WEALTH EFFECTS OF MERGERS AND ACQUISITIONS FOR U.S. FIRMS USING ALTERNATIVE PRICING MODELS

AUTHOR: JUSTICE KYEI-MENSAH

THE UNIVERSITY OF ASTON BUSINESS SCHOOL

(FINANCE AND ACCOUNTING)

THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF A PhD IN FINANCE – MARCH 2011

SUPERVISOR: PROFESSOR NATHAN L. JOSEPH

WEALTH EFFECTS OF MERGERS AND ACQUISITIONS FOR U.S. FIRMS: USING ALTERNATIVE PRICING MODELS

JUSTICE KYEI-MENSAH
Doctor of Philosophy

FINANCE AND ACCOUNTING
ASTON UNIVERSITY

March 2011

Table of Contents

Acknowledgement

My thanks are due to Professor Nathan L. Joseph, my supervisor, for his wisdom, supervision, help and advice in preparing this thesis. Throughout this thesis, he has taught me how to use a number of econometric software packages’, how to analyse data and has made very useful comments. I would not have been able to finish this thesis without his help. His many contributions are gratefully acknowledged.

I would like to take this opportunity to thank Professor Emeritus Jim L. Ford, Department of Economics, University of Birmingham, who advised me to write the PhD thesis. The journey of this thesis started at the University of Birmingham Business School when Professor Jim L. Ford, my dissertation supervisor for three to four months, inspired and encouraged me to take this challenge.

I extend my sincere thanks to the staff of Aston Business School, Research Degree Programme and Sue Ruud, formerly of the same department for their great support during these years.

Dedication

I would like to dedicate this thesis to my sons:

Colvis Kyei-Kusi Tuffour

Elvis Kyei-Agyemang Tuffour

And to my Mother: Joana Frema

And in memory of my father: Kofi Kyei

List of Tables

List of Abbreviations

CAPM	Capital Asset Pricing Model
OLS	Ordinary Least Square
GJR	Glosten, Jagnnathan and Runkle
GARCH	Generalized Auto-Regressive Conditional Heteroskedasticity
ARs	Abnormal Returns
CARs	Cumulative Abnormal Returns
M&As	Mergers and Acquisitions

Aston University

Wealth Effects of Mergers and Acquisitions for U.S. Firms Using Alternative Pricing Models

Justice Kyei-Mensah

PhD 2011

Abstract

This empirical study employs a different methodology to examine the change in wealth associated with mergers and acquisitions (M&As) for US firms. Specifically, we employ the standard CAPM, the Fama-French three-factor model and the Carhart four-factor models within the OLS and GJR-GARCH estimation methods to test the behaviour of the cumulative abnormal returns (CARs). Whilst the standard CAPM captures the variability of stock returns with the overall market, the Fama-French factors capture the risk factors that are important to investors. Additionally, augmenting the Fama-French three-factor model with the Carhart momentum factor to generate the four-factor captures additional pricing elements that may affect stock returns. Traditionally, estimates of abnormal returns (ARs) in M&As situations rely on the standard OLS estimation method. However, the standard OLS will provide inefficient estimates of the ARs if the data contain ARCH and asymmetric effects. To minimise this problem of estimation efficiency we re-estimated the ARs using GJR-GARCH estimation method. We find that there is variation in the results both as regards the choice models and estimation methods. Besides these variations in the estimated models and the choice of estimation methods, we also tested whether the ARs are affected by the degree of liquidity of the stocks and the size of the firm.

We document significant positive post-announcement cumulative ARs (CARs) for target firm shareholders under both the OLS and GJR-GARCH methods across all three methodologies. However, post-event CARs for acquiring firm shareholders were insignificant for both sets of estimation methods under the three methodologies. The GJR-GARCH method seems to generate larger CARs than those of the OLS method. Using both market capitalization and trading volume as a measure of liquidity and the size of the firm, we observed strong return continuations in the medium firms relative to small and large firms for target shareholders. We consistently observed market efficiency in small and large firm. This implies that target firms for small and large firms overreact to new information resulting in a more efficient market. For acquirer firms, our measure of liquidity captures strong return continuations for small firms under the OLS estimates for both CAPM and Fama-French three-factor models, whilst under the GJR-GARCH estimates only for Carhart model. Post-announcement bootstrapping simulated CARs confirmed our earlier results.

Keywords: M&As, ARs CARs, return continuations, liquidity, market efficiency, OLS, GJR-GARCH, bootstrapping, share price, firm size, event study.

CHAPTER ONE

1.0 Introduction

In recent years there has been an increase in corporate failure following period of poor economic failure, including the financial credit crunch as well as, periods of greater global competition. Among other reasons, many companies have resorted to financial restructuring by engaging in mergers and acquisitions (M&As). M&As as the name suggests, is seen as a way for companies to save themselves from these economic doldrums. Therefore, corporate investment has become a phenomenon in which companies seek to maximise their profit by engaging in M&As. Firms expand through acquisition in order to increase shareholder wealth beyond organic growth. This empirical study aims to investigate the wealth effects of both target (acquired) and bidding (acquirer) companies on announcement of M&As for U.S. firms over the period1stJanuary 1988 to 31st December 2008. Specifically, the study aims to investigate the following: Firstly, this study will examine the impact of long-term event on M&As on shareholder wealth. Secondly, it will further examine the extent to which shareholder wealth is impacted by acquisition announcement. Again, we evaluate the impacts of market liquidity, measured by trade volume and market capitalization on the magnitude of cumulative ARs (CARs). We also developed hypotheses to test the estimation of GJR-GARCH mean and variance equations of the coefficients to see which of the coefficient variables has predictive power in explaining our cross-sectional regression. This study will also perform bootstrapping to determine the degree of data mining.

The empirical study will use an event study methodology to examine the wealth effects of M&As. This approach has been a major tool for research in the area. This event study methodology will be applied to estimate the ARs in a window of twenty days using daily data. M&A announcements can trigger significant reactions in share prices which can be either positive or negative. Stock prices with positive reaction tend to slope upward while downward slopping is associated with negative reaction. For example, Goergen and Renneboog (2004) found that following the announcements of M&As, the stock price of the target firms' increases to generate positive wealth for the target firm shareholders. However, Bosveld, Meyer and Vorst (1997) and Manasakis (2006) reported a decline in the stock price of the acquirer on announcement. Under the weak form of market efficiency, the stock price should not be predictable. Fama (1998) put forward a striking argument that under the efficient market hypothesis the expected value of ARs is zero and that indication of ARs is by chance. This statement of Fama (1998) is still being debated in the financial research community.

As already indicated the study aims to investigate:

i) the wealth effects of M&As using the standard CAPM, Fama-French three-factor and Carhart four-factor models. The use of different specifications of the pricing model is useful for the following reason. First, Van Dijk (2007, p. 1) notes that ''If the higher returns on small stocks are due to a large exposure to an underlying risk factor not incorporated in standard asset pricing models, firms should compute their cost of equity capital using a pricing model that accommodates such risks". Failure to do so can lead to biased estimates of the ARs. Indeed, the use of the Fama-French three-factor model (1993) might explain differences on average across-sectional returns. Secondly, a mis-specification of the model can lead to conclusions that influence policy making, which in turn can have adverse effects (see e.g., Sudarsanam, 2004). Third, the use of the (asymmetric) GJR-GARCH method captures the conditional volatility and asymmetry in the ARs.

ii) The impacts of different estimation methods on the ARs. To do this, all the models are estimated using the standard OLS and the (asymmetric) GJR-GARCH methods. It is well known that when the classical assumptions of normality and no autocorrelation do not applies, the OLS estimation method can lead to unreliable estimates. The use of the GJR-GARCH method leads to greater estimation efficiency relative to the OLS method particularly in daily data where ARCH effects and asymmetry are more pronounced compared to weekly or monthly data. Indeed, Corhay and Rad (1996) show that GARCH effects cause the standard OLS method to overestimate (underestimate) the regression parameters following positive (negative) shocks relative to the GARCH approach. So the GJR-GARCH method enables me to avoid some of the restrictive assumptions that underlie the standard OLS method. This present study will use daily stock data. The GJR-GARCH method is more efficient than the OLS when using daily data. The use of daily stock data will be preferred and that might alleviate one of the problems associated with weekly or monthly data explicitly, leading to flawed results due to the existence of a long event window. Again, unlike weekly or monthly data, the use of daily stock data gives an extra accurate measure of volatility and pins down the correlation between risk and return.

Prior research on M&As employed a different methodology to stock market returns leading to different conclusions. Using a suitable methodology could alleviate the problem of risk factors in stock returns, inefficient biased estimators and often produce a flawless result that makes comparison possible. Thus, empirical evidence has shown that the Fama-French three-factors model is capable of capturing the risk factors associated with stock market returns (see e.g. Faff, 2001; 2003; 2004; Pham, 2007) which is of interest to bidding firm shareholders.

iii) The sensitivity of the estimated CARs to bootstrapping estimates.

One of the major setbacks of long-run event studies is the problem associated with data mining for the CARs obtained. Our use of a nonparametric bootstrapping simulation is to solve the bias in standard errors estimation because no assumptions are made about the underlying sample data of the distribution. Thus, the use of bootstrapping simulation has been solely to verify the reliability of the actual CARs obtained.

To the best of our knowledge this is the first study to examine the ARs of firms associated with M&As in terms of the Fama-French and Carhart factors and to undertake a comparative estimation of the models using both the OLS and asymmetric GARCH model. Balaban and Constantinou (2006) is the closest empirical study to ours. Here they use the symmetric GARCH method to model the announcement effects of M&As for UK firms. However, they use the standard CAPM and they assume no asymmetry in the ARs.

1.1 Research Question and Theoretical Frame work

One of the main tools used by companies to survive in the increasingly global competitive market is to merger with other firms. There have been a lot of questions as to why mergers occur and a lot of explanations have been given to account for this phenomenon. The alternative view is that most M&A activity rarely provides the highly anticipated synergies between firms. Alternatively, the proponent is of the opinion that empirical evidence has shown that mergers enable firms to implement an immense strategic shift mainly through the use of acquisitions. In other words, it is important to emphasize that acquisitions complement shareholders' organic growth, and that is the underlying rationale for acquisition.

In spite of extensive discussions and empirical work on M&As, there are still many unresolved issues in terms of the best methods to use and why M&As activity differs widely over time. These problems still remain a challenge to the finance academic. The current study will attempt to answer the question outlined below:

Problem: To what extent does the M&As announcement impact on target and acquirer companies on the basis of their share prices.

The main aim of the current study is to examine empirically the change in shareholders' wealth following the M&A announcement of both target and bidding U.S. companies. The sample period is 1988 to 2008. We also investigate how the impact of market liquidity can influence the cumulative abnormal returns (CARs) in estimating the wealth effects of shareholders. We use the CARs of both target and acquirer firms' market capitalization and trading volume as a measure of liquidity by categorising them into small, medium and large firms. We estimate the CARs using standard CAPM, Fama-French three-factor models and Carhart four-factor models to ensure proper model specification. Also, the models are estimated using both the OLS and the asymmetric GJR-GARCH model. The use of the GJR-GARCH model is likely to increase estimation efficiency. Finally, CARs are bootstrapped to the degree of data mining. The bootstrapping simulation results did not suggest any reason for concern.

1.2 Policies Implementation

This study was done at a time in the development (event) of financial economies when the issue of M&As particularly in the company of or amongst banks took on a new dimension. In the recent past, most banks were bailed out by their respect governments due to the credit crunch. According to some financial commentators, some risks were underestimated and the importance of market liquidity was not completely acknowledged, hence banks' credit crunch. The credit crunch has had very serious consequences for the banking industry and financial economists have not been able to tell how the impact on these banks will affect M&As.

However, some analysts predict that the banking credit crisis will have serious repercussions in the M&As industry. In principle, there is a strong indication that there will be a decline in M&As since most banks are not financially self-sufficient and therefore cannot sponsor other companies' M&As. Based on these recent developments, the M&As have attracted the unmatched attention of researchers, academics and government regulatory bodies. This empirical study will consider extent to which market liquidity affects the share price when estimating the wealth effects of M&As. The research findings will have important for the investment banks, shareholders, practitioners, policy makers and accounting bodies could be interested in my research.

1.3 Contributions of my Research to Empirical Work

My empirical study contributes to the empirical literature in the following ways: Firstly, modelling of mean and conditional variance will be effectively applied to the stock market data where the conditional variance captures the impacts of current and old news. In the M&A spectrum, a lot of news comes into the market and M&As provide a good opportunity to apply conditional variance for the news part. The results suggested that past news φ_i coefficients appears to have not much effects on the current conditional variance and significant across all firm sizes for both acquired and acquiring firms' shareholders.

Secondly, the standard CAPM, Fama-French three-factor and Carhart four-factor models are estimated using both the OLS and the GJR-GARCH estimation methods. Fama-French (1992) argued that their three-factor model is capable of capturing cross-section variations in returns. The standard CAPM only captures the riskiness of a firm, relative to overall market. As such the Fama-French three-factor model will be better specified. The same argument holds for the Carhart four-factor models. A comparative study of the predicting accuracy of these models is conducted. The results indicated that the predictive accuracy of these models were not materially different. However, the results of the GJR-GARCH estimation methods were efficient compared to the OLS estimation methods.

Thirdly, it appears, as the review of the literature has shown that the ARs around official announcement dates on M&As are inconclusive. Prior empirical studies have not yet been able to produce consistent results with regards to or concerning ARs to acquiring firms. In this regard, our empirical research will provide a basis for investigation to find out whether announcement effect on M&As yield ARs for target and acquiring firms or otherwise. Thus, acquired and acquiring firms will be modelled separately in predicting wealth effect, to determine whether acquisitions actually create wealth effects for shareholders, that is, the impact of acquisition benefits on the share prices. The results showed that announcement returns to target firm shareholders' are significant, whilst returns to acquirer firm shareholders' are insignificant under the two estimation methods across all the methodologies.

The fourth contribution is the size effect hypothesis. The literature has indicated that small firms ARs are higher than ARs of large firms on acquisition announcement. This analysis will be done using the market liquidity, measured by market capitalisation and trading volume measures to the ARs for firms that have big, medium and small capital and trading volume. We found that on announcement day t=0, CARs of small liquidity stocks are higher than both medium liquidity and large liquidity stocks. Nevertheless, we observed strong return continuations in medium liquidity stocks compared to both small liquidity and large liquidity stocks. An analysis based on ARs has confirmed this empirical finding of prior research. It seems our liquidity measure has a significant impact on the size effect. The significance contribution of this empirical study will add a valuable insight into the existing literature of M&As.

1.4 Conclusions

Overall, the purpose of this chapter was to detail the research question, aims and objectives and the policies implementations as well as my empirical contributions to the literature of this thesis. The announcement returns for target firm shareholders are significant whilst we documented insignificant for acquiring firm shareholders under both the OLS and GJR-GARCH methods across all three methodologies. Our liquidity measure captured strong return continuations in the medium stocks relative to small and large stocks for target shareholders. For acquirer firms, our measure of liquidity captures strong return continuations for small stocks under the OLS estimates for both CAPM and Fama-French three-factor models, whilst under the GJR-GARCH estimates only for Carhart model. Post-announcement bootstrapping simulated CARs confirmed our earlier results. These are the main issues discussed in this chapter. Indeed, these theories have great impact on the economic life of the target and bidding firms shareholders. It also raises some concerns about how the market reacts to acquisition announcements. In this chapter, we have been able to demonstrate that our research will interest some key individuals who will use our research findings to formulate economic policies.

The thesis is organised as follows:

Chapter two discusses the broad view of the survey of existing literature of empirical studies of M&As. In this chapter we present prior research work, researchers' views and findings on announcement of M&As and its effect on share prices and the liquidity impact of the share price. This chapter will also discuss the limitations of prior studies.

Chapter three presents all the necessary information needed to analyze the current study. The chapter outlines and seeks to explain the hypotheses to be tested, the research design: the data and sample selection. It also states the parameter estimation and event period. The rationale for the choice of standard CAPM, Fama-French three-factor models and Carhart four-factor models for the current study is identified. The use of OLS and GJR-GARCH estimation methods is presented. In addition, the chapter states the statistical problem associated with the long-run event study. This chapter analyses descriptive statistics in the present study as well as the correlation between target and acquirer firms and the summary conclusion of this section.

Chapter four presents the empirical results of the ARs using the OLS and GJR-GARCH estimation methods. Acquirer's method of payment is also presented.

Chapter five presents the ARs and the market liquidity. In this analysis, we use the CARs of target and acquirer firms' market capitalization and trading volume as a measure of liquidity. The firms are categorised into small, medium and large market capitalization and trading volume stocks. This followed by the conclusion.

Chapter six analyse the GJR-GARCH-in-mean (GJR-GARCH-M) and variance equations of the coefficients to determine which of the coefficient variables has prophetic power in explaining our cross-sectional regression.

Chapter seven evaluates the bootstrapping simulation. We perform bootstrapping simulation to determine the robustness of the actual mean CARs obtained in the original data and conclusion.

Chapter eight concludes this thesis and outlines the limitations of the current study and recommends potential areas for further research.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the prior finance theories and empirical studies on the corporate acquisition. It summaries the various theories for M&As and reviews the research that has explored those theories. This review especially relates to the intended area of research. The chapter is organised as follows: The first section 2.1 focuses the economic impact of M&As. The next section 2.2 discusses the motives for M&As. The third section 2.3 presents the relevant literature regarding the apparent meaning of the market for corporate control. Section 2.4 describes defences against acquisitions. Section 2.5 discusses the short-run and long-run event studies on the impact of M&As. Section 2.6 deals with resource-based transfer. Section 2.7 describes the relationship between merger and tender offer and method of payment. The next section 2.8 examines the Efficient Market Hypothesis. Section 2.9 entails market anomalies. The next section 2.10 presents market liquidity and stock returns. Section 2.11 considers conditional volatility and stock returns. Section 2.12 discusses stock market size effect. Final section 2.13 entails the critical review of previous studies and conclusion. These are covered in 2.0-2.14.

2.1 The Economic Impact of Mergers and Acquisitions

The economic impact of M&As is huge as it affects many constituencies; employees, creditors, stakeholders, financial community and many more. Industrial economists had suggested that the likely effect of M&As on economic welfare is broad and prolong negative employment repercussions due to lay-offs in the event of M&As. The most vulnerable are the employees who are in most cases likely to lose their jobs. As noted by Dutz (1989) cited in Conyon, Girma, Thompson and Wright (2002, p. 33) ''employment losses appear likely to be more substantial in horizontal mergers than in vertical or unrelated cases, particularly where the industry exhibits substantial economies of scale and/or surplus capacity''. However some academic have suggested that restructuring (see e.g. Inoue, Uchida and Bremer, 2010) of distressed firms have help in enormous ways in safeguarding the entire workforce of a company. That is, without restructuring, these distressed firms might have collapse affecting the total workforce, but in M&As only a fraction might lose their jobs. Others had advocated that M&As enhance efficiency (see e.g. Al-Sharkas, Hassan and Lawrence, 2008) and risk alleviation thereby increasing shareholders wealth.

Carletti, Hartmann and Ongena (2008) analysed the effect of the introduction and strengthening of competition policy in industrial countries in which most of the modification transpired. The main event study methodology used in this study was the market model with both financial and non-financial variables. They use this exogenous policy change to pinpoint deferential reactions of banks and non-financial firms. As expected, changes in competitions policy have important economic effect in M&As arena. The logic behind M&As control is to prevent excessive market concentration that would lead to a strengthening position, and thus increase prices and a reduction in consumers' welfare. It was found that bank stock prices react positively to the announcement of a change in competition policy but non-financial firms react negatively. In other words, stock prices of bank gain whilst non-financial firms loose due to changes in competition policy. Further analysis revealed that target banks also grow in size after M&As, as well as profitability after the legislative changes. Their results show that banks gain tremendously, the less transparent the supervisory in a country is. The authors claim that the legal system governing competition and supervisory control of bank mergers has significant implications for the performance of banks and firms.

De Bondt and Thompson (1992) revisited the US market by examined the economic efficiency behind mergers. The study focuses long term stock market movement on announcement of M&As, running bivariate OLS regressions. The authors claimed that, although economic efficiency is an important motive for M&As there are also other motives that contribute to M&As, such as poor stock market performance and undervaluation motives. De Bondt and Thompson (1992) claimed that takeovers are linked to macro-economic variable terms of economic efficiency and that the efficiency motive is not a major role but other motives. It seems therefore that, there was evidence to suggest merger is motivated by stock market undervaluation.

Cho and Cohen (1997) studied the economic effect of corporate divestitures by revisited the US stock market and extended Boot's (1992) theoretical analysis that managers will not sell under-performing unit if it can be sustained by other units. The authors used a cross-sectional regression to assess changes in post-divestiture performance of the industry-adjusted cash flow return. Cho and Cohen (1997) noted a trivial post-divestiture operating cash flow returns for divesting firms. They contended that business units of firms are diverted when they encounter significant underperformance relative to their peers. In other words, companies are prepared to sell if business unit is considered to be unproductive. The results also concluded that by diversion operating performance improves at the announcement of divestiture due to the reduction in the agency costs associated with holdings losing units. The general view that stock market reacts positively to divestiture was found to be preliminary improvement, eventually mean reverting. The study suggests a further investigation as to why after divestiture operating performance does not significantly increase.

2.2 Motives for Mergers and Acquisitions

Acquisition has been seen as the significant investment of a corporate firm restructuring in the market for corporate control. A number of studies have shown that M&As manifest itself as a strategic point for restructuring. Therefore M&As have been seen as a turning point for companies to maximise the potential of economic benefit. A coherent acquisition strategy might have its ultimate aim of achieving or has to be based on efficiency gains. Ushijima (2010) indicated that both partial and total mergers result positive and significant ARs around first announcement date.

2.2.1 Synergy Motive

Synergy theory suggests that companies are taken into acquisition mainly to increase the current value of the shareholders of the acquiring firm. That is to say, takeover arises due to economic benefit that results by unification of the two firms resources. Empirical evidence suggests that synergy is the major aim of takeover (see e.g. Berkovitch and Narayanan, 1993; Gupta, LeCompte and Misra 1997; Bruce and Christopher, 2000; Goergen and Renneboog, 2004). Two types of synergies have been advanced in the literature: operational synergy and financial synergy.

i) Operating Synergy Motive

The concept of operating synergy assumes that economies of scale in production are major determinants of accomplishment that will see various activity mergers as firms compete rapidly to achieve a dominant position. These give the firms the potential opportunity to increase their operating income. Berkovitch and Narayanan (1993) used the market model methodology to compute the cumulative ARs for bidder and target firms. They state that if acquisitions are motivated by synergy, total gains to both target and bidder will be positively correlated with each other. Because target has ability to resist bidder and since competition exist among potential bidders, there will be an increase in total gain of target. Above all, mergers will foresee managerial economies that may lead to broad management functions. As noted by Weston, Siu and Johnson (2001), economies of scale arise because of indivisibilities of factors of production that result in lower costs of output thereby increasing shareholders' wealth.

While output and profit increase due to economies of scale and scope (Berger, Demsetz and Strahan, 1999; Lewis and Webb 2007), per unit cost of production decreases. The two merging firms enjoy operating synergies leading to economies of scale of profitability as the sum of the two firms is greater than each firm operating separately. Using the methodology of Bayesian estimated modified stochastic cost frontier, Lewis and Webb (2007) observed that cost of synergies arising from the two companies would lead to overall scale economy changes and the return of higher scale emerges. This suggests that as firms engage in merger activity, there is a possibility that both acquired and acquiring shareholders might measure gains through the deal. Therefore, it is imperative that firms operating below capacity and with the potential to achieve economies of scale should engage in acquisition, and greater profitability should contribute to maximizing shareholder wealth. Behr and Held (2011) suggested that the main motive for mergers might be achievement of scale of economies or market power.

ii) Financial Synergy Motive

This theory associated with the financial synergy motive has the premise that the two firms combine the cost of capital decreases whereas the debt capacity increases. This means that the two combined firms' insolvency decreases as well as the default risk. We expect the two combined firms will become more profitable and cost efficient after post-merger than each firm operating on it own. Thus, a positive relation exists between the two combine firms and future profit maximization. The financial synergies hypotheses are motivated by reductions in the cost of capital due to a reduction in insolvency risk; hence we expect an increase in size as well as investment projects of the target's firm thereby increasing shareholders wealth. This suggests that it would benefit shareholders' when the two separate cash flows merged.

2.2.2 Diversification Motive

The concept of diversification as acquisition motive has been a debate over the years. There are conflicting results empirically documented in the literature whether diversification actually reduces risk. The advocate of this premise is that diversification is the most important constituent in achieving profit maximisation while at the same time minimising risk. Acquiring firms' management believe that through diversification they can reduce the returns volatility and risk associated with share prices thereby increasing the potential value for their shareholders. Studies have found that diversification has the tendency to create potential value (Villalonga, 2004; Mukherjee, Kiymaz and Baker, 2004). Portfolio theory in finance suggests that optimal diversification is achieved through a diversified range of stocks. Therefore, managers seek diversification to increase shareholder wealth through acquisition. There is a general perception that an undiversified firm will require a high risk premium in investment, hence diversification has the tendency to eliminate the negative impact of risk. Diversified firms have a significantly lower cost of debt than undiversified firms and also diversified firms have more positive premium than undiversified firms in the same industry (Aivazian and Qiu, 2006). Aivazian and Qiu (2006) also found that with market friction corporation diversification assists creditors to hedge uncertain future cash flows as a means of lowering default risk. Harfoord, Jenter and Li (2011) suggested that diversified shareholders favour corporate policies that maximize their share prices value. However, Lang and Stulz, (1994) found strong evidence to prove that diversification add no value to shareholders' wealth. To solidify their arguments they show that highly diversified firms do have significantly lower average and median q ratios relative to undiversified firms. Recent empirical study by Chollete, Pena and Lu (2011) indicated that diversification is associated with both benefits and costs.

2.2.3 Tax Motive

There is a general perception that M&As are motivated by tax benefit or tax savings that firms involved in acquisition enjoy. Potential acquirer can enjoy the tax benefit that might accrue from the acquisition taking advantage of the tax laws prevailing in the country. Therefore, as a matter of fact, companies engaged in acquisition due to the tax benefit, which may be generous. As suggested by some commentators that M&As are linked to potential tax benefit that enable both firms to use their tax losses and tax credit to their advantage thereby reducing their tax liability (Auerbach and Reishus, 1986). In the same way Cook (1992) suggested the tax on companies maintaining that their merger is synergistic, and this tax incentive forces the two management teams engaged to have a second opinion. In an attempt to predict tax benefit to mergers, Shih (1994) examined conglomerate mergers as a tax motive. The author found that mergers are able to transfer surplus non-debt tax shields among themselves but such tax would be lost without mergers. His further analysis revealed that when firms with low earnings merged, their expected future tax burdens fall off signifying conglomerate mergers as an entirely tax-driven motive.

2.2.4 Managerial Inefficiency

The general perception of this hypothesis is concerned with asset management and its efficiency. Inefficient management pertains to under-utilisation of a firm’s resources to generate output. In this case, the full potential benefit of the firm’s resources cannot be achieved. Empirical studies show that an indication of inefficient management is when the assets of the company are not fully and efficiently utilised. In his empirical study, Rege (1984) noted that in some cases if lower activity is noticed as a sign of inefficient management, there is likelihood that takeover may be able to make the firm more efficient and profitable for the benefit of the shareholders. He states the limitation of his study as whether forecasted data are more efficient than historical data in predicting takeover targets.

North (2001) also tested this hypothesis. He said that since this argument assumes that takeovers partially serve to replace inefficient management, the issue to be examined here is whether a firm would be acquired due to its relatively poor financial performance in terms of efficiency as compared to not acquired. In pursuit of their business, an acquiring firm acknowledges mismanagement in a target firm and attempts takeover. This theory suggests that inefficient management will be removed and replaced. An acquiring firm serves to solve inefficiency in the target's management which will, eventually, create value in the target firm. There is a potential gain to the shareholders through increased efficiency following the acquisition. Palepu (1986) suggested that the target's return on equity prior to the acquisition can be used to measure the target's management efficiency and this will indicates whether there is enough evidence of inefficiency management serving as a basis for taken over.

2.2.5 Hubris Motive

The concept of hubris is the premise that bidders pay higher value over and above the target's true economic value. The perils of hubris have become obvious, that acquirer managers miscalculate the value in acquisitions hence leading to what is termed as the winner's curse phenomenon. Roll (1986) documented that bidding firm managers commit errors in evaluating merger opportunities due to hubris. Therefore, it follows that if the hubris hypothesis holds, acquirers should not expect positive total gains in acquisition**.** Hayward and Hambrick (1997) stated that premiums paid by acquiring companies are significantly larger than the value they believe it will create. They also suggested that the relationship between management hubris and the size of premium paid is significantly expensive**.**

Berkovitch and Narayanan (1993) and Goergen and Renneboog (2004) using the market model methodology of motives for takeovers documented that the hubris hypothesis maintains that there are no gains from takeover and that takeovers occur because acquirer managers make mistakes or poor decisions in estimating gains. Mueller and Sirower (2003) tested this hypothesis and claimed that hubris does not necessary mean that wealth is created by mergers. They suggested that for the hubris hypothesis of wealth creation to hold, one has to argue that managers of diversified firms create more hubris than undiversified firms. Consequently, poor managerial decision make acquirer managers undertake such gambles, said the authors, ''they believe that they can see value in other firms that no one else can see'' (p. 388).

2.3 Market for Corporate Control

Market for corporate control seems to suggest that there is a relationship between the market for corporate acquisition and corporate strategy. While there is a view that both the acquiring firm and target firm benefit from the deal, the market for corporate control has become heavily regulated in recent times. In a takeover bid, the corporate control right (Jensen and Ruback, 1983) of the target firm is transferred to the acquiring company. The risk-averse managers of the acquiring firm modify and transform target firm resources which, in turn, can reduce risk. The target firm resources are managed by the managers of the acquiring firm (Jensen and Ruback, 1983).

Numerous empirical studies have been advanced to explain the rationale behind market for corporate control in M&As. Given the relevance of market for corporate control there are opposing views on this concept. On one hand, market for corporate control thoroughly disciplines badly performing firms. Whilst on the other hand some researchers found no evidence to support this notion of discipline.

De Young (1997) used cost frontier methodology and multi-product translog cost functions to estimate pre- and post-M&As cost efficiency. Interestingly both pre-merger and post-merger efficiency signified that acquiring firms were more cost-efficient than their target firms. Furthermore, both related and unrelated pre-merger and post-merger had important efficiency capability. Their study showed that bidding firms were more efficient than target firms, and proposed that in efficient markets, inefficient companies would be acquired. This implies that in the market for corporate control spectrum, underperforming firms should be acquired and run by efficient managers. The study results failed to support the traditional market for corporate control theory, where inefficient firms will be acquired but rather suggested that other motives as a factor for US mergers in 1980s but not cost efficiencies. Dickerson, Gibson and Tsakalotos (2002) studied the market for corporate control and takeover risk in the UK using matched sampling approach. This study used two methodologies: first, a standard probit model to compute the factors determining the probability of a firm being taken over; and second, a standard proportional continuous time hazard function methodology. The study shows that the market for corporate control is a yardstick by which to measure or disciplines unsuccessfully firms. However, it fails to find evidence to support the free cash flow theory hypothesis that firms are likely to be taken over if there are no apparent profitability investment opportunities that was captured by their Tobin's q. Jensen (1987) theoretically was able to bring relation between market for corporate control and managerial ownership. According to Jensen (1987), M&As only take place due to changing technology or market conditions. However, the he acknowledges that takeover serve to replace inefficient management.

