	-13.59*
	t-stat	(12.07)	(10.57)	(-37.63)
Panel B: Expansion, Target				
(-5,+5)	CAAR (%)	3.83*	3.84*	-4.59*
	t-stat	(15.26)	(12.81)	(-15.29)
(-5,+24)	CAAR (%)	4.81*	4.85*	-17.25*
	t-stat	(17.81)	(14.17)	(-50.39)
(-10,+10)	CAAR (%)	4.87**	3.81***	-12.39*
	t-stat	(2.21)	(1.95)	(-41.09)
Panel C: Recession, Target				
(-5,+5)	CAAR (%)	-3.75	-6.03*	-19.69*
	t-stat	(-1.54)	(-2.40)	(-7.83)
(-5,+24)	CAAR (%)	-8.88**	-6.20***	-50.15*
	t-stat	(-2.72)	(-1.84)	(-14.86)
(-10,+10)	CAAR (%)	-3.63***	-0.03	-22.01*
	t-stat	(-2.03)	(-0.01)	(-12.18)

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

As mentioned previously, the analysis of target banks' share price performance during periods of real economic contraction comprises M&A were both the bidder and target are banks. This statement however has one exception, the TARP deal made mention to in Chapter 3. While the study of the TARP deal is not an objective of the study a separate analysis provides insights into the effect these deals had on share prices of banks as well as to control and identify any significant changes it may have had on the overall results. Table 4.3 shows the target banks' CAARs excluding the TARP deal. Across all windows and models, the target banks' shareholders earn greater CAARs when the TARP deal is omitted. This result is found during periods of both real economic expansions and contractions. An explanation for this phenomenon relates to the fact that fewer target M&As occurring during real economic contractions are included in the total period sample. Thus, fewer CAARs are considered in calculating the total period CAAR.

Table 4.3: CAAR for target banks' shareholders excluding all TARP deals: total period and economic state

Event Period	Metric	Model 1	Model 2	Model 3
Panel A: Total Period, Target EXCL TARP				
(-5,+5)	CAAR (%)	3.15*	3.49*	-6.32*
	t-stat	(8.42)	(7.92)	(-14.32)
(-5,+24)	CAAR (%)	3.43*	3.87***	-23.01*
	t-stat	(7.37)	(1.97)	(-40.74)
(-10,+10)	CAAR (%)	4.94*	4.46*	-20.42*
	t-stat	(2.18)	12.77368	(-58.52)
Panel B: Recession, Target EXCL TARP				
(-5,+5)	CAAR (%)	-6.45	-1.45	-30.52*
	t-stat	(-1.50)	(-0.31)	(-6.58)
(-5,+24)	CAAR (%)	-15.89*	-9.93	-103.55*
	t-stat	(-2.76)	(-1.59)	(-16.59)
(-10,+10)	CAAR (%)	5.9**	13.47*	-33.85*
	t-stat	(16.64)	(3.67)	(-11.47)

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

An explanation for this phenomenon relates to the target bank analysed − National City Corp – being affected by the Subprime Crisis. During the Crisis, National City Corp's wholesale mortgage division closed and an investigation by the American Securities and Exchange Commission (SEC) in respect of irregularities in relation to loan underwriting and bank regulations was conducted. Thus, the bank's shareholders incurred substantial losses during this period. When compared to the other target bank sampled during the period of real economic contraction − Capital One Corp − shareholder losses were different. During the Subprime Crisis, Capital One Corp was in distress and required TARP funds to prevent it from bankruptcy, but its operating performance was affected less than National City Corp's. Thus, the losses that shareholders of Capital One Corp incurred were less than those incurred by shareholders of National City Corp. This caused a decrease in the magnitude of the targets' CAARs which were negative during the real economic contraction period. For targets and bidders, across periods of real economic expansions and contractions, daily CAAR appear in Appendix B, Table B1.1−B3.3.

4.3 EVENT SIGNIFICANCE

The application of the event study method allows one to determine whether an M&A had a statistically significant effect on the CAAR of the bidder and the target firm. Table 4.4 contains an overview of event windows and market models where a statistically significant effect on a bank's shareholders' CAAR is observed on the event day. Across all three event periods and models, the affect of the banking M&A was statistically significant for just over four-fifths of banks' share returns at the 5% and 10% level respectively. While over two-thirds of banks' share returns across all three event periods and models was significant at the 1% level. Target banks' share returns, measured during real economic expansions and contractions, were affected by their M&As, with more than four-fifths of all banks' CAARs on the event dates being statistically significant at the 1% level. Bidder banks' share returns measured during the same economic expansions and contractions were similar, with four-fifths of all event date CAARs being statistically significant at the 1% level.

Bidder banks' CAARs were affected by their M&As when these occurred during real economic expansions, with four-fifths of all event date CAARs being statistically significant at the 1% level. Bidder banks' CAARs, whose M&A occurred during a contraction, are affected less by their M&As in comparison to M&As occurring during real economic expansions, with one-third of all event date CAARs being statistically significant at the 1% level. Turning to target banks' M&As occurring during the bidder countries' economic expansions, fewer than two-thirds of all event date CAARs were statistically significant at the 1% level. The result is similar to the effect of M&As on target banks' share prices whose M&As occurred during periods of real economic contractions. Thus, when analysing target banks' CAAR, whose M&As occurred during real economic expansions and contractions, the discrepancy between the statistical significance of CAARs is less conspicuous when compared to the difference between bidder banks' CAARs during periods of real economic expansions and contractions. An explanation for this phenomenon relates to how the economic state is defined for the M&A. As mentioned in Chapter 1, an M&A is deemed to have occurred during a period of real economic expansion and contraction by determining the state of the economy of the bidder's country. Thus, the state of the economy will affect the bidder bank's CAAR more than the target bank's CAAR. This is especially the case if the country in which the target is domiciled has a different economic state to the bidder's country. An example is the case of cross-border M&As which comprise more than a tenth of the total deal sample.

For all economic states, target banks have a statistically significant CAAR on the day prior to the event day for less than four-fifths of the event windows, at the 1% level. In comparison to bidder banks, the CAAR is only statistically significant for two-thirds of all event windows, at the 1% level. For periods of economic expansion, target banks have a statistically significant CAAR on the day prior to the event day for two-thirds of all event windows, at the 1% level, while for bidder banks just more than half of event windows have a CAAR on the day prior to the event day that is significant at the 1% level. For periods of economic contraction, target banks have a statistically significant CAAR on the day prior to the event day for two-thirds of all event windows at the 5%

level, while for bidder banks under half of all event windows have a CAAR on the day prior to the event day that is significant at the 5% level. Thus, the market can identify M&A targets before the bidder is identified given that on average more targets experience statistically significant movement in share prices before the event day than when compared to bidders. One example is the Royal Bank of Scotland (RBS) and ABN AMRO M&A in 2007. On 23 April 2007, Barclays Bank announced a proposed acquisition of ABN AMRO. However, two days later a consortium led by RBS made a counter offer. Given that RBS offered a greater amount, ABN AMRO's board accepted its offer and withdrew its support for the Barclays bid on 30 July 2007. Thus, the target bank was identified almost three months before the potential bidder.

Turning to the issue of a target bank's M&A occurring during a period of real economic contraction, the removal of the TARP deal from the analysis did not affect the results. Thus, the market accounted for this deal in a similar way to other M&A deals that occurred during a period of real economic contraction. In relation to the suitability of the test statistic applied, De Jong, Kemna and Kloek (1992) explain that returns obtained under the assumptions of normality and homoscedasticity may be spurious if returns take extreme values and have differing variances. Kramer (2001) explains that if the above features are ignored, the test statistic tends not to follow its assumed distribution. This may cause the test statistic to over or under estimate the statistical significance of the event on share returns. To address this issue, bootstrapping procedures are often used to estimate the level of bias in the test statistic. Hein and Westfall (2004) classify these tests into two broad categories, namely data-based bootstrapping and test-statistic based bootstrapping. Data-based bootstrapping involves bootstrapping the share returns in order to estimate an empirical distribution function from which inferences about the possible bias in the test statistic can be made. Serra (2002) uses this technique as a means of estimating bias in a test statistic, by determining N AR in the event day where N is the number of firms used in the analysis. Many bootstrapped samples are generated from the initial sample of ARs determined above. No mention is made of the number of samples generated or whether sampling is done with replacement. For each sample, Serra (2002) computes the expected AAR and explains that in order to compute the statistical

significance of CAAR one would need to repeat this process for the preceding days in the event window in order to compute a CAAR for each bootstrapped sample. Serra (2002) applies the shift method where the distribution is shifted to the left by the average population expected value, in order to make inferences with regards to the possible bias in the test statistic. Thus, the null hypothesis of AAR = 0 is rejected if

$$\frac{\eta+1}{NS+1} < \alpha \qquad [4.1]$$

Where α is the level of significance, NS is the number of bootstrapped samples and η is the number of times the random sample generates an AAR which is less than a criterion value. The criterion value is defined as the actual sample value minus the population expected value (by assumption this is zero) plus the expected value of the simulation averages (AAR).

Test-statistic based bootstrapping involves bootstrapping the test statistic itself in order to create an empirical distribution from which inferences about the possible bias in the test statistic can be made. Kramer (2001) makes use of this method, determining a sample of N t_i statistics during a single-day event period. The t_i statistic in this case is the test statistic of the dummy variable coefficient for each firm in a multivariate regression model (MVRM), while N is the number of firms used in the study. Using the sample of t_i statistics, a Z statistic can be determined with

$$Z = \frac{\sum_{i=1}^{N} t_i}{\sqrt{N}} \qquad [4.2]$$

Kramer (2001) normalises the Z statistic by dividing by the standard deviation of the sample t_i statistics. In addition, the sample of t_i statistics are mean adjusted. Kramer (2001) notes that this is to prevent the empirical distribution constructed from the t_i statistics centring on the normalised value of the Z statistic. Using the sample of mean adjusted t_i statistics, Kramer (2001) draws 1000 samples via replacement. This author recommends the use of this sample size because the generation of larger sample sizes hardly affects the results. Kramer (2001) calculates a normalised Z statistic for each

bootstrapped sample and constructs an empirical distribution function from these values. Kramer (2001) then compares the Z statistic determined from the empirical data set to the critical values from the empirical distribution function and makes inferences about the extent of the bias present in the test statistic.

As shown by the level of skewness and kurtosis of the share returns appearing in Table 3.4 of the preceding chapter, such share returns do not follow a normal distribution. As such, possible bias may exist in the test statistic, thus detracting from the accuracy of the statistical significance of the CAARs. In order to test the robustness of the CAAR test statistic, a data-based bootstrapping procedure, adapted from Serra (2002), is applied. This method is preferred to the Kramer (2001) test-statistic based approach, as the latter is only applicable when the statistical significance on an event is determined in a MVRM framework, while this study makes use of the CAAR framework of MacKinlay (1997).

Table 4.4: Event date CAAR significance

	Bidder	Target	Target EXCL TARP	Expansion (Bidder)	Expansion (Target)	Recession (Bidder)	Recession (Target)	Recession (Target) EXCL TARP
Panel A: Model 1								
(-5,+5)	1	1	1	1	1	N/A	1	1
(-10,+10)	N/A	1	1	10	5	N/A	5	N/A
(-5,+24)	1	1	1	1	1	N/A	5	5
Panel B: Model 2								
(-5,+5)	1	5	5	1	1	N/A	1	1
(-10,+10)	1	1	1	1	5	N/A	N/A	10
(-5,+24)	1	1	N/A	1	1	N/A	5	5
Panel C: Model 3								
(-5,+5)	1	1	1	1	N/A	1	1	1
(-10,+10)	1	1	1	1	1	1	1	1
(-5,+24)	1	1	1	1	N/A	1	1	1

Note: 1, 5 and 10 denote an event date with statistically significant CAARs at the 1%, 5% and 10% levels respectively. Event dates which do not contain statistically significant CAARs are denoted by N/A

.

The procedure used in this study consists of the following steps:

1. Determine AAR for all shares on the event day ($\tau = 0$). This step is repeated for all days preceding the event date within the estimation window in order to determine a CAAR whose significance is tested using MacKinlay's CAAR test statistic. The estimation and event windows are chosen from Well (2006) owing to the small size, thus allowing the minimisation of the effect other variables may have on share and market return data.

2. The following steps are repeated 1000 times.

    a. *N* observations are randomly drawn from a normal distribution, where *N* is equal to the number of firms in the sample. Normal distribution is used since the test statistic under the null is assumed to be normal. Pop Tools[8] is used to generate the simulated sample owing to the deficiencies in Microsoft Excel's® random number generator.

    b. For each sample the AAR is calculated in the same way as done in Step 1.

3. For each day preceding the event, Step 2 is repeated.

4. The AARs produced for each day are summated to determine the CAAR.

5. The shift method is used in order to make inferences about the extent of bias in the test statistic. This is done in the same way as was computed for Serra (2002).

6. The result in Step 4 is compared with the test statistic in Step 1 in order to determine if the empirical value (Step 1) over- or underestimates the statistical significance determined by MacKinlay's CAAR test statistic when compared to bootstrapped results (Step 4).