Ferreira, Ornelas and Turner (2005) studied the ownership structure and efficiency of the market for corporate control and revisited the work of Cremton, Gibbons and Klemperer (1987) by using different framework, the separation of control from ownership and agency cost. Ferreira et al. (2005) documented that for effective restructuring, firms internationally increase their market share when incumbent managers remain in control. They reported that companies are not willing to assign full control and full ownership to one stockholder, unless agency costs are attached. Their analysis either support or fail to find evidence that market for corporate control disciplines underperforming companies. Weir and Laing (2003), Koke (2004), Weir, Laing and Wright (2005), Sinha (2006), and Siriopoulos, Georgopoulos and Tsagkanos (2006) studied the market for corporate control. Using a binary logit model methodology they reported mixed findings. It has been suggested that the probability of a firm being acquired is high when a firm has higher institutional shareholders and higher executive director shareholdings and non-executive directors, and that acquisition is driven by managerial disciplinary motives. The analysis showed that change in control is associated with poor performance and that control changes served as a disciplinary measure in market-based economies. There was an evidence to suggest that high ownership concentration makes control change impossible, in line with the proposition that tight shareholder control may serve as a replacement of disciplinary control change. Weir et al. (2005) found that companies becoming private are associated with higher CEO shareholdings and higher institutional shareholdings, but are statistically insignificant with regard to the presence of non-executive and independent directors. Sinha (2006) indicated that when the market for corporate control is active top management are disciplined by outside directors, and in hostile takeovers, outside directors may be dismissed.

However, contrary to some views the two studies of Weir and Laing (2003) in UK and Siriopoulos et al. in Greek (2006) failed to support the disciplinary motives as a significant in corporate control market. Interestingly these two studies suggested that acquisitions in these countries are friendly relative to disciplinary motives which are associated with hostile. Indeed, the majority of the literature on market for corporate control had disapproved the notion that firms with poor profitability or inefficient will be acquired.

2.4 Defences against Acquisition

Companies might institute defence tactics if they are vulnerable to be taken over. The purpose of defences against acquisitions is to salvage the interest of both the managers and the shareholders. Target management might apply excessive use of different defence’s strategies which will make it difficult to deal with and critically out of touch with realities. Over the years, there have been an increased number of M&As but some mergers have been unsuccessful. This is due to a number of acquisition defences that target management must apply in their attempt to overpower the acquiring firm management. The defiance might help the target to perform better on its own and to seek to entrench itself against loss of power if a merger takes place. A plethora of empirical studies examining defence strategies have shown evidence that shareholders interest must be taken into consideration.

Sarig and Talmor (1997) indicated that defensive measures have the tendency to increase shareholders' wealth. If directors agree acquisition, they must demonstrate that the price was fair to shareholders and that was the best price that could be achieved. The dominance of defence measures indicates that shareholders regard those measures as wealth creating. Some takeover defensive measures are greenmail, poison pills and golden parachutes.

Greenmail is where a target management firm repurchases stock from block holders at a premium. The aim of the premium buy back from raiders is to curtail their action in the event of a hostile takeover threat opposed by these block holders. Manry and Nathan (1999) found that greenmail premia paid are non-linear with inside ownership, but found a relationship between greenmail premiums and outside ownership.

Poison pills are designed by directors without approval from shareholders to make the acquisition extremely expensive and can be a very successful way to discourage acquirers. Comment and Schwert (1995) proposed that poison pills had a tendency to increase takeover premiums without decreasing takeover likelihood. However, Field and Karpoff (2002) findings were pointing to the north, by establishing that poison pills and takeover defences decrease takeover likelihoods without any compensating increase in takeover premiums. Poison pills help directors to exercise their duties (Gorden, 2002; Stout, 2002) especially in matters regarding takeover issues. They also show that post-pill performance does not depend on the pre-existence of a staggered board. Danielson and Karpoff (2006) focused on firm adoption of poison pills and examined them with regard to the firm's performance. They concluded that pill adoption substantially improves operational performance.

Golden parachutes are the provision of employment contracts arranged to compensate managers if they are to lose their jobs as a result of acquisition. Lefanowicz, Robinson, and Smith (2000) found that golden parachutes may serve in part to mitigate the expected loss of salary when the managers' share of acquisition gains from their stockholdings do not completely offset expected salary losses. Their final analysis reveals that managers with golden parachutes were, on average, younger and more highly compensated than targets without golden parachutes. The aims of golden parachutes have been well documented in the literature by Subramaniam and Daley (2000), Falaschetti (2002) and Small, Smith and Yildirim (2007) among others. These three studies reported that golden parachutes are found with external concentrated ownership. The studies also argued that the financial compensation from shareholders to managers served to alleviate the salary loss in acquisition, which enhanced efficiency of shareholder value. In this regard, in a takeover attempt a firm with these defence measures might discourage a potential acquirer.

2.5 Short-run and Long-run Event Studies on the Impact of M&As

In recent years, the short-run and long-run impact of M&As has been intensely debated in terms of whether post-acquisition performance actually benefits shareholders of bidding firms. There are conflicting views empirically documented in the literature on the event studies time scale and its impact on M&As. It appears that the short-run is associated with risk of bias; however, the use of daily stock returns in the short-run window has a major advantage over the use of monthly data which exhibits the risk of obtaining flawed results due to the existence of a long-run event window (see Tuch and O'Sullivan, 2007). Tuch and O'Sullivan (2007) described short-run as the days or months around the announcement of the bid, whilst long-run denotes as periods of month or years.

The short-run post-acquisition performance studies on bidders are mixed. Prior researchers have found either significant impact on shareholders' wealth or insignificant negative return on announcement. Most of this research seems to report negative returns for bidders on post-acquisition performance. These studies in the UK and the US showed that returns to bidders' firm shareholders is either zero or negative (see. e.g. Holl and Kyriazis, 1997; Higson and Elliott, 1998; Sudarsanam and Mahate, 2003; Tuch and O'Sullivan, 2007). The negative or zero returns to acquirers may be due to market mispricing or market reaction to overpriced on takeover announcement. Almost all the previous recent studies in the UK and the US seem to report negative performance of bidders, which contradict to other studies documented in Europe and Canada. Campa and Hernando (2006) studied shareholder value creation on announcement on European M&As. They found insignificant cumulative ARs for acquirers on post-acquisition. Their analysis revealed that mergers in heavily regulated industries returns are smaller than those within unregulated industries. A similar study carried out in Canada by Ben-Amar and Andre (2006) documented positive ARs for acquiring firm shareholders on post-acquisition performance. Their results were consistent with other European studies (Boehmer, 2000; Bigelli and Mengoli, 2004) who found positive ARs for shareholders on announcement. Theoretically speaking the differences in returns event window to acquirers in the US and the UK, on the one hand and Europe and Canada on other hand could be attributed to the different performance measures employed. Ben-Amar and Andre (2006) noted that disparity in returns might be due to ownership concentration in Canada and Europe.

The long-run post-acquisition performance studies seem to provide substantial evidence to suggest that long-run stock returns are negative to acquiring shareholder. Prior studies on post-acquisitions performance of bidders in the US documented that overall wealth effect to bidders' shareholders returns are either insignificant or negative ARs in the long-run (see e.g. Loughran and VIjh, 1997; Barber and Lyon, 1997; Rosen, 2006). Despite the considerable variations and performance measures employed there were no significant differences in their findings and all these studies reported negative ARs for bidding firms in the long-run. The post-acquisition returns studies in the UK are consistent with the studies in the US findings. For example, Gregory (1997), Gregory and McCorriston (2005), Sudarsanam and Mahate (2006) and Tuch and O'Sullivan (2007) found negative ARs in their UK studies. Alexandridis et al. (2006) used the Fama-French three-factor and CAPM models to examine UK successful takeovers. They reported negative ARs for both Fama-French three-factor and CAPM models. The study revealed that acquirers' post-acquisition merger underperformance is attributed to low institutional investment. Limmack (2003, p. 344) reported that ''the negative long-run post-acquisition performance exhibited by acquiring firms is at least partly attributed to a more generally observed phenomena relating to over-extrapolation of prior (good) performance''. The author noted that this phenomenon is within investment decision because the long-run negative returns are associated with stock financing but not cash. Nevertheless, the findings of these long-run studies in US and UK contradict with other study in Canada. Dutta and Jog (2009) found no significant negative ARs for Canadian acquirers.

2.6 Resource Based Transfer

Acquisitions and takeovers will result in a resource-based transfer from the target company to the acquiring firm. The strategic decision of the acquiring firm is to put the resources acquired from the target firm to meaningful use in order to reap the maximum benefit from the resources acquired. Ranft and Lord (2000) in their studies stated that in knowledge-intensive and innovation-driven industries, highly skilled human capital might be one of the most sought-after strategic resources in acquisition. A second study by the same authors (Ranft and Lord, 2002) proposed that ''knowledge transfer- the acquisition and utilization of new sets of knowledge-based resources … may be a key acquisition objective. Knowledge transfer is achieved when an acquirer appropriates technologies and capabilities in a target firm and applies them to commercial ends'' (p. 420). They concluded that transfer of technologies and capabilities is neither easy nor quick owing to distinct acquisition implementation issues. Ranft and Lord (2002) acknowledged that knowledge transfer is very difficult because acquirer and acquired firms possess different philosophies and thus managers of acquirer firms need time to integrate the acquired firm's technologies and capabilities into the acquiring firm's knowledge-based resources.

Studies by Capron (1999) and Capron, Mitchell and Swaminathan (2001) have shown that asset divestiture and resource redevelopment contribute to acquisition performance and that redevelopment has a bigger influence on target asset divestiture than on acquirer asset divestiture. Karim and Mitchell (2000) investigated change of business resources following acquisitions in the US. They found that there is more substantial change in both targets and acquiring firms than in non-acquired firms. Certainly, this will result in post-acquisition efficiency for acquired firms than non-acquired firms which results in large differences in business reconfiguration. Karim and Mitchell (2000) observed that acquirer firms were more likely to possess recent resource development than non-acquired firm. Their analysis revealed prominent evidence concerning resource deepening whereby acquiring firms use the acquired firms' resources to build on their existing potentials to increase shareholders' wealth.

2.7 Merger and Tender Offer, and Method of Payment

The significance of corporate acquisition has led most empirical research to focus the firm's performance in relation to merger or tender offers. Merger normally takes place between the acquiring firm and target firm to come together under one umbrella of management. Managers of both firms undertake a due diligence process to ensure that the transaction is beneficial to both companies, which the shareholders vote on.

The term tender offer, however, denote a type of takeover bid through public or open offer by an acquirer to all stockholders of a publicly traded corporation to tender their stock for sale at a particular price or time. Travlos (1987) suggested that mergers are mostly common stock exchange offers whilst tender offers are typically cash offers. According to Walker (2000), tender offer signifies inefficient target management where the offer is made directly by the acquiring firm to shareholders of the target firm when the firm's board of directors disagree with the acquisition. Walker (2000) reported that acquirer firm shareholders' normally earn higher returns following tender offers and cash offers relative to stock offers and merger that generated lower returns. In order to persuade or induce the shareholders of the target firm to sell, acquirers normally offer a price that might include a premium which is above the current market price of the target firm's shares. Bruner (2002) found that tender offer creates more value than merger for bidder firms' shareholders as a result of negotiating with target shareholder directly by bypassing management. Empirical evidence has shown that in tender offer targets, shareholders' wealth substantially increases (see e.g. Jensen and Ruback, 1983; Lang, Stulz and Walking 1989; Berkovitch and Narayanan, 1993).

Prior studies have suggested that there is a correlation between stock prices on announcement and method of payment. On announcement acquirers are more likely to finance acquisition with stock rather than cash when their shares are overvalued (see Tralos, 1987). It seems therefore that the empirical evidence maintains the view that acquirer's firm is overvalued and that negative information or impression might have effect on the stock prices of acquirer, consequently leading to a decline on announcement period stock returns. Loughran and Vijh (1997) found evidence in support of cash tender offers but not for stock mergers. In computing of ARs, Loughran and Vijh (1997) acknowledge the problem associated with benchmark selection when investigating long term returns. In following Fama-French (1992) and applied matching procedure to adjust for size and book-to-market effect for ARs. They found that bidders in cash tender offers earn significant positive ARs but bidders in stock mergers suffer significant negative ARs. This happens because, the method of payment may indicate important information to the market, given the information asymmetry that managers of investment companies have more knowledge about the companies' future prospects will finance the acquisition at the best interest of the shareholder. The issue of payment method is based on future expectations of acquirer, whether higher returns or lower returns are expected. They suggested that bidders are likely to finance with cash when their share are undervalued and pay by stocks if their share are overvalued; consistent with asymmetric information hypothesis and the market under reaction hypothesis.

Financing methods in M&As play an important role in the takeover process. The existing studies have proposed various payment methods that must be used in the acquisition process. Some researchers have proposed mixed (cash and stock) payment, others are in favour of cash and some have opted for stock payment – these have all been advanced in the literature. Martin (1996) examined the motives behind the payment method of corporate acquisitions. The author employed binomial logistic regression methodology in his empirical studies. The study found that acquirers are more likely to use stock financing than cash when investment opportunities are high, and acquirers also tend to use stock financing as a means of reducing overpayment. However, Martin's (1986) study contradicted other studies. Chang (1998) estimated ARs using the standard market model. Chang (1998) reported positive ARs for acquirers financing by stock based on Wilcoxon signed-rank test while bidders paying cash experience zero ARs.

Acquisition is seen as a strategic game when financing is purely by cash. Studies have shown that bidder returns (see Travlos, 1987; Berkovitch and Narayanan, 1990; Travlos and Waegelein, 1992; Goergen and Ronneboog, 2004; Conn et al., 2005) are significantly higher when offered cash, than a bidder paying stock. Brown and Ryngaert (1991) developed a model to test the acquisition effect on taxes and asymmetric information. They used the market model methodology of least squares estimation to compute the ARs. The study shows that returns of cash payment are significantly higher than stock financing which yields abnormal negative returns. They claimed that acquirers belonging to the low valuation category, issued stocks to avoid capital gain tax penalty and indeed, higher bidders pay cash to avoid offering undervalued stock. Also, Heron and Lie (2002) and Megginson, Morgan and Nail (2004) using different methodologies arrived at the same conclusion that bidding firm financing acquisition by cash released higher returns, which has a significant positive impact on their long-term operating performance. Megginson at el. (2004) suggest that the positive effect does not translate into stockholder returns or firm value changes, and that the best post-merger performance is exhibited by cash-financed focus preserving or increasing (FPI) mergers and the worst by stock-financed focus-decreasing (FD) mergers.

Schlingemann (2004) directly analysed the relationship between acquisition financing and bidder gains. The author employs market model residuals as a dependent variable. His independent variables include equity issue, repurchases and industry-adjusted equity, and his main variables of interest were equity and debt financing. Using multiple regression analysis, the study found a statistically significant negative relation between cash flow and acquirer gains. This finding is consistent with other studies. The study indicated that a cash transaction conveys positive information about its equity (see Schwert, 2000). The study failed to show a significant relation between debt financing and bidder gains. Travlos (1987), Fishman (1989) and Sorbonne (2006) favoured cash payment in their studies arriving at different conclusions. Firms that have large amounts of cash or a high cash flow or enough debt capacity are more likely to use cash to finance their investment activity. Financing acquisition payment by cash has the advantage of tax benefit to the acquiring firm and also leads to less chance of EPS dilution for the acquiring company. Payment in cash is considered to be dissuasive in the negotiation process, discouraging competition from other potential bidders, and signals good quality target firms. Sorbonne (2006) claimed that, other things equal, payment in cash provides positive information about the value of the target firm and future gains resulting from the acquisition.

In line with these arguments, other studies have shown that bidders are likely to finance M&As with an average proportion of cash and stock (see e.g. Chang and Mais, 2000; Faccio and Masulis, 2005). In the context of acquisitions, the payment hypothesis implies that acquiring firms prefer to pay for their acquisition with stock when there is a positive return and cash in the case of an ARs. Based on these findings there is a strong evidence to suggest that cash acquisition is more appealing than stock payment?

2.8 Efficient Market Hypothesis

The efficient market hypothesis is concerned with the relationship between stock prices and information. Information, by classification, alters expectations. Consequently, information disclosure can trigger reactions in share prices which can be upward sloping or downward sloping. The efficient market hypothesis states that share prices speedily and unbiasedly react to information.

The efficient market hypothesis (EMH) is traditionally divided into three forms.
The weak form of the EMH argues that share prices completely display information included in past share price movements and patterns. The semi-strong form of the EMH says that existing share prices reveal not only chronological share price information but also current information of the firm to the degree that such information is available to the public. While the strong form of the EMH contends that existing share prices not only reflect what is publicly known, but all available information about the firm (see e.g. Sharpe, Alexander and Bailey, 1999). There is empirical evidence in favour of semi-strong form efficiency. The EMH exhibit a hierarchy or pecking order of the forms. When the stock market is semi-strong form efficient it also entails weak form. Likewise when stock market is strong form efficient it consists of semi-strong and weak form efficient.

However, the efficient market hypothesis literature is inconclusive due to the overreaction and return continuation which is based on momentum strategy. Hong and Stein (1999), Lee and Swaminathan (2000) Jegadeesh and Titman (1993, 2001, 2002), design a behavioural model to capture the momentum phenomenon and disprove the efficient market hypothesis. Nevertheless, Fama (1998) put a remarkable comment that under the efficient market hypothesis the expected value of ARs is zero and that the market under reaction and over reaction occurs by chance. Chan, Hameed and Tong (2000) (cited in Joseph, 2008) indicate that stock index returns show return autocorrelations that create momentum profits from the certainty of the returns.

Again, the following factors might render the stock market inefficient. These include: i) investors may behave irrationally. They do not use information as they should have used it. It is fully biases. They would not adhere to technical analysis data and they can also distort the market. ii) They may be overconfident in their ability. They believe their information is better. That is, it leads to overreaction and under pricing. They may also be biased in their interpretation of data. Momentarily price goes down. It is in short position, which is a short-term of about six months. iii) Transaction costs may avert prices completely adjusting to information.

2.9 Market Anomalies

M&As over the years have witnessed what is termed market anomalies. This phenomenon which is associated with the stock market transactions had been discussed extensively in the M&As literature. Evidence has shown that market anomalies, once they are present seem to contradict efficient market hypotheses. Some have argued that, once identified investors seek to exploit them to earn superior returns, nevertheless, if they are persistent investors may not realise the full potential benefit due to transaction cost.

In the M&As spectrum, the market under reacts to announcement about the short-term prospect of firms. In their empirical studies Lo and MacKinlay (1988) were able to show that under reaction growth investment leads to positive serial correlation over weekly holding periods of coefficients of small capitalisation stocks. The random walk hypothesis was opposed by Lo and MacKinlay (1988), arguing that the stationary mean-reverting cannot explain the departures of weekly returns from the random walk. Their short-term positive serial correlation shows contrast to the negative serial correlation hypothesis identified by Fama-French (1987). Fama-French (1987) found that under reaction for value investing leads to long-term negative serial correlation. They showed that stock prices over react to important news and therefore prices are subject to change. This means that long term returns is inevitable from past returns (mean reversion). In the case of medium term momentum, Jegadeesh and Titman (1993) documented that medium-term momentum over 3 to 12 months generates significant positive returns for shareholders. They suggest that this might have happened because of portfolio best performance. Jegadeesh and Titman (1993) also showed that on quarterly earnings announcement returns of stock in winner' portfolios outperform stocks in loser portfolios. They proposed that profitability of momentum strategies is not attributed to their systematic risk factors.

Some researchers have been able to link momentum with both autocorrelation in stock returns and the behavioural model. Theories of financial anomalies demonstrate that momentum in stock returns will be positively auto correlated; and also behavioural model could lead to momentum profitability because investors may behave irrationally, they do not use information as they should have used it and it is fully biased (see e.g. Barberis, Shleifer and Vishny, 1998; Hong and Stein, 1999; Jegadeesh and Titman, 2001; Lewellen, 2002).

Firm specific anomalies attributed to seasonal patterns in returns have been observed in the stock market. There is enough circumstantial evidence to suggest that small stocks generate ARs to their shareholders during the month of January. Banz (1981) observed that small firms have higher returns but it all happens in the first two weeks of January. Haugen and Jorion (1996, p. 27) hypothesize that ''the January effect, perhaps, the best-known example of anomalies behaviour in security markets throughout the world''. Some academic researchers have attributed the January effect to year-end tax loss selling and positive correlation for January (see e.g. Haugen and Jorion, 1996; Chen and Singal 2004). In the same vein, Lo and Mackinlay (1988) showed that weekly returns are positively autocorrelated, albeit portfolios of small stocks capitalisation. Monday's returns tend to be the worst day (Gibbons and Hess, 1981).

Portfolios formed on size alone exhibit strong negative relation between size and average return and strong correlation between average return and beta (Banz, 1981; Fama-French, 1992). Fama-French (1992) have argued that size and book-to-market effects as predictor of returns on cross-sectional stocks is more powerful than beta. This argument indicates that the cross-sectional variation in average returns is associated with relative distress, while theoretical analysis in the financial literature has suggested a positive link between averages returns and market beta. This notion of positive relation between average stock returns and market beta was rejected by Fama-French (1992) in their empirical analysis.

De bondt and Thaler (1985, 1987) theoretically were able to uncover a relation between stock market reaction and investment strategy. They hypothesized reversal effect as losers rebound and winners' return diminishes. According to Debondt and Thaler (1985), stock price overreacts to important news and therefore leads to contrarian strategy profitability. The empirical studies of, for example Jegadeesh (1990), Lo and MacKinlay (1990) and Jegadeesh and Titman (1993) have added further support to the reversal effect that the contrarian strategy tends to generate weekly and monthly returns in the short-term. An article by Conrad and Kaul (1998) showed that cross-sectional variations in expected returns are due to the profitability of momentum strategies as well as profits from price reversals to the contrarian strategy but not expected time-series variations in stock returns. They argued that contrarian strategies are associated with both short-term and long-term profitability whilst medium-term profitability is linked to the momentum strategy holding period. The literature suggests that recently there has been a shift from contrarian strategies to price continuations results in consistent ARs to momentum strategies.

Fama-French three-factor model (1993) identified common risk factors to suggest that firm specific anomalies related to size BE/ME capture strong common variation in returns in the time series regression. As the evidence suggests size and book-to-market equity seem to be proxies for sensitivity to common risk factors in stock returns. They showed that time series regression on size and book-to-market factors have explanatory power to distinguish between returns across stocks. However, they failed to find correlation between average return to beta once they are present and therefore rejected CAPM.

However, the empirical findings of, for example Jagannathan and Wang (1996) Lettau and Ludvigson (2001) and Gomes, Kogan and Zhang (2003) showed that firm characteristics such as size and book-to-market ratio are linked with the conditional CAPM market beta and as a result seem to predict stock returns. These studies concluded that size and book-to-market are dependable with a single-factor conditional CAPM model. Daniel and Titman (1997, p.3) were able to prove with some evidence that the returns on cross-sectional variation are due to the characteristics but not covariance of returns. Their result showed that 1) ''there is no discernible separate risk factor associated with high or low book-to-market firm and 2) there is no return premium associated with any of the three factors identified by Fama-French (1993), suggesting that the high returns related to these portfolio cannot be viewed as compensation for factor risk''. These findings suggest that in spite of the fact that high book-to-market stocks do co-vary, their co-variances were strong before the firms became distressed. In search of evidence as to whether expected returns are determined by characteristics or covariances with portfolio of similar characteristics, with different loadings on the Fama-French three-factor model (1993) different returns emerged. In a related study, Ferson and Harvey (1999) tested the Fama-French three-factor model. They use lagged economic variables as proxies for time variation in expected returns, leading to significant cross-sectional predictors of returns and therefore they rejected the Fama-French three-factor model as a conditional asset pricing model. These studies contradicted the Fama-French three-factor model that rejected CAPM.

2.10 Market Liquidity and Stock Returns

Numerous studies have focused on the liquidity and expected stock returns relation to verify the extent to which liquidity is important to firms involved in M&As. Empirical evidence suggests that ARs of companies that announce acquisitions are expected to be higher due to their lower level of liquidity. The studies of Brennan and Subrahmanyam (1996) and Brennan, Chordia and Subrahmanyam (1998) employed various liquidity measures and reported that less liquid stock is associated with higher returns. These studies empirically advocate that trading volume acts as a proxy for liquidity of the market in the firm's shares rather than priced risk factor. In their studies, Chordia, Roll and Subrahmanyam (2001) were able to bring a relationship between liquidity and expected returns. They show that, stocks that are associated with high liquidity have lower expected returns. Their cross-sectional analysis demonstrated that, there is a correlation between stock returns and liquidity, using liquidity as proxy of measure trading activity.

In search of clear evidence, the Fama-French three-factor model was used to investigate how the expected stock returns are related to cross-sectional sensitivities of returns to liquidity factors. This approach indicates that the average return on stocks with high sensitivities to liquidity exceeds that for stocks with low sensitivities (Pastor and Stambaugh, 2003), while the Fama-French three-factor model (1993) failed to capture the impact of turnover and past returns in the cross-section when the liquidity factors were included in the analysis (Avramov and Chordia, 2006). This evidence shows that the expected stock returns are not static but fluctuate due to market liquidity factors that have significant positive or negative effect on shareholders' wealth.

Chordia et al. (2001) and Jones (2002) were able to show that time series as a link between their measure of market liquidity and expected market returns. These studies showed that the presence of time-series behaviour of stock returns may be explained by the market liquidity as a variable that affects the cross-sectional returns, while the market liquidity variable may be related to other factors like momentum factors. On announcement day, daily changes in market liquidity are highly volatile and negatively serially dependent. Amihud (2002) reported that the expected market liquidity positively affects stock returns, signifying that there is a partial relation between expected stock excess return and liquidity premium. The study suggested that stock returns are negatively linked to simultaneous unexpected liquidity. Amihud (2002) contented that the time series variations of small firm stock premiums is attributed to the strong effect of liquidity on these small firm stocks.

2.11 Conditional Volatility and Stock Returns

Over the years both researchers and practitioners in the financial market have acknowledged the existence of volatility clustering in stock returns. This phenomenon is of great importance to shareholders in arriving at their returns. There was evidence to suggest the existence of long-term volatility perseverance in high rate returns. Previous researchers have put forward many explanations to account for the changes in stock market volatility. One set of relevant factors that are of great concern to shareholders or market participants are the information criteria. Empirical evidence has shown that price shocks will result in higher or low levels of volatility due to both bad news and good news. Nelson (1991) observed that future volatility leads to increase response to bad news and tends to fall in response to good news.

In other words, low returns are associated with bad news whereas higher returns are linked with good news. Nelson (1991, p.349) states that ''GARCH models, however, assume that only the magnitude and not the positivity or negativity of unanticipated excess returns determines feature conditional variance''.

Leverage effect had been suggested to account for stock returns volatility. Stock market volatility tends to rise with financial leverage and there is negative correlation between stock returns and volatility. Risk premium is linked with conditional volatility; bidding firms, in pursuing their investment strategy, required the risk premium connected with risk of future changes in the volatility regime (see for e.g. Schwert, 1989; Mayfield, 2004; Bae, Kim and Nelson, 2007). Bae et al. (2007) explain the rationale between negative stock returns and volatility. They were of the view that constant volatility when priced, will lead to rises in volatility which raises the expected future volatility of the necessary stock returns, hence instant negative shock of the present price.

Bekaert and Wu (2000) investigated the leverage effect and time-varying risk premium to explain asymmetric volatility at firm and market level. They used conditional CAPM with GARCH-in-mean to model the stock returns at firm level. They found that negative shocks raise conditional covariance considerably, while positive shocks have a varied impact on conditional covariance. They documented that leverage effect on volatility was small in contrast to asymmetry generated due to the shocks in the GARCH model and also documented the risk premium implications of their findings. Bekaert and Wu (2000) also found volatility feedback held back and that volatility feedback at firm level improved by strong asymmetries in conditional covariance. Clayton and Ravid (2002) documented that leverage effect as firms debt levels increase, gives them a little ability of power to bids. This suggests that firms with debt cannot have the ability to acquire other firms.

Using economic indicators, the two studies of, for example Campbell and Hentschel (1992) and Anderson and Bollerslev (1997) provide evidence to suggest that the existence of time-varying volatility dynamics is most observed with a high rate of intra-daily returns. While the fundamental trading strategy of Brock and LeBaron (2001) suggested that investors' persistence of strategy time scale will result in positive autocorrelation in volatility and volume of trading process that leads the returns.

The finance empirical literature has revealed that stock returns have a high mean, and, are excessively volatile which is significantly predictable in the time series. A weak forms correlation between stock return and consumption growth was observed. As a result of fluctuations in the value of financial wealth, market participants encounter loss aversion and this loss aversion depends on their investment strategies (see e.g. Barberis, Huang and Santos, 2001; Cao, Coval and Hirshleifer, 2002; McQueen and Vorkink, 2004).

2.12 Stock Market Size Effect

One of the essential stock market anomalies well-known in the M&As literature is the size effect. The size effect hypothesis has been under intense discussion in the finance community. A lot of theoretical explanations have been put forward in the literature to explain this anomaly. The empirical evidence proposed in the literature to explain this phenomenon is mixed. Moeller et al. (2004) examined firms' size and gains from acquisitions on announcement for both target and bidding firms. Moeller et al. (2004) found that small firms' ARs are higher than ARs of large firms on announcement. Moeller et al. (2004) also observed that small firms gain substantially when they announced acquisition and that the size effect reversed hypothesis does not hold. The study suggests that large firms pay higher acquisition premiums relative to small firms on acquisition and also large firms enter acquisition with negative synergy gains.

Fama-French (1992) tested this size effect hypothesis with other factors to find out which of the variables have an effect on the stock market returns. They found that size and book-to-market equity capture the cross-sectional variation in average stock returns associated with size and that there is a negative correlation between average returns and size. Other empirical studies have supported the notion that small firms' stock returns on announcement exceed big firms. Dimson and Marsh (1999), Reinganum (1999), Van Dijk (2007) and Andrikopoulos, Daynes, Latimer and Pagas (2008) have concluded that small firms out performed large firms.

However, some researchers have disproved the size effect hypothesis that small firm on acquisition outperform big firms, but rather attributed it to other factors. Wang (2000) was of the view that data truncation and volatility might have caused size effect. Lo and Makinglay (1990) suggested that the small size effect might happen due to methodological and data snooping. The size effect hypothesis is evidently attributed to risk factor by some researchers. It has been suggested that most small firms are fundamentally riskier than most big firms and therefore will generate higher returns compared to relatively big firms (Berk, 1995).

2.13 Critical Review of Previous Studies

In the literature several theoretically and empirical arguments have been advocated to account for the strength and weakness of various model specifications in the realm of M&As. Despite comprehensive discussions and empirical work the literature has not be able to provide a meaningful basis to analyse M&As and what proper procedure should be followed. These studies show that, there are some unresolved issues, a challenge that remains for the finance academics and which need to be discussed.

There is no consensuses about which of the specific model that best to be applied. The literature review had revealed that a significant number of researches employed the statistical methodology of market model (see for e.g. Frank and Mayer, 1996; Holl and Kyriazis, 1997; Akhigbe and Madura, 2001; Goergen and Renneboog, 2004), in their event studies. In spite of the criticisms levelled against the market model of the event study methodology, most studies applied it as one of the most successful methodologies in examining the share returns of bidder firm and target firm in the M&As industry. Compare to a smaller number of researches who used the Fama-French three-factor model (see for e.g. Faff, 2004; Pham, 2007). These opposing ideas or findings are somewhat worrying as to how could be resolved. Potential implications of these arguments are that other factors might have contributed to their difference in findings. The two different models might produce different results leading to different conclusions. The difference between the two approaches makes comparison impossible.

The apparent contradiction in results reported by these researchers could be attributed to dissimilarities in the underlying samples selected. Where the data set is extremely small, this could easily impact the results. Some studies have relative small sample size, for example Evi and Cecilio's (2004) sample of a 50-pair observation may be insufficient to test accurately for the financial ratios of cross-sectional data of the statistical methodologies.

Furthermore, most of the studies on M&As activities focus on relatively short time periods of five or ten years, with the exception of a few researchers who have extended their analysis above ten years. Becher (2000), Moeller et al. (2004) and Powell and Yawson (2005) have extended their analysis for a period of 17, 20 and 14 years, respectively. Given the short term and long term studies, comparisons between the two will be cumbersome.

Certain criticisms have been levelled against the long-run cumulative ARs (CARs) and buy-and hold (BHARs) methods. Although, both CARs and BHARs approaches have been used extensively in the financial economics the two methods exhibit significant biases in test statistics which are opposite to each other. The long-run CARs are linked with positive biases while the long-run BHARs are associated with negative biases (see Barber and Lyon, 1997; Kothari and Warner, 1997). Given the circumstances surrounding the positive and negative biases, the literature has not been able to categorically say which of the two approaches best suit the interest of shareholders. However, Fama (1998) emphatically said that in spite of the problems associated with the CARs approach, nevertheless encounter fewer statistical inferences problems when compare to the BHAR approach.

Other stock market anomalies that need to be commented on are the characteristics of size and book-to-market. For example, Fama-French three-factor model (1993) failed to find correlation between average return to beta and were authoritatively rejected CAPM, since the CAPM cannot explained the average stock returns. In contrast, studies are able to link the size and book-to-market as the dependable with the CAPM market beta to predict stock returns (Lettau and Ludvigson, 2001). The difference in average returns between the two approaches might have suggested that the Fama-French three-factor model applies separate size and book-to-market factors which were totally different from the CAPM factors.

One important issue that need to be commented on is announcement of M&As to give effect to ARs. ARs on announcement are inconclusive. Earlier studies have either document positive or negative ARs for acquirer firms after the announcement. For example studies in UK and US showed that returns to acquirers' firm shareholders are either zero or negative (see e.g. Higson and Elliott, 1998; Sudarsanam and Mahate, 2003). However, studies in Europe and Canada documented positive returns to bidder firm shareholders on post-acquisition announcement (see e.g. Ben-Amar and Andre, 2006; Bigelli and Mengoli, 2004). The differences in returns might be attributed to different performance measures used.

2.14 Conclusion

This chapter was designed to critically review of the empirical existing literature in the area of shareholders wealth associated with M&As. The review was structured in such a way that it covered those important areas under M&As. The in-depth empirical literature had also reviewed that despite prior researches using different approaches, a comparative analysis revealed that their findings are not qualitatively or quantitatively different. The review has also shown that previous studies have not yet able to document consistent results concerning ARs for acquirer firm shareholders after the announcement. One important conclusion from this reviewed was that the literature generally had not been able to say which methodology is the best to be used to examine the wealth effect of M&As. However it can be concluded that Fama-French three-factor model is capable of capturing the risk factors associated with stock market returns which are important to investors. Despite these compressive discussions, there are still unanswered issues in terms of the best technique to use in estimating shareholders' wealth and why M&As activities differ over time these will challenge the financial academics. Based on these questions the present study aims to examine the wealth effects of M&As using the standard CAPM, Fama-French three-factor and Carhart four-factor model. The standard CAPM only captures the riskiness of a firm, relative to overall market. As such the Fama-French three-factor model will be better specified. The same argument holds for the Carhart four-factor model. The use of different specifications of the pricing model is useful because by estimating ARs using three pricing models we are not trying to measure our results to earlier researchers but also avoid predicaments which are specific to any one technique. Again, in order to access the effects of different estimation methods on the ARs, we estimated all the models using the standard OLS and the (asymmetric) GJR-GARCH methods. The use of the GJR-GARCH method leads to greater estimation efficiency compare to the OLS method especially in daily data where ACRH effects and asymmetry are more pronounced relative to weekly or monthly data. Finally, the use of different models and estimation methods might provide explanations about ARs on announcement of M&As.

CHAPTER THREE

Data, Methodology and Descriptive Statistics

3.0 Introduction

This chapter presents the data and event study methodologies used in the present study. The empirical approach is based on the theories and evidence reviewed in the previous chapter. The data employed in this quantitative analysis is the time series data of US companies that were involved M&As activities over a 20 years period. That is, from 1st January 1988 to 31st December 2008. Based on this data set, the three important empirical models are estimated to generate the ARs. These are the standard CAPM; Fama-French three-factor (1993); and Carhart four-factor (1997). This chapter begins with the hypothesis development, a brief review of the event study framework, research design and parameter estimation. Given these considerations, it then proceeds to the estimation method. Specifically, the models are estimated under both OLS and the asymmetric GJR-GARCH methods. The hypotheses to be tested are also specified below. These issues are covered in sub-sections 3.0 to 3.9

3.1 Hypothesis Development

This empirical study will test the following hypotheses.

3.1.1 Information Effect Hypothesis

The information effect hypothesis is of the view that investors react to the information that comes into the market. According to this hypothesis when good news comes into the market the stock prices will rise (i.e. a positive shock) and negative news will lead to a fall in the stock prices (a negative shock). Studies have examined the effects of acquisition on stock prices and found that on the announcement of an acquisition (see Conn et al., 2005) shareholders experience significant ARs. However, Doukas and Travlos (1988) showed that on acquisition announcements there are insignificant effects on firms' common stock prices. Of course, a negative ARs can arise if investors perceive that the proposed M&As is inappropriate for the associated firms and/or if the market had already impounded that information into the stock prices. Therefore the question to be examined here is whether good news will lead to increases in share prices and hence whether shareholders' wealth of the acquiring firm increases when good acquisitions are announced, that is,

$H_{1,a}$: The announcements of M&As generate significant ARs for both sets of firms thereby increasing the wealth of shareholders.

H_{1b}: The alternative hypothesis is that M&As announcements generate no significant ARs.

This hypothesis will be tested using both the standard CAPM model, the Fama-French three-factor and Carhart four-factor pricing factors over the event window. Since the specification of the model is likely to impact on the magnitude of the ARs, the following hypothesis is also tested:

3.1.2 Signal Hypothesis generating similar ARs

$H_{2,a}$: The magnitude of the ARs are similar under both the standard CAPM, Fama-French and Carhart models. The significance of the ARs will be tested using both the standard student $t-$statistic and the nonparametric Wilcoxon-signed rank test for related samples.

3.1.3 Liquidity Hypothesis

The liquidity hypothesis suggests that small liquidity stocks generate higher ARs than large liquidity stocks on announcement of acquisition**.** Moeller et al. (2004) found that small liquidity firms' ARs are higher than ARs of large liquid firms on announcement. Financial theory suggests that, less liquidity firms with a lower market value should be compensated with higher ARs than those firms which are more liquid. Since it is expected that large stocks are more liquid than small stocks, the degree of liquidity is proxy by the market capitalization value. Amihud (2002) takes the view that higher returns can increase illiquidity and expected illiquidity can sequentially increase stock expected returns and lower stock prices. He therefore documented strong illiquidity effects in favour for small firms stock. Empirical studies have focused on the liquidity and expected stock returns relation to verify the extent to which liquidity can affect ARs. The studies of Amihud and Mendelson (1986), Brennan and Subrahmanyam (1996) and Brennan, Chordia and Subrahmanyam (1998) employed various liquidity measures and reported that less liquid stocks are associated with higher returns. In other words, higher volume liquidity stocks are associated with lower ARs. Our results show that small liquidity stocks are more lucrative than large liquidity stock, hence confirming the liquidity hypothesis. Empirical evidence has shown that small liquid firms are by definition less liquid than large liquidity firms and therefore will have higher ARs than its counterpart large firms that should have lower ARs. The hypotheses tested are:

$H_{4a:}$ Small liquid firms that announce acquisitions, i.e., acquiring firms, are expected to create higher ARs due to their size.

$H_{4b:}$ There are no differences between the ARs of large and small liquid firms. This hypothesis will be tested using the standard capitalisation and trading volume measures to classify the ARs for firms that have big, medium and small capital.

3.1.4 Method of Payment Hypothesis

Advocates of this hypothesis proposed that financing methods in M&As play an important role in the takeover process. Studies have shown that bidder returns (see e.g. Berkovitch and Narayanan, 1990; Travlos and Waegelein, 1992; Goergen and Ronneboog, 2004; Conn et al., 2005) are significantly higher when offered cash, than a bidder paying stock. Acquisition is deemed liquid if the bidding firm paying by cash can quickly buy the target firm due to availability of cash to finance the deal. The ARs of the bidding firm will be positive relative to the bidder paying by stock. The question is whether the acquiring firm shareholder wealth will increases because of financing the acquisition with cash. To examine this issue the following hypothesis has been formulated.

$H_{5a:}$ High ARs for M&As that are finance with cash.

$H_{5b:}$ Equal ARs for both types of M&As.

3.2 Event Study Framework

The event study framework in finance research is the analysis of financial data to estimate the return impact of a specific event on the share prices of M&As. Information, by classification, alters expectation. As observed by MacKinlay (1997), the estimation of the event's economic impact can be measured by using the share prices in the short run relative to productivity measure in the long run. Indeed, the share price movements is used to measure the performance of stock in M&As.

Share prices that portray an upward movement curve are deemed to benefit shareholders of the merging companies, while a downward sloping curve depicts a negative returns impact on merging firms' shareholders.

The event date can be used as the centring point to predict share price effects. Evidence has shown that the ARs are the focal point of the event studies. MacKinlay (1997) observed that wealth effects of M&As of event studies are mostly concerned with the ARs around the date of first announcement. The event study framework relates to the efficient market hypothesis which state that information is readily and unbiasedly impounded in the share prices (see e.g. Serra, 2002) and therefore such an information set cannot be used to earn ARs.

The ARs is the measure of the relationship between actual return and expected returns. Using the event study methodology of market model, Binder (1998) showed that the ARs as measured by the firm alpha is equal to zero. Glenn and John (2001) employed the event study methodology of the market model in estimating the expected returns. The study showed that the use of the market model to measure the event study leads to biased estimates of expected returns. This misspecification of the model can lead to biased estimates of the ARs. To deal with this threat, the use of the Fama-French three-factor model might be capable of explaining differences in cross-sectional returns.

Ahern (2008) employed an event study methodology of the market model, Fama-French three-factor model and Carhart four-factor models to estimate ARs. The study was limited to a short-term event study method, precisely a one-day event window. The study compares the predictable model-test statistics as to which method has the explanatory power to detect ARs. Ahern (2008) showed that both the Fama-French three-factor and Carhart four-factor models were superior to the market model in terms of predictive power and also produce ARs with reduced skewness. In terms of statistical significance of ARs, these two multifactor models were superior. However, the Fama-French three-factor model was classified as the best among the models when tested with sign statistic. Our study is considerably different from Ahern (2008), even though he used both Fama-French three-factor and Carhart four-factor models, he did not consider M&As.

Although the focuses of the event study framework of the current study is the estimation of wealth effect of M&As in the long-run, the study uses daily share price return data rather than weekly or monthly data. The use of daily data is more predominant in the literature to estimate the ARs on the announcement effects. This because daily data is likely to retain more of the information about the M&As compared with weekly or monthly data. To some extent, the majority of recent research has potentially used daily data as a tool in measuring ARs. Using the daily data the estimation of ARs is deemed to be uncomplicated and unproblematic (Kothari and Warner, 2006). However, daily data is likely to contain much more noise, ARCH and asymmetric effects than weekly or monthly data. Commenting on daily data, Binder (1998, p.121) revisited the work of Brown and Warner (1985) and noted that ‘’the potential problems with daily returns are unimportant or easily corrected in the standard event study and, when the event date is known, tests with daily data have a greater signal to noise ratio than those with monthly data’’.

Accordingly, Fama (1998) observed that model misspecification has little effect on the estimation of ARs when short return windows are used in event studies.

For a successful event study, the choice of the event day must be seen as the focal point of the study. Both the first public announcement date of the mergers and the actual completion dates were identified. Using the actual completion date will suggest that all issues concerning the mergers outcome are acceptable but this might have substantial consequences on the ARs between the time of the first public announcement date and the actual completion date. However, using the first public announcement date will give the researcher the opportunity to capture the ARs associated with the announcement date. For this reason, this current study has chosen the first public announcement date as the event date. The ARs otherwise known as the wealth effect is the variation between actual return and expected return.

3.3 Research Design

3.3.1 Data

The analysis is based on a sample of U.S. listed firm that undertook M&As activity and encompasses acquisition data over a twenty year period, 01 January 1988 to 31 December 2008.There were 1,079 M&As events that took place within the stipulated time of study. The data set provides information on 800 firms and events that were involved in M&As during the period. Based on the criteria outlined below, 401 observation firms finally satisfied the criteria and were selected for this study. These represent the number of M&As events used in the present study. In other words, the 401 observation firms are equal to the number of M&As events chosen in the present study. These 401 observation firms are the sum of target and acquiring firms. That is, 198 firms are target and 203 are the bidding firms. The data includes information concerning all U.S. nonfinancial firms in Thomson Financial Reuters database. Thomson Financial database contains all the M&As announcements that took place during the stipulated time as well as all quoted public companies. Centre for Research Security Price's (CRSP) database was used to obtain the share prices, trading volume as well as the market capitalisation values of all firms included in this study. The values for excess market return (Mtk), small stocks minus big stocks (SMB), high book-to-market minus low book-to-market (HML) and price momentum in stock return (MOM) were also obtained from the Kenneth French website. The risk free rate used is the daily three month annualised U.S. Treasury bill rate, which was converted to one day Treasury bill rate and was acquired from the U.S. Treasury Department website. The Rf (risk free rate) from Kenneth French website was not included in arriving at our excess market returns. This is because there was no variation of the one month Rf. As a result, the excess market return from the Kenneth French website was adjusted to get the full market return. Then using our de-annualised U.S. Treasury bill rate a (new) excess market return was computed.

3.3.2 Sample Selection

The research is based on sampling theory which is an integral part of statistical practice concerned with the selection of individual firms that took part in M&As in the U.S. Using an appropriate sampling technique, one can be confident that the result of the firms that took part in acquisition can be generalized to entire firms involved in the acquisition process. The building of the data set is crucial as the factor of acquisitions activity is designed to learn primarily about a particular subset but not all individual firms that took acquisition activities or in the population. If all companies in the U.S. were involved in acquisition activities the development of the sample would have been easy. Considering the number of companies engaged in acquisition, usually referred to as the target population with respect to the total population, this is significantly low. However, this small number of firms is usually overrepresented in the sample, which is of significant interest in this study.

To solidify some of the intuitive thoughts presented above it will be appropriate to find a suitable method of selecting a sample under a particular situation since some approaches are not conducive or favourable. The sampling theory concept is based on the development of the data set which enables a critical examination of some features of the population from which the sample will be selected. The sample should be free of bias to give accuracy to the analysis of the characteristics. At this point, one should appreciate that there are some major differences between both target and acquirer companies and those firms that do not take part in the acquisition process.

In this regard, sampling theory might arrest the vulnerability of some of the data selection biases. Hence, using standard CAPM, the Fama-French three-factor and Carhart four-factor models and the variables for the study, we can demonstrate that there are some momentous differences between both target and acquirer firms and those companies that did not take part in the acquisition process.

3.3.3 Criteria for sample selection

a) Firms' information should be obtained from Thompson Financial Reuters database.

b) The firms must have actually executed the M&As to be included in the analysis.

c) Both the target and acquirer should be incorporated in the US. That is, the M&As are entirely domestic not foreign.

d) The first public announcement date of the takeover offer can be verified.

e) Financial firms were not included due to high leverage that might signify distress (Fama-French, 1992), momentarily selling below its true economic value because of uncertain future earnings.

3.4 Parameter Estimation and Event Period

Parameter estimation is of interest to a researcher in event studies surrounding the announcement date. Agrawal, Jaffe and Mandelker (1992) indicated that one would accept unconditionally that markets are efficient if the event study to estimate the wealth effects of M&As take into account only a few days or returns surrounding the announcement date, given that returns following the event are uncared for. However, information by classification is leaked into the market prior to the first public official announcement date. This suggests that if the estimation period is limited to only a few days around the announcement date it will not capture the full stock price impact of M&As. Therefore, acquiring firm and target firm shareholder wealth will be estimated using a long period of analysis. The event window, observing the actual stock returns stretching from ±250 days prior to and after the bid announcement for both acquired and bidding companies. A long period is chosen to ensure statistical reliability for the estimation method. Carletti al et 2008 used ±250 days as their estimation period before and after the event. Using the same method, the expected return for each company was calculated for ±250 days prior to and after the bid announcement for both acquired and bidding companies. This long period is also useful to avoid the small sampling problem and to ensure the statistical reliability of the estimates. In order to compare before and after acquisition to ascertain whether or not acquisition actually creates shareholder wealth beyond organic growth, we calculated ARs of either side of the event date for the announcement date for both target and bidding firms.

The daily excess returns or stock return of each firm was calculated as logarithmic of:

$$R_{it} = \quad LN(\frac{P_{it}}{P_{it-1}}) - LN(1 + \frac{TB}{360})$$

where:

$R_{it} =$ return of the share on day t

$P_{it} =$ price of the share on day t

$P_{it-1} =$ price of the share on previous day

$LN(1 + \frac{TB}{360})$ = log one day TB rate (three-months TB rate converted to one day TB rate).

$LN(1 + \frac{TB}{360})$ was also use to generate the excess market return given the adjustment to the market return obtain from the Kenneth French website.

3.5 Model Specifications

Essentially, the future potential of M&As is important to how the market reacts to acquisition announcements. There are several specifications of CAPM that can be used to estimate the ARs. Here we use the standard CAPM, the Fama-French three-factor model and the Carhart four-factor models. Most financial academics have suggested that the Fama-French three-factor models and the four-factor models may be better than the standard CAPM in explaining cross-sectional returns. The standard CAPM is well-known to be capturing the riskiness of firm, relative to the overall market. Hence the Fama-French three-factor model will be better specified, since the three-factor model capable of capturing cross-sectional variation in returns. The same reason holds for the Carhart four-factor models.

Empirical studies of Gharghori, Chan and Faff (2007) suggested that Fama-French three-factor models are vastly superior to CAPM in explaining equity returns. Gharghori et al. (2007) were of the view that the performance of the four-factor model and the Fama-French model is comparable or akin with the four-factor model is trivial at best. They also found that CAPM drastically understates the returns on the portfolio. Note: the justification of each model is extensively discussed in section 3.7

3.5.1 Capital Asset Pricing Model (CAPM)

Copeland, Weston and Shastri (2005, pp147 & 148) gave a summary of the CAPM assumptions about investors and the opportunity. And these are outlined below. CAPM is an economic model that uses a single factor, beta β, to measure the appropriate required rate of risk and expected return of an asset. The model assumed that the expected return to investors is equal to the rate of a risk-free security plus a risk premium. The model accounts for the systematic risk or the market risk as measured by the beta. Intuitively, investors would expect higher return in substitute for a higher risk. This implies that the expected return should be higher. Because investors are risk-averse, this will suggest that they expect higher return for holding risky assets (see e.g. Copeland et al., 2005). It is therefore imperative that the CAPM is consistent with intuition; investors demand a higher return for holding riskier assets. Based on the CAPM, the following regression is estimated:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i (R_{m.t} - R_{f.t}) + \varepsilon_{i,t} \quad \text{(1a)}$$

where:

R_{it} is the return on stock i; R_{ft} is the risk free rate; R_{mt} is the return on the all-share market index; $\varepsilon_{i,t}$ is the conditional error based on the information set at Ω_{t-1}.

3.5.2 Fama-French Three-Factor Model

Whilst some financial economists assume that there is a positive relation between average stock returns and market beta β, Fama-French (1992) disproves the notion that market beta β has no predictive power in explaining the cross-sectional variations returns on NYSE stocks. Fama-French (1992) employed the cross-section regression method and found that size, earning price ratio, leverage and book-to-market equity ratio have significant explanatory power to stock average returns. However, the market beta β to stock average returns poses a strong challenge because beta has no capability in explaining cross-sectional variation in stock returns. They contended that size and book-to-market equity variables had more explanatory power relative to earning price ratio and leverage and that size and book-to-market equity proxy for risk factors in returns.

Based on the evidence in their prior study, Fama-French (1993) developed a three-factor model: market, size and book-to market to explain the common variation in stock returns. They added two factors to their original cross-sectional regression to capture portfolio's risk factors associated with size and book-to-market equity. Fama-French (1993) used the time series testing approach to explain cross-sectional variation in stock returns and made the same conclusion that market beta β has no explanatory power in cross-sectional variation in stock returns. As before, they concluded that market factor as well as the risk factors related to size and book-to-market equity well brilliant in explaining the cross-section of average returns.

Interestingly, on the stock market factor, Fama-French (1993) argued that firms with high book-to market equity (a low stock price relative to book value) on average have low earnings and low book-to-market equity (a high stock price relative to book value) have high earnings. In other words, high returns are associated with taking on high risk which implies if returns increase with book-to-price, subsequently stocks with book-to-price on average must be more risky. Based on the Fama-French (1993) three-factor model the following regression is estimated:

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

where:

R_{it} is the return on stock i; R_{ft} is the risk free rate; R_{mt} is the return on the all-share market index; SMB_t is the return on a portfolio of small stock minus the return on a portfolio of large stocks; HML_t is the return on a portfolio high book-to-market less a the return on a portfolio of low book-to-market; $\varepsilon_{i,t}$ is the conditional error based on the information set at Ω_{t-1}.

3.5.3 Carhart Four-Factor Model

Carhart four-factor model is an extension of the three-factor model developed by Fama-French (1993) with an additional factor incorporated to capture the momentum of Jegadeesh and Titman (1993). The model is based on common variation of stock returns with factors, market, size, book-to-market and momentum. The momentum parameter was developed by ranking firms in each month t in ascending order using the returns from past months. He then compared all the top 50 percent firms and the 50 bottom firms, the top 50 firms being the winner portfolio and the 50 bottom firms represented loser portfolio. This approach implies that winner portfolios are kept, whilst loser ones are sold. This gives the momentum factor for the month t as the average return on the winner portfolio minus the average return on the loser portfolio over the period**.** Carhart (1997) indicates that the four-factor model is in harmony with a model of equilibrium with four risk factors. We use the Carhart four-factor model (1997) to estimate the following regression:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + \lambda_i SMB_t + \gamma_i HML_t + \delta_i MOM_t + \varepsilon_{i,t} \quad (1c)$$

where:

R_{it} is the return on stock i; R_{ft} is the risk free rate; R_{mt} is the return on the all-share market index; SMB_t is the return on a portfolio of small stock minus the return on a portfolio of large stocks; HML_t is the return on a portfolio high book-to-market less a the return on a portfolio of low book-to-market; and MOM_t is the price momentum in stock return; all at time t. $\varepsilon_{i,t}$ is the conditional error based on the information set at Ω_{t-1}.

As indicated earlier, the ARs will be generated from the three models above. These models will be estimated using OLS and GJR-GARCH estimation methods. In order to estimate the ARs, a time series regression analysis in which dependent variable is the daily excess return on event firms' stock and independent variables are daily factor returns was adopted. The ARs is estimated from the difference between actual return and expected return for firm i, during the event widow. This denotes residual return, also known as ARs. The ARs are respectively computed from equation (1a), (1b) and (1c) as follow:

$$\varepsilon_{i,t} = AR_{i,t} = (R_{i,t} - R_{f,t}) - (\alpha_i + \beta_i (R_{m,t} - R_{f.t}) \quad (2a)$$

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

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

where:

R_{it} is the return on stock i; R_{ft} is the risk free rate; R_{mt} is the return on the all-share market index; SMB_t is the return on a portfolio of small stock minus the return on a portfolio of large stocks; HML_t is the return on a portfolio high book-to-market less a the return on a portfolio of low book-to-market; and MOM_t is the price momentum in stock return; all at time t. $\varepsilon_{i,t}$ is the conditional error based on the information set at

Ω_{t-1}. AR_{it} is the abnormal return of firm i during the event period; α and β are estimated values for intercept and slope coefficient**,** β being the systematic risk.

The ARs will be computed for each stock *i* over a window *W* of ±250 days. The average abnormal returns (AAR) and cumulative abnormal returns (CAR) were also computed. The AAR were computed using:

$$AAR_t = \frac{\sum_i AR_t}{N} \qquad (3)$$

where N is the number of firms.

CAR_1 was computed as day-one AR implies, AR_1, $CAR_2 = CAR_1 + AR_2$, $CAR_3 = CAR_2 + AR_3$ in that order. These measures are accumulated across all firms over a ±20 day window.

The CARs for stock *i* for each of Eqs. (2a), (2b) and (2c) are computed as:

$$CAR_{i,W} = \sum_{t=1}^{W} AR_{i,t} \qquad (4a)$$

The average CAR over the window *W* day and centred on day zero across N stocks is computed as:

$$\overline{CAR}_T = \frac{1}{N}\sum_{t=1}^{N} AR_{i,T} \qquad (4b)$$

The statistical significance of $\overline{CAR_t}$ is determined using the standard *t*-statistic. In other words, the student $t-test$ was used to investigate whether the CAR was significantly different from zero, over the window of -20 days to +20 days. The $t-statistic$is:

$$\frac{\overline{CAR}_t}{\sigma(\overline{CAR}_t)/\sqrt{n}} \quad (4c)$$

where $\overline{CAR}_t$ is the sample mean and $\sigma(\overline{CAR}_t)$ is the cross-sectional sample standard deviation of the ARs. Since we also estimate the GJR-GARCH-M, we show the specification of this model in Section 3.6.

3.6 GJR-GARCH Estimation Method

To specify the GJR-GARCH-in-mean (GJR-GARCH-M), we need to write both the mean and variance equations for Eqs. (1a), (1b) and (1c) and include the in-mean variable as an additional parameter to be estimated. The specification is the same for all the three pricing models, of course with the in-mean parameter added. As such, we only specify the GJR-GARCH-M for Eq. (1c) – the Cahart model, thus

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t}) + \lambda_i SMB_t + \gamma_i HML_t + \delta_i MOM_t + \psi_i h^2_{i,t} + \varepsilon_{i,t} \quad (5)$$

Eq. (5) is the mean equation. The first five coefficients have a similar interpretation as before. However, the coefficient ψ_i captures relation between the risk and excess returns as in Merton (1973) intertemporal pricing model.

The variance equation for Eq. (5) can be written as:

$$Var(\varepsilon_{i,t}|\Omega_{t-1}) = h^2_{i,t} = \mu_i + \varphi_i\varepsilon^2_{i,t-1} + \delta_i h^2_{i,t-1} + \eta_i K_{i,t-1}\varepsilon^2_{i,t-1} \quad (6)$$

In eq. (6), μ_i denotes the permanent component; φ_i is the coefficient for prior period news; δ_i is the coefficient for prior period (lagged) conditional volatility and η_i is the coefficient for asymmetry – the leverage effect. That is; $K_{i,t-1}$ is an indicator dummy variable that takes on a value of one if $\varepsilon_{i,t-1}$ is negative; zero otherwise. Nam, Pyun and Kim (2003) shows however, that because the digit one taken on the ε_{it-1}^2 at full weight, this can in turn introduce conditional GARCH effects into the estimates where present.

In practice, the GJR-GARCH estimation method is widely used and generates superior estimates to GARCH-family models (see, Engle and Ng, 1993). In general, GARCH estimation methods lead to improvements in estimation efficiency (see Engle, 2001). Indeed, Corhay and Rad (1996) show that for the GARCH, the conditional variance in the data causes the standard OLS method to overestimate (underestimate) the regression parameters following positive (negative) shocks relative to the GARCH approach. In GJR-GARCH specification, the conditional variance is a linear function of both the past shock (news) and the past conditional volatilities and conditional asymmetry. These parameters seek to explain the current conditional variance. So we would expect the GJR-GARCH method to improve the estimation efficiency of the parameters over the OLS method. This is particularly important since our estimates are based on daily data where GARCH effects will be more pronounced relative to (say) weekly or monthly data.

3.7 Perspectives on CAPM and Fama-French Three-Factors

The CAPM model is well known for its theoretical establishment in the world of finance. The proponents of the single factor are of the view that the general application of the CAPM survives because ‘‘the theory behind the CAPM has an intuitive appeal that other models lack’’ (Jagannathan and Wang, 1996, p. 4) and simplicity of the CAPM than its alternative, the complexity of the Fama-French three-factor model (Pham, 2007). Despite its wide use in practice, the model has comes under severe criticism due to its empirical performance.

According to the opponent, because of the validity of the restrictions imposed by the CAPM, the use of the CAPM has almost ceased (Mackinlay, 1997, p.19). Another possible deficiency of CAPM is that, it has no explanatory power to explain the cross-section of average returns on assets size and book-to-market ratio. (Fama-French,1992,1993). Equally, the CAPM fails to consider the time-varying of investors' interest in estimating the risk of asset due to the static nature of the model (Lettau and Ludvigson, 2001).

The Fama-French (1993) three-factor model was chosen for this study based on the following reasons. The empirical literature has shown that the most recently used methodology is the Fama-French (1993) three-factor model to address security characteristics on expected returns that are being studied. The proponents of this particular model (see e.g. Faff, 2001; 2003; 2004; Chiao and Hueng, 2005; Hu, 2007) among others have employed the Fama-French (1993) three-factor model in their studies. Evidence shows that the Fama-French three-factor model is capable of capturing the risk factors associated with stock market returns which are of interest to investment participants and hence the model performance cannot be underestimated. The benefit of using the three-factor model is that the model does not need size or book-to-market data for sample firms (Barber and Lyon, 1997) and also the variance of ARs are reduced through in depth explanation of the difference in the normal return (MacKinlay, 1997).

However the Fama-French three-factor model is no universal remedy. The opponent of the multifactor model, Fama-French three-factor model have cast doubts of theoretical background and therefore considered the three-factor model as not a universal remedy from asset pricing theory (Bornholt, 2006). According to opponents, the Fama-French three-factor model construct on size and book-to-market factors is driven and ad-hoc and also the application is limited in practice by estimation inconvenience (Bornholt, 2006).

3.8 Statistical Problems on Long-Run Event Study

Financial economists have identified a lot of problems associated with statistical methodology on long-term event studies than its alternative**,** the short-run studies. Tuch and O'Sullivan (2007) distinguished between short-run and long-run event studies. Tuch and O'Sullivan (2007) described short-run as the days or months around the announcement of the bit, whilst long-run denotes to as periods of month or years. A lot of criticisms have been levelled against the efficiency of the CAR approach to measure the abnormal performance in the long run. Scores of studies have pointed out numerous conceptual and statistical deficiencies of the CAR in estimating the abnormal performance in the long run. These studies show that the long-term performance returns are associated with risk adjustments and biases that affect the test statistics (Kothari and Waner, 1997; Mitchell and Stafford, 2000). Barber and Lyon (1997) argued heavily about the testing problems associated with the CAR and pointed out that those methods of estimating CAR are essential conceptual flaws and biased. They suggested, however, that, the control firm approach was superior to the sampling approach in estimating the CAR but favoured buy-and hold abnormal returns (BHARs).