[8] Available at http://www.cse.csiro.au/poptools/

7.The above steps are repeated for all three market return models.

In Model 1, the AAR on the event day for 41 firms ($N = 41$) is calculated at −0.09%. The foregoing procedure is repeated for all 5 days, which yields an event day CAAR of 0.48%. When MacKinlay's (1997) *t*-statistic is calculated, the null hypothesis of no CAARs on the event date is rejected at the 5% level of statistical significance. By conducting Step 2 above the bootstrapped sample, CAAR is −0.02%, which implies that the criterion value is 0.47%. Only two AARs in the 1000 event day ($\tau = 0$) samples are greater than the criterion value. By substitution in equation (4.1), the null hypothesis of no CAAR on the event date is rejected at the 1% level. Thus the AAR generated by Model 1 underestimate the significance that the M&A had on CAARs on the event day by 2.43% points. For shareholders, the M&A has a greater effect on the share price of either the bidder or target firms, however, whether the effect is positive or negative in relation to shareholder wealth is undetermined.

Table 4.5: Model 1 – bootstrap results

Panel A: Empirical Event Day	
CAAR	0.48
t-stat	(2.32)
p-value	0.02
Panel B: Bootstrapped Sample	
CAAR	0.02
Criterion Value	0.47%
NS	1000
η	2

The ARs generated by Model 2 are similar to those in Model 1, as the null hypothesis of no CAAR on the event date is rejected at the 5% level. Thus, ARs generated by Model 2 underestimate the statistical significance that the M&A had on CAARs on the event day by 25.1% points. The implications for shareholders are the same as above. Thus, when assessing the statistical significance of the CAARs in Model 1 and Model 2, the test static will tend to yield a Type II error where the null hypothesis is erroneously accepted.

Turning to the ARs obtained from Model 3, the results differ with the null hypothesis of no CAAR on the event date being accepted at the 10% level of statistical significance. Thus, ARs obtained from Model 3 overestimated the significance that the M&A had on CAARs on the event day by 50.05% points. Thus, when assessing the statistical significance of CAARs in Model 3, the test static will tend to yield a Type I error where the null hypothesis is erroneously rejected.

Table 4.6: Model 2 – bootstrap results

Panel A: Empirical Event Day	
CAAR	0.33
t-stat	(1.25)
p-value	0.27
Panel B: Bootstrapped Sample	
CAAR	0.01
Criterion Value	0.35%
NS	1000
η	13

As discussed in the previous section, the results from Model 3 tend to differ from those yielded by Model 1 and Model 2. This may be attributed to the downward bias in beta estimates owing to thin trading in the sample of bank's shares.

Table 4.7: Model 3 – bootstrap results

Panel A: Empirical Event Day	
CAAR	-5.03
t-stat	(19.26)
p-value	0.00
Panel B: Bootstrapped Sample	
CAAR	0.01
Criterion Value	-5.02%
NS	1000
η	500

4.4 SEMI-STRONG MARKET EFFICIENCY

The study of the CAARs earned or lost by shareholders of the bidder and target firms during an M&A can be extended to assess the speed at which the market accounts for new information relating to a firm. The previous section revealed that M&As can have a statistically significant effect on CAARs on the event date, however, the question still remains as to how quickly shareholders react to news of the M&A. Fama (1991) states that under the assumption of the SSME, all public information is instantly and accurately incorporated by the market and is reflected in the share price of the firm, thus shareholders cannot earn ARs or gain from holding shares to a greater extent than would have been obtained if the investment had been held via an exchange traded fund (ETF). Consistent with this idea, when new information about a firm, such as an M&A, is released to the public, shareholders should buy or sell shares in this company, thus incorporating such information into the share price.

Therefore, on the day new information is made available (the event day), CAARs attributable to shareholders of the firms contained in the sample should be absent. By using a large sample of firms, which are affected by similar events, one can make inferences about the extent of SSME of the share exchange on which the share is traded. In order to determine if CAARs are present on the event day, the method as well as event and estimation window lengths follow MacKinlay (1997). Only markets where three or more share returns are sampled for the study of bidder and target CAARs are assessed. These include the New York Stock Exchange (NYSE), the NASDAQ, the Bombay Stock Exchange (BSE) and Euronext Paris. The bidder and target banks' AAR and CAAR are plotted during the (−20, +20) window and appear in Appendix C, Figures C1 to C3.

Across all markets the existence of non-zero CAARs around the event date is observed. This contradicts SSME as no shareholders should earn ARs when new information is released because the market immediately incorporates this information into the share price. This finding implies that in share markets of both developed and developing countries the notion of the inability of shareholders to earn AR is rejected, as the rejection of the SSME occurs for both the BSE, representing the share exchange of a developing

country, and the NYSE, representing the share exchange of a developed country. In relation to the extent of the SSME of developing countries' share markets, the rejection of the SSME is consistent with Yip (2009), who rejects the notion of SSME by assessing, from 2004 to 2008, the extent to which shareholders earn or lose ARs during the final dividend announcements of firms from multiple industries listed on the Kuala Lumpur Stock Exchange (KLSE). Other authors find AARs on announcement days of firms listed on developing countries' share exchanges. These include Odabasi (1998), who studied share market reactions to firms from multiple industries earning announcements from 1992 to 1995 in the Istanbul stock market (ISM). The above articles thus provide an example of how the SSME can be tested using a share-specific event besides an M&A.

In relation to the extent of the SSME of a developing country's share markets, the rejection of the SSME is consistent with Von Gersdorff and Bacon (2009) who assessed the SSME for firms listed on the NYSE. However, events are sampled during a much shorter period (April 2007–August 2007) and use firms from multiple industries. McCluskey, Burton, Power and Sinclair (2006) concur by rejecting the notion of SMEE when analysing the extent to which shareholders earned ARs during the final dividend announcements of firms from multiple industries listed on the Dublin Stock Exchange (DSE) during the 1987−2001 period. Other authors that use the event study method to determine if shareholders earn or lose AARs on announcement days of firms listed on developed countries' share exchanges include Barnes (1985) on the London Stock Exchange (LSE) and Samitas and Kenourgios (2004) on Athens Stock Exchange (ASE).

Turning to the ability of share markets to incorporate new information, more than four-fifths of equity market/model combinations may be efficient two days after the M&A, as shareholders' CAARs approach zero through the purchase or sale of shares by shareholders. Thus, share prices take, on average, two days before they represent all publicly available information. Shareholders are relatively slow to buy or sell shares when information in relation to an M&A is released. An explanation of this phenomenon relates to that fact that M&As are often complex deals where several elements, such as the purchase price, the means of financing (shares, cash or combination of the two) and

which divisions of the target company are to be purchased, can all affect the future operating performance of the new entity. Certain examples exist of shareholders taking longer than two days to incorporate new information. The BSE may be efficient three days after an M&A while using Model 3 to estimate CAAR (Panel A, Figure C3).

4.5 RESEARCH PROSPECTS

The above study suffers from several deficiencies that detract from the results observed. In relation to data, the sample size of firms is relatively small, particularly in terms of M&As that occurred during periods of real economic contraction where only three bidders and two targets were assessed. The reason for the small sample size is related to many identified banks sampled from the period of real economic contraction containing firm-specific events besides the M&A. These events included bankruptcy or the announcement that the bank was to receive TARP funds. In addition, two-thirds of bidding banks and all target banks were sampled from the Subprime Crisis of 2008 to 2009. Thus, the result produced may be specific to the sample period of the study. Expanding the research to include a variety of periods characterised by real economic contraction would enable a much broader view of the study and mitigate against any factors affecting the results that are specific to the time period. The data used in the study was observed as being non-normally distributed. As such, a possible extension would be to incorporate a non-parametric test of statistical significance to compare with the CAAR test statistic of MacKinlay (1997). This would provide a useful comparison of the two methods and supply insights into which provides the most reliable results in the face of non-normality.

Turning to the models used to estimate non-event returns, no adjustment, as mentioned in Bradfield (2003), is made with regards to the β used in Model 3. As such, comparisons made between Model 3 and Model 1 and Model 2 are relatively limited as the parameters mentioned in Model 3 exhibit a great degree of bias, as mentioned above. In terms of Model 2, the market index used comprises a variety of firms from different industries. Thus market-wide changes in the share prices of firms listed on the exchange may have been taken into account when calculating the ARs earned or lost by shareholders. The

ability of this market return to represent movements of the share prices during the non-merger period is thus limited. A possible improvement would be to include an index which represents the financial industry specifically. This would provide a much more accurate view of the movements of the share price in order to assess any returns that may be considered abnormal. This study makes use of three models, however, a fourth model could have been used that takes into account skewness preference in the measurement of ARs. This type of model is used by Mishra, Prakash and Karels (2003). The authors mention that this type of model can significantly change the results of the ARs measured when compared to models that do not. The inclusion of such a model could thus provide additional insights into the findings of this study.

In relation to the ARs measured, a possible bias is noted by Moeller *et al.* (2005), who state that ARs earned by shareholders of the bidding firm tend to be greater for bidder firms with greater market capitalisation than for bidding firms whose market capitalisation is smaller. As such, Moeller *et al.* (2005) make use of value-weighted share returns, where the share price is divided by the market capitalisation of the firm. Through this Moeller *et al.* (2005) are able to assess the ARs attributable to the bidder firm's shareholders during an M&A. An amendment such as this could provide an interesting comparison with the ARs produced in this study and add credibility to the results produced.

Turning to the periods of real economic growth and contraction, no lagged figures were made use of. Thus, the study determines the effects of the state of the economy on the shareholder returns during the quarter during which either real economic growth or contraction is recorded. A possible improvement would be to incorporate a lagged effect and as such measure the ARs those shareholders of bidding and target firms earn or lose one quarter after the two consecutive quarters of real economic expansion or contraction. In such cases one can compare the results and determine whether the effects that the recession had on the shareholders' ARs is still present even though the economy is in a period of real economic expansion.

Given the definition of the economic state of the country, this can be expanded to include elements that are more specific to the banking industry and thus have a much greater effect on the earnings of banks. This includes elements such as real domestic interest rates or business and household credit demand.

CHAPTER FIVE

CONCLUSION

In the years preceding the Subprime Crisis, global M&A volumes were on the rise (Dealogic, 2010). The financial sector contributed to the increase in M&A volumes owing to the promotion of a unified banking sector by regulators, as well the push by managers to enhance operational efficiency, consolidate market share and promote geographical diversification. In 2009, the Subprime Crisis resulted in the financial sector representing the greatest contributor to global M&A volumes. This result was due to the crisis itself and the state of the economy at the time. As such, a change in economic state can have a great affect on the decisions of managers to engage in M&A activity. In addition, controversy exists as to the ARs attributable to shareholders of bidding and target firms when an M&A occurs, with examples being shown where both bidder and target firms shareholders gain or lose in an M&A. The controversy continues with regards to the choice of method applied to determine the ARs, with both market and accounting data methods having apparent benefits and flaws.

The aim of the study is to establish what the overriding opinion in literature is as to the affects of M&As on the bidder and target firms shareholders' returns respectively, and to determine if these results change during periods of real economic expansion and contraction. With regards to the literature, the findings suggest that on average shareholders of the bidding firm consider M&As to be a wealth-destroying event with a decrease in the share price being observed. For target firms' shareholders the opposite occurs, with M&As being considered to be a wealth-creating event with an increase in the share price being observed. However, when these results are split per economic period the result observed differ.

The results obtained indicate that shareholders of bidding firms during periods of real economic growth and contraction consider an M&A to be a wealth-destroying event where their CAAR is characterised by a negative value. In relation to target firms' shareholders, M&As are considered to be a wealth-creating event when the M&As

occurred during a period of real economic expansion. However, for periods of real economic contraction, the AR of target firms' shareholder differ with an M&A being considered to be a wealth-destroying event owing to their CAARs being characterised by a negative value. Thus, the state of the economy can have an effect on whether an M&A is considered to be wealth-creating or wealth-destroying for the target firms' shareholders.

In this study, several methods where applied to determine the AR attributable to shareholders, namely Model 1, Model 2 and Model 3. With regards to Model 1 and Model 2, the results produced were similar in terms of the wealth implications of M&As, as well as in terms of whether the M&A had a statically significant effect on the CAARs of the bidder and target firms. However, for Model 3 the results were largely different. A possible explanation for this is the bias in beta estimates that thin trading can cause. As such, when measuring AR in Model 3, adjustments such as those done in Dimson and Marsh (1983) are advocated. In addition, a fourth model could have been used that takes into account skewness preference in the measurement of ARs. This type of model is detailed by Mishra *et al.* (2003) and could provide additional insights into the findings of this study. In relation to the test statistic applied in the study, the effects of non-normality in the data are observed as the test statistic underestimates the significance of the CAARs in Model 1 and Model 2 and overestimates the significance of the CAARs in Model 3. Given this, a non-parametric test statistic may be more useful with regards to event studies given the non-normal distribution of share returns.

In relation to SSME, the findings contained in this study reject the SSME for all markets analysed. Share prices are found to take, on average, one day before they represent all publicly available information. Thus, shareholders are relatively slow to buy or sell shares when information in relation to an M&A is released. This conclusion is possibly related to the complex nature of such deals. In relation to the markets of developed and developing countries, no distinction in the results is observed. Thus, shareholders of banks domiciled in developed and developing countries can earn ARs when an M&A is announced.