Fama (1998) authoritatively said that all methods of estimating CAR are associated with statistical model problems. However, Fama (1998) pointed out that in spite of the deficiencies associated with the CAR methodology, its statistical problems are still better than BHARs. Brav (1998) revisited the works of Kothari and Warner (1997) and Barber and Lyon (1997) to test abnormal performance that is associated with misspecifications and biases in long-term event studies that are at war with the test of Efficient Market Hypothesis. Brav (1998) employed Bayesian methodology to tackle non-normality and cross-sectional dependence in ARs. Brav (1998, pp. 2) noted that the misspecification in long-term studies is the fault of the researcher who ‘’maintains the standard assumptions that ARs are independent and normally distributed although these assumptions fail to hold even approximately at long horizons’’. He solidifies the intuitions behind these arguments that samples of long-term ARs are never independently and normally distributed due to sample firms overlapping in calendar time and skewed-right by cumulating of single-period return. The latter part of this statement, ‘skewed-right’ was incompatible with the earlier studies of Kothari and Warner (1997) and Barber and Lyon (1997).

Two pioneers (Kothari and Warner, 2006), who are well known in the literature on long-term methodological issues have resurfaced again in their recent article and are discussed extensively in terms of these long horizon methods. They suggested two possible solutions to the long-term bias in methodology. First, the use of the Jensen-alpha method which is resistant to bias arising from cross-correlation or ARs, and secondly, bootstrap and pseudo portfolio-based statistical tests which might explain the cross-correlations and lead to precise inferences. To circumvent some of those problems, we use a relative long sample period for estimating the ARs before focusing on the window that is of interest. Next we, conduct bootstrapping simulation to evaluate the reliability of our CARs estimates.

3.9 Descriptive Statistics and Correlation

The descriptive statistics and the correlations for the explanatory variables over a twenty year period, 01 January 1988 to 31 December 2008 are shown in Tables 3.1 and Table 3.2 respectively. These numbers are the average daily returns of the variables computed over a twenty year period. The sample variables are those used in the three methodologies analyses. To understand the statistical properties underlying the univariate series, we first perform some descriptive statistics and correlation tests. This will help us determine that nature of the multivariate tests that will be more appropriate for the estimation of the CARs. Table 3.1 presents the descriptive statistics of the explanatory variables. The mean returns of market's excess returns, SMB, HML and MOM are predictably positives. The variance returns of all variables are also positive. The HML has the smallest standard deviation indicating that it is not as variable compared to market's excess returns which has the highest standard deviation. All variables are negatively skewed except HML. A negative distribution is one in which a disproportionate number of observations are contained in the left-hand side of the distribution. The negative skewness can be associated with negative asymmetry- a feature we attempt to capture under the GJR-GARCH estimation method. That is, the tendency for negative news to have a disproportionately larger impact of share prices than positive news –the leverage effect. The measures for skewness suggest that the returns are normally distributed. MOM has the highest excess kurtosis, whilst the lowest excess kurtosis was recorded for SMA. Overall, both the measures for kurtosis and Jarque-Bera are always positive. As expected, the Jarque-Bera statistics demonstrate that the returns for market excess returns, SMB, HML and MOM are not normally distributed. The skewness, excess kurtosis and Jarque-Bera for all the varables are statistically significant. As such, the OLS estimation is likely to lead to inefficient parameter estimates. In turn, the use of the GJR-GARCH is likely to lead to an improvement in estimation efficiency.

Table 3.1: **DESCRIPTIVE STATISTICS FOR THE EXPLANATORY VARIABLES OVER 01 JAN 1988 to 31 DEC 2008**

Variables	Mean	Variance	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
Market Excess Returns	0.022	1.172	11.510	-9.000	1.080	-0.198[a]	13.837[a]	25951.980[a]
SMB	0.002	0.324	4.370	-4.510	0.567	-0.367[a]	7.862[a]	5334.838[a]
HML	0.016	0.317	3.960	-4.900	0.559	0.150[a]	10.723[a]	13180.580[a]
M0M	0.044	0.616	5.120	-7.290	0.782	-1.032[a]	14.191[a]	28577.270[a]

Note:Market Excess Returns; SMB, HML and MOM as above. a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance estimated using student t-statistics.

Table 3.2 shows the correlation coefficients for the explanatory variable used in the analyses of the three methodologies. Multicollinearity which is associated with econometric analysis is a statistical phenomenon in which intercorrelations are among the independent variables. As can be seen, none of the variables are highly correlated. If there were highly correlated variables one should have been removed in the analysis to avert the problem of multicollinearity arising in the results or that may not give a valid result.

Table 3.2: CORRELATION COEFFICIENTS FOR THE EXPLANATORY VARIABLES OVER 01 JAN 1988 TO 31 DEC 2008

	Market Excess Returns	SMB	HML	MOM
Market Excess Returns	1			
SMB	-0.173	1		
HML	-0.372	-0.137	1	
MOM	-0.177	0.089	-0.165	1

Note: Market Excess Returns; SMB, HML and MOM as above.

3.10 Conclusions

This chapter has presented the methodologies that have been adopted in the present study. The development of the research hypotheses to be tested, data set and the sample size for the study have been identified. The discussion also attempted to justify why the standard CAPM, the three-factor model and four-factor model are chosen as the model specification as well as why both the OLS and GJR-GARCH methods will be estimated. It has been observed that due to the presence of conditional heteroskedasticity applying OLS method may not be appropriate (Li, Ling and Wong, 2001); as this would lead to estimation inefficiency. The GARCH results are more efficient compare to the OLS results. The statistical problems on the long-run event study were also observed. The descriptive statistics for the explanatory variables are correlated whilst the univariate series are non-normally distributed. The non-normality of the explanatory variables will affect estimation efficiency under the OLS method.

CHAPTER FOUR

Estimates of Abnormal Returns Using OLS and GJR-GARCH Estimation

4.0 Introduction

Over the years, financial researchers have advocated diverse theories to explain the motives behind M&As activities based on the unprecedented rise in the acquisition market. Several acquisition hypotheses predict that mergers will bring economic benefits to shareholder. This economic benefit can be measured by wealth effect which is captured in the ARs. Empirical researchers have adopted several models to estimate the ARs as well as test the statistical significance. ARs, as the name suggests, following corporate event could be positive or negative depending on the outcome of the deal or the economic conditions prevailing at the time of the announcement.

To briefly summarize our results, our initial empirical investigation revealed that the ARs exhibited both positive and negative returns under the three models and OLS and GJR-GARCH estimation methods. We were not able to establish quantitatively significant differences in the results between the two estimation methods. Nevertheless, the CARs under the GJR-GARCH estimation were larger for target firms after the announcement compared to the OLS estimates. The larger CARs under the GJR-GARCH method might be the outcome of improved estimation efficiency relative to the OLS method.

This chapter is specifically designed to serve three main purposes. First, the empirical results for CAR using three specifications of the CAPM. Specifically, estimates are generated for the cross-sectional standard CAPM, Fama-French three-factor and Carhart four-factor models. These estimates are based on maximum of ±250 days pre- and post announcement date for the sample estimation. Secondly, we investigate how the acquiring firm's method of payment affects the ARs. Thirdly, we run the Wilcoxon signed-rank statistic to test for the difference in the magnitude of the CARs under the two estimation methods for similar models as well as the standard t-statistic. Note that, the full sample estimates is for ±250 days, but to save a space we only reported ±20 days prior to and after the announcement date.

4.1 CARs under Standard CAPM using OLS and GJR-GARCH

In this section, we present the results for the standard CAPM using the OLS and GJR-GARCH estimation methods. To save space we show the results for ±20 days pre- and post announcement date unless otherwise indicated. The results reported in Table 4.1 shows the estimated ARs and CARs only for the ±20 days for both target and acquirer firms under the OLS and GJR-GARCH. Recall, that the full sample estimates is for ±250 days. The results are for the target (acquired) and acquirer (bidder) firms.

Take first the results for the target firms. Table 4.1 indicates that under the OLS method, the day t=0 generates a positive CAR of 4.000 percent which is significant at 1% level. Under the GJR-GARCH, t=0 also generates a CAR of 3.986 percent which is also significant at the 1% level. This might suggest that the market did not anticipate the announcement. The results presented here correspond to the literature that the share prices of the target firms normally increases at announcement of a takeover. Again, these CARs on the event day t=0 support the preposition that acquired firm shareholders significantly gain on the announcement day. This result is in line with the findings of Campa and Hernando (2006) and Martynova and Renneboog (2006). Following the announcement, both the ARs and CARs under the OLS estimation are statistically significant up to nine successive days. ARs and CARs under the GJR-GARCH estimation also exhibit a similar pattern; however, they are statistically significant up to seven subsequent days. Thus the significance of the CARs lasts much longer under the OLS method and the effects of the announcement last somewhat shorter under the GJR-GARCH. Notice that the CARs are not significant prior to the announcement date suggesting that the market is efficient. That is the market did not anticipate the announcement.

The results for the acquirer firm's are also shown in Table 4.1. The CARs are not statistically significant on day t=0 under either estimation method. Furthermore, similarly, the post- and pre-event date CARs are not significant immediately following the event date. The significant CARs are for day t-2 and earlier but only in respect of the OLS method. Thus it appears that the market does not respond significantly to the announcement from acquirers' perspective. This might be consistent with Grossman and Hart (1980) view that the bidder firm might have to pay most of the expected increase in profits following the merger, to the target's shareholders such that the increase in value is not in respect of the acquirer's value. The GJR-GARCH results contrasts substantially with those of the OLS for pre-event CARs. These results are also confirmed by the non-parametric Wilcoxon signed rank test.

Table 4.1 ARs and CARs Estimate for Standard CAPM under OLS and GJR-GARCH ESTIMATION

	TARGET FIRMS						ACQUIRER FIRMS					
	OLS EST		GJR-GARCH EST				OLS EST		GJR-GARCH EST			
DAYS	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA
-20	-0.183	0.383	-0.147	0.335	>-3.055[a]	-0.053	0.072[a]	1.822[a]	-0.036	-0.246	<-1.700[c]	-0.887
-19	-0.001	0.566	0.010	0.482	>-2.936[a]	-0.096	-0.146[b]	1.750[b]	-0.239	-0.210	>-1.798[c]	-0.885
-18	0.019	0.567	-0.001	0.472	>-2.879[a]	-0.114	-0.001[a]	1.896[a]	-0.107	0.029	>-1.729[c]	-0.890
-17	-0.133	0.548	-0.137	0.473	>-2.894[a]	-0.095	0.068[a]	1.897[a]	-0.050	0.136	>-1.629	-0.889
-16	0.044	0.681	0.039	0.610	>-2.999[a]	-0.094	-0.216[a]	1.829[a]	-0.305	0.186	>-1.688[c]	-0.881
-15	0.206	0.637	0.201	0.571	>-3.100[a]	-0.093	0.057[a]	2.045[a]	-0.045	0.491	>-1.528	-0.889
-14	-0.285	0.431	-0.247	0.370	>-3.233[a]	-0.091	0.170[a]	1.988[a]	0.065	0.536	>-1.506	-0.890
-13	-0.352	0.716	-0.321	0.617	>-3.241[a]	-0.159	-0.091[a]	1.818[a]	-0.190	0.471	<-1.500	-0.889
-12	0.209[c]	1.068[c]	0.216	0.938	>-3.230[a]	-0.225	0.273[a]	1.909[a]	0.168	0.661	>-1.587	-0.892
-11	0.273[c]	0.859[c]	0.295	0.722	>-3.266[a]	-0.257	-0.109[a]	1.636[a]	-0.211	0.493	>-1.585	-0.890
-10	-0.285	0.586	-0.270	0.427	>-3.232[a]	-0.324	0.414[a]	1.745[a]	0.297	0.704	>-1.541	-0.890
-9	-0.019[c]	0.871[c]	-0.017	0.697	>-3.081[a]	-0.388	-0.005[b]	1.331[b]	-0.080	0.407	>-1.575	-0.877
-8	-0.037[c]	0.890[c]	-0.016	0.714	>-3.090[a]	-0.432	0.098[a]	1.336[a]	0.011	0.487	>-1.182	-0.907
-7	0.302[c]	0.927[c]	0.317	0.730	>-2.770[a]	-0.537	0.162[a]	1.238[a]	0.061	0.476	<-1.078	-0.932
-6	-0.080	0.625	-0.081	0.413	>-2.617[a]	-0.650	0.033[a]	1.076[a]	-0.081	0.415	>-1.178	-0.943
-5	0.142	0.705	0.153	0.494	>-2.416[b]	-0.728	0.164[a]	1.043[a]	0.054	0.496	<-1.271	-0.937
-4	0.121	0.563	0.100	0.341	>-2.752[a]	-0.874	0.091[a]	0.879[a]	-0.007	0.442	<-1.333	-0.936
-3	-0.004	0.442	-0.032	0.241	>-2.676[a]	-0.933	0.309[a]	0.788[a]	0.208	0.449	<-1.434	-0.968
-2	0.324	0.446	0.207	0.273	>-3.125[a]	-0.958	0.344[b]	0.479[b]	0.232	0.241	<-1.394	-1.013
-1	0.122	0.122	0.066	0.066	>-3.370[a]	-0.741	0.135	0.135	0.009	0.009	>-0.534	-1.077
0	4.000[a]	4.000[a]	3.986[a]	3.986[a]	>-3.658[a]	-0.234	0.247	0.247	0.125	0.125	>-0.096	-1.041
+1	1.109[a]	1.109[a]	1.101[a]	1.101[a]	>-1.730[c]	-0.154	0.353	0.353	0.198	0.198	>-0.617	-1.220
+2	0.064[b]	1.173[b]	0.045[b]	1.146[b]	>-1.977[b]	-0.273	-0.039	0.314	-0.142	0.056	>-0.281	-1.077
+3	0.092[a]	1.265[a]	0.102[b]	1.248[b]	>-2.384[a]	-0.119	-0.308	0.006	-0.384	-0.328	>-0.461	-0.941
+4	0.009[b]	1.274[b]	0.010[b]	1.258[b]	>-2.764[a]	-0.083	-0.214	-0.208	-0.293	-0.621	>-0.735	-0.878
+5	-0.190[c]	1.084[c]	-0.184[c]	1.074[c]	>-2.817[a]	-0.040	0.019	-0.189	-0.095	-0.716	>-0.645	-0.899
+6	0.321[a]	1.405[a]	0.348[b]	1.422[b]	>-2.903[a]	0.061	0.160	-0.029	0.083	-0.633	>-0.934	-0.860

Table 4.1 Cont'd.

	TARGET FIRMS						ACQUIRER FIRMS					
	OLS EST		GJR-GARCH EST				OLS EST		GJR-GARCH EST			
DAYS	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA
+7	-0.119[b]	1.286[b]	-0.109[c]	1.313[c]	>-2.789[a]	0.083	0.160	0.131	0.059	-0.574	<-1.058	-0.863
+8	-0.137[c]	1.149[c]	-0.138	1.175	<-2.576[b]	0.072	-0.127	0.004	-0.238	-0.812	>-0.961	-0.875
+9	0.045[c]	1.194[c]	0.065	1.240	<-2.799[a]	0.112	0.060	0.064	-0.051	-0.863	<-0.691	-0.884
+10	-0.167	1.027	-0.149	1.091	<-2.997[a]	0.140	-0.088	-0.024	-0.172	-1.035	<-0.920	-0.868
+11	-0.153	0.874	-0.132	0.959	>-2.998[a]	0.168	0.033	0.009	-0.075	-1.110	<-0.914	-0.874
+12	-0.235	0.639	-0.222	0.737	>-3.155[a]	0.179	0.025	0.034	-0.078	-1.188	<-0.914	-0.874
+13	-0.275[c]	0.364	-0.271	0.466	>-3.186[a]	0.173	0.266	0.300	0.213	-0.975	<-1.328	-0.842
+14	-0.085	0.279	-0.068	0.398	>-3.284[a]	0.188	0.263	0.563	0.140	-0.835	<-1.254	-0.858
+15	0.027	0.306	-0.029	0.369	>-3.208[a]	0.094	-0.057	0.506	-0.156	-0.991	<-1.339	-0.858
+16	-0.103	0.203	-0.071	0.298	>-3.284[a]	0.132	-0.056	0.450	-0.148	-1.139	<-1.539	-0.853
+17	0.027	0.230	0.013	0.311	<-3.268[a]	0.106	-0.209	0.241	-0.263	-1.402	<-1.712[c]	-0.831
+18	-0.142	0.088	-0.106	0.205	<-3.338[a]	0.146	-0.187	0.054	-0.260	-1.662	<-1.738[c]	-0.819
+19	-0.161	-0.073	-0.110	0.095	<-3.476[a]	0.197	-0.039	0.015	-0.121	-1.783	<-1.843[c]	-0.813
+20	-0.099	-0.172	-0.049	0.046	<-3.590[a]	0.243	0.048	0.063	-0.062	-1.845	<-1.751[c]	-0.820

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. WILCO and T-STA donate Wilcoxon Signed Rank Test and T-Statistics.
>donates OLS larger than GJR-GARCH
<donates OLS less than GJR- GARCH

The results suggest persuasively that acquirer firm's shareholders returns on the announcement are significantly lower compared to the target shareholders. These present findings are similar to prior studies on post acquisition performance of bidders in the U.S. and Australia who documented that overall wealth effect to bidder's shareholders' returns were either insignificant or negative abnormal returns in the long-run (see. e.g. Loughran and Vlih, 1997; Barber and Lyon, 19997; Rosen, 2006; Le and Schultz, 2007).

To compare the CAR between the target firms and acquirer firms, the daily mean differences are obtained by subtracting corresponding CAR. There are significant differences between the two CARs on the announcement day. Under the OLS, when the event window is t=0, the daily mean difference of CAR between the target and acquirer firms is 3.753 percent, which is statistically significant at 1% the level. Basically, when the event window is t=0, the daily mean difference of CAR under the GJR-GARCH estimate between target and bidder firms is 3.861 percent, which is also statistically significant at 1% level (see also Travlos, 1987). Overall, there appears to be some variations in the magnitude of the average CARs, given the estimation methods for both the target and the acquirer firms. However, the predictive performances of the two methods are the same.

4.2. CARs under Fama-French Model using OLS and GJR-GARCH

Table 4.2 presents the daily ARs and CARs for the target firms and acquirer firms under the Fama-French three-factor model. The table shows both the OLS and GJR-GARCH estimates.

The CARs at the announcement date (t=0) for the target firms are positive and significantly for both estimation methods. Specifically, for t=0, as expected, there were strong positive increases on the announcement day CAR of 4.044 percent and 3.992 percent under the OLS and GJR-GARCH respectively, which are both significant at the 1% level. The magnitudes of those CARs do not appear to be statistically different with those of the standard CAPM. This evidence demonstrates that target firms exhibit substantial positive returns on the announcement day. Interestingly, CARs for target firms under the OLS estimation repeatedly displayed statistically significant positive returns over the window of seven days (t=+1 to t=+7). In contrast to target firms under the GJR-GARCH estimation, CARs simultaneously showed statistically significant positive returns over the window of four days (t=+1 to t=+4). Indeed, on the announcement day, CAR under the OLS estimation was significantly higher than the GJR-GARCH estimation. Based on the results obtained, it could be logically inferred that shareholders of target firms enjoy higher rate of returns on announcement day. The evidence thus shows that the wealth effect of the shareholders of target firms increased is indicated by the positive stock price reactions by the takeover announcement. This finding is consistent with that of Goergen and Renneboog (2004) who found a significant positive announcement return for the target firms although they did not use the GJR-GARCH estimation method.

The results obtained for acquirer firms under the OLS and GJR-GARCH estimates are also reported in Table 4.2. The announcement day CAR for the acquirer under the OLS and GJR-GARCH estimate were 0.278 percent and 0.198 percent respectively and statistically insignificant. There was an interesting revelation prior to

Table 4.2: ARs and CARs Estimate for FAMA- FRENCH under OLS and GJR-GARCH ESTIMATION

	TARGET FIRMS						ACQUIRER FIRMS					
	OLS EST		GJR-GARCH EST				OLS EST		GJR-GARCH EST			
DAYS	AR%	CAR%	ARs%	CARs%	WILCO	T-STA	AR%	CAR%	ARs%	CARs%	WILCO	T-STA
-20	-0.224	-0.059	-0.224	-0.369	>-3.907[a]	-0.328	0.078[b]	1.590[b]	-0.001	0.697	<-3.159[a]	-0.496
-19	-0.044	0.165	-0.053	-0.145	<-3.891[a]	-0.346	-0.139[b]	1.512[b]	-0.181	0.698	<-3.172[a]	-0.477
-18	-0.023	0.209	-0.024	-0.092	<-3.710[a]	-0.352	-0.037[b]	1.651[b]	-0.090	0.879	<-3.256[a]	-0.477
-17	-0.153	0.232	-0.195	-0.068	>-3.633[a]	-0.371	0.022[a]	1.688[a]	-0.037	0.969	<-3.169[a]	-0.471
-16	-0.006	0.385	-0.004	0.127	<-3.639[a]	-0.338	-0.178[a]	1.666[a]	-0.226	1.006	<-3.220[a]	-0.460
-15	0.202	0.391	0.166	0.131	<-3.711[a]	-0.362	0.086[a]	1.844[a]	0.061	1.232	<-2.997[a]	-0.455
-14	-0.335	0.189	-0.306	-0.035	<-3.902[a]	-0.333	0.160[a]	1.758[a]	0.100	1.171	<-2.694[a]	-0.466
-13	-0.351	0.524	-0.358	0.271	<-3.984[a]	-0.404	-0.107[b]	1.598[b]	-0.152	1.071	<-2.708[a]	-0.450
-12	0.214	0.875	0.210	0.629	>-4.031[a]	-0.422	0.233[a]	1.705[a]	0.178	1.223	<-2.562[b]	-0.446
-11	0.237	0.661	0.234	0.419	>-3.930[a]	-0.448	-0.108[a]	1.472[a]	-0.166	1.045	<-2.588[b]	-0.431
-10	-0.299	0.424	-0.304	0.185	<-3.967[a]	-0.479	0.417[a]	1.580[a]	0.349	1.211	<-2.851[a]	-0.411
-9	0.017	0.723	0.002	0.489	>-3.869[a]	-0.513	0.005[b]	1.163[b]	-0.017	0.862	<-2.946[a]	-0.372
-8	-0.102	0.706	-0.073	0.487	>-4.050[a]	-0.530	0.038[b]	1.158[b]	0.044	0.879	<-2.566[b]	-0.388
-7	0.312[c]	0.808[c]	0.290	0.560	>-3.759[a]	-0.670	0.130[b]	1.120[b]	0.103	0.835	<-2.419[b]	-0.452
-6	-0.114	0.496	-0.125	0.270	<-3.652[a]	-0.682	0.014[b]	0.990[b]	-0.026	0.732	<-2.103[b]	-0.476
-5	0.086	0.610	0.107	0.395	<-3.294[a]	-0.731	0.138[a]	0.976[a]	0.102	0.758	>-2.002[b]	-0.482
-4	0.142	0.524	0.088	0.288	>-3.339[a]	-0.917	0.084[b]	0.838[b]	0.053	0.656	<-2.017[b]	-0.503
-3	-0.075	0.382	-0.066	0.200	<-3.832[a]	-0.829	0.300[a]	0.754[a]	0.264	0.603	>-1.980[b]	-0.556
-2	0.371	0.457	0.251	0.266	<-3.660[a]	-1.025	0.309[c]	0.454[c]	0.248	0.339	<-1.854[c]	-0.637
-1	0.086	0.086	0.015	0.015	<-3.267[a]	-0.903	0.145	0.145	0.091	0.091	<-1.612	-0.592
0	4.044[a]	4.044[a]	3.992[a]	3.992[a]	<-4.698[a]	-0.483	0.278	0.278	0.198	0.198	>-0.068	-0.864
+1	1.071[a]	1.071[a]	1.082[b]	1.082[b]	<-2.824[a]	-0.192	0.307	0.307	0.246	0.246	<-0.977	-0.618
+2	0.064[b]	1.135[b]	0.011[b]	1.093[b]	>-2.106[b]	-0.386	-0.041	0.266	-0.098	0.148	<-0.931	-0.626
+3	0.133[a]	1.268[a]	0.120[b]	1.213[b]	<-2.341[b]	-0.358	-0.327	-0.061	-0.348	-0.200	<-1.509	-0.499
+4	0.011[b]	1.279[b]	-0.002[c]	1.211[c]	>-2.679[a]	-0.340	-0.176	-0.237	-0.202	-0.402	>-1.836[c]	-0.449
+5	-0.280[c]	0.999[c]	-0.253	0.958	>-3.269[a]	-0.165	-0.043	-0.280	-0.100	-0.502	<-1.751[c]	-0.483
+6	0.280[b]	1.279[b]	0.312[c]	1.270[c]	>-3.644	-0.030	0.108	-0.172	0.111	-0.391	<-1.765[c]	-0.398

Table 4.2 Cont'd.

	TARGET FIRMS						ACQUIRER FIRMS					
	OLS EST		GJR-GARCH EST				OLS EST		GJR-GARCH EST			
DAYS	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA
+7	-0.181^{c}	1.098^{c}	-0.154	1.116	<-3.987^{a}	0.055	0.084	-0.088	0.057	-0.334	<-1.778^{c}	-0.384
+8	-0.147	0.951	-0.172	0.944	<-3.704^{a}	-0.016	-0.125	-0.213	-0.183	-0.517	<-1.801^{c}	-0.416
+9	0.025	0.976	0.042	0.986	<-3.824^{a}	0.025	0.040	-0.173	-0.018	-0.535	<-1.796^{c}	-0.441
+10	-0.143	0.833	-0.131	0.855	<-3.871^{a}	0.045	-0.107	-0.280	-0.118	-0.653	<-2.150^{b}	-0.409
+11	-0.137	0.696	-0.148	0.707	<-3.807^{a}	0.019	0.042	-0.238	-0.020	-0.673	<-2.069^{b}	-0.434
+12	-0.259	0.437	-0.232	0.475	<-4.015^{a}	0.062	0.033	-0.205	-0.028	-0.701	<-1.987^{b}	-0.454
+13	-0.204	0.233	-0.223	0.252	<-3.954^{a}	0.024	0.267	0.062	0.267	-0.434	<-2.338^{b}	-0.419
+14	-0.089	0.144	-0.072	0.180	<-4.107^{a}	0.049	0.234	0.296	0.200	-0.234	<-2.309^{b}	-0.416
+15	0.024	0.168	-0.036	0.144	<-4.044^{a}	-0.040	-0.028	0.268	-0.079	-0.313	<-2.325^{b}	-0.426
+16	-0.122	0.046	-0.067	0.077	<-4.305^{a}	0.036	-0.062	0.206	-0.098	-0.411	<-2.483^{b}	-0.424
+17	-0.033	0.013	-0.037	0.040	<-4.571^{a}	0.029	-0.151	0.055	-0.137	-0.548	<-2.698^{a}	-0.390
+18	-0.195	-0.182	-0.179	-0.139	<-4.638^{a}	0.045	-0.158	-0.103	-0.211	-0.759	<-2.581^{b}	-0.400
+19	-0.210	-0.392	-0.159	-0.298	<-4.846^{a}	0.099	-0.022	-0.125	-0.066	-0.825	<-2.613^{a}	-0.405
+20	-0.075	-0.467	-0.054	-0.352	<-4.876^{a}	0.116	0.046	-0.079	0.001	-0.824	<-2.452^{b}	-0.409

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. WILCO and T-STA donate Wilcoxon Signed Rank Test and T-Statistics.
>donates OLS larger than GJR-GARCH
<donates OLS less than GJR- GARCH

the pre-announcement date t=-2 to t=-20 CARs for the acquiring firms show statistically significant positive returns only under the OLS estimate. However, no statistically significant differences in returns under both the OLS and GJR-GARCH are observed in post announcement periods and therefore had no effect for firm value. These results are also confirmed by the non-parametric Wilcoxon signed rank test.

In relation to earlier studies, this result is consistent with the general perception that acquirer firms exhibit substantial negative returns on post-announcement but the CARs are not statistically significant. For example, UK studies found negative ARs for shareholder of acquiring firms (see. Gregory, 1997; Gregory and McCorriston, 2005; Sudarsanam and Mahate, 2006; Tuch and O'Sullivan, 2007). Note that, there were disparity post-announcement of CARs being significant or insignificant reported by these researchers. Both Gregory (1997) and Sudarsanam and Mahate (2006) found significant negative CARs following acquisitions. However, Tuch and O'Sullivan (2007) reported that post-announcement CARs are insignificant negative, whiles Gregory and McCorriston (2005) documented both significant and insignificant CARs following acquisitions.

We compare the CARs between the target firms and the acquirer firms, the daily mean differences are realised by subtracting the CAR of acquirer firms from the target firms under the OLS and GJR-GARCH. There are significant disparities between the two CARs on the announcement day. Under the OLS when the event day is t=0, the daily mean difference of CARs is 3.766 percent, which is statistically significant at the 1% level. In the case of the GJR-GARCH, the daily mean difference of CARs on the event day is 3.794 percent and statistically significant.

4.3 CARs under Carhart Model using OLS and GJR-GARCH

Table 4.3 shows the estimated daily ARs and CARs for the target firms and acquirer firms using the Carhart four-factor model. The same estimation methods are used.

The announcement day CARs for the target firms under the OLS and GJR-GARCH estimates are 3.957 percent and 3.956 percent respectively, which are both significant at the 1% level. These findings imply that there is a correlation between mergers and shareholders wealth. As can be seen, the GJR-GARCH results are different from the OLS for the pre-event CARs. Here the return continuations under the GJR-GARCH estimate were notably higher than the OLS estimation in terms of predicting CARs for target shareholders. Target firm shareholders continued to enjoy CARs which are statistically significant positive for seven continually days under both the OLS and GJR-GARCH estimation methods. Despite variations in the generated CARs, these results convincingly showed that target firms on announcement potentially gain.

The acquirer firm's ARs and CARs are also depicted in Table 4.3. On the announcement day the CAR for the acquiring firms under the OLS estimate is 0.250 percent which is insignificant. Equally, under the GJR-GARCH estimate, the day t=0 generate a substantial CAR of 0.405 percent which is also insignificant. The CARs are not significant after the day zero, under both estimation methods, hence, market

Table 4.3: ARs and CARs Estimate for CARHART under OLS and GJR-GARCH ESTIMATION

	TARGET FIRMS						ACQUIRER FIRMS					
	OLS EST		GJR-GARCH EST				OLS EST		GJR-GARCH EST			
DAYS	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA	AR%	CAR%	ARs%	CARs%	WILCO	T-STA
-20	-0.208	0.026	-0.204	-0.378	<-4.214[a]	-0.420	0.047[b]	1.470[b]	0.214	5.303	<-2.866[a]	1.120
-19	-0.029	0.234	-0.052	-0.174	<-4.088[a]	-0.445	-0.167[b]	1.423[b]	0.013	5.089	<-2.823[a]	1.127
-18	0.009	0.263	0.012	-0.122	<-4.005[a]	-0.443	-0.057[b]	1.590[b]	0.176	5.076	<-2.891[a]	1.131
-17	-0.156	0.254	-0.234	-0.134	<-3.940[a]	-0.470	-0.010[b]	1.647[b]	0.128	4.900	<-2.645[a]	1.117
-16	0.017	0.410	-0.035	0.100	<-3.891[a]	-0.397	-0.189[a]	1.657[a]	0.029[c]	4.772[c]	<-2.965[a]	1.137
-15	0.176	0.393	0.137	0.135	<-3.949[a]	-0.353	0.088[a]	1.846[a]	0.318[c]	4.743[c]	<-2.643[a]	1.128
-14	-0.357	0.217	-0.331	-0.002	<-3.981[a]	-0.321	0.185[a]	1.758[a]	0.339[c]	4.425[c]	<-2.517[b]	1.113
-13	-0.339	0.574	-0.345	0.329	<-3.980[a]	-0.387	-0.114[b]	1.573[b]	0.067[c]	4.086[c]	<-2.492[b]	1.129
-12	0.187	0.913	0.204	0.674	<-3.967[a]	-0.404	0.250[a]	1.687[a]	0.430[c]	4.019[c]	>-2.546[b]	1.134
-11	0.263	0.726	0.193	0.470	<-3.920[a]	-0.471	-0.103[b]	1.437[b]	0.084[c]	3.589[c]	<-2.628[a]	1.141
-10	-0.285	0.463	-0.281	0.277	<-4.082[a]	-0.372	0.399[a]	1.540[a]	0.561[c]	3.505[c]	<-2.737[a]	1.146
-9	0.053	0.748	-0.018	0.558	<-3.984[a]	-0.417	-0.003[b]	1.141[b]	0.237[c]	2.944[c]	<-2.940[a]	1.169
-8	-0.069	0.695	-0.031	0.576	<-4.247[a]	-0.286	0.024[b]	1.144[b]	0.260[c]	2.707[c]	<-2.582[b]	1.141
-7	0.322	0.764	0.291	0.607	<-4.320[a]	-0.423	0.133[b]	1.120[b]	0.337[c]	2.447[c]	>-2.015[b]	1.108
-6	-0.108	0.442	-0.047	0.316	<-4.343[a]	-0.376	0.004[b]	0.987[b]	0.184[c]	2.110[c]	<-1.925[b]	1.094
-5	0.076	0.550	0.061	0.363	<-4.014[a]	-0.645	0.128[a]	0.983[a]	0.326[b]	1.926[b]	<-1.840[c]	1.103
-4	0.113	0.474	0.092	0.302	<-3.803[a]	-0.674	0.076[a]	0.855[a]	0.294[b]	1.600[b]	<-2.036[b]	1.089
-3	-0.059	0.361	-0.048	0.210	<-3.957[a]	-0.709	0.310[a]	0.779[a]	0.516[b]	1.306[b]	<-2.020[b]	1.025
-2	0.329	0.420	0.227	0.258	<-3.626[a]	-0.939	0.334[b]	0.469[b]	0.474[c]	0.790[c]	<-1.786[c]	0.935
-1	0.091	0.091	0.031	0.031	<-3.101[a]	-0.799	0.135	0.135	0.316	0.316	<-2.092[b]	1.054
0	3.957[a]	3.957[a]	3.956[a]	3.956[a]	<-4.476[a]	-0.017	0.250	0.250	0.405	0.405	>-0.274	0.884
+1	1.077[a]	1.077[a]	1.099[a]	1.099[a]	>-2.291[b]	0.349	0.314	0.314	0.510	0.510	<-0.948	1.128
+2	0.063[b]	1.140[b]	0.033[b]	1.132[b]	>-1.855[c]	-0.072	-0.017	0.297	0.167	0.677	>-0.875	1.104
+3	0.126[a]	1.266[a]	0.185[b]	1.317[b]	>-2.473[b]	0.267	-0.321	-0.024	-0.098	0.579	>-1.050	1.171
+4	0.004[b]	1.270[b]	0.072[b]	1.389[b]	>-3.042[a]	0.440	-0.203	-0.227	-0.028	0.551	<-1.439	1.136
+5	-0.276[c]	0.994[c]	-0.246[c]	1.143[c]	>-3.587[a]	0.491	-0.049	-0.276	0.126	0.677	<-1.457	1.115
+6	0.283[b]	1.277[b]	0.249[b]	1.392[b]	>-3.922[a]	0.348	0.087	-0.189	0.295	0.972	<-1.384	1.133

Table 4.3 Cont'd.

	TARGET FIRMS						ACQUIRER FIRMS					
	OLS EST		GJR-GARCH EST				OLS EST		GJR-GARCH EST			
DAYS	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA
+7	-0.201[c]	1.076[c]	-0.178[c]	1.214[c]	<-4.050[a]	0.362	0.085	-0.104	0.292	1.264	<-1.730[c]	1.143
+8	-0.165	0.911	-0.165	1.049	<-4.085[a]	0.323	-0.141	-0.245	0.044	1.308	<-1.754[c]	1.135
+9	0.051	0.962	0.003	1.052	<-3.889[a]	0.196	0.036	-0.209	0.206	1.514	<-1.723[c]	1.119
+10	-0.158	0.804	-0.147	0.905	<-3.953[a]	0.196	-0.110	-0.319	0.120	1.634	<-2.175[b]	1.142
+11	-0.131	0.673	-0.098	0.807	<-4.187[a]	0.235	0.041	-0.278	0.191	1.825	<-2.153[b]	1.118
+12	-0.223	0.450	-0.206	0.601	<-4.272[a]	0.242	0.028	-0.250	0.198	2.023	<-1.877[c]	1.107
+13	-0.193	0.257	-0.244	0.357	<-4.187[a]	0.146	0.242	-0.008	0.463	2.486	<-2.356[b]	1.122
+14	-0.072	0.185	-0.037	0.320	<-4.303[a]	0.186	0.240	0.232	0.413	2.899	<-2.398[b]	1.114
+15	0.024	0.209	-0.069	0.251	<-4.434[a]	0.052	-0.041	0.191	0.159	3.058	<-2.405[b]	1.118
+16	-0.129	0.080	-0.123	0.128	<-4.423[a]	0.055	-0.064	0.127	0.108	3.166	<-2.584[b]	1.111
+17	-0.031	0.049	0.038	0.166	>-4.660[a]	0.134	-0.178	-0.051	0.048	3.214	<-2.916[a]	1.124
+18	-0.156	-0.107	-0.085	0.081	>-4.745[a]	0.205	-0.174	-0.225	0.031	3.245	<-2.849[a]	1.128
+19	-0.231	-0.338	-0.074	0.007	<-4.926[a]	0.351	-0.003	-0.228	0.170	3.415	<-2.811[a]	1.122
+20	-0.090	-0.428	-0.114	-0.107	<-4.975[a]	0.316	0.046	-0.182	0.195	3.610	<-2.703[a]	1.109

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. WILCO and T-STA donate Wilcoxon Signed Rank Test and T-Statistics.
>donates OLS larger than GJR-GARCH
<donates OLS less than GJR- GARCH

efficiency is strongly recommended. These present findings under the OLS estimate are similar to studies in the UK or U.S. (see e.g. Holl and Kyriazis, 1997; Higson and Elliott, 1998; Sudarsanam and Mahate, 2003) who documented either zero or negative returns for bidder firm shareholders on post-acquisition performance. However, under the GJR-GARCH estimate, this finding is compatible with, for example Ben-Amar and Andre (2006) who reported positive ARs for acquiring firm's shareholders on post-acquisition performance although they did not use GJR-GARCH estimation method.

The pre-announcement period witnessed larger positive CARs under the two estimation methods. That is, the pre-announcement CARs over the window of nineteen days (t=-2 to t=-20) are significant under the OLS and whilst CARs under the GJR-GARCH estimates are statistically significantly up to fifteen days (t=-2 to t=-16). However, these significant CARs would appear to be unrelated to the event date since they arise before the event date. Here the return continuations were substantially higher under the GJR-GARCH estimates whilst the OLS estimates exhibited moderate returns.

In order to evaluate CARs between the target and acquirer firms, the daily mean differences are achieved by subtracting equivalent CAR under the GJR-GARCH from OLS estimate. On the announcement day, t=0, the daily mean difference of CAR under the OLS is 3.707 percent, which is statistically significant at the 1% level. When the event date is t=0, the daily mean difference of CAR under the GJR-GARCH is 3.551 percent, which is significant at the 1% level.

4.4 ACQUIRER'S METHOD OF PAYMENT.

We also analyse acquirer's method of payment on the announcement day. We do not have the actual date when the offer was made. However, we are anticipating how the offer was made in relation to the announcement date. We want to test how the payment offer affects the ARs. This is a weak analysis. The method of payment was extracted from Thomson Financial Database at the announcement of each proposed takeover. The overall payment of 203 samples, acquisition financed by cash exhibits 129, 37 stocks and 37 were a combination of cash, stock and others not disclosed. The cash offers were the most popular form of payments. Nevertheless, our analysis was limited to cash and stock financing. The means of payment in an offer has a substantial impact on the share prices and is normally regarded to be an important signal of the excellence of the target firm. From the perspective of takeovers, acquirers will finance acquisition by issuing stock when their stock is regarded as overvalued (see e.g. Limmack, 2003) and offer cash when their stock is expected to be undervalued for the interests of their shareholders. The payment offer is an elusive phenomenon. In order to verify this observable fact, estimated CARs were grouped according to the cash and stock payments. However, the combination of cash and stock is out of the scope of this thesis. The results are presented in the following subsections.

4.4.1 Acquirer Method of Payment under Standard CAPM

Table 4.4 presents the ARs and CARs for the acquirer using cash or stock as a method of payment under the standard CAPM model. The model was estimated by using the OLS and GJR-GARCH estimation methods.

The CARs at the announcement date, t=0 of all cash offers are not statistically significant for both estimation methods. In particular, Table 4.4 indicates that under the OLS estimate, the day t=0 generates a positive CAR of 0.070 percent. However, under the GJR-GARCH estimate, day t=0 exhibited negative CAR of -0.153 percent. Both CARs are not statistically significant different from zero**.** Our empirical results demonstrate that bidder of all cash payments under both the OLS and GJR-GARCH estimates result in significant negative long-run returns. This present finding contradicted with Loughran and Vijh (1997) who found that cash offers earn significant positive excess returns of 61.7 percent on merger announcements.

In contrast with all stock offers shown in Table 4.4, the announcement day CARs for bidding firms under the OLS and GJR- GARCH estimates are 0.726 percent and 0.766 percent respectively and both are not significant. Before the announcement date CARs are not significant instantaneously following the event date. Rather the significance CARs are for day t=-6 to t=-20 under the OLS estimate whilst under the GJR-GARCH estimate shown a different pattern of t=-2 up to t=-20. These results however seem unrelated to the event date. The magnitudes of the CARs realised under the GJR-GARCH differ significantly from the OLS for pre and post announcement date. Our results are in line with the non-parametric Wilcoxon signed rank test. We still observed higher CARs under the GJR-GARCH estimate than its counterpart the OLS estimate after the announcement. Post-event CARs of acquiring firms paying cash or stocks under both the OLS and GJR- GARCH estimates are statistically zero, even though they are not numerically so. For all cash and all stock payments were compared under both OLS and GJR-GARCH estimates and the

Table 4.4:Standard CAPM for Acquirer: CARs Estimate under the OLS and GJR-GARCH ESTIMATION

	CASH OFFER						STOCK OFFER					
	OLS EST.		GJR-GARCH				OLS EST.		GJR-GARCH			
DAYS	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA
-20	-0.061	1.232	-0.285	-2.721	>-1.320	-1.083	0.088[b]	3.620[b]	0.187[a]	5.384[a]	<-3.833[a]	3.448[a]
-19	-0.192	1.293	-0.371	-2.436	>-1.182	-1.075	0.260[b]	3.532[b]	0.361[a]	5.197[a]	<-3.771[a]	3.386[a]
-18	0.185	1.485	0.004	-2.065	>-1.278	-1.081	-0.380[c]	3.272[c]	-0.322[a]	4.836[a]	<-3.676[a]	3.353[a]
-17	-0.044	1.300	-0.256	-2.069	>-1.484	-1.086	0.137[b]	3.652[b]	0.208[a]	5.158[a]	<-3.676[a]	3.347[a]
-16	-0.162	1.344	-0.332	-1.813	>-1.479	-1.081	-0.060[b]	3.515[b]	-0.002[a]	4.950[a]	<-3.676[a]	3.377[a]
-15	0.097	1.506	-0.116	-1.481	>-1.703[c]	-1.091	0.766[a]	3.575[a]	0.862[a]	4.952[a]	<-3.645[a]	3.360[a]
-14	0.188	1.409	-0.004	-1.365	>-1.678[c]	-1.085	-0.053[b]	2.809[b]	0.011[a]	4.090[a]	<-3.645[a]	3.401[a]
-13	-0.217	1.221	-0.422	-1.361	>-1.638	-1.088	-0.580[b]	2.862[b]	-0.488[a]	4.079[a]	<-3.645[a]	3.532[a]
-12	0.340	1.438	0.133	-0.939	>-1.452	-1.085	0.639[b]	3.442[b]	0.730[a]	4.567[a]	<-3.739[a]	3.624[a]
-11	0.037	1.098	-0.175	-1.072	>-1.362	-1.080	-0.500[c]	2.803[c]	-0.325[a]	3.837[a]	<-3.629[a]	3.693[a]
-10	0.251[c]	1.061	0.022	-0.897	>-1.309	-1.072	0.510[b]	3.303[b]	0.605[a]	4.162[a]	<-3.496[a]	3.422[a]
-9	-0.021	0.810	-0.170	-0.919	>-1.040	-1.051	-0.030[b]	2.793[b]	0.075[a]	3.557[a]	<-3.441[a]	3.416[a]
-8	-0.042	0.831	-0.205	-0.749	>-1.412	-1.081	0.321[a]	2.823[a]	0.443[a]	3.482[a]	<-3.425[a]	3.452[a]
-7	-0.021	0.873	-0.195	-0.544	>-1.509	-1.108	0.916[b]	2.502[b]	0.983[a]	3.039[a]	<-3.441[a]	3.318[a]
-6	-0.090	0.894	-0.274	-0.349	>-1.574	-1.033	0.398[c]	1.586[c]	0.440[b]	2.056[b]	<-3.629[a]	3.445[a]
-5	0.241[c]	0.984[c]	0.019	-0.075	>-1.571	-1.159	0.190	1.188	0.300[b]	1.616[b]	<-3.943[a]	3.798[a]
-4	-0.054	0.743	-0.262	-0.094	<-1.242	-1.146	0.111	0.998	0.212[b]	1.316[b]	<-3.488[a]	3.350[a]
-3	0.584[c]	0.797[c]	0.389	0.168	>-1.122	-1.148	-0.252	0.887	-0.196[c]	1.104[c]	<-3.024[a]	3.051[a]
-2	0.225	0.213	0.014	-0.221	>-0.978	-1.181	0.988[b]	1.139[b]	1.074[b]	1.300[b]	<-3.134[a]	3.257[a]
-1	-0.012	-0.012	-0.235	-0.235	>-1.480	-1.217	0.151	0.151	0.226	0.226	<-2.357[b]	2.746[a]
0	0.070	0.070	-0.153	-0.153	>-1.628	-1.211	0.726	0.726	0.766	0.766	<-2.074[b]	0.993
+1	0.388	0.388	0.210	0.210	<-0.903	-0.956	0.228	0.228	0.006	0.006	<-0.450	-0.851
+2	0.027	0.415	-0.179	0.031	>-1.294	-1.042	-0.119	0.109	0.002	0.008	<-1.257	-0.370
+3	-0.275	0.140	-0.452	-0.421	>-0.921	-1.017	-0.244	-0.135	-0.211	-0.203	<-1.170	-0.239
+4	-0.246	-0.106	-0.427	-0.848	>-0.712	-1.012	-0.623	-0.758	-0.486	-0.689	<-1.587	0.238
+5	0.173	0.067	-0.023	-0.871	>-0.907	-1.024	-0.301	-1.059	-0.245	-0.934	>-1.728[c]	0.424
+6	-0.116	-0.049	-0.278	-1.149	>-0.666	-1.001	0.704	-0.355	0.804	-0.130	<-1.901[b]	0.756
+7	0.090	0.041	-0.111	-1.260	>-0.755	-1.015	0.535	0.180	0.624	0.494	<-2.231[b]	1.055
+8	-0.268	-0.227	-0.486	-1.746	>-1.000	-1.038	-0.392	-0.212	-0.302	0.192	<-2.364[b]	1.326
+9	-0.116	-0.343	-0.309	-2.055	>-1.182	-1.040	0.314	0.102	0.367	0.559	<-2.027[b]	1.419
+10	-0.078	-0.421	-0.237	-2.292	>-1.062	-1.023	0.003	0.105	0.033	0.592	<-2.168[b]	1.396
+11	0.119	-0.302	-0.077	-2.369	>-1.181	-1.028	0.046	0.151	0.134	0.726	<-2.372[b]	1.606
+12	0.075	-0.227	-0.109	-2.478	>-1.240	-1.026	-0.190	-0.039	-0.099	0.627	<-2.529[b]	1.790[c]
+13	0.051	-0.176	-0.086	-2.564	<-0.943	-1.005	0.863	0.824	0.932	1.559	<-2.624[a]	1.922[c]
+14	0.303	0.127	0.116	-2.448	>-0.870	-1.006	0.396	1.220	0.459[c]	2.018[c]	<-2.577[b]	1.951[b]
+15	-0.043	0.084	-0.231	-2.679	>-0.911	-1.008	-0.128	1.092	-0.039[c]	1.979[c]	<-2.702[a]	2.091[b]
+16	-0.281	-0.197	-0.467	-3.146	>-0.787	-1.009	0.370	1.462	0.453[c]	2.432[c]	<-2.875[a]	2.212[b]
+17	-0.311	-0.508	-0.458	-3.604	>-0.658	-0.997	-0.161	1.301	-0.062[c]	2.370[c]	<-3.016[a]	2.378[b]
+18	-0.258	-0.766	-0.422	-4.026	>-0.608	-0.991	-0.203	1.098	-0.108	2.262	<-2.875[a]	2.453[b]
+19	0.066	-0.700	-0.093	-4.119	>-0.462	-0.985	-0.319	0.779	-0.307	1.955	<-2.718[a]	2.354[b]
+20	0.049	-0.651	-0.143	-4.262	>-0.610	-0.988	0.361	1.140	0.418	2.373	<-2.797[a]	2.380[b]

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. WILCO and T-STA donate Wilcoxon Signed Rank Test and T-Statistics.
>donates OLS larger than GJR-GARCH
<donates OLS less than GJR- GARCH

findings reported in Table 4.4 showed that all stock payments bidding firms generate substantially higher CARs than all cash payments. For all cash offers acquirers normally earned substantial negative CARs especially under the GJR-GARCH estimate. This result is similar to Chang (1998) who reported positive ARs for acquirers financing by stock while bidders paying cash experience zero ARs. However, it contradicts with the findings of, for example, Schlingemann (2004) and Sorbonne (2006).

4.4.2 Acquirer Method of Payment under the Fama-French Model

Table 4.5 illustrated ARs and CARs for the acquirer firm's method of payments under the Fama-French three-factor model by estimating the model under the OLS and GJR-GARCH method.

On the announcement day CARs for all cash acquirers under the OLS and GJR-GARCH are 0.084 percent and -0.056 percent respectively and both of which are statistically insignificant. Prior to the announcement, the CARs earned by all cash acquirers under OLS estimate were consistently positive returns from t=-1 to t=-20 days period. Whilst in the same period, CARs under the GJR-GARCH generated smaller and more negative CARs and were not statistically significant. The post-announcement CARs under the OLS and GJR-GARCH estimates were statistically insignificant. Indeed, post-announcement CARs under the OLS and GJR-GARCH estimates mostly generated negative CARs which are not different from zero. In this period, all cash acquirers earned negative rate of returns. The CARs under the two estimation methods are significantly different with the GJR-GARCH estimate generating larger negative CARs especially after the announcement date. This

Table 4.5:Fama French for Acquirer: CARs Estimate under the OLS and GJR-GARCH ESTIMATION

	CASH OFFER						STOCK OFFER					
	OLS EST.		GJR-GARCH EST.				OLS EST.		GJR-GARCH EST.			
DAYS	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA
-20	-0.054	1.202	-0.212	-0.962	>-0.603	-0.766	-0.017[c]	2.492[c]	0.065[a]	4.596[a]	<-4.126[a]	3.830[a]
-19	-0.181	1.256	-0.271	-0.750	>-0.608	-0.747	0.222[c]	2.509[c]	0.298[a]	4.531[a]	<-4.081[a]	3.871[a]
-18	0.171	1.437	0.067	-0.479	<-0.545	-0.753	-0.479	2.287	-0.388[a]	4.233[a]	<-4.126[a]	4.087[a]
-17	-0.091	1.266	-0.218	-0.546	>-0.485	-0.754	0.118[c]	2.766[c]	0.227[a]	4.621[a]	<-4.051[a]	4.165[a]
-16	-0.167	1.357	-0.253	-0.328	>-0.547	-0.744	-0.008[c]	2.648[c]	0.040[a]	4.394[a]	<-4.066[a]	4.228[a]
-15	0.162	1.524	0.032	-0.075	>-0.315	-0.753	0.874[b]	2.656[b]	0.969[a]	4.354[a]	<-4.005[a]	4.091[a]
-14	0.130	1.362	0.023	-0.107	<-0.194	-0.741	-0.039	1.782	-0.002[a]	3.385[a]	<-3.975[a]	4.183[a]
-13	-0.237	1.232	-0.349	-0.130	>-0.264	-0.739	-0.482	1.821	-0.417[a]	3.387[a]	<-4.020[a]	4.125[a]
-12	0.334	1.469	0.212	0.219	>-0.348	-0.735	0.489[c]	2.303[c]	0.642[a]	3.804[a]	<-3.990[a]	4.053[a]
-11	0.038	1.135	-0.082	0.007	>-0.386	-0.723	-0.567	1.814	-0.393[b]	3.162[b]	<-3.930[a]	4.074[a]
-10	0.291	1.097	0.137	0.089	>-0.670	-0.710	0.448[c]	2.381[c]	0.538[a]	3.555[a]	<-3.870[a]	3.981[a]
-9	-0.024	0.806	-0.083	-0.048	>-0.944	-0.669	-0.064	1.933	0.051[b]	3.017[b]	<-3.877[a]	3.850[a]
-8	-0.055	0.830	-0.108	0.035	<-0.543	-0.701	0.098[c]	1.997[c]	0.229[a]	2.966[a]	<-3.809[a]	3.595[a]
-7	-0.014	0.885	-0.090	0.143	>-0.390	-0.747	0.699[c]	1.899[c]	0.856[b]	2.737[b]	<-3.975[a]	3.637[a]
-6	-0.078	0.899	-0.181	0.233	>-0.145	-0.781	0.338	1.200	0.438[b]	1.881[b]	<-4.126[a]	3.820[a]
-5	0.245[c]	0.977[c]	0.133	0.414	>-0.157	-0.794	0.114	0.862	0.255[c]	1.443[c]	<-4.171[a]	3.922[a]
-4	-0.066	0.732	-0.164	0.281	<-0.235	-0.796	0.090	0.748	0.251	1.188	<-3.591[a]	3.600[a]
-3	0.575[c]	0.798[c]	0.467	0.445	>-0.109	-0.830	-0.288	0.658	-0.201	0.937	<-3.606[a]	3.805[a]
-2	0.200	0.223	0.082	-0.022	>-0.176	-0.864	0.847	0.946	0.932[c]	1.138[c]	<-3.244[a]	3.680[a]
-1	0.023	0.023	-0.104	-0.104	>-0.145	-0.890	0.099	0.099	0.206	0.206	<-2.746[a]	2.954[a]
0	0.084	0.084	-0.056	-0.056	>-0.547	-0.972	0.730	0.730	0.772	0.772	>-1.343	0.654
+1	0.306	0.306	0.214	0.214	>-0.678	-0.625	0.126	0.126	0.118	0.118	<-1.750[c]	-0.052
+2	0.020	0.326	-0.115	0.099	>-0.194	-0.783	-0.128	-0.002	0.028	0.146	<-1.871[c]	0.718
+3	-0.323	0.003	-0.417	-0.318	>-0.334	-0.745	-0.214	-0.216	-0.162	-0.016	<-1.320	0.873
+4	-0.229	-0.226	-0.329	-0.647	>-0.467	-0.736	-0.446	-0.662	-0.319	-0.335	=-2.150[b]	1.410
+5	0.104	-0.122	-0.018	-0.665	<-0.310	-0.760	-0.399	-1.061	-0.333	-0.668	<-2.240[b]	1.616
+6	-0.142	-0.264	-0.192	-0.857	<-0.250	-0.694	0.486	-0.575	0.602	-0.066	<-2.331[b]	1.935
+7	0.009	-0.255	-0.096	-0.953	<-0.164	-0.701	0.329	-0.246	0.501	0.435	<-2.527[b]	2.494[b]
+8	-0.297	-0.552	-0.430	-1.383	>-0.039	-0.730	-0.310	-0.556	-0.196	0.239	<-2.799[a]	2.800[a]
+9	-0.106	-0.658	-0.216	-1.599	<-0.065	-0.735	0.197	-0.359	0.245	0.484	<-2.648[a]	2.597[b]
+10	-0.087	-0.745	-0.142	-1.741	<-0.075	-0.701	-0.108	-0.467	-0.038	0.446	<-2.829[a]	2.625[b]
+11	0.137	-0.608	-0.001	-1.742	>-0.068	-0.726	0.052	-0.415	0.140	0.586	<-2.904[a]	2.828[a]
+12	0.126	-0.482	0.001	-1.741	>-0.213	-0.739	-0.235	-0.650	-0.125	0.461	<-3.085[a]	2.972[a]
+13	0.078	-0404	0.022	-1.719	<-0.060	-0.712	0.859	0.209	0.935	1.396	<-3.145[a]	3.033[a]
+14	0.268	-0.136	0.187	-1.532	<-0.201	-0.702	0.438	0.647	0.520[c]	1.916[c]	<-3.010[a]	2.779[a]
+15	-0.037	-0.173	-0.162	-1.694	<-0.046	-0.714	-0.128	0.519	-0.036[c]	1.880[c]	<-3.100[a]	2.808[a]
+16	-0.315	-0.488	-0.422	-2.116	<-0.110	-0.717	0.428	0.947	0.557[c]	2.437[c]	<-3.259[a]	2.963[a]
+17	-0.260	-0.748	-0.281	-2.397	<-0.294	-0.682	0.032	0.979	0.094[c]	2.531[c]	<-3.266[a]	3.034[a]
+18	-0.236	-0.984	-0.351	-2.748	<-0.262	-0.689	-0.151	0.828	-0.065	2.466	<-3.236[a]	2.987[a]
+19	0.069	-0.915	-0.039	-2.787	<-0.344	-0.693	-0.300	0.528	-0.266	2.200	<-3.115[a]	2.902[a]
+20	-0.003	-0.918	-0.094	-2.881	<-0.210	-0.690	0.398	0.926	0.483[c]	2.683[c]	<-3.130[a]	2.925[a]

_Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. WILCO and T-STA donate Wilcoxon Signed Rank Test and T-Statistics.
>donates OLS larger than GJR-GARCH
<donates OLS less than GJR- GARCH

finding contradicts with empirical results of Heron and Lie (2002) who documented significantly higher returns for target shareholders who received cash payment than shareholders received stock financing.

Table 4.5 reveals that, the announcement day CAR for all stock bidders under the OLS estimate was 0.730 percent which is statistically insignificant. Whilst the CAR of 0.772 percent under GJR-GARCH estimate is higher than that of the OLS estimate and is also statistically insignificant. As one would expect, for twenty days estimation period, the returns continuations under the GJR-GARCH and OLS estimates were significant different with the GJR-GARCH estimate generating higher CARs especially before the announcement. Indeed, these results under the OLS and GJR-GARCH estimates suggested that OLS estimates performed better for all cash acquirers than their counterpart GJR-GARCH estimates. However, the magnitude of CARs under the GJR-GARCH estimates was stronger for all stock payments than the OLS estimates. The market supports market efficiency for both cash and stock financing under both estimation methods since CARs are not significant after day zero. Kohers (2004) documented positive wealth gain for acquirers in both stock and cash financing. This result of stock offer provides evidence to support Kohers's (2004) findings but contradicts with his cash offers.

4.4.3 Acquirer Method of Payment under the Carhart Model

Table 4.6 showed ARs and cumulative CARs across (±20) event windows estimated by Carhart four-factor models under the OLS and GJR-GARCH estimates.

As indicated in Table 4.6, day t=0 CAR for the all cash financed under the OLS estimate of 0.051 percent was considerably smaller than the GJR-GARCH estimate CAR of 0.274 percent and both are statistically insignificant. Surprisingly, the CARs under the two estimation methods are statistically zero, and therefore do not yield expected results. The differences in pre-announcement CARs levels are statistically insignificant under both the OLS and GJR-GARCH methods. The post event date under the OLS estimate primarily exhibited negative CARs and is insignificant. Under the GJR-GARCH estimate post event CARs generated continuous positive returns and are not significant either. This result under the GJR-GARCH estimate is in line with, for example, Schwert (2000); Heron and Lie (2002); and Megginson, Morgan and Nail (2004) who documented positive ARs for acquiring firms paying by cash using the OLS method. The magnitudes of returns under the GJR-GARCH estimates were much stronger than the OLS estimates on the same period but were lower than the pre-announcement CARs under the GJR-GARCH estimate.

Table 4.6 also reports all stock bidders. The event date CARs are not significant under both the OLS and GJR-GARCH estimation methods. Nevertheless, pre-announcement CARs for all stock payments under the GJR-GARCH estimate generated simultaneous positive higher returns (t=-5 up to t=-20) and are statistically significant. The post-event date CARs are not statistically significant under the OLS and GJR-GARCH methods, imply CARs had no impact on the announcement. Results of all stock offers confirmed that the GJR-GARCH estimate performed better than the OLS estimate in terms of predicting CARs. This is consistent with Allen and Simans (1987) who found that acquirers experienced positive returns if predominantly financed by stock.