The findings contained in this study should be interpreted with caution. One notes that the sample size of firms measured is rather low and only sampled during similar periods of real economic expansion and contraction. As such, increasing this time period would enable a much broader view of the study and mitigate against any factors affecting the results which are specific to the time period. The definition of the economic state could also be expanded to include elements that are more specific to the banking industry and thus have a much greater effect on the earnings of banks. This includes elements such as real domestic interest rates and business and household credit demand. Expanding the study across a larger time period and incorporating other industries will help to increase the sample size and make the results more applicable in terms of the broader economy. In addition to the deficiencies of the paper, the comparison of market models is limited owing to the lack of betas used which contained an adjustment for thin trading. In this case the amount of inference made from the ARs produced is limited.

In summary, the state of the economy can have a significant affect on a firm's decision to engage in M&A activity. In addition, the economic state can have an effect on the ARs attributable to the shareholders of bidding and target firms involved in M&As. This result is, however, specific to the banking industry and M&As that occurred during the first decade of the twenty-first century. The above findings have important implications for the short-term investing strategies of shareholders, as the state of an economy during an M&A can affect average ARs considerably.

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APPENDIX A

Table A1 Literature Review Table

Author	Date	Hybrid = 2 , Theoretical = 1, Empirical = 0	Country		Period	Aim	Method (semi-parametric = 0, parametric = 1, non-parametric = 2, other = 3)	Data (Market = 0, Accounting = 1)	Empirical Bidder Outcome (loss = 0, profit = 1, inconclusive = 2, neither = 3)	Empirical Target Outcome (profit = 1, loss = 0, inconclusive = 2, neither = 3)
			Bidder	Target						
LUBATKIN	1983	1		N/A		Address why firms merge, if the merger provides any benefit and why empirical studies are to the contrary	3	N/A	0	N/A
ECKBO	1983	0	USA	USA	1963-1978	Assess whether horizontal mergers generate returns for bidding and target firms	1	0	1	1
BARNES	1984	0	UK	UK	1974-1976	Assess the benefits of merger activity to the bidding firm's shareholders and determine to what degree the efficient market hypothesis can be used to interpret these results	1	0	0	N/A
DODDS and QUEK	1985	0	UK	UK	1974-1976	Determine the effects on the share price of acquiring UK construction firms	1	0	0	N/A
MIKKELSON and RUBACK	1985	0	USA	USA	1978-1980	Measure the effects on stock prices of corporate investments in another company	1	0	2	1
DENNIS and McCONNELL	1986	0	USA	USA	1962-1980	Determine the degree to which the retruns attributable to a merger differ amoung different kinds of securities	1	0	1	1

Author	Date	Hybrid = 2 , Theoretical = 1, Empirical = 0	Country		Period	Aim	Method (semi-parametric = 0, parametric = 1, non-parametric = 2, other = 3)	Data (Market = 0, Accounting = 1)	Empirical Bidder Outcome (loss = 0, profit = 1, inconclusive = 2, neither = 3)	Empirical Target Outcome (profit = 1, loss = 0, inconclusive = 2, neither = 3)
			Bidder	Target						
JAMES and WIER	1987	0	USA	unspecified	1972-1983	Examine the extent to which competition in the market for bank acquisitions effects the returns on the acquirer's share price	1	0	1	N/A
BRADLEY, DESAI and KIM	1988	0	USA	USA	1963-1984	Assess the synergistic gains from corporate acquisitions	1	0	1 (aggregate view)	1
JARRELL and POULSEN	1989	0	unspecified	unspecified	1963-1986	Determine the returns to acquiring and target firm's shareholders when tender offers are tabled	1,2	0	1	1
ASQUITH, BRUNER and MULLINS	1990	0	USA	USA	1975-1983	Determine if the form of financing used in a deal and the size of respective firms explain abnormal retuns	1	0	1 for cash deals, 0 for equity	2
CHOI	1991	0	USA	USA	1982-1985	Determine whether toehold acquisitions facilitate value enhancing control transfers	1	0	N/A	N/A
FRANKS, HARRIS and TITMAN	1991	0	USA	USA	1975-1984	Determine the post merger share price performance of acquiring frims	1	0	1	N/A

Author	Date	Hybrid = 2 , Theoretical = 1, Empirical = 0	Country		Period	Aim	Method (semi-parametric = 0, parametric = 1, non-parametric = 2, other = 3)	Data (Market = 0, Accounting = 1)	Empirical Bidder Outcome (loss = 0, profit = 1, inconclusive = 2, neither = 3)	Empirical Target Outcome (profit = 1, loss = 0, inconclusive = 2, neither = 3)
			Bidder	Target						
HEALY, PALEPU and RUBACK	1992	0	USA	unspecified	1979-1983	Determine the post merger operating performance of merged firms	1, 2	0	1	N/A
KANG	1993	0	Japan, USA	Japan, USA	1975-1988	Determine if bidder specific characteristics and exchange rate movements are useful in explaining cross-sectional variation in abnormal returns	0,1	0,1	2	1
HOUSTON and RYNGAERT	1994	0	USA	USA	1985-1991	Analyse the gains to shareholders during banking M&A and assess which merger characteristics the market perceives as most valuable	1	0,1	0	1
ZHANG	1995	0	USA	USA	1980-1990	Determine if bank mergers are wealth creating and assess what are the potential sources for these gains	1	0,1	1 (aggregate view)	
PILLOFF	1996	0	USA	USA	1982-1991	Determine the effect that mergers have on bank performance and shareholder wealth	0,1	0,1	0,1 (aggregate view)	
MAQUIEIRA, MEGGINSON and NAIL	1998	0	USA	USA	1963-1996	Examine the effect of stock-for-stock mergers on the publicly traded debt/equity instruments of firms involved	1,2	0	1	1
RAU and VERMAELEN	1998	0	USA	USA	1980-1991	Determine if bidders in mergers under-perform while bidders in tender offers over-perform the Market Index	1	1,0	1 for tender offer, 0 for merger	N/A

Author	Date	Hybrid = 2 , Theoretical = 1, Empirical = 0	Country		Period	Aim	Method (semi-parametric = 0, parametric = 1, non-parametric = 2, other = 3)	Data (Market = 0, Accounting = 1)	Empirical Bidder Outcome (loss = 0, profit = 1, inconclusive = 2, neither = 3)	Empirical Target Outcome (profit = 1, loss = 0, inconclusive = 2, neither = 3)
			Bidder	Target						
MAHONEY and WEINSTEIN	1999	0	unspecified	USA	1975-1991	Determine the effect of access to appraisal on target shareholder gains from acquisitions	1	0	N/A	2
BECHER	2000	0	unspecified	unspecified	1980-1997	Assess if mergers are wealth creating. Determine if mergers occurring during the 90's differ from those in the 80's	1,2	0	2	1
ANDRADE, MITCHELL and STAFFORD	2001	0		N/A		Provide evidence on debates around mergers such as profitability and why they occur	3	N/A	N/A	N/A
HOUSTON, JAMES and RYNGAERT	2001	0	USA	USA	1985-1996	Determine the stock value bank mergers create	1	0	0	1
FULLER, NETTER and STEGEMOLLER	2002	0	USA	unspecified	1990-2000	Determine the impact on shareholder returns for firms that acquired five or more public, private, and/or subsidiary targets within a short time period	1	0	2	2
DELONG	2003	0	USA, Non-USA (unspecified)	USA, Non-USA (unspecified)	1988-1999	Analyse if market reactions to non-US bank mergers are similar to the reaction in the US	1	0	2 for Non-USA, 0 for USA	1 for Non-USA, 1 for USA
CAMPA and HERNANDO	2004	0	European	European	1998-2000	Determine the effect of M&As on the value of shareholders stock	1	0	1,0	1,0

Author	Date	Hybrid = 2 , Theoretical = 1, Empirical = 0	Country		Period	Aim	Method (semi-parametric = 0, parametric = 1, non-parametric = 2, other = 3)	Data (Market = 0, Accounting = 1)	Empirical Bidder Outcome (loss = 0, profit = 1, inconclusive = 2, neither = 3)	Empirical Target Outcome (profit = 1, loss = 0, inconclusive = 2, neither = 3)
			Bidder	Target						
MOELLER, SCHLINGEMANN and STULZ	2005	0	USA	USA	1980-2001	Determine the post merger share price performance of acquiring firms	1,2	0	0	N/A
KARCESKI, ONGENA and SMITH	2005	0	Norway	Norway	1983-2000	Assess the impact of bank consolidations on commercial borrowers	1	0	1	0
WELL	2006	0	Scandanavia, Iceland	Scandanavia, Iceland, Baltic	1999-2000	Provide further empirical evidence on merger gains in the financial services industry	1	0	2	1
LORENZ and SCHIERECK	2007	0	European	European	1990-2002	Compares the implications to shareholder wealth of completed vs. uncompleted banking M&A	1	0	0	1
ALTUNBAS and MARQUES	2008	0	EU (27 countries)	EU (27 countries)	1992-2001	Role of strategic similarities on two year post M&A financial performance of European banks	0	0,1	1	N/A
BETZER, GOERGEN and METZGER	2009	0	USA	USA	1989-2003	Using acquisition motives to determine positive or negative abnoraml stock performance	0,1	0,1	2	2
RAMAKRISHNAN	2010	0	India	India	1996-2002	Determine the effect on shareholder wealth of merger announcements of Indian firms	1	0	3	1

APPENDIX B

Table B1.1 Model 1 CAAR, test statistic and p-value during event window (-5,+5)

	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**
-5	0.05	0.37	0.72	0.44	1.15	0.28	0.34	0.91	0.39	0.23	1.54	0.15
-4	0.17	1.16	0.27	0.54	1.41	0.19	0.70	1.87	0.09	0.27	1.78	0.11
-3	0.16	1.10	0.30	0.99	2.61	0.03	1.20	3.20	0.01	0.19	1.29	0.23
-2	0.17	1.13	0.29	1.02	2.69	0.02	1.35	3.62	0.00	0.16	1.09	0.30
-1	0.03	0.18	0.86	1.45	3.79	0.00	1.32	3.54	0.01	0.14	0.94	0.37
0	-1.02	-6.95	0.00	2.83	7.43	0.00	3.21	8.59	0.00	-1.12	-7.45	0.00
+1	-0.60	-4.13	0.00	2.40	6.30	0.00	2.75	7.37	0.00	-0.66	-4.43	0.00
+2	-0.62	-4.22	0.00	2.74	7.18	0.00	3.10	8.29	0.00	-0.58	-3.90	0.00
+3	-0.41	-2.79	0.02	2.37	6.21	0.00	3.01	8.07	0.00	-0.13	-0.84	0.42
+4	-0.35	-2.42	0.04	2.24	5.89	0.00	2.85	7.62	0.00	0.03	0.21	0.83
+5	-0.34	-2.29	0.04	2.88	7.56	0.00	3.15	8.42	0.00	0.11	0.72	0.49
	Expansion (Target)			**Contraction (Bidder)**			**Contraction (Target)**			**Contraction (Target) EXCL TARP**		
Days	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**
-5	0.41	1.61	0.14	-1.24	-2.07	0.07	0.67	0.28	0.79	-0.59	-0.14	0.89
-4	1.02	4.05	0.00	-0.54	-0.90	0.39	-2.84	-1.16	0.27	-3.79	-0.88	0.40
-3	1.38	5.50	0.00	-0.07	-0.12	0.90	-1.71	-0.70	0.50	-1.40	-0.33	0.75
-2	1.54	6.15	0.00	0.18	0.30	0.77	-2.61	-1.07	0.31	-1.36	-0.32	0.76
-1	1.62	6.46	0.00	-0.82	-1.36	0.20	0.21	0.09	0.93	-2.84	-0.66	0.52
0	4.41	17.58	0.00	-0.28	-0.47	0.65	-8.24	-3.38	0.01	-13.65	-3.18	0.01
+1	3.90	15.53	0.00	-0.17	-0.28	0.78	-8.08	-3.32	0.01	-13.31	-3.10	0.01
+2	4.08	16.23	0.00	-0.87	-1.45	0.18	-6.63	-2.72	0.02	-10.64	-2.48	0.03
+3	4.05	16.12	0.00	-2.48	-4.13	0.00	-9.40	-3.86	0.00	-11.45	-2.66	0.02
+4	3.83	15.25	0.00	-3.19	-5.31	0.00	-8.85	-3.63	0.00	-10.90	-2.54	0.03
+5	3.83	15.26	0.00	-3.59	-5.98	0.00	-3.75	-1.54	0.16	-6.45	-1.50	0.16

Table B1.2 Model 1 CAAR, test statistic and p-value during event window (-10,+10)