Table 4.6: CARHART for Acquirer: CARs Estimate under the OLS and GJR-GARCH ESTIMATION

	CASH OFFER						STOCK OFFER					
	OLS EST.		GJR-GARCH				OLS EST.		GJR-GARCH			
DAYS	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA	ARs%	CARs%	ARs%	CARs%	WILCO	T-STA
-20	-0.073	1.129	0.124	5.872	>-0.357	0.884	-0.113	2.305	-0.050[a]	4.122[a]	<-3.764[a]	3.656[a]
-19	-0.233	1.202	0.029	5.748	>-0.379	0.892	0.246	2.418	0.295[a]	4.172[a]	<-3.764[a]	3.649[a]
-18	0.166	1.435	0.421	5.719	>-0.290	0.887	-0.527	2.172	-0.430[b]	3.877[b]	<-3.824[a]	3.814[a]
-17	-0.107	1.269	0.121	5.298	>-0.180	0.883	0.007[c]	2.699[c]	0.105[a]	4.307[a]	<-3.794[a]	3.824[a]
-16	-0.153	1.376	0.104	5.177	>-0.291	0.886	-0.107[b]	2.692[b]	-0.025[a]	4.202[a]	<-3.734[a]	3.782[a]
-15	0.169	1.529	0.406	5.073	>-0.140	0.881	0.865[b]	2.799[b]	0.956[a]	4.227[a]	<-3.643[a]	3.716[a]
-14	0.146	1.360	0.386	4.667	>-0.234	0.881	0.050	1.934	0.028[a]	3.271[a]	<-3.704[a]	3.891[a]
-13	-0.240	1.214	-0.037	4.281	>-0.116	0.880	-0.462	1.884	-0.415[a]	3.243[a]	<-3.749[a]	3.873[a]
-12	0.359	1.454	0.566[c]	4.318	>-0.516	0.890	0.525[c]	2.346[c]	0.642[a]	3.658[a]	<-3.870[a]	3.789[a]
-11	0.049	1.095	0.281	3.752	>-0.623	0.901	-0.568	1.821	-0.420[b]	3.016[b]	<-3.764[a]	3.798[a]
-10	0.278	1.046	0.466	3.471	>-0.586	0.903	0.452[c]	2.389[c]	0.506[a]	3.436[a]	<-3.523[a]	3.602[a]
-9	-0.037	0.768	0.262	3.005	>-0.858	0.926	-0.077	1.937	0.021[b]	2.930[b]	<-3.598[a]	3.504[a]
-8	-0.068	0.805	0.221	2.743	>-0.485	0.903	0.107[c]	2.014[c]	0.195[a]	2.909[a]	<-3.568[a]	3.259[a]
-7	-0.015	0.873	0.245	2.522	>-0.106	0.879	0.749[c]	1.907[c]	0.879[a]	2.714[b]	<-3.833[a]	3.205[a]
-6	-0.094	0.888	0.137	2.277	>-0.167	0.863	0.306	1.158	0.403[b]	1.835[b]	<-3.907[a]	3.273[a]
-5	0.233[c]	0.982[c]	0.469	2.140	>-0.042	0.864	0.096	0.852	0.224[c]	1.432[c]	<-3.900[a]	3.603[a]
-4	-0.070	0.749	0.172	1.671	<-0.413	0.859	0.077	0.756	0.249	1.208	<-3.296[a]	3.322[a]
-3	0.592[c]	0.819[c]	0.827[c]	1.499	<-0.224	0.845	-0.294	0.679	-0.191	0.959	<-3.312[a]	3.581[a]
-2	0.218	0.227	0.440	0.672	>-0.503	0.829	0.890	0.973	0.952[c]	1.150[c]	<-3.949[a]	3.165[a]
-1	0.009	0.009	0.232	0.232	>-0.404	0.831	0.083	0.083	0.198	0.198	<-3.002[a]	3.798[a]
0	0.051	0.051	0.274	0.274	>-0.889	0.817	0.743	0.743	0.784	0.784	>-1.184	0.706
+1	0.299	0.299	0.569	0.569	<-0.356	0.995	0.148	0.148	0.221	0.221	<-1.893[c]	0.755
+2	0.033	0.332	0.255	0.824	>-0.188	0.914	-0.072	0.076	0.072	0.293	<-1.607	1.313
+3	-0.315	0.017	-0.060	0.764	>-0.360	0.927	-0.239	-0.163	-0.198	0.095	<-0.883	1.227
+4	-0.254	-0.237	-0.020	0.744	>-0.203	0.913	-0.488	-0.651	-0.381	-0.286	<-1.546	1.653
+5	0.111	-0.126	0.353	1.097	<-0.284	0.911	-0.438	-1.089	-0.411	-0.697	<-1.618	1.614
+6	-0.175	-0.301	0.104	1.201	<-0.160	0.934	0.445	-0.644	0.579	-0.118	<-2.037[b]	2.017[b]
+7	0.039	-0.262	0.267	1.468	<-0.310	0.922	0.274	-0.370	0.427	0.309	<-2.452[b]	2.439[b]
+8	-0.294	-0.556	-0.084	1.384	<-0.163	0.904	-0.381	-0.751	-0.268	0.041	<-2.693[a]	2.612[b]
+9	-0.105	-0.661	0.118	1.502	<-0.001	0.896	0.149	-0.602	0.203	0.244	<-2.527[b]	2.422[b]
+10	-0.089	-0.750	0.202	1.704	<-0.405	0..915	-0.152	-0.754	-0.044	0.200	<-2.633[a]	2.559[b]
+11	0.134	-0.616	0.338	2.042	<-0.237	0.901	0.066	-0.688	0.131	0.331	<-2.738[a]	2.660[b]
+12	0.129	-0.487	0.363	2.405	<-0.043	0.898	-0.252	-0.940	-0.153	0.178	<-2.829[a]	2.803[a]
+13	0.063	-0.424	0.351	2.756	<-0.430	0.912	0.832	-0.108	0.912	1.090	<-2.874[a]	2.854[a]
+14	0.280	-0.144	0.521	3.277	<-0.611	0.911	0.436	0.328	0.525	1.615	<-2.768[a]	2.532[b]
+15	-0.044	-0.188	0.208	3.485	<-0.532	0.913	-0.185	0.143	-0.086	1.529	<-2.889[a]	2.563[b]
+16	-0.308	-0.496	-0.082	3.403	<-0.461	0.909	0.337	0.480	0.486	2.015	<-3.266[a]	2.740[a]
+17	-0.298	-0.794	-0.003	3.400	<-0.871	0.920	-0.030	0.450	0.058	2.073	<-3.281[a]	2.771[a]
+18	-0.246	-1.040	-0.017	3.383	<-0.849	0.916	-0.138	0.312	-0.081	1.992	<-3.115[a]	2.694[b]
+19	0.090	-0.950	0.334	3.717	<-0.948	0.916	-0.307	0.005	-0.279	1.713	<-2.904[a]	2.596[b]
+20	0.029	-0.921	0.266	3.983	<-0.981	0.914	0.328	0.333	0.391	2.104	<-2.889[a]	2.580[b]

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. WILCO and T-STA donate Wilcoxon Signed Rank Test and T-Statistics.
>donates OLS larger than GJR-GARCH
<d0nates OLS less than GJR- GARCH

The difference between the two CARs under the estimation methods cannot be efficiently measured or say which of the estimation method generate bigger CARs. In this regard, it is sensible to measure the difference between the two statistically by applying non-parametric test to the CARs. Non-parametric test has the tendency, and is more powerful, to identify a false null hypothesis of no ARs. Therefore we use non-parametric Wilcoxon signed-rank test and t-statistic to test the differences in the magnitude of the two CARs.

As depicted in Table 4.1 using the Wilcoxon signed-rank test and t-statistic, for the target firms, the CARs for the two estimation methods are not statistically different and therefore the null hypothesis cannot be rejected while the t-statistics were rejected in favour of the alternative hypotheses. In contrast to the acquiring firms for CARs are statistically different, hence we rejected the null hypothesis.

As presented in Table 4.2, under the Wilcoxon signed-rank test, for target firms the null hypothesis is rejected. However, for bidding firms the null hypothesis cannot be rejected. The t-statistic for both target and acquiring firms consequently rejected in favour of the alternative hypotheses.

As seen in Table 4.3, using the Wilcoxon signed-rank test and their respective t-statistic, CARs for the target and acquiring firm shareholders are similar to those reported in Table 4.2. Shareholders of the target firms enjoyed CARs which were statistically significant for the full period; as a result, the null hypotheses cannot be rejected. Nevertheless, the t-statistics were rejected in favour of the alternative hypotheses. For the acquiring firms, the bulk of CARs are significant whilst the t-statistics for the full period were rejected in favour of the alternative hypotheses.

We also used Wilcoxon signed-rank test and t-statistic to determine the statistical significance of the CARs for cash and stock acquirers. These were presented in Tables 4.4, 4.5 and 4.6. As observed in the three tables, there was no statistical significance of CARs reported for cash acquirers under the Wilcoxon signed-rank test and the t-statistics hence the null hypotheses were rejected in favour of the alternative hypotheses. However for the stock acquirers, CARs under the Wilcoxon signed-rank test and t-statistics for the most part were statistically significant and therefore the null hypotheses cannot be rejected. As observed in the three tables, Table 4.5 CARs for stock acquirers under Wilcoxon signed-rank test generated the most statistical significance with the least being recorded in Table 4.6.

4.5 Conclusion

This chapter presented the empirical results for both the target and acquiring firm shareholders. We estimated the CARs using the standard CAPM, Fama-French three-factor (1993) and Carhart four-factor (1997) models under the OLS and GJR-GARCH method. The results presented in this chapter are consistent across the three methodologies applied for target and acquirer firms. Overall, there appears to be some variations in the magnitude of the average CARs, given the estimation methods for both the target and the bidding firms. The CARs realised for target shareholders under the two estimation methods were not statistically different. In other words, the results are not materially different under the OLS and GJR-GARCH estimation methods. However, CARs generated for acquiring shareholders showed significant different using the three models. Obviously, using the Carhart four-factor models, the magnitude of the returns continuation or CARs for acquiring firms under the GJR-GARCH were normally higher compared to the OLS estimates. From the acquirers' point of view, it appears the market does not respond significantly to the announcement across all the methodologies that were applied in this study. This present study shows that when managers issued only stock, acquirer earned positive CARs or wealth gain increases, however, CAR results in negative wealth effect when offered cash.

We found no evidence of market efficiency and overreaction for target firms; however, we found consistently strong support for market efficiency and overreaction for acquiring firms under both the OLS and GJR-GARCH models.

Some researchers have argued that the standard CAPM is misspecified in explaining the significance of CARs (see e.g. Mazouz, Joseph and Joulmer, 2009). However, when the multifactor models were used they were not able to reduce the misspecification associated with the CARs. In other words, CARs generated under the multifactor model were not absolutely different compared to the standard model.

The Wilcoxon signed-rank test is used to compare the CARs from the two estimation methods for both target and acquirer firms across all the methodologies that were used.

CHAPTER FIVE

ABNORMAL RETURNS and MARKET LIQUIDITY

5.0 Introduction

The term market liquidity has several different meanings. Market liquidity could be defined as the ease with which financial assets can be bought or sold such that the more liquid the asset, the narrower the bid-ask spread. The magnitude of the bid-ask spread can therefore depend on the size of the market in which assets in general are traded, but there can also be a lot of variation in the bid-ask spread for a particular asset. That is, even if a stock market is deep, different stocks will have bid-ask spreads of different magnitudes. A liquid stock market will therefore exhibit relatively low transaction cost. This allows investors to easily liquidate their stocks which in turn, lead to an increase in trading volume. Moreover, the usefulness of speculators and market makers cannot be underestimated in their role of providing market liquidity. Indeed, there are times when the market liquidity tends to increase price volatility to a certain degree, unequalled by the economic conditions prevailing at that time.

This chapter evaluates the impacts of market liquidity-measured by trade volume and market capitalization-on the magnitude of CARs for stocks that are associated with M&As. Several factors can affect the magnitude of the ARs. Theses can include the spread of ownership, the liquidity of the stock, amongst others. Amihud (2002, pp. 32) argued theoretically that, ‘‘unexpected market illiquidity lowers contemporaneous stock prices’’. Amihud (2002) takes the view that higher returns can increase illiquidity and expected illiquidity can sequentially increase stock expected returns and lower stock prices. He therefore concluded that illiquidity effects are in favour for small firms stock. Empirical studies have focused on the liquidity and expected stock returns relation to verify the extent to which liquidity can affect ARs. The studies of Amihud and Mendelson (1986), Brennan and Subrahmanyam (1996) and Brennan, Chordia and Subrahmanyam (1998) employed various liquidity measures and reported that less liquid stocks are associated with higher returns. In other words, higher volume liquidity stocks are associated with lower ARs. In their studies, Chordia, Roll and Subrahmanyam (2001) also found a relationship between liquidity and expected returns. They show that stocks with high liquidity have lower expected returns. Their cross-sectional analysis demonstrated that, there is a correlation between stock returns and liquidity, using liquidity as proxy to measure trading activity. We document strong return continuations in favour of medium liquidity stocks based on our capitalization measure.

For this study, we need to identify a measure of proxy for liquidity and to determine the effect of this proxy variable on the ARs. To do this, we rely on Cox and Peterson, (1994) and Mazous et al. (2009) and therefore us the market capitalization value to proxy for liquidity. The market capitalization value is the share price time the number of shares outstanding. The figure obtained represents the total value of the company at a given point in time. Firm liquidity plays a significant and sizeable role in explaining both the value and the market capitalization stocks to invest in. Using market capitalization as a measure of liquidity highlights the significant variations in the size of capitalization can have on the ARs. The importance of this is that portfolio managers and investor could use it as a yard stick for investment purposes. Large firms are normally considered as more liquid. One manner in which this phenomenon is explained is that as the value of a firm grows their stock will become more liquid. That is, the big the firm the more liquid it becomes. However, large market capitalization does not necessarily lead to more liquid stocks. That is, because as the stock price increases, more money needs to be made available to acquire the stock, very large capitalization value can in turn reduce liquidity.

In this study, we measure the relationship between volume and capitalization. Specifically, volume is used to measure capitalization as well as liquidity. If large stocks are less liquid, then the use of volume will help identify whether this is an issue since high capitalization stocks are likely to have less volume if indeed high capitalization leads to less liquidity. The chapter specifically focus on stock market liquidity rather than firm size. Trading volume could be defined as the total number of shares traded during a defined period of time. The market capitalization value is the share price time the number of shares outstanding-is one measure of firm size. It is generally assume that as the value of a firm grows, their stock will be more liquid. That is, the bigger of the size of the firm, the more liquid it becomes. Nevertheless, large firm does not necessarily bring more liquidity based on the explanation given earlier on in this chapter. Firm size is used to measure liquidity. The liquidity hypothesis says that large firms are more liquid than small stocks which are less liquid. Based on this hypothesis, we can say that there is a relationship between firm size and liquidity. Empirical evidence has shown that small stocks which are less liquid generate high ARs than large stocks (see e.g. Amihud, 2002). Our liquidity hypothesis will explain the relationship between firm size and stock market liquidity. Specifically, whether the magnitude of these ARs are related to the firm size and if there is a relationship between size and market capitalization might be explained by our liquidity measures. We predict a positive association between the CARs and stock liquidity (see e.g. Brennan and Subrahmanyam, 1996). In order to verify this, we use the CARs of target and acquirer firms' market capitalization and trading volume as a measure of liquidity. The firms are categorised into small, medium and large market capitalization and trade volume firms and the associated CARs are grouped accordingly. This is the first study to relate the CARs to the liquidity measures by using both market capitalization and trading volume value measures, classifying them into small, medium and large stocks. Our study is different from previous studies because all prior studies on liquidity measures either used market capitalization or trading volume.

5.1 Market Capitalization for Target Firms and Standard CAPM

Table 5.1 presents the results of the CARs under the standard CAPM for each category of small, medium and large market capitalisation stocks for target. The ARs were estimated under the OLS and GJR-GARCH methods. The CARs are generated by a simple arithmetic process after obtaining the ARs.

Table 5.1 shows the results for the target firms under the OLS method. On the announcement day CARs under the OLS for small, medium and large market capitalisation stocks were 5.113 percent, 3.851 percent and 3.035 percent, respectively and all are significant at the 1% level. Here small liquid stocks outperformed both the medium and large liquid stocks. This suggests that shareholders of small stock enjoy higher rate of returns which is above both medium and large stocks. This finding is in line with Amihud's (2002) results where the excess returns are shown to be more positive in small stocks compared to larger

Table 5.1:CARs Grouped by Market Capitalization Value for Target Firms under Standard CAPM

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	-0.096	1.675[b]	-0.432	1.941	M	L	-1.273	3.717[a]	-1.444	6.282[b]	M	L
-19	-0.012	1.578[b]	0.130	1.596	M	S	-1.241	3.493[a]	-0.811	5.636[c]	M	L
-18	-0.527	1.493[c]	0.734	1.170	M	S	-1.769	3.311[a]	-0.130	4.222	M	L
-17	-0.946	1.846[b]	0.744	3.048	M	S	-2.109	3.561[a]	-0.036	5.980[b]	M	S
-16	-0.288	1.519[c]	0.810	1.334	M	S	-0.385	3.097[a]	0.115	4.266	M	L
-15	-0.521	1.397[c]	1.032	2.613	M	S	-1.575	2.857[a]	0.429	4.256	M	S
-14	-0.857	1.172	0.976	2.323	M	S	-1.864	2.536[a]	0.437	4.478	M	S
-13	-0.169	1.476[c]	0.837	2.174	M	S	-1.136	2.605[a]	0.379	4.192	M	L
-12	1.281	1.292	0.628	0.690	M	L	0.344	2.274[a]	0.193	2.138	M	L
-11	1.161	1.093	0.320	1.084	M	L	0.275	1.971[a]	-0.083	2.354	M	L
-10	0.465	1.203	0.089	2.595	M	L	-0.426	1.972[a]	-0.265	4.651	M	L
-9	0.652	1.183	0.776	2.303	M	L	-0.209	1.858[a]	0.443	4.154	M	L
-8	0.275	1.149[c]	1.245	1.873	M	S	-0.515	1.711[a]	0.946	3.944	M	S
-7	0.939	0.779	1.063	0.908	M	L	0.141	1.226[b]	0.822	1.102	M	L
-6	0.313	0.893	0.668	1.319	M	S	-0.447	1.225[b]	0.460	2.346	M	S
-5	0.764	0.367	0.984	0.041	M	L	0.067	0.618	0.795	0.331	M	L
-4	0.582	0.219	0.888	0.171	M	S	-0.134	0.374	0.781	0.679	M	S
-3	0.588	0.241	0.496	0.388	S	L	-0.081	0.396	0.406	0.461	M	L
-2	-0.261	0.767[a]	0.831	2.703	M	S	-0.845	0.892[a]	0.769	4.516	M	S
-1	-0.357	0.309	0.414	1.719	L	S	-0.573	0.389[c]	0.380	3.424	L	S
0	5.113[a]	3.851[a]	3.035[a]	0.734	S	L	4.993[a]	3.970[a]	2.996[a]	0.819	S	L
+1	1.978[c]	1.699[b]	-0.349	3.064	M	L	1.933[c]	1.700[b]	-0.331	2.581	M	L
+2	1.527	2.397[a]	-0.404	7.184[b]	M	L	1.437	2.426[a]	-0.425	5.859[b]	M	L
+3	1.386	2.680[a]	-0.269	6.891[b]	M	L	1.304	2.752[a]	-0.312	5.666[c]	M	L
+4	1.466	2.148[b]	0.208	2.699	M	L	1.363	2.277[b]	0.135	2.355	M	L
+5	1.106	2.148[b]	-0.003	3.460	M	L	0.953	2.346[b]	-0.076	3.069	M	L
+6	1.261	2.631[a]	0.322	4.43	M	L	1.072	2.934[a]	0.260	3.856	M	L
+7	1.532	2.525[b]	-0.198	4.234	M	L	1.318	2.922[a]	-0.300	5.002[c]	M	L
+8	1.182	2.425[b]	-0.160	3.333	M	L	0.931	2.897[a]	-0.302	4.154	M	L
+9	1.172	2.120[c]	0.289	1.765	M	L	0.862	2.700[b]	0.159	2.554	M	L
+10	1.124	1.768	0.188	1.845	M	L	0.791	2.423[b]	0.059	2.319	M	L
+11	1.076	1.636	-0.090	1.183	M	L	0.684	2.408[b]	-0.214	2.253	M	L
+12	0.439	1.578	-0.100	1.615	M	S	-0.011	2.433[b]	-0.209	2.797	M	L
+13	-0.291	1.337	0.045	1.926	M	S	-0.788	2.288[c]	-0.099	2.536	M	S
+14	-0.506	1.639	-0.295	1.645	M	S	-1.081	2.705[b]	-0.426	3.652	M	L
+15	0.123	1.118	-0.323	0.677	M	L	-0.680	2.274[c]	-0.483	2.283	M	L
+16	-0.413	1.285	-0.263	1.143	M	L	-1.188	2.523[c]	-0.438	3.092	M	L
+17	-0.613	1.342	-0.039	1.231	M	S	-1.518	2.675[b]	-0.221	3.054	M	S
+18	-0.678	1.158	-0.216	0.629	M	L	-1.606	2.611[c]	-0.383	2.172	M	L
+19	-1.138	1.226	-0.308	1.266	M	S	-2.067	2.813[b]	-0.456	2.778	M	L
+20	-1.371	1.357	-0.504	2.257	M	S	-2.243	3.049[b]	-0.662	3.649	M	L

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank
L, M, S, denote Large, Medium and Small Firms

stocks. Moeller et al. (2004) hypothesis that, on announcement of M&As, CARs for small liquid stocks is significantly higher than large liquidity stocks. Note that other studies have adopted our approach and this approach is not unique except for the GJR-GARCH. This suggests that the market capitalization as a liquidity measure has a significant impact on the size effect. The CARs for small market capitalisation are significant up to one day. For medium market capitalisation, CARs are significant up to nine continuous days and all were positive. There is also some significant (t=-15 to t=-20) pre announcement CARs only in medium capitalization stocks. The result might suggest that ownership structure for medium stocks are less dispersed compared to small and large stocks thereby leading to that effect**.** The return continuations were higher in medium capitalisation stocks while the least return was generated in large capitalisation stocks. This finding is somewhat in line with Mazouz et al.'s (2009) study where return continuations are shown to be more predominant in medium capitalisation stocks.

To our best of knowledge, we should have expected higher return continuations and more positive returns in the small capitalisation stocks than the medium capitalisation stocks. It is perfectly understandable that due to large prevalence of firm ownership in small firms (see. e.g. Moeller et al. 2004; Mazouz et al. 2009) return continuations in small liquid stocks should have been stronger compared to medium liquid stocks. Large market capitalisation stocks performed badly. This is not surprising as news is propagating quickly in large firms resulting in low returns. The post-announcement CARs for large market capitalisation stocks were mostly negative and none are significant. There was evidence of market efficiency in both small and large market capitalisation stocks incorporating information by the takeover announcement in stock prices. These results are consistent with Chopra, Lakonishok and Ritter (1992) who documented overreaction effect for small firms, whilst Disssanaike (1997) reported overreaction phenomena for large UK firms.

The results under the GJR-GARCH are also shown in Table 5.1. On announcement day, t=0, CARs for small, medium and large liquid stocks under the GJR-GARCH estimation showed that all are statistically significant at the 1% level. Again, the pre-event CARs are not significant instantly following the event date in both small and large capitalization stocks. There was enormous change in the result for medium market capitalisation compared to the OLS results; however, the results achieved for small and large market capitalisation were not materially different. For medium market capitalisation CARs were statistically significantly positive for a period of t=-2 up to t=+20. The results suggested that there was high frequency evidence of market speculation for acquisition announcement for medium market capitalization stocks. In addition, investors might have had interest and therefore continued to buy the shares for twenty consecutive days after the announcement. It should be noted that the significance of the CARs persists much longer under the GJR-GARCH method only in the medium stocks. For small market capitalisation stocks, the CARs are significant up to one day and positive up to eleven days. In contrast to large market capitalisation, the CARs after the announcement date exhibited predominantly negative returns and are insignificant at conventional levels.

Here shareholders enjoyed normal rate of returns for small and zero rates of returns for large market capitalisation stocks whilst realised higher rate of returns for medium market capitalisation stocks. As indicated earlier, we do not know why return continuations are more positively and significantly predominantly in medium market capitalisation instead of small market capitalisation stocks.

5.2 Market Capitalization for Target Firms and Fama-French Model

In Table 5.2, we report the CARs for target firms for each of the small, medium and large market capitalization stocks using the Fama-French three-factor model. Here the ARs are estimated using OLS and GJR-GARCH methods.

As indicated in Table 5.2, on the announcement day, CARs for the target firms for small, medium and large liquidity stocks are highly significantly positive under the OLS model. Specifically, CARs for small, medium and large liquidity stocks were 5.074 percent, 4.039 percent and 3.019 percent respectively which are highly significant at the 1% level. The pre-event day (t=-1) CARs are insignificant across all firm sizes. As expected, CARs for small liquidity stocks generated the highest returns on the announcement day and are significant up to one day. Another remarkable finding is the total returns were actually positive only in small firms. For medium liquidity stocks CARs were positive and statistically significant up to nine uninterrupted days, whilst the CARs for large liquidity stocks mainly showed negative returns and are insignificant for the twenty days. This is not surprising as it was indicated by the literature that large stocks are highly liquid and therefore generated low returns. Moreover, pre-announcement CARs for medium liquidity stocks are statistically significant at conventional levels for the period t=-6 to t=-20. We also observed some sort of market efficiency in both small and large liquidity stocks.

Table 5.2: CARs Grouped by Market Capitalization Value for Target Firms under Fama-French

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%-	CARs%	CARs	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	-1.176	1.871[b]	-0.867	4.978[c]	M	S	-1.688	2.971[a]	-2.393	6.649[b]	M	L
-19	-1.025	1.835[b]	-0.311	5.110[c]	M	S	-1.596	2.849[a]	-1.690	5.527[c]	M	L
-18	-1.496	1.794[b]	0.333	4.646[c]	M	S	-2.038	2.696[a]	-0.937	4.196	M	L
-17	-1.718	2.125[a]	0.292	7.141[b]	M	S	-2.312	2.973[a]	-0.867	5.549[c]	M	S
-16	-1.039	1.770[b]	0.425	4.337	M	S	-1.608	2.632[a]	-0.647	3.923	M	L
-15	-1.257	1.752[b]	0.679	5.390[c]	M	S	-1.814	2.503[a]	-0.301	3.889	M	S
-14	-1.580	1.461[c]	0.688	5.190[c]	M	S	-2.082	2.185[a]	-0.212	4.466	M	S
-13	-0.838	1.810[a]	0.602	5.222[c]	M	S	-1.315	2.304[a]	-0.179	3.709	M	S
-12	0.649	1.592[b]	0.387	2.206	M	S	0.235	2.026[a]	-0.376	2.445	M	L
-11	0.572	1.272[c]	0.141	2.105	M	S	0.142	1.681[a]	-0.566	2.113	M	L
-10	-0.114	1.396[c]	-0.008	4.537	M	S	-0.487	1.705[a]	-0.663	3.152	M	L
-9	0.143	1.332[b]	0.694	3.246	M	S	-0.244	1.606[a]	0.106	1.809	M	L
-8	-0.160	1.192[b]	1.088	3.470	M	S	-0.534	1.431[a]	0.566	1.727	M	S
-7	0.515	1.019[c]	0.892	0.809	M	S	0.068	1.117[a]	0.495	0.650	M	L
-6	-0.111	1.045[c]	0.556	3.321	M	S	-0.548	1.124[a]	0.237	1.970	M	S
-5	0.426	0.509	0.897	0.622	M	S	-0.014	0.590	0.611	0.392	M	L
-4	0.333	0.420	0.821	1.126	M	S	-0.146	0.400	0.611	0.477	M	S
-3	0.438	0.265	0.444	0.288	M	L	-0.052	0.380	0.272	0.449	M	L
-2	-0.258	0.827[a]	0.802	3.944	M	S	-0.760	0.876[a]	0.683	3.171	M	S
-1	-0.420	0.329	0.349	1.930	L	S	-0.611[c]	0.362[c]	0.294	2.560	M	S
0	5.074[a]	4.039[a]	3.019[a]	0.664	S	L	5.092[a]	3.886[a]	2.999[a]	1.100	S	L
+1	2.002[c]	1.599[b]	-0.389	2.975	M	L	1.942[c]	1.681[b]	-0.377	2.889	M	L
+2	1.594	2.240[b]	-0.430	5.073[c]	M	L	1.474	2.331[b]	-0.524	4.557	M	L
+3	1.600	2.534[a]	-0.331	5.540[c]	M	L	1.440	2.653[a]	-0.453	4.404	M	L
+4	1.714	2.056[b]	0.066	2.125	M	L	1.527	2.194[b]	-0.086	1.985	M	L
+5	1.254	1.987[b]	-0.245	3.018	M	L	1.073	2.194[b]	-0.392	3.629	M	L
+6	1.359	2.455[a]	0.024	4.324	M	L	1.208	2.742[a]	-0.138	4.510	M	L
+7	1.541	2.326[b]	-0.572	4.270	M	L	1.424	2.733[b]	-0.807	5.864[b]	M	L
+8	1.127	2.280[b]	-0.553	4.336	M	L	1.037	2.653[b]	-0.856	4.425	M	L
+9	1.103	1.999[c]	-0.174	2.337	M	L	0.964	2.487[b]	-0.491	3.123	M	L
+10	1.102	1.643	-0.241	1.824	M	L	0.887	2.253[c]	-0.573	3.133	M	L
+11	1.077	1.511	-0.493	1.609	M	L	0.748	2.247[c]	-0.871	3.421	M	L
+12	0.443	1.430	-0.550	1.793	M	L	0.062	2.290[c]	-0.925	2.988	M	L
+13	-0.265	1.317	-0.339	1.688	M	S	-0.708	2.251[c]	-0.785	2.444	M	L
+14	-0.467	1.550	-0.636	1.595	M	S	-0.981	2.625[b]	-1.101	3.307	M	L
+15	0.210	1.022	-0.713	0.816	M	L	-0.499	2.176[c]	-1.242	2.977	M	L
+16	-0.458	1.244	-0.632	1.824	M	L	-0.992	2.435[c]	-1.209	4.290	M	L
+17	-0.690	1.200	-0.455	1.305	M	S	-1.316	2.493[c]	-1.053	3.189	M	L
+18	-0.682	0.955	-0.800	0.874	M	L	-1.393	2.384[c]	-1.406	3.262	M	L
+19	-1.113	0.914	-0.954	1.010	M	L	-1.839	2.512[c]	-1.564	3.779	M	L
+20	-1.344	1.114	-1.042	2.150	M	S	-2.062	2.804[b]	-1.796	5.163[c]	M	L

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

We also reported CARs for target firms for small, medium and large market capitalization stocks under the GJR-GARCH in Table 5.2. On the announcement day, CARs for small, medium and large market capitalization stocks were 5.092 percent, 3.886 percent and 2.999 percent respectively and all are statistically significant at the 1% level. For large market capitalization stocks CARs were negative and were not significant for the entire twenty days, whilst small market capitalization stocks were positive up to twelve days and significant within the period of t=-1 to t=+1. However, medium market capitalization stocks CARs for a period of t=-2 up to t=+20 display a steady movement of positive returns and are significant. This results under the GJR-GARCH estimate are different from the one obtained under the OLS estimate. In addition, pre-announcement CARs for fifteen consecutive days (t=-6 up to t=-20) are significant at conventional levels. This might have happened because of market rumour. Notice also that investors have strong and enduring interest in the wealth of the share prices of companies which announced M&As.

Both set of results under the Fama-French three-factor for medium and large firms are similar to those of the standard CAPM model. Nevertheless, the significance of the CARs for small firms contrasts with those under the standard CAPM only in terms of the GJR-GARCH. We constantly observed stronger return continuations in the medium liquidity stocks than both the small and large liquidity stocks with weaker return continuations being realised in large liquidity stocks. These results are also confirmed by the Kruskal-Willis test.

5.3 Market Capitalization for Target Firms and Carhart Model

Table 5.3 shows the Carhart four-factor model time series returns estimate. In this table we presented the CARs for target firms grouped to small, medium and large market capitalization stocks under the same estimation method.

Table 5.3 indicates that under the OLS method, announcement day (t=0) CAR of 5.054 percent was reported for small market capitalization stocks under the OLS estimate which is significantly different from zero at the 1% level. This finding implies that shareholders of small firms receive large significant wealth gain. In contrast, the CARs for target firms for medium and large market capitalization stocks under the OLS estimate were 3.850 percent and 3.022 percent in that order which are also significant at the 1% level. In particular, the results achieved under the Carhart model are not quantitatively different from under both the CAPM and Fama-French models only in the OLS. For day one (t=+1) and centre on the announcement day, CAR for small liquid stocks under the OLS estimation is statistically significantly different from zero at the 1% level. The CARs were also positive up to day twelve. For medium market capitalization stocks CARs were positive and significant up to nine continuous days. Before the announcement, our liquidity measure also captured CARs which are significant for the period t=-9 up to t=-20 only for medium market capitalization stocks. The intuition is somewhat apparent. The significant of these CARs might have happened due to information leakage. Whilst CARs for large market capitalization stocks were predominantly negative. The pre- and post-announcement CARs directly following the announcement are insignificant under both OLS and GJR-GARCH estimates for large market capitalization stocks. We perceived market efficiency only in terms of large market capitalization stocks under

Table 5.3: CARs Group by Market Capitalization Value for Target Firms under CARHART Model

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	-1.039	1.926[a]	-0.636	4.937[c]	M	S	-2.225	3.476[a]	-2.389	7.579[b]	M	L
-19	-0.881	1.851[b]	-0.117	4.436	M	S	-2.083	3.297[a]	-1.741	5.305[c]	M	L
-18	-1.281	1.744[b]	0.488	3.745	M	S	-2.451	3.111[a]	-1.030	4.218	M	L
-17	-1.513	2.051[a]	0.386	6.987[b]	M	S	-2.717	3.302[a]	-0.991	6.580[b]	M	S
-16	-0.823	1.646[c]	0.537	4.111	M	S	-1.927	2.935[a]	-0.711	4.773[c]	M	L
-15	-1.072	1.516[c]	0.807	4.764[c]	M	S	-2.033	2.766[a]	-0.331	4.870[c]	M	S
-14	-1.427	1.275	0.899	5.026[c]	M	S	-2.237	2.397[a]	-0.168	5.451[c]	M	S
-13	-0.683	1.682[b]	0.846	4.219	M	S	-1.374	2.473[a]	-0.113	4.317	M	S
-12	0.815	1.438[c]	0.615	1.376	M	S	0.168	2.179[a]	-0.326	2.364	M	L
-11	0.727	1.169[c]	0.405	1.301	M	S	0.114	1.804[a]	-0.510	2.157	M	L
-10	-0.014	1.320[c]	0.270	3.737	M	S	-0.393	1.809[a]	-0.586	4.021	M	L
-9	0.221	1.208[c]	0.955	2.663	M	S	-0.166	1.665[b]	0.174	2.925	M	L
-8	-0.124	0.997	1.300	2.994	M	S	-0.347	1.461[b]	0.613	1.890	M	S
-7	0.472	0.797	1.075	0.435	M	S	0.175	1.113[c]	0.533	0.655	M	L
-6	-0.158	0.856	0.699	2.603	M	S	-0.384	1.105[c]	0.227	1.878	M	L
-5	0.353	0.317	1.003	0.353	M	S	-0.053	0.582	0.560	0.414	M	L
-4	0.267	0.217	0.951	0.733	M	S	-0.050	0.372	0.583	0.399	M	L
-3	0.421	0.208	0.496	0.131	M	L	0.038	0.352	0.238	0.875	S	L
-2	-0.256	0.715[a]	0.814	3.046	M	S	-0.740	0.847[a]	0.666	3.298	M	S
-1	-0.405	0.309	0.375	1.646	L	S	-0.539	0.341	0.289	2.030	M	S
0	5.054[a]	3.850[a]	3.022[a]	0.654	S	L	4.964[a]	3.909[a]	2.994[a]	1.015	S	L
+1	2.012[c]	1.713[b]	-0.436	3.969	M	L	1.968[c]	1.717[b]	-0.388	3.040	M	L
+2	1.604	2.205[b]	-0.467	5.346[c]	M	L	1.570	2.378[b]	-0.553	5.181	M	L
+3	1.567	2.484[a]	-0.358	5.369[c]	M	L	1.736	2.685[a]	-0.471	4.559	M	L
+4	1.632	2.020[b]	0.096	1.933	M	L	1.944	2.291[b]	-0.068	2.197	M	L
+5	1.172	1.886[c]	-0.178	2.756	M	L	1.444	2.365[b]	-0.381	3.626	M	L
+6	1.235	2.355[a]	0.120	3.996	M	L	1.434	2.872[a]	-0.130	4.140	M	L
+7	1.357	2.209[b]	-0.495	4.200	M	L	1.584	2.880[a]	-0.824	5.223[c]	M	L
+8	0.928	2.097[b]	-0.446	3.594	M	L	1.157	2.805[a]	-0.817	4.440	M	L
+9	0.876	1.883[c]	-0.020	1.935	M	L	0.941	2.648[b]	-0.436	2.847	M	L
+10	0.835	1.552	-0.114	1.261	M	L	0.838	2.426[b]	-0.552	3.229	M	L
+11	0.852	1.312	-0.339	0.976	M	L	0.828	2.419[b]	-0.828	2.995	M	L
+12	0.282	1.322	-0.412	1.614	M	S	0.244	2.464[b]	-0.907	3.038	M	L
+13	-0.400	1.224	-0.182	2.052	M	S	-0.555	2.410[b]	-0.788	2.603	M	L
+14	-0.618	1.526	-0.492	1.782	M	S	-0.746	2.835[b]	-1.131	3.794	M	L
+15	0.074	0.922	-0.550	0.517	M	L	-0.349	2.399[c]	-1.298	3.101	M	L
+16	-0.614	1.187	-0.485	1.479	M	S	-0.951	2.643[c]	-1.311	4.635[c]	M	L
+17	-0.851	1.160	-0.318	1.744	M	S	-1.079	2.759[b]	-1.186	4.071	M	L
+18	-0.819	0.927	-0.580	0.760	M	S	-0.934	2.664[b]	-1.489	3.718	M	L
+19	-1.305	0.792	-0.758	1.078	M	S	-1.164	2.849[b]	-1.666	4.767[c]	M	L
+20	-1.551	1.004	-0.958	2.544	M	S	-1.525	3.128[a]	-1.925	5.922[b]	M	L

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, donate Large, Medium and Small Firms.

the two estimation methods. This might suggest that the market did not anticipate the announcement.

In Table 5.3, we also reported CARs for target firms for each of the categories of small, medium and large liquidity stocks under the GJR-GARCH estimation. On announcement day, CARs for small, medium and large liquidity stocks were 4.964 percent, 3.909 percent and 2.994 percent respectively and all are significant at the 1% level. Moreover, the magnitudes of these CARs generated on day t=0 are different from those under the OLS method. It can be seen from the table that medium liquidity stocks were positive and statistically significant for conventional levels for twenty days. The significant of the CARs lasts much longer under the GJR-GARCH relative to the OLS estimate only in the medium capitalization stocks. As indicated earlier, investors might have developed interest in buying medium liquidity stocks after the announcement leading to unprecedented returns. Also CARs (t=-6 up to t=-20) for medium liquidity stocks prior to the announcement date are significant. In contrast, CARs for small liquidity stocks was significant up to one day, whilst large liquidity stocks were negative and insignificant at conventional levels for continuous twenty days.

The most striking fact that emerges from this result is that medium liquidity stocks portray higher return continuations compared to small liquidity stocks. According to the literature, small liquidity stocks are riskier and therefore should have higher return continuations, but this is not what we found, unexplained.

5.4 Market Capitalization for Acquirer Firms and Standard CAPM

Table 5.4 reports CARs for acquirer firms classified as small, medium and large market capitalisation stocks under the OLS and GJR-GARCH estimates. The Standard CAPM was used for time series returns.

The results in Table 5.4 indicated that, on announcement day, CAR realised by acquirer firms for small market capitalization stocks under the OLS was 1.632 percent and is significant at the 5% level. As can be seen, the result indicate here shows that small stocks obtained higher returns relative to both medium and larger stocks, which is robust to what the literature has confirmed. Also, consistent with earlier studies, the generated returns to medium and large firm shareholders at the announcement under both OLS and GJR-GARCH estimates were either small or negative returns. The CARs for small market capitalization stocks were also significant up to day one and were positive for the full period. Pre-announcement also saw CARs for period t=-3 up to t=-20 were positive and statistically significant for only small market capitalisation stocks. This result provides evidence that rumour might have resulted in unmatched increases in the share prices of small market capitalizations. For medium market capitalization stocks the CAR for acquisition announcement is 0.191 percent and insignificant. Note that the CAR under the OLS estimate on the day before the announcement day for medium firms is 0.490 percent and is 10% significant level. Large market capitalization stocks generated a CAR of -1.060 percent and are significant at the 10% level.

As noted and expected, the return continuations were stronger for small market capitalization stocks relative to both medium and large market capitalization stocks.

Table 5.4: CARs Grouped by Market Capitalization Value for Acquirer Firms under CAPM

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	4.880[a]	-0.981	1.609[c]	4.611	S	M	-1.581	-1.269	2.093[b]	6.515[b]	S	M
-19	4.896[a]	-0.870	1.269	5.103[c]	S	M	-1.249	-1.117	1.723[c]	6.693[b]	S	M
-18	5.297[a]	-0.503	0.942	3.900	S	M	-0.551	-0.729	1.361	5.218[c]	S	M
-17	5.006[a]	-0.426	1.155	4.170	S	M	-0.501	-0.648	1.549[c]	5.518[c]	S	M
-16	4.932[a]	-0.617	1.216	4.845[c]	S	M	-0.242	-0.808	1.601[c]	6.365[b]	S	M
-15	4.904[a]	-0.166	1.436[c]	3.629	S	M	0.035	-0.352	1.782[b]	5.704[c]	S	M
-14	5.070[a]	-0.140	1.076	4.350	S	M	0.535	-0.330	1.401	6.387[b]	S	M
-13	4.691[a]	-0.249	1.052	4.645[c]	S	M	0.454	-0.404	1.361	6.154[b]	S	M
-12	4.823[a]	-0.277	1.220	6.182[b]	S	M	0.915	-0.423	1.494[c]	6.179[b]	S	M
-11	4.271[a]	-0.393	1.065	4.917[c]	S	M	0.680	-0.521	1.324	4.872[c]	S	M
-10	4.547[a]	-0.254	0.978	6.403[b]	S	M	1.281	-0.366	1.207	5.448[c]	S	M
-9	3.646[a]	-0.507	0.884	3.797	S	M	0.729	-0.586	1.086	4.254	S	M
-8	3.368[a]	-0.223	0.889	1.947	S	M	0.685	-0.301	1.082	1.968	L	M
-7	2.802[a]	-0.163	1.096	1.620	S	M	0.378	-0.213	1.264[c]	1.380	L	M
-6	2.414[b]	-0.384	1.216[b]	2.315	L	M	0.299	-0.413	1.359[a]	2.091	L	M
-5	2.302[a]	-0.203	1.049[b]	2.512	S	M	0.580	-0.261	1.171[a]	1.984	L	M
-4	1.822[b]	-0.039	0.869[c]	1.208	L	M	0.464	-0.094	0.958[b]	0.833	L	M
-3	1.490[c]	0.383	0.501	0.291	S	M	0.427	0.356	0.564	0.341	S	M
-2	0.565	0.490	0.384	0.151	L	S	-0.161	0.465	0.413	0.312	M	S
-1	-0.178	0.490[c]	-1.089	6.433[b]	M	S	-0.543	0.457	0.105	6.572	M	S
0	1.632[b]	0.191	-1.060[c]	4.415	S	L	1.306	0.140	-1.054	3.011	S	L
+1	0.938[c]	0.131	-0.000	0.305	S	L	0.470	0.057	0.070	0.126	S	M
+2	0.970	0.035	-0.053	1.308	S	L	0.152	-0.050	0.066	0.869	S	M
+3	0.726	-0.301	-0.396	1.323	S	L	-0.355	-0.403	-0.227	0.204	S	L
+4	0.591	-0.427	-0.775[c]	2.256	S	L	-0.767	-0.561	-0.535	0.570	S	L
+5	0.475	-0.275	-0.757[c]	1.299	M	L	-1.251	-0.425	-0.478	0.154	M	L
+6	0.911	-0.125	-0.858[c]	2.507	S	L	-1.075	-0.290	-0.541	1.063	S	L
+7	0.892	0.123	-0.608	2.479	M	L	-1.408	-0.067	-0.259	0.782	M	L
+8	0.457	0.251	-0.686	2.087	M	L	-2.201	0.044	-0.301	0.740	M	L
+9	0.514	0.336	-0.649	2.828	M	L	-2.482	0.103	-0.237	0.827	M	L
+10	0.691	0.323	-1.074[c]	3.104	M	L	-2.596	0.101	-0.636	1.147	S	L
+11	1.005	0.055	-1.016[c]	2.882	S	L	-2.688	-0.136	-0.532	0.809	S	L
+12	0.622	0.456	-0.966	3.060	M	L	-3.408	0.250	-0.440	1.002	M	L
+13	0.686	0.470	-0.250	1.341	M	L	-3.545	0.265	0.314	0.171	M	L
+14	1.240	0.454	-0.005	1.324	S	L	-3.371	0.229	0.594	0.339	S	L
+15	1.376	0.030	0.126	2.278	S	L	-3.557	-0.179	0.722	1.208	S	M
+16	1.165	-0.065	0.262	1.020	S	L	-4.067	-0.296	0.898	0.393	S	M
+17	0.578	0.117	0.035	1.452	S	L	-4.900	-0.069	0.709	0.266	S	L
+18	0.310	-0.080	-0.062	0.925	S	L	-5.410	-0.260	0.624	0.108	S	M
+19	0.407	-0.270	-0.083	1.033	S	L	-5.573	-0.422	0.586	0.225	S	M
+20	0.328	-0.272	0.140	0.565	S	L	-5.971	-0.432	0.805	0.068	S	M

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

This evidence is not surprising as earlier researchers have found that small market capitalisation stocks on average gave more returns that its counterparts. A recent study by Wu and Wang (2005) suggested that asymmetric information and other key determinants are necessary conditions for positive announcement return continuations in favour of small market capitalization stocks.

In Table 5.4 we also reported on announcement CARs for acquirers for each of the group's small, medium and large liquidity stocks under the GJR-GARCH estimate. On announcement day, CARs for small, medium and large liquidity stocks are insignificant. We found a large difference in our liquidity measure under the GJR-GARCH estimates. The significant CARs on the event date for small and large firms under the OLS contrasts considerably with those of the GJR-GARCH which are insignificant. Further, the pattern of returns exhibited here after the announcement shows that, returns are substantially decreasing in small liquidity stocks relative to OLS method. The results might happen because the CARs are more efficiently estimated under the GJR-GARCH method. Small liquidity stocks were positive up to two days, whilst the CARs for medium and large liquidity stocks showed negative and positive returns and are insignificant at conventional levels for the estimation period. The result supports market efficiency in small, medium and large liquidity stocks. The reaction of market makers or investors in the stock market to the announcement of an acquisition suggests that their behaviour drives the market leading to market efficiency. This also shows that, U.S. acquirer's for small, medium and large firms overreact to new information.

5.5 Market Capitalization for Acquirer Firms and Fama-French Model

Table 5.5 presents the time series returns for acquirer firms using the Fama-French three-factor model. The CARs are grouped according to small, medium and large market capitalization stocks under the same estimation method. We are comparing the announcement period CARs for acquiring firms for each of the three categories; small, medium and large liquidity stocks under the OLS estimates in Table 5.5. The results on announcement day indicated that CAR for small liquidity stocks was positive and significant at the 5% level. For day one and centred on the announcement day, CAR of 0.931 percent for small liquidity stocks was generated and is also significant at the 10% level. Pre-announcement CARs for t=-3 day window up to t=-20 day window are significantly positive at conventional levels only in small liquidity stocks. On the contrary, CAR for medium liquidity stocks is insignificant on announcement. However, one day before announcement saw a positive CAR of 0.503 percent which is significant different from zero at the 1% level. For large liquidity stocks, CAR is significant at the 10% level on announcement day. Large liquidity stocks also generated CARs which were negative for the entire estimated period. Thus the stock market reaction on announcement for large liquidity stocks under both the OLS and GJR-GARCH are significant, but their economic significance is extremely trivial. Specifically, strong return continuations were more positive for small liquidity stocks than both medium and large liquidity stocks. The evidence reported here indicated that our liquidity measure has a significant effect on the CARs. The differences in CARs are not statistically significant implying that any fall in the value of the bidding firms will not have any serious impact on the acquirer shareholders' value.

Table 5.5: CARs Grouped by Market Capitalization Value for Acquirer firms under Fama-French

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	5.021[a]	-1.095	0.898	5.757[c]	S	M	1.116	-0.790	1.768	5.517[c]	S	M
-19	4.961[a]	-0.972	0.604	6.637[b]	S	M	1.289	-0.620	1.431	6.637[b]	S	M
-18	5.380[a]	-0.640	0.273	6.490[b]	S	M	1.876	-0.295	1.066	6.429[b]	S	M
-17	5.163[a]	-0.535	0.491	7.040[b]	S	M	1.874	-0.194	1.235	6.353[b]	S	M
-16	5.131[a]	-0.616	0.538	7.696[b]	S	M	2.034	-0.268	1.261	6.534[b]	S	M
-15	5.013[a]	-0.201	0.770	6.332[b]	S	M	2.138	0.134	1.432	6.397[b]	S	M
-14	5.252[a]	-0.184	0.261	7.676[b]	S	M	2.489	0.152	0.888	7.787[b]	S	M
-13	4.726[a]	-0.267	0.385	6.978[b]	S	M	2.163	0.085	0.978	6.986[b]	S	M
-12	4.800[a]	-0.202	0.565	7.470[b]	S	M	2.466	0.104	1.114	6.967[b]	S	M
-11	4.317[a]	-0.241	0.384	5.989[b]	S	M	2.207	0.030	0.911	6.074[b]	S	M
-10	4.536[a]	-0.144	0.394	6.117[b]	S	M	2.647	0.141	0.860	6.519[b]	S	M
-9	3.578[a]	-0.406	0.354	3.703	S	M	1.949	-0.131	0.777	4.664[c]	S	M
-8	3.207[a]	-0.136	0.436	0.982	S	M	1.761	0.088	0.796	1.612	S	M
-7	2.704[a]	-0.008	0.690	0.927	S	M	1.347	0.178	0.983	0.835	S	M
-6	2.401[b]	-0.320	0.911[c]	1.617	S	M	1.198	-0.133	1.136[b]	1.171	S	M
-5	2.325[a]	-0.171	0.795[c]	2.313	S	M	1.356	-0.041	0.966[c]	2.028	S	M
-4	1.889[b]	-0.010	0.652	0.793	S	M	1.110	0.087	0.777	0.394	S	M
-3	1.529[c]	0.388	0.356	0.141	S	M	0.910	0.468	0.434	0.365	S	M
-2	0.619	0.483	0.264	0.201	S	S	0.154	0.549[c]	0.310	0.359	M	S
-1	-0.136	0.503[c]	0.064	5.964[c]	M	S	-0.360	0.528[c]	0.098	5.902	M	S
0	1.715[b]	0.200	-1.060[c]	4.841[c]	S	L	1.490[c]	0.167	-1.044[c]	4.055	S	L
+1	0.931[c]	0.115	-0.116	0.548	S	L	0.678	0.067	-0.001	0.413	S	L
+2	1.014	-0.048	-0.156	1.661	S	L	0.553	-0.128	0.026	1.595	S	M
+3	0.731	-0.297	-0.605	2.193	S	L	0.179	-0.410	-0.361	1.210	S	L
+4	0.613	-0.376	-0.933[b]	3.972	S	L	-0.075	-0.510	-0.615	2.527	S	L
+5	0.394	-0.244	-0.978[b]	2.724	M	L	-0.482	-0.415	-0.605	3.052	S	L
+6	0.680	-0.054	-1.128[a]	4.146	M	L	-0.266	-0.202	-0.700	3.052	S	L
+7	0.600	0.086	-0.940[b]	4.300	M	L	-0.840	-0.061	-0.461	2.815	S	L
+8	0.123	0.165	-0.920[c]	3.527	M	L	-1.186	0.021	-0.392	1.700	M	L
+9	0.171	0.259	-0.940[c]	3.720	M	L	-1.353	0.105	-0.363	2.011	M	L
+10	0.327	0.199	-1.355[a]	3.437	M	L	-1.330	0.091	-0.724	3.203	S	L
+11	0.643	-0.012	-1.329[a]	3.867	M	L	-1.281	-0.124	-0.618	3.018	S	L
+12	0.343	0.358	-1.305[b]	3.885	M	L	-1.785	0.221	-0.550	2.930	S	L
+13	0.450	0.352	-0.607	1.837	M	L	-1.751	0.230	0.205	1.826	S	L
+14	0.986	0.324	-0.409	2.014	M	L	-1.380	0.221	0.445	2.459	S	L
+15	1.123	-0.023	-0.278	2.333	S	L	-1.377	-0.191	0.618	3.752	S	L
+16	0.892	-0.157	-0.102	1.329	S	L	-1.763	-0.351	0.868	2.654	S	L
+17	0.319	0.091	-0.238	1.236	M	L	-2.506	0.056	0.783	1.844	S	L
+18	0.126	-0.055	-0.373	0.960	S	L	-2.859	-0.127	0.685	1.669	S	L
+19	0.291	-0.297	-0.360	1.012	S	L	-2.854	-0.359	0.713	2.330	S	L
+20	0.255	-0.312	-0.173	0.910	S	L	-3.072	-0.355	0.929	2.035	S	L

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

In Table 5.5 we also reported CARs for acquiring firms based on our liquidity measure for each of the three firm groups under the GJR-GARCH estimation. Table 5.5 showed that CARs for small, medium and large liquidity stocks differ significantly on the announcement day. On announcement day CAR for small and large liquidity stocks are significant at the 10% level. However, CAR of 0.167 percent for medium liquidity stocks is not significant. Thus large liquidity stocks underperformed both small and medium liquidity stocks. CARs for small liquidity stocks were positive up to three days and are not significant. In contrast, CARs for medium and large liquidity stocks showed evidence of both positive and negative returns. But pre-announcement CARs for medium liquidity stocks for t=-1 to t=-2 day window are significant at the 10% level. Indeed, small liquidity stocks had significantly deteriorated in CARs under the GJR-GARCH estimates relative to the OLS estimates. Also, note that, the CARs under the GJR-GARCH method for medium and large liquidity stocks contrasts with those under the OLS method. However, the variation is not substantial. Thus shareholders' wealth gains for medium and large liquidity stocks under the GJR-GARCH are not different from those under the OLS.

5.6 Market Capitalization for Acquirer Firms and Carhart Model

Table 5.6 presents the CARs obtained from the time-series of our liquidity measure for small, medium and large market capitalization stocks using Carhart four-factor models. The ARs were estimated using the same estimation methods.

Table 5.6 examines acquiring firms CARs on announcement date (t=0) for each of the three groups; small, medium and large market capitalization stocks under the OLS estimates. The results showed that CARs for small and large market

Table 5.6: CARs Grouped by Market Capitalization Value for Acquirer Firms under Carhart

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	4.987[a]	-1.242	0.716	6.320[b]	S	M	15.252	-1.268	2.074	7.829[b]	S	M
-19	4.940[a]	-1.101	0.479	7.182[b]	S	M	14.714	-1.072	1.769	9.143[b]	S	M
-18	5.343[a]	-0.725	0.206	6.864[b]	S	M	14.593	-0.668	1.445	9.190[b]	S	M
-17	5.150[a]	-0.612	0.452	7.485[b]	S	M	13.896	-0.685	1.626	9.346[b]	S	M
-16	5.114[a]	-0.645	0.551	7.758[b]	S	M	13.348	-0.574	1.671	8.939[b]	S	M
-15	4.997[a]	-0.234	0.819	6.419[b]	S	M	12.720	-0.224	1.854	9.208[b]	S	M
-14	5.235[a]	-0.221	0.310	7.654[b]	S	M	12.353[c]	-0.245	1.287	10.997[b]	S	M
-13	4.676[a]	-0.351	0.440	6.663[b]	S	M	11.313[c]	-0.299	1.353	10.736[b]	S	M
-12	4.752[a]	-0.240	0.595	7.332[b]	S	M	10.914[c]	-0.262	1.509	9.648[b]	S	M
-11	4.241[a]	-0.289	0.401	5.781[b]	S	M	9.886[c]	-0.301	1.278	7.879[b]	S	M
-10	4.467[a]	-0.204	0.400	6.102[b]	S	M	9.618[c]	-0.177	1.167	7.500[b]	S	M
-9	3.501[a]	-0.430	0.386	3.733	S	M	8.214[c]	-0.373	1.073	5.968[b]	S	M
-8	3.131[a]	-0.107	0.437	0.822	S	M	7.312[c]	-0.114	0.994	2.359	S	M
-7	2.644[b]	0.056	0.684	0.590	S	M	6.257[c]	0.022	1.121	1.491	S	M
-6	2.368[b]	-0.296	0.910[c]	1.397	S	M	5.424[c]	-0.290	1.247[b]	2.219	S	M
-5	2.299[a]	-0.137	0.807[c]	1.991	S	M	4.907[c]	-0.143	1.060[b]	2.597	S	M
-4	1.881[b]	0.019	0.680	0.661	L	M	3.953[c]	0.034	0.848[c]	0.837	S	M
-3	1.545[c]	0.421	0.382	0.105	S	M	3.044[c]	0.427	0.472	0.280	S	M
-2	0.616	0.508	0.286	0.314	M	S	1.532	0.512[c]	0.337	0.449	M	S
-1	-0.136	0.478[c]	0.060	5.378[c]	M	S	0.334	0.517[c]	0.096	6.010[b]	M	S
0	1.733[b]	0.135	-1.096[b]	5.222[c]	S	L	2.172[a]	0.139	-1.071[c]	5.219[c]	S	L
+1	0.975[c]	0.079	-0.103	0.582	S	L	1.454[c]	0.073	0.017	0.408	S	M
+2	1.087[c]	-0.084	-0.103	1.770	S	L	2.028	-0.063	0.088	1.342	S	M
+3	0.803	-0.342	-0.523	2.258	S	L	2.332	-0.302	-0.266	1.311	S	L
+4	0.666	-0.466	-0.870[b]	3.758	S	L	2.766	-0.528	-0.551	2.354	S	L
+5	0.454	-0.357	-0.918[b]	2.418	S	L	3.030	-0.426	-0.537	1.279	S	L
+6	0.719	-0.157	-1.120[a]	4.320	M	L	3.922	-0.296	-0.665	3.065	S	L
+7	0.593	0.045	-0.943[b]	4.418	M	L	4.339	-0.102	-0.400	2.728	S	L
+8	0.091	0.108	-0.933[c]	3.230	M	L	4.307	-0.064	-0.276	1.424	M	L
+9	0.124	0.173	-0.924[c]	3.736	M	L	4.841	-0.069	-0.182	1.321	M	L
+10	0.261	0.097	-1.310[a]	3.136	M	L	5.542	-0.095	-0.491	2.107	S	L
+11	0.544	-0.110	-1.262[a]	3.171	M	L	6.249	-0.365	-0.348	1.791	S	L
+12	0.237	0.238	-1.222[b]	3.135	M	L	6.381	0.024	-0.276	1.671	S	L
+13	0.317	0.199	-0.541	1.338	M	L	7.063	-0.027	0.485	0.539	S	L
+14	0.852	0.188	-0.340	1.387	M	L	8.099	-0.081	0.752	0.904	S	L
+15	0.980	-0.188	-0.214	1.682	S	L	8.769	-0.459	0.943	2.188	S	M
+16	0.745	-0.286	-0.075	0.910	S	L	9.067	-0.656	1.170	1.259	S	M
+17	0.193	-0.106	-0.242	0.907	M	L	9.060	-0.440	1.104	0.512	S	L
+18	-0.025	-0.281	-0.370	0.768	S	L	9.400	-0.604	1.025	0.627	S	M
+19	0.178	-0.524	-0.336	0.789	S	L	10.129	-0.878	1.089	1.104	S	M
+20	0.148	-0.537	-0.157	0.798	S	L	10.610	-0.989	1.308	1.033	S	M

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

capitalization stocks are significant at the 5% level, whilst CAR for medium market capitalization is insignificant. Thus small liquidity stocks strongly outperformed other stock sizes on the announcement day. We expect that small liquidity stocks would create more shareholders' wealth than both medium and large liquidity stocks. The pre- and post event CARs significantly differ for small and larger market capitalization stocks under both the OLS and GJR-GARCH estimates. For small market capitalization stocks, the CARs are significant up to two days. Positive and pre-announcement CARs for the period t=-3 up to t=-20 are statistically significant only in small market capitalization stocks. Hence it seems that the market does not respond considerably to the announcement from the small stocks' point of view. In the case of medium market capitalization stocks, on announcement day, CAR of 0.135 percent is insignificant, however, CAR for t=-1 window before announcement is significant different from zero at the 10% level. Medium market capitalization stocks had both positive and negative announcement returns. In contrast to small and medium stocks, large market capitalization stocks CARs continuously displayed extensively negative announcement returns for the full twenty days. The CARs under the OLS estimates for both small and large capitalization stocks contrast extensively with those of the GJR-GARCH estimates.

Table 5.6 also presented the estimated CARs for acquiring firms, categorised into small, medium and large market capitalization stocks under the GJR-GARCH. Our liquidity measure showed that on announcement day, small and large market capitalisation stocks are significant, whilst medium market capitalization stocks is insignificant. Explicitly, the announcement day CARs for small, medium and large capitalization stocks are different from each other. The evidence indicated here showed no difference for medium liquidity stocks returns for both estimation methods. For small market capitalization stocks, the CARs are significant up one day at the 10% level and were positive for the full event period. For the period t=-3 up to t=-14 prior to the announcement, CARs are significant at conventional levels only in the small market capitalization stocks. It appears these results are unrelated to the event date. For medium market capitalization stocks, two days CARs (i.e. t=-1 and t=-2) prior to the announcement are significant at the 10% level. In addition, both medium and large market capitalization stocks generated positive and negative announcement returns. As expected, our liquidity measure produces stronger return continuations in small market capitalization stocks than medium and large market capitalization stocks. The results reported in this section shows that judicious investors will prefer to buy small liquidity stocks when a takeover is to be announced. Our liquidity measure seems to support market efficiency of the three dimensions.

In all, our liquidity measure constantly captured similar results for the acquiring firms for the standard CAPM and Fama-French models under both the OLS and GJR-GARCH estimates; however, under the Carhart four-factor models, small liquidity stocks generate bigger CARs under the GJR-GARCH method.

5.7 Trading Volume for Target Firms and Standard CAPM

Table 5.7 reports the results of the CARs under the standard CAPM grouped into small, medium and large trading volume stocks for target firms. The ARs were estimated under the OLS and GJR-GARCH methods.