	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-10	-0.38	-2.72	0.71	0.32	1.01	0.33	0.34	1.14	0.27	-0.39	-2.76	0.70
-9	-0.60	-4.32	0.56	0.43	1.37	0.19	0.47	1.57	0.13	-0.41	-2.89	0.68
-8	-0.63	-4.54	0.54	1.82	5.77	0.00	1.71	5.78	0.00	-0.48	-3.39	0.63
-7	-0.40	-2.91	0.69	1.48	4.71	0.00	1.80	6.07	0.00	-0.36	-2.53	0.72
-6	-0.60	-4.34	0.55	1.53	4.86	0.00	1.97	6.64	0.00	-0.67	-4.71	0.51
-5	-0.55	-3.95	0.59	1.97	6.26	0.00	2.31	7.78	0.00	-0.44	-3.09	0.66
-4	-0.43	-3.12	0.67	2.07	6.57	0.00	2.67	8.99	0.00	-0.41	-2.85	0.69
-3	-0.44	-3.18	0.66	2.53	8.02	0.00	3.16	10.67	0.00	-0.48	-3.36	0.64
-2	-0.44	-3.15	0.67	2.56	8.11	0.00	3.32	11.19	0.00	-0.51	-3.57	0.62
-1	-0.58	-4.15	0.57	2.98	9.45	0.00	3.29	11.10	0.00	-0.53	-3.72	0.60
0	-1.62	-11.67	0.12	4.37	13.85	0.00	5.18	17.46	0.00	-1.79	-12.52	0.09
+1	-1.21	-8.69	0.24	3.94	12.48	0.00	4.72	15.91	0.00	-1.34	-9.35	0.20
+2	-1.22	-8.80	0.24	4.27	13.55	0.00	5.06	17.07	0.00	-1.26	-8.79	0.22
+3	-1.01	-7.28	0.32	3.90	12.37	0.00	4.98	16.80	0.00	-0.80	-5.59	0.43
+4	-0.96	-6.90	0.35	3.78	11.98	0.00	4.82	16.24	0.00	-0.64	-4.49	0.53
+5	-0.94	-6.76	0.36	4.42	14.01	0.00	5.12	17.24	0.00	-0.57	-3.95	0.58
+6	-0.90	-6.46	0.38	4.43	14.06	0.00	4.82	16.25	0.00	-0.53	-3.72	0.60
+7	-1.01	-7.31	0.32	4.64	14.71	0.00	5.05	17.02	0.00	-0.54	-3.80	0.59
+8	-0.82	-5.92	0.42	4.77	15.14	0.00	5.13	17.30	0.00	-0.42	-2.96	0.68
+9	-1.19	-8.61	0.25	4.72	14.98	0.00	5.20	17.52	0.00	-0.69	-4.82	0.50
+10	-0.99	-7.13	0.33	3.80	12.07	0.00	4.94	16.64	0.00	-0.42	-2.92	0.68
	Expansion (Target)			Contraction (Bidder)			Contraction (Target)			Contraction (Target) EXCL TARP		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-10	0.55	0.25	0.81	-0.25	-0.44	0.80	-1.30	-0.73	0.47	-2.63	-0.97	0.34
-9	0.59	0.27	0.79	-1.97	-3.43	0.06	-0.70	-0.39	0.70	-1.32	-0.49	0.63
-8	0.99	0.45	0.66	-1.70	-2.96	0.10	7.63	4.26	0.00	11.88	4.39	0.00
-7	0.70	0.32	0.75	-0.71	-1.24	0.49	6.98	3.90	0.00	17.23	6.37	0.00
-6	1.14	0.52	0.61	-0.08	-0.14	0.94	4.31	2.41	0.03	13.62	5.03	0.00
-5	1.54	0.70	0.49	-1.32	-2.30	0.20	4.98	2.78	0.01	13.03	4.82	0.00
-4	2.16	0.98	0.34	-0.62	-1.08	0.54	1.47	0.82	0.42	9.83	3.64	0.00
-3	2.52	1.14	0.27	-0.15	-0.27	0.88	2.60	1.45	0.16	12.22	4.52	0.00
-2	2.68	1.22	0.24	0.10	0.17	0.92	1.70	0.95	0.35	12.26	4.53	0.00
-1	2.76	1.25	0.23	-0.90	-1.56	0.38	4.52	2.52	0.02	10.78	3.98	0.00
0	5.55	2.52	0.02	-0.36	-0.63	0.72	-3.93	-2.20	0.04	-0.04	-0.01	0.99
+1	5.04	2.28	0.03	-0.25	-0.43	0.81	-3.78	-2.11	0.05	0.30	0.11	0.91
+2	5.21	2.36	0.03	-0.95	-1.65	0.35	-2.33	-1.30	0.21	2.98	1.10	0.28
+3	5.18	2.35	0.03	-2.56	-4.46	0.02	-5.09	-2.84	0.01	2.17	0.80	0.43
+4	4.97	2.25	0.04	-3.27	-5.69	0.00	-4.54	-2.54	0.02	2.72	1.01	0.33
+5	4.97	2.25	0.04	-3.67	-6.39	0.00	0.56	0.31	0.76	7.17	2.65	0.02
+6	4.85	2.20	0.04	-3.57	-6.21	0.00	1.53	0.85	0.40	4.46	1.65	0.12
+7	5.00	2.27	0.03	-4.47	-7.79	0.00	2.09	1.16	0.26	5.70	2.11	0.05
+8	5.13	2.32	0.03	-3.75	-6.52	0.00	2.30	1.28	0.21	5.24	1.94	0.07
+9	5.10	2.31	0.03	-4.90	-8.53	0.00	2.10	1.17	0.26	6.62	2.45	0.02
+10	4.87	2.21	0.04	-5.18	-9.01	0.00	-3.63	-2.03	0.06	5.90	2.18	0.04

Table B1.3 Model 1 CAAR, test statistic and p-value during event window (-5,+24)

	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-5	0.05	0.36	0.73	0.44	0.90	0.37	0.34	0.73	0.47	0.23	1.46	0.16
-4	0.17	1.11	0.28	0.54	1.10	0.28	0.70	1.50	0.14	0.27	1.68	0.10
-3	0.16	1.05	0.30	0.99	2.05	0.05	1.20	2.57	0.02	0.19	1.22	0.23
-2	0.17	1.08	0.29	1.02	2.11	0.04	1.35	2.90	0.01	0.16	1.03	0.31
-1	0.03	0.17	0.87	1.45	2.97	0.01	1.32	2.85	0.01	0.14	0.89	0.38
0	-1.02	-6.65	0.00	2.83	5.83	0.00	3.21	6.90	0.00	-1.12	-7.05	0.00
+1	-0.60	-3.95	0.00	2.40	4.94	0.00	2.75	5.92	0.00	-0.66	-4.18	0.00
+2	-0.62	-4.04	0.00	2.74	5.63	0.00	3.10	6.66	0.00	-0.58	-3.68	0.00
+3	-0.41	-2.67	0.01	2.37	4.87	0.00	3.01	6.48	0.00	-0.13	-0.79	0.43
+4	-0.35	-2.32	0.03	2.24	4.62	0.00	2.85	6.12	0.00	0.03	0.20	0.84
+5	-0.34	-2.20	0.04	2.88	5.93	0.00	3.15	6.76	0.00	0.11	0.68	0.50
+6	-0.29	-1.92	0.06	2.90	5.96	0.00	2.85	6.13	0.00	0.14	0.90	0.38
+7	-0.41	-2.70	0.01	3.11	6.39	0.00	3.08	6.62	0.00	0.13	0.82	0.42
+8	-0.22	-1.44	0.16	3.24	6.66	0.00	3.16	6.80	0.00	0.25	1.58	0.12
+9	-0.59	-3.87	0.00	3.19	6.56	0.00	3.23	6.94	0.00	-0.02	-0.10	0.92
+10	-0.39	-2.53	0.02	2.27	4.67	0.00	2.97	6.38	0.00	0.26	1.61	0.12
+11	-0.39	-2.55	0.02	2.71	5.57	0.00	2.94	6.32	0.00	0.48	3.04	0.00
+12	-0.24	-1.58	0.13	2.73	5.62	0.00	2.86	6.15	0.00	0.33	2.10	0.04
+13	-0.32	-2.11	0.04	2.37	4.87	0.00	2.60	5.59	0.00	0.13	0.81	0.42
+14	-0.89	-5.80	0.00	2.84	5.84	0.00	2.86	6.15	0.00	-0.07	-0.41	0.68
+15	-1.18	-7.71	0.00	2.76	5.68	0.00	2.74	5.90	0.00	-0.21	-1.35	0.19
+16	-1.06	-6.96	0.00	2.52	5.19	0.00	2.72	5.85	0.00	-0.12	-0.74	0.47
+17	-1.03	-6.71	0.00	2.42	4.99	0.00	2.62	5.63	0.00	0.11	0.72	0.47
+18	-0.67	-4.41	0.00	1.76	3.62	0.00	2.36	5.06	0.00	0.07	0.41	0.68
+19	-0.50	-3.25	0.00	2.11	4.34	0.00	2.61	5.62	0.00	0.14	0.87	0.39
+20	-0.78	-5.10	0.00	1.93	3.96	0.00	2.65	5.71	0.00	0.07	0.47	0.64
+21	-0.94	-6.17	0.00	2.94	6.06	0.00	3.35	7.21	0.00	-0.01	-0.08	0.94
+22	-0.77	-5.03	0.00	2.95	6.06	0.00	3.50	7.53	0.00	0.12	0.75	0.46
+23	-0.94	-6.15	0.00	3.04	6.25	0.00	3.55	7.62	0.00	0.11	0.71	0.48
+24	-1.18	-7.70	0.00	3.10	6.37	0.00	3.43	7.37	0.00	0.13	0.80	0.43

	Expansion (Target)			Contraction (Bidder)			Contraction (Target)			Contraction (Target) EXCL TARP		
Days	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**
-5	0.41	1.50	0.14	-1.24	-1.76	0.09	0.67	0.21	0.84	-0.59	-0.10	0.92
-4	1.02	3.77	0.00	-0.54	-0.77	0.45	-2.84	-0.87	0.39	-3.79	-0.66	0.52
-3	1.38	5.11	0.00	-0.07	-0.11	0.92	-1.71	-0.52	0.60	-1.40	-0.24	0.81
-2	1.54	5.72	0.00	0.18	0.25	0.80	-2.61	-0.80	0.43	-1.36	-0.24	0.81
-1	1.62	6.01	0.00	-0.82	-1.16	0.26	0.21	0.06	0.95	-2.84	-0.49	0.62
0	4.41	16.36	0.00	-0.28	-0.40	0.69	-8.24	-2.52	0.02	-13.65	-2.37	0.02
+1	3.90	14.45	0.00	-0.17	-0.24	0.81	-8.08	-2.48	0.02	-13.31	-2.32	0.03
+2	4.08	15.11	0.00	-0.87	-1.23	0.23	-6.63	-2.03	0.05	-10.64	-1.85	0.07
+3	4.05	15.00	0.00	-2.48	-3.51	0.00	-9.40	-2.88	0.01	-11.45	-1.99	0.06
+4	3.83	14.19	0.00	-3.19	-4.51	0.00	-8.85	-2.71	0.01	-10.90	-1.90	0.07
+5	3.83	14.20	0.00	-3.59	-5.08	0.00	-3.75	-1.15	0.26	-6.45	-1.12	0.27
+6	3.71	13.75	0.00	-3.49	-4.93	0.00	-2.78	-0.85	0.40	-9.16	-1.59	0.12
+7	3.87	14.33	0.00	-4.39	-6.21	0.00	-2.22	-0.68	0.50	-7.92	-1.38	0.18
+8	3.99	14.78	0.00	-3.67	-5.19	0.00	-2.01	-0.62	0.54	-8.38	-1.46	0.16
+9	3.96	14.67	0.00	-4.82	-6.82	0.00	-2.21	-0.68	0.50	-7.00	-1.22	0.23
+10	3.73	13.82	0.00	-5.10	-7.21	0.00	-7.94	-2.43	0.02	-7.72	-1.34	0.19
+11	3.66	13.57	0.00	-6.78	-9.59	0.00	-3.97	-1.21	0.23	-7.16	-1.25	0.22
+12	3.62	13.41	0.00	-4.45	-6.29	0.00	-3.48	-1.07	0.30	-7.78	-1.35	0.19
+13	3.44	12.76	0.00	-3.63	-5.14	0.00	-5.16	-1.58	0.12	-9.19	-1.60	0.12
+14	3.55	13.15	0.00	-6.91	-9.78	0.00	-2.13	-0.65	0.52	-6.79	-1.18	0.25
+15	3.53	13.10	0.00	-8.25	-11.67	0.00	-2.64	-0.81	0.42	-8.34	-1.45	0.16
+16	3.61	13.37	0.00	-8.01	-11.33	0.00	-5.08	-1.56	0.13	-9.70	-1.69	0.10
+17	3.67	13.62	0.00	-9.39	-13.28	0.00	-6.33	-1.94	0.06	-12.15	-2.11	0.04
+18	3.71	13.74	0.00	-6.10	-8.63	0.00	-11.88	-3.64	0.00	-16.59	-2.88	0.01
+19	4.12	15.27	0.00	-5.15	-7.28	0.00	-11.98	-3.67	0.00	-18.47	-3.21	0.00
+20	4.33	16.06	0.00	-7.05	-9.97	0.00	-14.94	-4.58	0.00	-20.86	-3.63	0.00
+21	4.75	17.59	0.00	-7.77	-11.00	0.00	-9.67	-2.96	0.01	-16.12	-2.80	0.01
+22	4.78	17.71	0.00	-7.28	-10.30	0.00	-9.89	-3.03	0.01	-14.40	-2.50	0.02
+23	4.90	18.17	0.00	-8.66	-12.25	0.00	-10.00	-3.06	0.00	-15.47	-2.69	0.01
+24	4.81	17.81	0.00	-10.74	-15.19	0.00	-8.88	-2.72	0.01	-15.89	-2.76	0.01

Table B2.1 Model 2 CAAR, test statistic and p-value during event window (-5,+5)

	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**
-5	-0.09	-0.46	0.66	0.19	0.43	0.85	0.22	0.50	0.83	0.09	0.44	0.67
-4	0.09	0.50	0.63	0.48	1.09	0.64	0.70	1.58	0.50	0.12	0.61	0.56
-3	-0.19	-1.02	0.33	0.80	1.82	0.44	1.08	2.45	0.31	-0.15	-0.77	0.46
-2	-0.35	-1.84	0.10	0.35	0.80	0.73	0.78	1.77	0.45	-0.30	-1.48	0.17
-1	-0.58	-3.08	0.01	0.90	2.04	0.39	1.04	2.36	0.32	-0.47	-2.31	0.04
0	-1.33	-7.03	0.00	2.73	6.21	0.02	3.20	7.26	0.01	-1.40	-6.94	0.00
+1	-0.95	-5.01	0.00	2.42	5.51	0.04	2.99	6.79	0.01	-0.99	-4.88	0.00
+2	-0.94	-4.94	0.00	2.54	5.78	0.03	3.18	7.21	0.01	-1.15	-5.69	0.00
+3	-0.78	-4.12	0.00	2.30	5.23	0.04	3.20	7.26	0.01	-0.75	-3.71	0.00
+4	-0.49	-2.58	0.03	2.26	5.15	0.05	3.31	7.50	0.01	-0.36	-1.78	0.10
+5	-0.50	-2.61	0.03	2.61	5.94	0.03	3.49	7.92	0.01	-0.36	-1.80	0.10
	Expansion (Target)			**Contraction (Bidder)**			**Contraction (Target)**			**Contraction (Target) EXCL TARP**		
Days	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**
-5	0.27	0.90	0.79	-1.38	-2.08	0.06	-0.37	-0.15	0.72	-0.50	-0.11	0.63
-4	0.84	2.80	0.42	-0.11	-0.17	0.87	-2.04	-0.81	0.07	-1.31	-0.28	0.22
-3	1.15	3.83	0.28	-0.48	-0.73	0.48	-1.65	-0.66	0.13	0.08	0.02	0.94
-2	1.00	3.33	0.34	-0.71	-1.08	0.31	-4.19	-1.67	0.00	-2.25	-0.49	0.05
-1	1.32	4.39	0.22	-1.44	-2.18	0.05	-2.04	-0.81	0.07	-2.83	-0.61	0.02
0	4.49	14.97	0.00	-0.82	-1.24	0.24	-9.59	-3.81	0.00	-14.80	-3.19	0.00
+1	4.31	14.38	0.00	-0.67	-1.02	0.33	-10.85	-4.31	0.00	-15.50	-3.34	0.00
+2	3.98	13.26	0.00	0.63	0.95	0.37	-7.53	-2.99	0.00	-8.02	-1.73	0.00
+3	4.07	13.57	0.00	-1.00	-1.52	0.16	-10.11	-4.02	0.00	-8.95	-1.93	0.00
+4	4.04	13.47	0.00	-1.43	-2.16	0.06	-10.17	-4.04	0.00	-6.93	-1.50	0.00
+5	3.84	12.81	0.00	-1.46	-2.21	0.05	-6.03	-2.40	0.00	-1.45	-0.31	0.18

Table B2.2 Model 2 CAAR, test statistic and p-value during event window (-10,+10)

	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-10	-0.34	-1.78	0.09	0.27	0.85	0.41	0.21	0.59	0.56	-0.31	-1.54	0.14
-9	-0.51	-2.67	0.01	0.45	1.43	0.17	0.36	1.03	0.31	-0.47	-2.29	0.03
-8	-0.45	-2.38	0.03	1.93	6.14	0.00	1.72	4.92	0.00	-0.42	-2.06	0.05
-7	-0.40	-2.12	0.05	1.48	4.70	0.00	1.56	4.46	0.00	-0.32	-1.60	0.13
-6	-0.49	-2.55	0.02	1.16	3.68	0.00	1.48	4.25	0.00	-0.61	-3.00	0.01
-5	-0.57	-3.01	0.01	1.36	4.30	0.00	1.71	4.89	0.00	-0.52	-2.57	0.02
-4	-0.39	-2.05	0.05	1.65	5.23	0.00	2.19	6.27	0.00	-0.49	-2.41	0.03
-3	-0.68	-3.57	0.00	1.97	6.26	0.00	2.57	7.38	0.00	-0.77	-3.78	0.00
-2	-0.84	-4.39	0.00	1.53	4.84	0.00	2.28	6.54	0.00	-0.91	-4.50	0.00
-1	-1.07	-5.62	0.00	2.08	6.59	0.00	2.55	7.29	0.00	-1.08	-5.33	0.00
0	-1.82	-9.55	0.00	3.91	12.41	0.00	4.71	13.50	0.00	-2.02	-9.94	0.00
+1	-1.44	-7.54	0.00	3.61	11.44	0.00	4.51	12.91	0.00	-1.60	-7.89	0.00
+2	-1.42	-7.47	0.00	3.73	11.83	0.00	4.69	13.45	0.00	-1.77	-8.70	0.00
+3	-1.27	-6.65	0.00	3.49	11.08	0.00	4.72	13.53	0.00	-1.37	-6.74	0.00
+4	-0.98	-5.12	0.00	3.46	10.98	0.00	4.83	13.85	0.00	-0.98	-4.82	0.00
+5	-0.98	-5.16	0.00	3.81	12.09	0.00	5.02	14.39	0.00	-0.98	-4.85	0.00
+6	-0.95	-4.96	0.00	3.85	12.20	0.00	4.57	13.08	0.00	-0.93	-4.59	0.00
+7	-1.21	-6.34	0.00	4.28	13.59	0.00	4.85	13.91	0.00	-1.10	-5.42	0.00
+8	-1.23	-6.48	0.00	4.14	13.12	0.00	4.62	13.23	0.00	-1.07	-5.25	0.00
+9	-1.63	-8.54	0.00	4.00	12.69	0.00	4.48	12.85	0.00	-1.33	-6.57	0.00
+10	-1.27	-6.68	0.00	3.33	10.57	0.00	4.46	12.77	0.00	-0.96	-4.72	0.00

	Expansion (Target)			Contraction (Bidder)			Contraction (Target)			Contraction (Target) EXCL TARP		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-10	0.42	0.22	0.83	-0.53	-0.81	0.43	-0.82	-0.45	0.65	-2.83	-0.77	0.45
-9	0.13	0.07	0.95	-0.83	-1.26	0.22	2.68	1.48	0.15	3.55	0.97	0.34
-8	0.64	0.33	0.75	-0.72	-1.09	0.29	11.03	6.11	0.00	16.83	4.59	0.00
-7	0.36	0.18	0.86	-0.99	-1.50	0.15	9.38	5.19	0.00	18.39	5.01	0.00
-6	0.38	0.20	0.85	0.42	0.64	0.53	6.62	3.66	0.00	16.89	4.60	0.00
-5	0.66	0.34	0.74	-0.95	-1.44	0.17	6.22	3.44	0.00	16.35	4.45	0.00
-4	1.24	0.63	0.53	0.32	0.49	0.63	4.53	2.51	0.02	15.49	4.22	0.00
-3	1.56	0.80	0.43	-0.04	-0.07	0.95	4.89	2.70	0.01	16.83	4.59	0.00
-2	1.41	0.72	0.48	-0.27	-0.40	0.69	2.32	1.28	0.21	14.44	3.94	0.00
-1	1.74	0.89	0.38	-0.99	-1.50	0.15	4.44	2.46	0.02	13.82	3.77	0.00
0	4.92	2.52	0.02	-0.36	-0.55	0.59	-3.13	-1.73	0.10	1.80	0.49	0.63
+1	4.75	2.43	0.02	-0.21	-0.32	0.75	-4.41	-2.44	0.02	1.05	0.29	0.78
+2	4.42	2.27	0.03	1.10	1.66	0.11	-1.12	-0.62	0.54	8.48	2.31	0.03
+3	4.52	2.32	0.03	-0.53	-0.80	0.43	-3.73	-2.06	0.05	7.50	2.04	0.05
+4	4.50	2.31	0.03	-0.94	-1.43	0.17	-3.81	-2.11	0.05	9.47	2.58	0.02
+5	4.31	2.21	0.04	-0.97	-1.47	0.16	0.30	0.17	0.87	14.90	4.06	0.00
+6	4.01	2.05	0.05	-1.03	-1.57	0.13	2.73	1.51	0.15	12.39	3.38	0.00
+7	4.08	2.09	0.05	-1.99	-3.01	0.01	5.70	3.16	0.00	15.69	4.27	0.00
+8	4.00	2.05	0.05	-2.47	-3.74	0.00	5.07	2.81	0.01	13.19	3.59	0.00
+9	3.90	2.00	0.06	-3.78	-5.72	0.00	4.69	2.60	0.02	12.64	3.44	0.00
+10	3.81	1.95	0.06	-3.58	-5.43	0.00	-0.03	-0.01	0.99	13.47	3.67	0.00

Table B2.3 Model 2 CAAR, test statistic and p-value during event window (-5,+25)

	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-5	-0.08	-0.44	0.66	0.21	0.38	0.71	0.24	0.12	0.90	0.10	0.52	0.61
-4	0.11	0.58	0.56	0.53	0.93	0.36	0.74	0.38	0.71	0.15	0.75	0.46
-3	-0.18	-0.95	0.35	0.87	1.55	0.13	1.15	0.59	0.56	-0.12	-0.59	0.56
-2	-0.32	-1.77	0.09	0.45	0.79	0.44	0.88	0.45	0.66	-0.25	-1.26	0.22
-1	-0.55	-3.01	0.01	1.02	1.80	0.08	1.16	0.59	0.56	-0.40	-2.05	0.05
0	-1.30	-7.05	0.00	2.88	5.09	0.00	3.35	1.70	0.10	-1.33	-6.73	0.00
+1	-0.91	-4.93	0.00	2.59	4.59	0.00	3.16	1.61	0.12	-0.90	-4.55	0.00
+2	-0.89	-4.83	0.00	2.73	4.84	0.00	3.37	1.72	0.10	-1.05	-5.32	0.00
+3	-0.73	-3.94	0.00	2.52	4.46	0.00	3.42	1.74	0.09	-0.64	-3.23	0.00
+4	-0.43	-2.32	0.03	2.51	4.44	0.00	3.55	1.81	0.08	-0.23	-1.19	0.25
+5	-0.43	-2.32	0.03	2.88	5.09	0.00	3.76	1.91	0.07	-0.22	-1.14	0.26
+6	-0.38	-2.09	0.05	2.93	5.19	0.00	3.32	1.69	0.10	-0.16	-0.81	0.42
+7	-0.64	-3.48	0.00	3.39	6.00	0.00	3.63	1.85	0.07	-0.31	-1.60	0.12
+8	-0.66	-3.59	0.00	3.26	5.78	0.00	3.42	1.74	0.09	-0.27	-1.35	0.19
+9	-1.05	-5.69	0.00	3.15	5.57	0.00	3.30	1.68	0.10	-0.52	-2.64	0.01
+10	-0.69	-3.73	0.00	2.50	4.43	0.00	3.30	1.68	0.10	-0.13	-0.66	0.52
+11	-0.82	-4.47	0.00	2.74	4.86	0.00	3.33	1.69	0.10	-0.02	-0.09	0.93
+12	-0.75	-4.09	0.00	2.84	5.03	0.00	3.21	1.63	0.11	-0.18	-0.90	0.37
+13	-0.76	-4.13	0.00	2.67	4.72	0.00	3.07	1.56	0.13	-0.21	-1.09	0.29
+14	-1.35	-7.34	0.00	3.17	5.62	0.00	3.45	1.75	0.09	-0.52	-2.63	0.01
+15	-1.54	-8.35	0.00	3.38	5.98	0.00	3.52	1.79	0.08	-0.46	-2.32	0.03
+16	-1.57	-8.54	0.00	2.98	5.28	0.00	3.22	1.64	0.11	-0.46	-2.31	0.03
+17	-1.41	-7.67	0.00	2.93	5.18	0.00	3.23	1.64	0.11	-0.10	-0.52	0.61
+18	-1.12	-6.06	0.00	2.08	3.69	0.00	2.73	1.39	0.18	-0.20	-1.02	0.32
+19	-1.07	-5.81	0.00	1.91	3.39	0.00	2.51	1.28	0.21	-0.15	-0.76	0.46
+20	-1.37	-7.43	0.00	1.92	3.40	0.00	2.73	1.39	0.18	-0.37	-1.87	0.07
+21	-1.30	-7.10	0.00	2.88	5.10	0.00	3.40	1.73	0.09	-0.34	-1.71	0.10
+22	-1.11	-6.06	0.00	3.30	5.85	0.00	3.84	1.95	0.06	-0.24	-1.24	0.23
+23	-1.33	-7.21	0.00	3.28	5.82	0.00	3.79	1.93	0.06	-0.31	-1.56	0.13
+24	-1.66	-9.02	0.00	3.47	6.14	0.00	3.86	1.97	0.06	-0.36	-1.82	0.08

	Expansion (Target)			Contraction (Bidder)			Contraction (Target)			Contraction (Target) EXCL		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-5	0.30	0.88	0.39	-1.42	-1.96	0.06	-0.40	-0.12	0.91	-0.58	-0.09	0.93
-4	0.90	2.64	0.01	-0.19	-0.27	0.79	-2.10	-0.62	0.54	-1.48	-0.24	0.81
-3	1.25	3.64	0.00	-0.61	-0.84	0.41	-1.74	-0.52	0.61	-0.17	-0.03	0.98
-2	1.13	3.29	0.00	-0.88	-1.21	0.24	-4.32	-1.28	0.21	-2.59	-0.42	0.68
-1	1.48	4.32	0.00	-1.65	-2.28	0.03	-2.20	-0.65	0.52	-3.25	-0.52	0.61
0	4.68	13.68	0.00	-1.07	-1.47	0.15	-9.77	-2.90	0.01	-15.31	-2.45	0.02
+1	4.54	13.26	0.00	-0.96	-1.33	0.19	-11.06	-3.28	0.00	-16.09	-2.58	0.02
+2	4.23	12.37	0.00	0.30	0.41	0.69	-7.78	-2.30	0.03	-8.69	-1.39	0.17
+3	4.36	12.73	0.00	-1.38	-1.90	0.07	-10.39	-3.08	0.00	-9.71	-1.56	0.13
+4	4.36	12.74	0.00	-1.84	-2.54	0.02	-10.47	-3.10	0.00	-7.78	-1.25	0.22
+5	4.20	12.26	0.00	-1.91	-2.65	0.01	-6.37	-1.89	0.07	-2.38	-0.38	0.71
+6	3.91	11.43	0.00	-2.02	-2.80	0.01	-3.94	-1.17	0.25	-4.93	-0.79	0.44
+7	4.01	11.72	0.00	-3.02	-4.18	0.00	-0.97	-0.29	0.78	-1.67	-0.27	0.79
+8	3.96	11.56	0.00	-3.55	-4.91	0.00	-1.61	-0.48	0.64	-4.20	-0.67	0.51
+9	3.88	11.34	0.00	-4.91	-6.79	0.00	-1.99	-0.59	0.56	-4.79	-0.77	0.45
+10	3.82	11.15	0.00	-4.76	-6.59	0.00	-6.71	-1.99	0.06	-3.99	-0.64	0.53
+11	3.83	11.19	0.00	-6.72	-9.30	0.00	-4.87	-1.44	0.16	-3.71	-0.60	0.56
+12	3.80	11.09	0.00	-4.97	-6.87	0.00	-3.83	-1.14	0.27	-5.02	-0.80	0.43
+13	3.90	11.38	0.00	-4.76	-6.58	0.00	-5.93	-1.76	0.09	-8.47	-1.36	0.19
+14	3.90	11.39	0.00	-7.45	-10.30	0.00	-1.92	-0.57	0.57	-2.88	-0.46	0.65
+15	4.20	12.27	0.00	-9.44	-13.05	0.00	-2.39	-0.71	0.48	-6.01	-0.96	0.34
+16	4.04	11.79	0.00	-9.74	-13.47	0.00	-4.40	-1.30	0.20	-8.23	-1.32	0.20
+17	4.17	12.17	0.00	-11.00	-15.22	0.00	-5.76	-1.71	0.10	-9.97	-1.60	0.12
+18	4.13	12.06	0.00	-7.82	-10.81	0.00	-12.24	-3.63	0.00	-16.87	-2.70	0.01
+19	4.23	12.35	0.00	-7.81	-10.80	0.00	-14.30	-4.24	0.00	-21.50	-3.44	0.00
+20	4.42	12.91	0.00	-8.68	-12.01	0.00	-15.59	-4.62	0.00	-20.95	-3.36	0.00
+21	4.59	13.39	0.00	-8.40	-11.61	0.00	-9.06	-2.68	0.01	-13.20	-2.12	0.04
+22	4.90	14.30	0.00	-7.49	-10.35	0.00	-7.86	-2.33	0.03	-10.92	-1.75	0.09
+23	4.79	13.99	0.00	-8.79	-12.16	0.00	-7.25	-2.15	0.04	-10.21	-1.64	0.11
+24	4.85	14.17	0.00	-11.19	-15.48	0.00	-6.20	-1.84	0.08	-9.93	-1.59	0.12

Table B3.1 Model 3 CAAR, test statistic and p-value during event window (-5,+5)

	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**
-5	-1.08	-5.68	0.00	-0.59	-1.35	0.21	-0.63	-1.42	0.19	-0.82	-4.05	0.00
-4	-1.88	-9.94	0.00	-1.13	-2.56	0.03	-1.04	-2.35	0.04	-1.76	-8.71	0.00
-3	-2.73	-14.41	0.00	-1.66	-3.77	0.00	-1.57	-3.56	0.01	-2.84	-14.06	0.00
-2	-3.82	-20.16	0.00	-2.89	-6.57	0.00	-2.71	-6.15	0.00	-3.91	-19.35	0.00
-1	-4.90	-25.83	0.00	-3.29	-7.48	0.00	-3.47	-7.88	0.00	-4.92	-24.35	0.00
0	-6.41	-33.78	0.00	-2.23	-5.09	0.00	-2.15	-4.89	0.00	-6.72	-33.21	0.00
+1	-6.88	-36.31	0.00	-3.38	-7.70	0.00	-3.27	-7.42	0.00	-7.22	-35.70	0.00
+2	-8.18	-43.14	0.00	-4.04	-9.20	0.00	-3.93	-8.91	0.00	-8.48	-41.92	0.00
+3	-8.74	-46.12	0.00	-5.04	-11.48	0.00	-4.72	-10.71	0.00	-8.94	-44.21	0.00
+4	-9.18	-48.40	0.00	-5.94	-13.52	0.00	-5.55	-12.58	0.00	-9.51	-47.00	0.00
+5	-10.06	-53.06	0.00	-6.47	-14.74	0.00	-6.31	-14.32	0.00	-10.35	-51.16	0.00
	Expansion (Target)			**Contraction (Bidder)**			**Contraction (Target)**			**Contraction (Target) EXCL TARP**		
Days	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**
-5	-0.45	-1.49	0.17	-2.97	-4.50	0.00	-1.61	-0.64	0.54	-3.14	-0.68	0.52
-4	-0.64	-2.14	0.06	-2.78	-4.21	0.00	-4.52	-1.80	0.11	-6.59	-1.42	0.19
-3	-1.12	-3.75	0.00	-1.93	-2.91	0.02	-5.38	-2.14	0.06	-7.85	-1.69	0.12
-2	-1.99	-6.64	0.00	-3.16	-4.78	0.00	-9.16	-3.64	0.01	-12.82	-2.77	0.02
-1	-2.58	-8.59	0.00	-4.70	-7.11	0.00	-8.25	-3.28	0.01	-16.04	-3.46	0.01
0	-0.12	-0.40	0.70	-4.13	-6.24	0.00	-17.04	-6.77	0.00	-30.66	-6.61	0.00
+1	-1.08	-3.58	0.01	-4.43	-6.70	0.00	-19.54	-7.77	0.00	-34.00	-7.34	0.00
+2	-2.13	-7.09	0.00	-6.00	-9.07	0.00	-17.46	-6.94	0.00	-29.16	-6.29	0.00
+3	-2.72	-9.08	0.00	-7.31	-11.06	0.00	-21.29	-8.46	0.00	-32.73	-7.06	0.00
+4	-3.56	-11.88	0.00	-6.78	-10.25	0.00	-22.59	-8.98	0.00	-33.35	-7.20	0.00
+5	-4.59	-15.29	0.00	-7.97	-12.06	0.00	-19.69	-7.83	0.00	-30.52	-6.58	0.00

Table B3.2 Model 3 CAAR, test statistic and p-value during event window (-10,+10)

	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-10	-1.09	-5.74	0.00	-0.51	-1.41	0.18	-1.08	-3.09	0.01	-1.06	-5.21	0.00
-9	-2.04	-10.71	0.00	-1.11	-3.06	0.01	-1.53	-4.37	0.00	-2.13	-10.49	0.00
-8	-3.27	-17.15	0.00	-0.46	-1.28	0.22	-0.72	-2.06	0.05	-3.32	-16.36	0.00
-7	-4.32	-22.68	0.00	-1.76	-4.88	0.00	-2.33	-6.67	0.00	-4.26	-20.96	0.00
-6	-5.60	-29.39	0.00	-2.86	-7.91	0.00	-3.89	-11.14	0.00	-5.62	-27.65	0.00
-5	-6.71	-35.22	0.00	-3.43	-9.50	0.00	-4.86	-13.92	0.00	-6.48	-31.91	0.00
-4	-7.55	-39.63	0.00	-3.95	-10.92	0.00	-6.22	-17.82	0.00	-7.47	-36.78	0.00
-3	-8.43	-44.25	0.00	-4.46	-12.34	0.00	-7.09	-20.30	0.00	-8.60	-42.32	0.00
-2	-9.56	-50.15	0.00	-5.67	-15.69	0.00	-8.82	-25.28	0.00	-9.71	-47.82	0.00
-1	-10.67	-55.96	0.00	-6.05	-16.74	0.00	-9.56	-27.40	0.00	-10.77	-53.03	0.00
0	-12.21	-64.05	0.00	-4.98	-13.78	0.00	-8.94	-25.62	0.00	-12.61	-62.07	0.00
+1	-12.72	-66.74	0.00	-6.11	-16.90	0.00	-11.34	-32.50	0.00	-13.16	-64.77	0.00
+2	-14.05	-73.71	0.00	-6.75	-18.68	0.00	-11.52	-33.01	0.00	-14.46	-71.20	0.00
+3	-14.65	-76.85	0.00	-7.73	-21.39	0.00	-12.99	-37.22	0.00	-14.97	-73.70	0.00
+4	-15.11	-79.29	0.00	-8.60	-23.82	0.00	-13.87	-39.75	0.00	-15.58	-76.70	0.00
+5	-16.03	-84.10	0.00	-9.12	-25.24	0.00	-14.55	-41.70	0.00	-16.47	-81.07	0.00
+6	-17.03	-89.39	0.00	-9.84	-27.24	0.00	-15.27	-43.76	0.00	-17.44	-85.89	0.00
+7	-18.33	-96.17	0.00	-10.19	-28.21	0.00	-15.58	-44.66	0.00	-18.75	-92.33	0.00
+8	-19.14	-100.44	0.00	-11.14	-30.85	0.00	-16.91	-48.47	0.00	-19.58	-96.42	0.00
+9	-20.50	-107.56	0.00	-12.11	-33.53	0.00	-18.34	-52.56	0.00	-20.77	-102.27	0.00
+10	-21.16	-111.04	0.00	-13.59	-37.63	0.00	-20.42	-58.52	0.00	-21.34	-105.07	0.00

	Expansion (Target)			Contraction (Bidder)			Contraction (Target)			Contraction (Target) EXCL TARP		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-10	-0.31	-1.04	0.31	-1.34	-2.04	0.06	-1.87	-1.03	0.31	-5.08	-1.72	0.10
-9	-1.35	-4.47	0.00	-1.38	-2.10	0.05	0.58	0.32	0.75	-0.95	-0.32	0.75
-8	-1.66	-5.49	0.00	-2.87	-4.35	0.00	7.89	4.37	0.00	10.07	3.41	0.00
-7	-2.75	-9.14	0.00	-4.80	-7.28	0.00	5.19	2.87	0.01	9.37	3.18	0.00
-6	-3.46	-11.49	0.00	-5.49	-8.31	0.00	1.38	0.77	0.45	5.63	1.91	0.07
-5	-3.91	-12.98	0.00	-8.40	-12.73	0.00	-0.06	-0.03	0.97	2.83	0.96	0.35
-4	-4.11	-13.63	0.00	-8.15	-12.35	0.00	-2.80	-1.55	0.14	-0.29	-0.10	0.92
-3	-4.59	-15.24	0.00	-7.24	-10.96	0.00	-3.49	-1.93	0.07	-1.20	-0.41	0.69
-2	-5.46	-18.12	0.00	-8.41	-12.75	0.00	-7.11	-3.93	0.00	-5.83	-1.98	0.06
-1	-6.05	-20.07	0.00	-9.90	-14.99	0.00	-6.03	-3.34	0.00	-8.71	-2.95	0.01
0	-3.59	-11.92	0.00	-9.26	-14.03	0.00	-14.65	-8.11	0.00	-22.99	-7.79	0.00
+1	-4.55	-15.10	0.00	-9.51	-14.40	0.00	-16.98	-9.40	0.00	-25.99	-8.81	0.00
+2	-5.61	-18.59	0.00	-11.02	-16.69	0.00	-14.73	-8.16	0.00	-20.81	-7.05	0.00
+3	-6.20	-20.58	0.00	-12.27	-18.59	0.00	-18.39	-10.18	0.00	-24.04	-8.15	0.00
+4	-7.05	-23.37	0.00	-11.68	-17.69	0.00	-19.52	-10.80	0.00	-24.32	-8.24	0.00
+5	-8.07	-26.77	0.00	-12.82	-19.42	0.00	-16.45	-9.11	0.00	-21.15	-7.17	0.00
+6	-9.09	-30.16	0.00	-14.03	-21.25	0.00	-15.07	-8.34	0.00	-25.91	-8.78	0.00
+7	-9.77	-32.40	0.00	-15.20	-23.03	0.00	-13.14	-7.27	0.00	-24.87	-8.43	0.00
+8	-10.62	-35.21	0.00	-15.90	-24.09	0.00	-14.82	-8.21	0.00	-29.62	-10.04	0.00
+9	-11.52	-38.21	0.00	-18.49	-28.01	0.00	-16.25	-8.99	0.00	-32.43	-10.99	0.00
+10	-12.39	-41.09	0.00	-19.86	-30.09	0.00	-22.01	-12.18	0.00	-33.85	-11.47	0.00

Table B3.3 Model 3 CAAR, test statistic and p-value during event window (-5,+25)

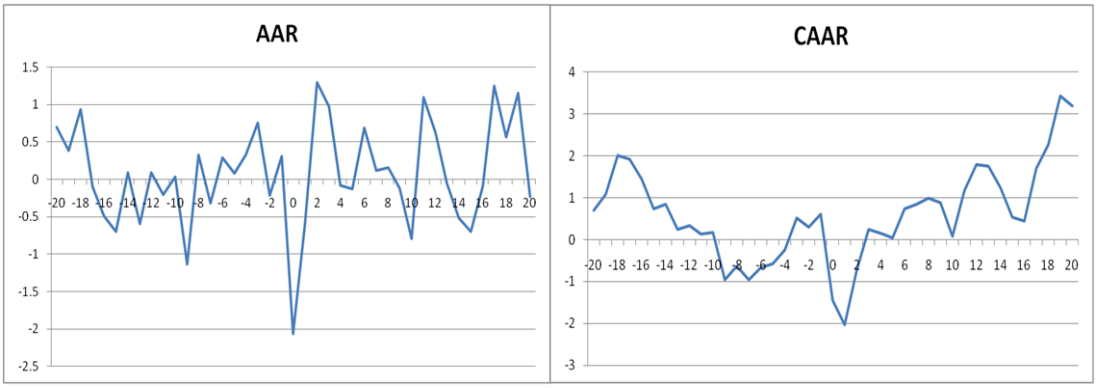
	Bidder			Target			Target EXCL TARP			Expansion (Bidder)		
Days	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value	CAAR	t-stat	p-Value
-5	-1.16	-6.30	0.00	-0.57	-1.02	0.32	-0.61	-1.08	0.29	-0.90	-4.56	0.00
-4	-2.04	-11.12	0.00	-1.09	-1.93	0.06	-1.01	-1.78	0.09	-1.92	-9.74	0.00
-3	-2.97	-16.17	0.00	-1.60	-2.83	0.01	-1.52	-2.70	0.01	-3.08	-15.62	0.00
-2	-4.14	-22.53	0.00	-2.81	-4.98	0.00	-2.65	-4.69	0.00	-4.23	-21.45	0.00
-1	-5.30	-28.81	0.00	-3.19	-5.65	0.00	-3.39	-6.01	0.00	-5.32	-26.98	0.00
0	-6.89	-37.45	0.00	-2.12	-3.76	0.00	-2.06	-3.64	0.00	-7.19	-36.47	0.00
+1	-7.45	-40.49	0.00	-3.25	-5.76	0.00	-3.16	-5.59	0.00	-7.78	-39.42	0.00
+2	-8.82	-47.97	0.00	-3.89	-6.90	0.00	-3.80	-6.73	0.00	-9.11	-46.21	0.00
+3	-9.47	-51.48	0.00	-4.88	-8.63	0.00	-4.58	-8.11	0.00	-9.66	-48.96	0.00
+4	-9.98	-54.27	0.00	-5.76	-10.19	0.00	-5.39	-9.54	0.00	-10.30	-52.22	0.00
+5	-10.94	-59.50	0.00	-6.27	-11.10	0.00	-6.14	-10.87	0.00	-11.22	-56.89	0.00
+6	-12.00	-65.24	0.00	-6.99	-12.38	0.00	-7.41	-13.13	0.00	-12.23	-62.02	0.00
+7	-13.34	-72.52	0.00	-7.34	-13.00	0.00	-7.98	-14.13	0.00	-13.58	-68.83	0.00
+8	-14.20	-77.20	0.00	-8.30	-14.69	0.00	-9.09	-16.10	0.00	-14.44	-73.21	0.00
+9	-15.60	-84.84	0.00	-9.27	-16.41	0.00	-10.13	-17.93	0.00	-15.66	-79.41	0.00
+10	-16.31	-88.70	0.00	-10.75	-19.03	0.00	-11.04	-19.55	0.00	-16.26	-82.46	0.00
+11	-17.84	-97.00	0.00	-11.34	-20.09	0.00	-11.91	-21.10	0.00	-17.46	-88.53	0.00
+12	-18.86	-102.54	0.00	-12.11	-21.45	0.00	-12.97	-22.97	0.00	-18.64	-94.50	0.00
+13	-19.82	-107.80	0.00	-13.02	-23.05	0.00	-13.90	-24.62	0.00	-19.61	-99.43	0.00
+14	-21.11	-114.77	0.00	-13.40	-23.73	0.00	-14.49	-25.66	0.00	-20.61	-104.51	0.00
+15	-21.83	-118.71	0.00	-14.02	-24.82	0.00	-15.30	-27.10	0.00	-21.26	-107.77	0.00
+16	-22.77	-123.85	0.00	-15.21	-26.94	0.00	-16.47	-29.16	0.00	-22.28	-112.94	0.00
+17	-23.88	-129.84	0.00	-16.11	-28.53	0.00	-17.37	-30.77	0.00	-23.17	-117.48	0.00
+18	-25.13	-136.64	0.00	-17.80	-31.51	0.00	-18.78	-33.26	0.00	-24.62	-124.82	0.00
+19	-26.27	-142.84	0.00	-18.82	-33.33	0.00	-19.92	-35.28	0.00	-25.89	-131.25	0.00
+20	-27.49	-149.50	0.00	-19.59	-34.69	0.00	-20.54	-36.38	0.00	-27.07	-137.24	0.00
+21	-28.31	-153.93	0.00	-19.50	-34.53	0.00	-20.82	-36.87	0.00	-27.94	-141.67	0.00
+22	-29.05	-157.95	0.00	-19.87	-35.18	0.00	-21.23	-37.59	0.00	-28.64	-145.20	0.00
+23	-30.32	-164.87	0.00	-20.69	-36.64	0.00	-22.16	-39.23	0.00	-29.86	-151.40	0.00
+24	-31.57	-171.66	0.00	-21.36	-37.83	0.00	-23.01	-40.74	0.00	-31.25	-158.44	0.00

	Expansion (Target)			Contraction (Bidder)			Contraction (Target)			Contraction (Target) EXCL		
Days	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**	**CAAR**	**t-stat**	**p-Value**
-5	-0.39	-1.14	0.26	-3.06	-4.23	0.00	-1.86	-0.55	0.59	-3.70	-0.59	0.56
-4	-0.53	-1.54	0.14	-2.95	-4.08	0.00	-5.03	-1.49	0.15	-7.72	-1.24	0.23
-3	-0.95	-2.78	0.01	-2.18	-3.01	0.01	-6.14	-1.82	0.08	-9.53	-1.53	0.14
-2	-1.76	-5.15	0.00	-3.50	-4.84	0.00	-10.18	-3.02	0.01	-15.07	-2.42	0.02
-1	-2.29	-6.69	0.00	-5.13	-7.09	0.00	-9.52	-2.82	0.01	-18.85	-3.02	0.01
0	0.23	0.66	0.52	-4.63	-6.41	0.00	-18.56	-5.50	0.00	-34.03	-5.45	0.00
+1	-0.67	-1.97	0.06	-5.02	-6.94	0.00	-21.32	-6.32	0.00	-37.94	-6.08	0.00
+2	-1.67	-4.87	0.00	-6.68	-9.23	0.00	-19.49	-5.78	0.00	-33.66	-5.39	0.00
+3	-2.21	-6.44	0.00	-8.07	-11.16	0.00	-23.57	-6.99	0.00	-37.80	-6.06	0.00
+4	-2.99	-8.73	0.00	-7.62	-10.54	0.00	-25.12	-7.45	0.00	-38.98	-6.25	0.00
+5	-3.96	-11.55	0.00	-8.91	-12.32	0.00	-22.48	-6.66	0.00	-36.71	-5.88	0.00
+6	-4.92	-14.36	0.00	-10.26	-14.19	0.00	-21.52	-6.38	0.00	-42.38	-6.79	0.00
+7	-5.53	-16.16	0.00	-11.58	-16.01	0.00	-20.01	-5.93	0.00	-42.24	-6.77	0.00
+8	-6.32	-18.46	0.00	-12.42	-17.17	0.00	-22.12	-6.56	0.00	-47.89	-7.67	0.00
+9	-7.17	-20.93	0.00	-15.15	-20.95	0.00	-23.97	-7.10	0.00	-51.60	-8.27	0.00
+10	-7.98	-23.29	0.00	-16.66	-23.04	0.00	-30.15	-8.94	0.00	-53.92	-8.64	0.00
+11	-8.71	-25.44	0.00	-20.59	-28.47	0.00	-29.77	-8.82	0.00	-56.77	-9.09	0.00
+12	-9.53	-27.83	0.00	-20.46	-28.29	0.00	-30.20	-8.95	0.00	-61.19	-9.80	0.00
+13	-10.05	-29.36	0.00	-21.38	-29.56	0.00	-33.77	-10.01	0.00	-67.76	-10.86	0.00
+14	-10.86	-31.71	0.00	-24.72	-34.18	0.00	-31.22	-9.25	0.00	-65.30	-10.46	0.00
+15	-11.28	-32.95	0.00	-26.04	-36.01	0.00	-33.16	-9.83	0.00	-71.54	-11.46	0.00
+16	-12.15	-35.49	0.00	-26.43	-36.55	0.00	-36.62	-10.85	0.00	-76.88	-12.32	0.00
+17	-12.78	-37.32	0.00	-29.05	-40.17	0.00	-39.45	-11.69	0.00	-81.74	-13.10	0.00
+18	-13.57	-39.62	0.00	-28.85	-39.90	0.00	-47.40	-14.05	0.00	-91.77	-14.70	0.00
+19	-14.24	-41.58	0.00	-29.06	-40.19	0.00	-50.92	-15.09	0.00	-99.51	-15.94	0.00
+20	-14.72	-42.99	0.00	-30.58	-42.29	0.00	-53.68	-15.91	0.00	-102.08	-16.35	0.00
+21	-15.34	-44.81	0.00	-30.97	-42.82	0.00	-48.61	-14.41	0.00	-97.46	-15.61	0.00
+22	-15.72	-45.92	0.00	-32.03	-44.29	0.00	-48.88	-14.49	0.00	-98.30	-15.75	0.00
+23	-16.55	-48.32	0.00	-33.67	-46.56	0.00	-49.73	-14.74	0.00	-100.70	-16.13	0.00
+24	-17.25	-50.39	0.00	-33.89	-46.86	0.00	-50.15	-14.86	0.00	-103.55	-16.59	0.00

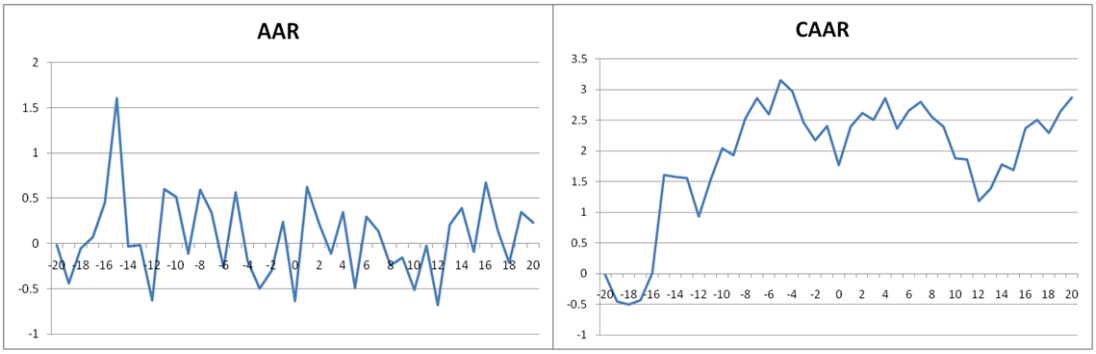
APPENDIX C

Figure C1: Model 1

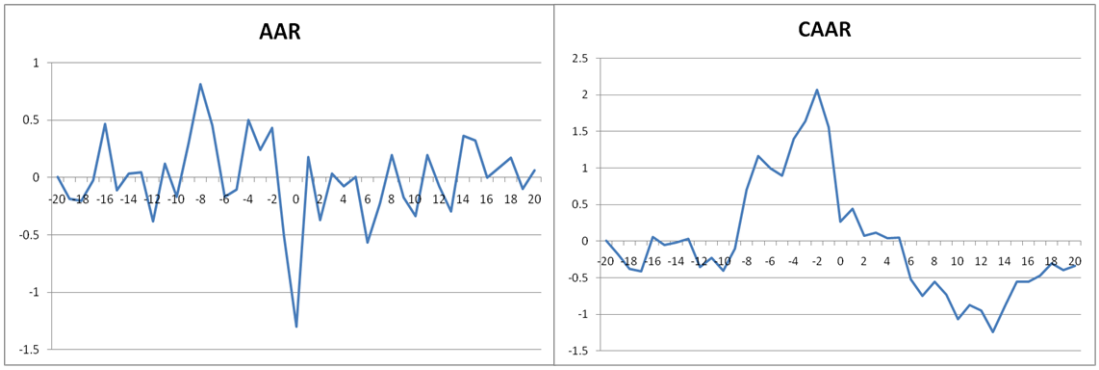
Panel A: Bombay Stock Exchange



Panel B: Euronext Paris



Panel C: NASDAQ



Panel D: New York Stock Exchange

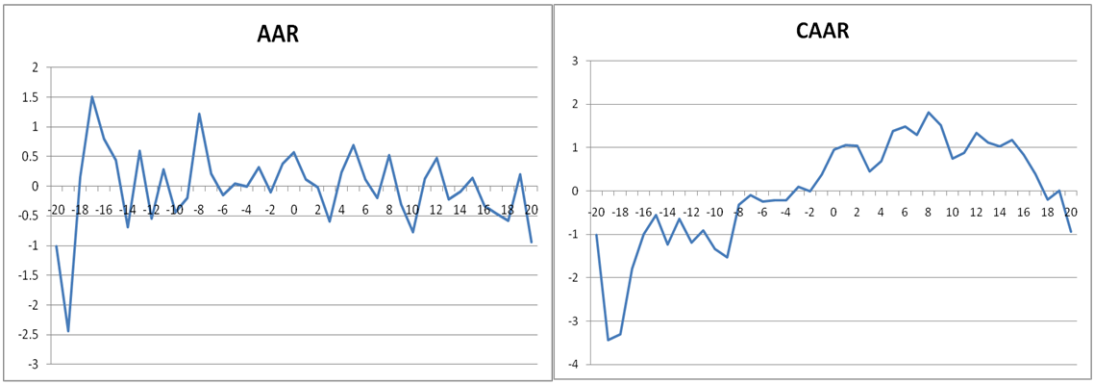
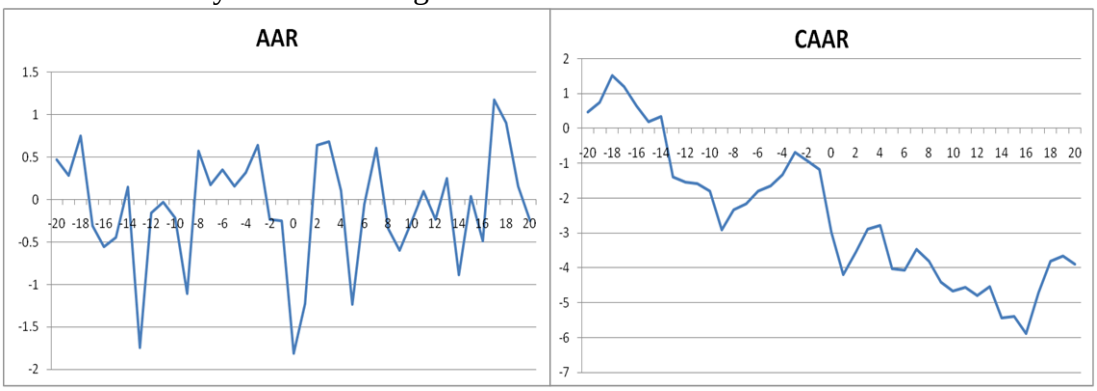
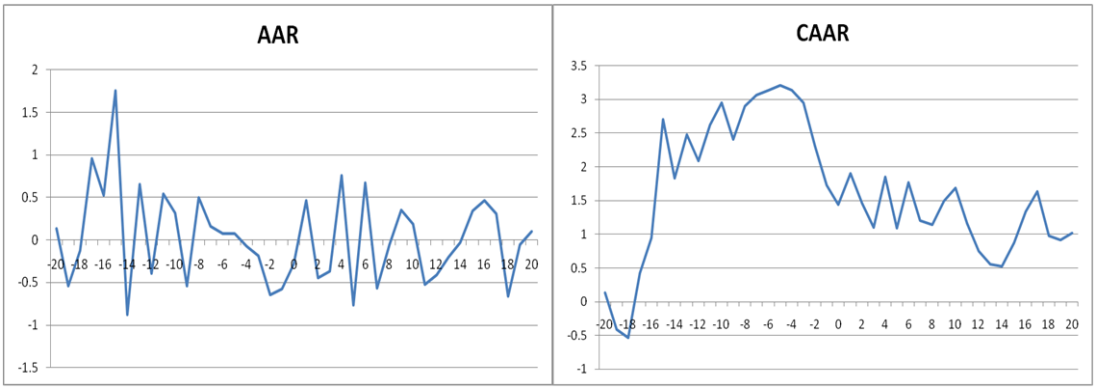


Figure C2: Model 2

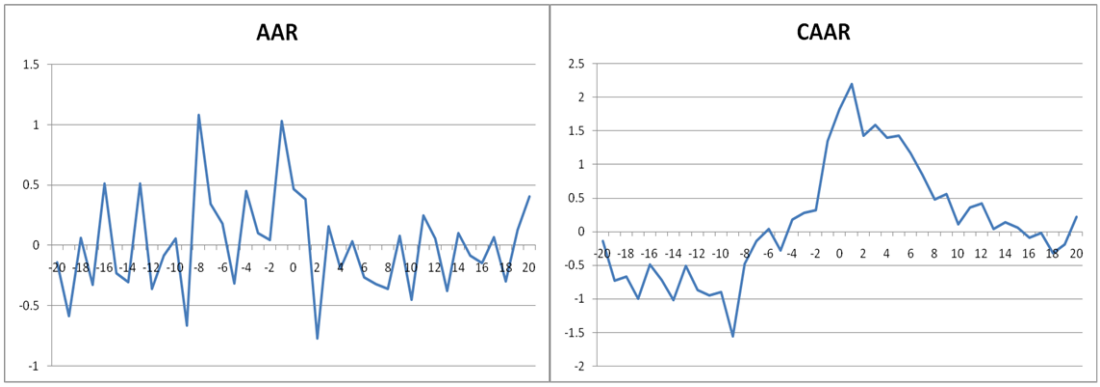
Panel A: Bombay Stock Exchange



Panel B: Euronext Paris



Panel C: NASDAQ



Panel D: New York Stock Exchange

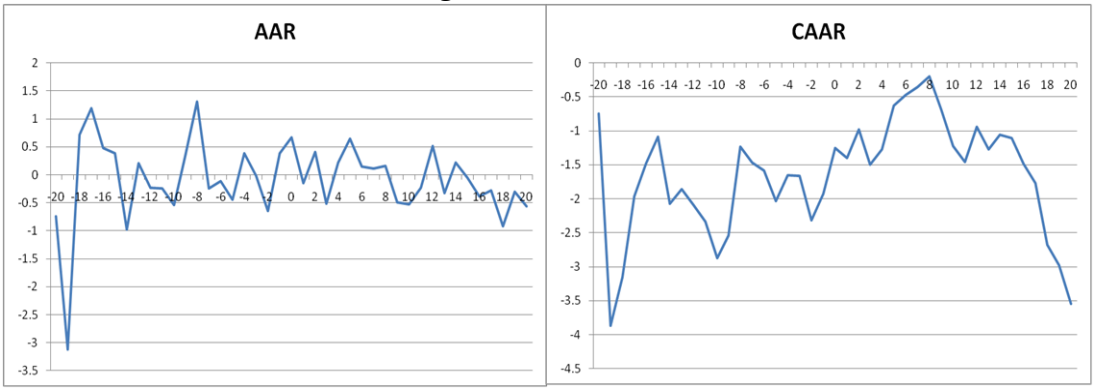
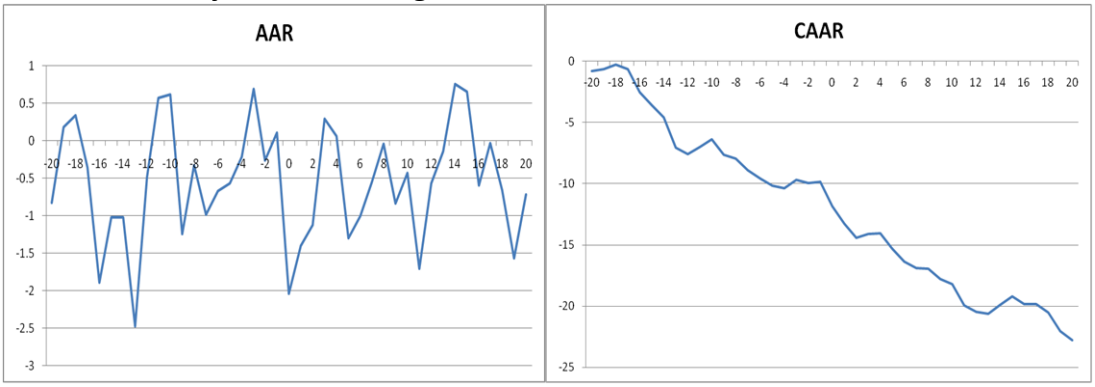
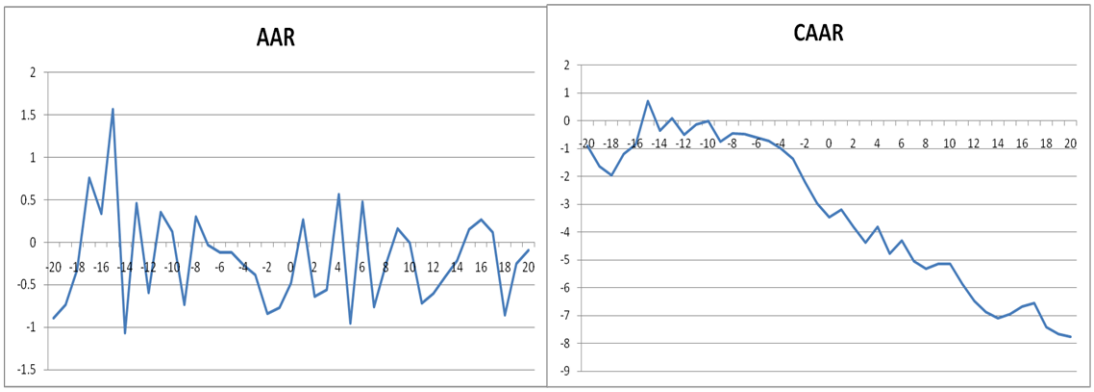


Figure C3: Model 3

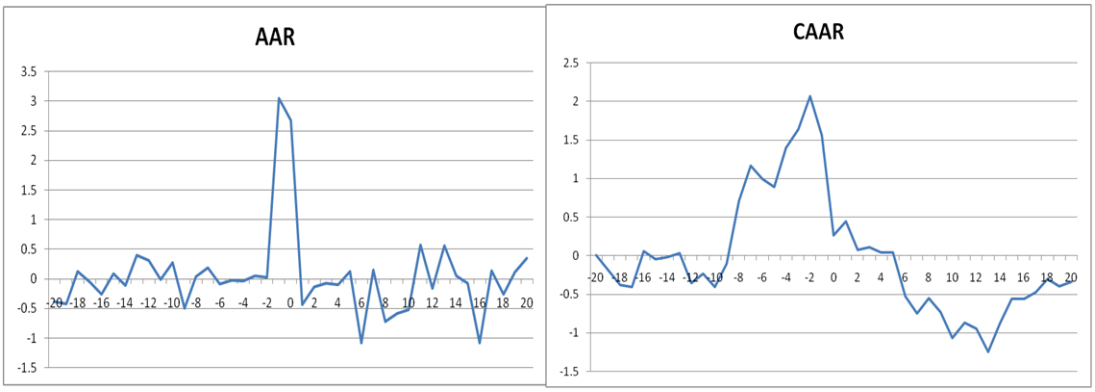
Panel A: Bombay Stock Exchange



Panel B: Euronext Paris



Panel C: NASDAQ



Panel D: New York Stock Exchange