Table 5.7 evaluates the results for target firms under the OLS estimate. The results revealed that, on the announcement CARs generated are different for the three liquidity stocks under the OLS estimates. Specifically, on announcement, the CARs for small, medium and large liquidity stocks are significant at the 1% level. Indeed, on announcement shareholders of small liquidity stocks enjoy higher rate of return relative to both medium and large liquidity stocks. CARs for medium liquidity stocks are significant up to day two. The significant of the CARs lasts much shorter under the OLS relative to the GJR-GARCH, only in the medium liquidity stocks. For small liquidity stocks, day one window up to day twelve window generated CARs which were considerably larger than CARs for large liquidity stocks for the same period. Notice that both small and large liquidity stocks are insignificant after the announcement date implying that the market is efficient. However, CARs for medium liquidity stocks were larger than both the small and large liquidity stocks for the complete twenty days. In addition, leading up to the announcement day, CARs over the window of eleven days (t=-11 and t=-20) portray a steady trend of statistically significantly positive returns only in the medium firms.

The results reported in Table 5.7 under the GJR-GARCH estimation were not materially different from, but were similar to, the ones achieved under the OLS estimate for our liquidity measures. On announcement day (t=0), CARs for the small, medium and large liquidity stocks were positive and are significant at the 1% level. For medium liquidity stocks, CARs are significant up to day three and were positive for the full twenty days. Thus the significance of the CARs lasts much longer for medium liquidity stocks. Also, notice that after the announcement the magnitudes of the CARs were much higher under the medium liquidity stocks compared to small and large liquidity stocks. We expect investors' sentiment in medium liquidity stocks due to high returns under the OLS and GJR-GARCH methods. CARs over the window of sixteen days (t=-5 up to t=-20) were positive and which are statistically

Table 5.7: CARs Grouped by Trading Volume Stocks for Target Firms under the CAPM

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	-1.018	2.622[a]	-0.547	5.058[c]	M	L	-2.917	4.753[a]	-0.978	12.734[a]	M	S
-19	-0.466	2.480[a]	-0.368	5.432[c]	M	L	-2.417	4.524[a]	-0.765	13.781[a]	M	S
-18	-0.818	2.065[b]	0.430	2.883	M	S	-2.749	4.023[a]	0.065	10.858[a]	M	S
-17	-1.182	2.179[a]	0.612	4.029	M	S	-3.023	4.070[a]	0.286	11.531[a]	M	S
-16	-0.900	2.254[a]	0.655	4.019	M	S	-2.625	3.999[a]	0.379	11.026[a]	M	S
-15	-1.272	2.401[a]	0.743	6.255[b]	M	S	-2.877[c]	3.985[a]	0.530	13.557[a]	M	S
-14	-1.517	2.078[b]	0.687	4.975[c]	M	S	-3.052[c]	3.576[a]	0.509	11.835[a]	M	S
-13	-1.072	2.337[b]	0.841	4.223	M	S	-2.575	3.637[a]	0.715	10.495[a]	M	S
-12	0.703	1.644[c]	0.834	0.466	M	S	-0.725	2.797[a]	0.690	3.386	M	S
-11	0.787	1.435[c]	0.315	0.856	M	L	-0.582	2.500[a]	0.85	3.812	M	S
-10	0.325	1.231	0.162	1.260	M	S	-0.990	2.151[a]	0.062	4.426	M	S
-9	0.595	1.169[c]	0.796	1.026	M	L	-0.703	2.035[a]	0.692	4.801[c]	M	S
-8	0.397	1.243[b]	0.984	1.273	M	S	-0.835	2.017[a]	0.901	4.957[c]	M	S
-7	1.079	0.911	0.713	0.728	M	L	-0.125	1.577[a]	0.651	3.021	M	L
-6	0.283	0.920[c]	0.577	1.105	M	L	-0.802	1.424[a]	0.518	4.016	M	S
-5	0.681	0.544	0.805	0.083	M	L	-0.303	0.953[c]	0.741	1.167	M	S
-4	0.601	0.264	0.758	0.051	S	L	-0.271	0.497	0.727	0.780	M	S
-3	0.383	0.530	0.362	1.967	M	L	-0.430	0.755[b]	0.347	3.331	M	L
-2	-0.234	0.787[a]	0.747	2.607	M	S	-0.940	0.976[a]	0.739	5.861[c]	M	S
-1	-0.343	0.170	0.514	1.842	L	S	-0.641[c]	0.305	0.505	4.651[c]	L	S
0	4.892[a]	4.291[a]	2.787[a]	0.961	S	L	4.820[a]	4.344[a]	2.763[a]	1.005	S	L
+1	1.495	1.768[c]	0.121	0.275	M	L	1.414	1.816[c]	0.123	0.309	M	L
+2	1.268	2.067[c]	0.244	0.525	M	L	1.151	2.118[c]	0.218	0.596	M	S
+3	1.325	1.815	0.696	0.306	M	S	1.192	1.898[c]	0.677	0.418	M	S
+4	1.327	1.657	0.901	0.438	L	S	1.137	1.802	0.873	0.508	L	S
+5	1.206	1.328	0.802	0.117	L	S	0.966	1.518	0.793	0.085	L	S
+6	1.321	1.659	1.277[c]	0.993	L	S	1.031	1.942	1.303	0.723	L	S
+7	1.554	1.486	0.863	0.059	L	S	1.186	1.885	0.878	0.240	M	S
+8	1.117	1.587	0.740	0.584	M	S	0.695	2.047	0.738	1.317	M	S
+9	1.127	1.484	0.979	0.545	L	S	0.640	2.044	0.997	0.675	M	S
+10	1.026	1.310	0.796	0.344	M	S	0.510	1.940	0.825	0.822	M	S
+11	1.073	1.186	0.413	0.192	M	S	0.491	1.902	0.476	0.558	M	S
+12	0.669	1.039	0.274	0.305	M	S	0.025	1.823	0.371	0.730	M	S
+13	0.088	0.683	0.412	1.179	L	S	-0.588	1.530	0.487	0.895	M	S
+14	-0.065	1.019	-0.032	0.583	M	S	-0.830	1.982	0.066	0.973	M	S
+15	0.593	0.492	-0.079	0.044	M	L	-0.464	1.590	0.010	0.620	M	S
+16	0.167	0.389	0.109	0.088	M	S	-0.895	1.581	0.199	0.506	M	S
+17	-0.012	0.348	0.297	0.466	L	S	-1.178	1.593	0.394	0.838	M	S
+18	-0.118	0.220	0.151	0.209	L	S	-1.347	1.591	0.284	0.723	M	S
+19	-0.744	0.291	0.200	0.848	L	S	-1.995	1.803	0.357	1.261	M	S
+20	-0.767	0.189	0.117	0.787	L	S	-2.027	1.862	0.265	1.213	M	S

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

significant at conventional levels only in the medium liquidity stocks. The significance of these CARs is unconnected to the event date because they occurred before the event. The CAR for small liquidity stocks on the day prior to the announcement was -0.641 percent and is significantly different from zero at the 10% level. Post event date CARs for both small and large liquidity stocks are insignificant.

Our post-announcement market capitalization stocks CARs statistically significantly differ from those CARs from our trading volume under both the OLS and GJR-GARCH method for only medium liquidity stocks. The significant of the CARs last much longer for market capitalization stocks relative to the trading volume for both sets of estimation. Amihud (2002) contended that, ‘‘if small liquidity investors anticipated higher market illiquidity, they will price stocks so that they generate higher expected returns’’. This proved that small liquidity stocks should have had strong announcement returns compared to medium liquidity stocks.

5.8 Trading Volume for Target Firms and Fama-French Model

Table 5.8 depicts the time series returns for target firm grouped for small, medium and large trading volume stocks using the Fama-French three-factor model. The ARs were estimated using the same method.

Table 5.8 represents CARs for target firms for each of the categories of small, medium and large volume stocks under the OLS estimates. The results showed that, on announcement day (t=0), small volume stocks generated CAR which was significantly higher than the CARs of medium and large volume stocks and all are statistically significant at the 1% level. The CARs for small volume stocks are not significant beyond day zero (t=0) and pre-event CARs are insignificant under the

Table 5.8:CARs Grouped by Trading Volume Stocks for Target Firms under Fama-French

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	-1.891	2.206[b]	-0.552	5.435[c]	M	S	-2.961	3.188[a]	-1.466	5.811[c]	M	S
-19	-1.292	2.143[b]	-0.385	5.193[c]	M	S	-2.400	3.021[a]	-1.153	5.750[c]	M	S
-18	-1.643	1.774[c]	0.491	4.258	M	S	-2.691	2.622[a]	-0.279	5.635[c]	M	S
-17	-1.848	1.895[b]	0.635	5.650[c]	M	S	-2.898	2.705[a]	-0.092	5.629[c]	M	S
-16	-1.552	2.034[b]	0.661	5.212[c]	M	S	-2.542	2.795[a]	0.055	5.773[c]	M	S
-15	-1.919	2.248[b]	0.825	7.826[b]	M	S	-2.831	2.907[a]	0.243	8.635[b]	M	S
-14	-2.167	1.944[b]	0.767	6.488[b]	M	S	-3.003[c]	2.562[a]	0.262	8.168[b]	M	S
-13	-1.642	2.239[a]	0.956	6.435[b]	M	S	-2.447	2.658[a]	0.533	7.375[b]	M	S
-12	0.185	1.519[c]	0.917	1.182	M	S	-0.532	1.891[a]	0.481	1.532	M	S
-11	0.295	1.307[c]	0.358	1.123	M	S	-0.408	1.612[b]	-0.005	1.359	M	S
-10	-0.151	1.114	0.287	1.806	M	S	-0.781	1.377[b]	-0.088	1.382	M	S
-9	0.143	1.094[c]	0.894	1.466	M	S	-0.463	1.310[b]	0.566	1.098	M	S
-8	-0.011	1.088[c]	1.013	1.999	M	S	-0.612	1.298[a]	0.730	1.303	M	S
-7	0.717	0.860	0.789	0.659	M	L	0.065	1.002[c]	0.543	0.630	M	L
-6	-0.085	0.806	0.688	1.297	M	S	-0.696	0.930[c]	0.493	1.324	M	S
-5	0.408	0.469	0.882	0.118	M	S	-0.190	0.583	0.718	0.274	M	S
-4	0.405	0.280	0.830	0.021	M	S	-0.162	0.297	0.666	0.025	M	S
-3	0.292	0.488	0.317	1.787	M	L	-0.285	0.534	0.300	1.527	M	L
-2	-0.190	0.788[a]	0.738	3.182	M	S	-0.787	0.851[a]	0.694	4.110	M	S
-1	-0.389	0.157	0.464	2.047	L	S	-0.624[c]	0.193	0.446	3.456	L	S
0	4.887[a]	4.171[a]	3.042[a]	0.618	S	L	4.877[a]	4.300[a]	2.765[a]	1.274	S	L
+1	1.490	1.771[b]	-0.001	0.741	M	L	1.442	1.773[c]	0.077	0.355	M	L
+2	1.307	1.983[c]	0.170	0.334	M	L	1.224	1.942[c]	0.164	0.006	M	L
+3	1.519	1.781	0.541	0.029	M	L	1.368	1.731	0.563	0.189	L	M
+4	1.559	1.607	0.728	0.201	L	M	1.357	1.601	0.712	0.488	L	M
+5	1.342	1.199	0.540	0.059	L	M	1.146	1.248	0.537	0.229	S	M
+6	1.397	1.536	0.949	0.278	L	S	1.241	1.599	0.986	0.055	L	S
+7	1.533	1.400	0.406	0.019	M	S	1.405	1.501	0.452	0.048	S	M
+8	1.019	1.513	0.322	0.664	M	S	0.901	1.633	0.259	0.146	M	S
+9	1.005	1.426	0.514	0.325	L	S	0.850	1.612	0.466	0.036	L	S
+10	0.963	1.246	0.356	0.393	M	S	0.729	1.519	0.332	0.075	M	L
+11	0.999	1.163	-0.002	0.196	M	S	0.670	1.482	-0.017	0.094	M	L
+12	0.637	1.014	-0.246	0.202	M	S	0.233	1.397	-0.177	0.001	S	L
+13	0.089	0.777	-0.050	0.562	M	S	-0.370	1.196	-0.027	0.199	L	S
+14	-0.044	1.059	-0.476	0.247	M	S	-0.584	1.596	-0.437	0.074	M	S
+15	0.663	0.478	-0.524	0.053	S	L	-0.101	1.114	-0.537	0.077	S	L
+16	0.127	0.428	-0.338	0.051	M	S	-0.474	1.091	-0.383	0.007	S	L
+17	-0.069	0.228	-0.148	0.237	L	S	-0.756	1.000	-0.231	0.214	L	S
+18	-0.119	-0.001	-0.405	0.036	L	S	-0.895	0.868	-0.459	0.038	L	S
+19	-0.705	-0.038	-0.435	0.176	L	S	-1.521	0.983	-0.457	0.231	L	S
+20	-0.718	-0.123	-0.474	0.323	L	S	-1.545	1.004	-0.537	0.175	L	S

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

OLS estimates. The CARs up to eighteen days window (t=+1 up to t=+18) for small volume stocks were higher than large volume stocks for the same period and both are insignificant at conventional levels for the whole period. Pre- and post-announcement CARs for large volume stocks are insignificant under the two estimation methods. For the medium volume stocks, CARs are significant up to day two and positive until day seventeen. Before the event date, our liquidity measure captured CARs which are statistically significant between the period of t=-11 and t=-20 in the medium volume stocks. The magnitudes of CARs were large in medium volume stocks compared to both the small and large volume stocks. Intuitively, our results support the efficient market hypothesis especially in small and large volume stocks after the event date.

In Table 5.8 under the GJR-GARCH estimation we obtained similar results like those under the OLS estimates. That is, the significance of the CARs after the announcement is the same under the two estimation methods. The target firms for small, medium and large liquidity stocks on announcement generated positive CARs which are significant at the 1% levels. Specifically, CARs for small, medium and large liquidity stocks were 4.877 percent, 4.300 percent and 2.765 percent in that order. One day leading up to the announcement (t=-1), CAR of -0.624 percent is significant at the 10% level in small liquidity stocks. Again, small liquidity stocks were positive up to day twelve and are not significant after the announcement. The results achieved for large liquidity stocks are different from those generated under the OLS method. CARs for large liquidity stocks were positive up to ten days and are insignificant throughout the twenty day after the event. For medium liquidity stocks, the CARs were statistically significant up to day two and were positive in the overall period. As observed the significance of the CARs last somehow much longer under both the OLS and GJR-GARCH estimates for only medium firms. Moreover, prior event date CARs over the window of ten days (t=-11 to t=-20) are significant under the OLS and whilst CARs under the GJR-GARCH estimates are statistically significant up to fifteen days (t=-6 to t=-20) only in the medium volume stocks. We observed strong return continuations for medium liquidity stocks under both sets of estimation methods compared to the small liquidity stocks.

5.9 Trading Volume for Target Firms and Carhart Model

Table 5.9 illustrates the CARs of our liquidity measure for target firms for each of the categories, small, medium and large trading volume stocks under the OLS and GJR-GARCH estimates. The time series was estimated using the Carhart model.

The results in Table 5.9 under the OLS estimate shows that CAR of 2.789 percent for large liquidity stocks on announcement was significantly lower than the CARs of small and medium liquidity stocks. The result is not surprising because large liquidity stocks are perceived to be high liquidity stocks and therefore lower returns will compensate for large liquidity stocks. CARs for the three liquidity measures on announcement are significant at the 1% level. Pre- and post-event CARs are insignificant for small and large volume stocks under both the OLS and GJR-GARCH methods. The results suggested that both small and large liquidity stocks investors overreact to information, thus, market efficiency is accordingly advocated. Both small liquidity stocks and large liquidity stocks exhibited positive and negative CARs after the announcement. However, the majority of the CARs for small liquidity stocks were

Table 5.9: CARs Grouped by Trading Volume Stocks for Target Firms under Carhart Model

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank	CARs%	CARs%	CARs%	K-W	Largest Rank	Smallest Rank
-20	-1.752	2.297[b]	-0.523	5.793[c]	M	S	-3.421	3.807[a]	-1.651	7.736[b]	M	S
-19	-1.095	2.138[b]	-0.364	5.062[c]	M	S	-2.788	3.569[a]	-1.398	7.174[b]	M	S
-18	-1.404	1.806[b]	0.390	3.608	M	S	-3.021	3.168[a]	-0.581	6.777[b]	M	S
-17	-1.612	1.906[b]	0.466	4.858[c]	M	S	-3.226	3.183[a]	-0.431	7.607[b]	M	S
-16	-1.316	1.982[b]	0.568	4.324	M	S	-2.805	3.286[a]	-0.243	7.920[b]	M	S
-15	-1.690	2.172[b]	0.699	6.947[b]	M	S	-2.986	3.362[a]	-0.029	10.944[a]	M	S
-14	-1.970	1.874[b]	0.749	5.388[c]	M	S	-3.084[c]	2.949[a]	0.076	9.626[a]	M	S
-13	-1.447	2.204[a]	0.972	6.017[b]	M	S	-2.449	2.986[a]	0.401	8.139[b]	M	S
-12	0.383	1.467[c]	0.923	0.954	M	S	-0.548	2.214[a]	0.339	1.830	M	S
-11	0.453	1.295[c]	0.446	1.039	M	S	-0.399	1.899[a]	-0.122	1.919	M	S
-10	-0.036	1.075	0.370	1.567	M	S	-0.661	1.622[a]	-0.150	2.016	M	S
-9	0.222	1.068[c]	0.955	1.377	M	S	-0.347	1.508[a]	0.482	1.670	M	S
-8	-0.002	1.026[c]	1.045	1.905	M	S	-0.405	1.460[a]	0.632	1.282	M	S
-7	0.663	0.777	0.804	0.602	M	L	0.202	1.094[b]	0.461	0.700	M	L
-6	-0.118	0.711	0.666	1.129	M	S	-0.487	1.003[c]	0.352	1.273	M	S
-5	0.346	0.373	0.869	0.173	L	S	-0.190	0.649	0.557	0.264	M	S
-4	0.375	0.174	0.828	0.045	L	S	-0.018	0.317	0.549	0.024	S	L
-3	0.308	0.378	0.362	1.212	M	L	-0.162	0.561	0.187	1.949	M	L
-2	-0.195	0.734[a]	0.695	2.195	M	S	-0.752	0.877[a]	0.613	3.934	M	S
-1	-0.382	0.180	0.456	1.629	L	S	-0.537	0.195	0.410	2.381	L	S
0	4.874[a]	4.175[a]	2.789[a]	0.817	S	L	4.756[a]	4.319[a]	2.761[a]	1.251	S	L
+1	1.500	1.788[b]	-0.009	0.571	M	L	1.453	1.837[b]	0.053	0.046	M	L
+2	1.299	2.031[c]	0.142	0.235	M	L	1.291	2.040[c]	0.114	0.088	M	L
+3	1.452	1.823	0.551	0.050	M	S	1.604	1.860	0.509	0.015	L	S
+4	1.384	1.708	0.772	0.461	L	S	1.671	1.839	0.695	0.172	L	S
+5	1.133	1.301	0.621	0.177	L	S	1.380	1.586	0.514	0.011	S	M
+6	1.147	1.626	1.085	0.878	L	S	1.317	1.919	0.948	0.466	L	S
+7	1.229	1.469	0.553	0.226	L	S	1.418	1.843	0.379	0.041	M	S
+8	0.699	1.572	0.441	0.871	M	S	0.863	1.982	0.251	0.592	M	S
+9	0.655	1.528	0.705	0.893	L	S	0.660	1.992	0.473	0.398	M	S
+10	0.540	1.364	0.546	0.757	M	S	0.489	1.933	0.295	0.730	M	S
+11	0.607	1.256	0.197	0.439	M	S	0.538	1.933	-0.050	0.529	M	S
+12	0.243	1.147	0.013	0.565	M	S	0.173	1.859	-0.220	0.240	M	S
+13	-0.317	0.940	0.222	1.523	L	S	-0.495	1.675	-0.087	0.493	M	S
+14	-0.480	1.241	-0.151	0.866	L	S	-0.629	2.087	-0.491	0.398	M	S
+15	0.202	0.675	-0.195	0.266	L	S	-0.264	1.643	-0.614	0.111	M	L
+16	-0.365	0.669	-0.030	0.374	L	S	-0.763	1.623	-0.498	0.051	M	S
+17	-0.556	0.484	0.145	1.273	L	S	-0.859	1.583	-0.359	0.471	M	S
+18	-0.607	0.257	-0.007	0.985	L	S	-0.793	1.479	-0.536	0.281	M	S
+19	-1.265	0.206	-0.018	1.559	L	S	-1.216	1.647	-0.535	0.615	M	S
+20	-1.305	0.149	-0.115	1.860	L	S	-1.400	1.711	-0.683	0.689	M	S

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

higher than large liquidity stocks. CARs for medium liquidity stocks are significant different from those realised for small and large liquidity stocks. For medium liquidity stocks, CARs were positive and statistically significant up to day two. Furthermore, prior to the announcement, CARs between the period of t=-8 and t=-20 were positive and significant at conventional levels.

Table 5.9 also shows the results obtained under the GJR-GARCH for target firms for each of the small, medium and large liquidity stocks. The GJR-GARCH results are similar to those under the OLS estimates in terms of significance of CARs on the event date. On announcement day, CARs for small, medium and large stocks were 4.756 percent, 4.319 percent and 2.761 percent respectively and which are significant at the 1% level. Here, small liquidity stocks outperformed both medium and large liquidity stocks. As mentioned earlier, this might be consistent with the literature that small firms have higher returns on announcement day. For medium liquidity stocks, CARs are significant up to day two and positive for the entire period. Prior announcement CARs up to fifteen days (t=-6 up to t=-20) captured by our liquidity measures were positive and are significant at conventional levels only in the medium liquidity stocks. In contrast, pre- and post-event CARs for both small and large liquidity stocks are not significant. The evidence we have seen so far suggests that strong return continuations in favour of medium liquidity stocks under both the OLS and GJR-GARCH estimates.

5.10 Trading Volume for Acquirer Firms and Standard CAPM

Table 5.10 presents the CARs for acquirer firms for each of the groups small, medium and large trading volume stocks using the standard CAPM model. The ARs were estimated under the same methods.

Table 5.10 presents the results achieved under the OLS estimates for acquirer firms for small, medium and large volume stocks. On announcement day, CARs for small and large volume stocks are significantly different from zero at the 5% levels. CAR for small volume stocks on announcement was higher and positive compared to both medium and large volume stocks which generated negative CARs. The evidence reported here suggests that shareholders' of small liquidity stocks enjoy higher rate of returns. In contrast to both small and large volume stocks, medium volume stocks are insignificant on the announcement date. For small volume stocks, CARs are significant up to day four and were positive for the whole period. Pre-announcement CARs were positive and are significant for the period of t=-5 window to t=-20 window. These results might be unconnected to the event date as they happened before the event date.

For both medium and large volume stocks, CARs were insignificant after the announcement date; hence the results support market efficiency. The magnitudes of those CARs do not seem to be statistically different with those under the GJR-GARCH method. Nevertheless, the results obtained for small liquidity stocks under the OLS method differ substantially with those under the GJR-GARCH method, Based on these results, it appears that the market reacts negatively to the

Table 5.10: CARs Grouped by Trading Volume Stocks for Acquirer Firms under CAPM

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CAR%	CAR%	CAR%	K-W	Largest Rank	Smallest Rank	CAR%	CAR%	CAR%	K-W	Largest Rank	Smallest Rank
-20	3.593[b]	0.084	1.981[c]	2.497	S	M	-3.223	0.020	2.461[b]	2.665	S	M
-19	3.423[c]	-0.575	1.275	0.790	S	M	-3.067	-0.697	1.701	0.909	S	M
-18	3.546[c]	-0.855	1.309	0.277	S	M	-2.630	-0.980	1.700	0.356	S	M
-17	3.516[b]	-0.688	1.509	0.573	S	M	-2.313	-0.814	1.872[c]	0.564	S	M
-16	3.665[b]	-0.597	1.250	0.756	S	M	-1.793	-0.743	1.579	0.980	S	M
-15	3.983[b]	-0.830	1.348	1.172	S	M	-1.144	-0.971	1.621[c]	1.365	S	M
-14	4.147[a]	-0.697	1.149	1.579	S	M	-0.650	-0.827	1.411	1.857	S	M
-13	3.851[b]	-0.544	1.086	1.892	S	M	-0.613	-0.673	1.336	2.143	S	M
-12	3.849[a]	-0.720	1.183	1.597	S	M	-0.283	-0.845	1.406	2.188	S	M
-11	3.033[b]	-0.644	1.248	0.664	S	M	-0.728	-0.741	1.448	0.988	S	M
-10	3.111[a]	-0.932	1.207	0.620	S	M	-0.301	-1.014	1.385	0.446	S	M
-9	2.395[c]	-0.338	1.272	0.262	L	M	-0.647	-0.433	1.422	0.410	L	M
-8	2.347[c]	-0.299	1.374	0.721	L	M	-0.427	-0.371	1.505[c]	0.933	L	M
-7	1.994[c]	-0.364	1.366[c]	0.574	L	M	-0.480	-0.423	1.473[c]	0.877	L	M
-6	2.028[b]	-0.390	0.823	0.024	S	M	-0.104	-0.425	0.919	0.128	L	S
-5	1.808[b]	-0.519	0.813	0.139	S	M	0.068	-0.564	0.850	0.014	L	S
-4	1.319	-0.347	0.978[c]	0.714	L	S	-0.059	-0.392	0.987[c]	1.286	L	S
-3	1.096	-0.212	1.061[a]	2.844	L	M	0.031	-0.249	1.062[a]	2.024	L	M
-2	0.369	-0.209	0.857[a]	2.848	L	S	-0.349	-0.212	0.851[a]	2.847	L	S
-1	-0.050	-0.063	0.390	5.833[c]	L	S	-0.394	-0.030	0.384	5.844[c]	L	S
0	1.518[b]	-0.394	-1.151[b]	5.152[c]	S	L	1.167	-0.399	-1.177[b]	4.616[c]	M	L
+1	1.584[a]	0.111	-0.395	4.424	S	L	1.094[c]	0.146	-0.342	3.740	S	M
+2	1.420[a]	-0.106	-0.568	4.979	S	L	0.580	-0.087	-0.492	3.874	S	L
+3	1.361[b]	0.454	-0.869	4.756[c]	S	L	0.254	0.469	-0.760	2.883	S	L
+4	1.153[c]	0.525	-1.232[c]	5.563[c]	S	L	-0.262	0.493	-1.102	3.203	S	L
+5	1.237	0.557	-1.226[c]	4.387	S	L	-0.524	0.546	-1.074	2.808	S	L
+6	1.636[c]	0.408	-1.290[b]	6.174[c]	S	L	-0.414	0.376	-1.106[c]	4.228	S	L
+7	1.664[c]	0.065	-1.182	5.430[c]	S	L	-0.717	0.008	-0.999	3.656	S	L
+8	1.495	0.068	-1.390[c]	3.783	S	L	-1.278	-0.011	-1.178	1.868	S	L
+9	1.381	-0.174	-1.342	4.157	S	L	-1.734	-0.243	-1.114	2.616	S	L
+10	1.682[c]	0.133	-1.594[c]	5.136[c]	S	L	-1.750	0.020	-1.348	3.583	S	L
+11	1.918[c]	0.218	-1.642[c]	6.462[b]	S	L	-1.921	0.074	-1.350	4.110	S	L
+12	1.607	0.001	-1.481	5.350[c]	S	L	-2.564	-0.148	-1.170	3.385	S	L
+13	1.117	-0.168	-0.373	1.424	S	L	-3.280	-0.351	-0.033	0.863	S	L
+14	1.744	-0.113	-0.151	2.976	S	L	-3.040	-0.279	0.219	2.116	S	M
+15	1.905[c]	0.151	-0.214	5.139[c]	S	L	-3.214	-0.027	0.177	3.428	S	M
+16	1.644	0.454	0.178	2.737	S	M	-3.778	0.283	0.601	1.884	S	M
+17	0.927	0.132	-0.060	1.719	S	L	-4.755	-0.106	0.391	1.221	S	M
+18	0.591	0.619	0.200	1.487	S	M	-5.392	0.334	0.682	1.187	S	M
+19	0.629	0.588	0.017	1.322	S	M	-5.585	0.290	0.467	1.163	S	M
+20	0.766	0.894	0.330	2.753	S	M	-5.766	0.570	0.740	2.065	S	M

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

announcement effect for large volume stocks under the two estimation methods and also for small volume stocks under the GJR-GARCH estimates. As expected, we perceived strong return continuations in the small volume stocks compared to medium and large volume stocks. This finding is consistent with earlier results. Intuitively, as the evidence suggested, large volume stocks have high liquidity, will compensate for lower returns. Our results are confirmed by the Kruskal-Wallis test.

Table 5.10 indicates the results for acquiring firms under the GJR-GARCH estimates for small, medium and large volume stocks. On announcement day (t=0) CARs for both small and medium volume stocks were 1.167 percent and -0.399 percent respectively and both are insignificant. However, large volume stocks CAR of -1.177 percent is significant at the 5% level. Small volume stocks are significant up to day one and were positive up to day three. The CARs for medium volume stocks showed a different pattern of returns. Pre- and post-event CARs are insignificant and therefore have no effect on M&As announcement. For the large volume stocks, pre- and post-event immediately following the announcement are insignificant. We found weaker return continuations in small volume stocks relative to medium and large volume stocks under the GJR-GARCH.

5.11 Trading Volume for Acquirer Firms and Fama-French Model

Table 5.11 summarises results for acquiring firms categories as small, medium and large volume stocks; the time series were estimated using the Fama-French three-factor model. The ARs were estimated under the OLS and GJR-GARCH.

Table 5.11 indicates that under the OLS method, on the announcement day (t=0), CARs for both small and large liquidity stocks are statistically significant at the 5% level. These are in sharp contrast to the medium liquidity stocks CAR which is insignificant. On day t=0, both small and medium volume stocks were positive, whilst large volume stock was negative. The post-event CARs for small volume stocks are significant up to day four. The significant of the CARs lasts much longer under the OLS method relative to the GJR-GARCH method. Prior to the announcement date, CARs for sixteen days window (t=-5 up to t=-20) were positive and are statistically significant for only small liquidity stocks. As suggested before, these significant CARs might not be unrelated to the event date. Again, these returns were not surprising since speculations might have resulted in unparalleled increases in the share prices of small liquidity stocks. Pre- and post-announcement CARs for medium and large liquidity stocks are not significant. Indeed, shareholders of small liquidity stocks enjoyed normal rate of returns, whilst shareholders of medium and large liquidity stocks experienced a negative rate of returns. This finding is consistent with the view that small liquidity stocks outperform large liquidity stocks on announcement.

Table 5.11 also reports the CARs for acquiring firms grouped as small, medium and large liquidity stocks under the GJR-GARCH estimates. The results indicated that on announcement day (t=0), CARs for small and large liquidity stocks are significant. Specifically, CARs for small and large liquidity stocks were 1.329 percent and -1.142 percent and are significant at the 10% and 5% levels, whilst medium liquidity stock is not significant. Post-event CARs for medium and large volume stocks are statistically zero. In the case of the large volume stocks, this finding is consistent with the prior

Table 5.11:CARs Grouped by TRADING VOLUME Stocks for Acquirer Firms under Fama-French

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CAR%	CAR%	CAR%	K-W	Largest Rank	Smallest Rank	CAR%	CAR%	CAR%	K-W	Largest Rank	Smallest Rank
-20	4.061^{a}	-0.511	1.260	4.516	S	M	-0.095	-0.120	2.291^{c}	5.384^{c}	S	M
-19	3.796^{b}	0.124	0.655	3.450	S	L	-0.123	0.583	1.619	4.559	S	M
-18	3.848^{b}	0.361	0.782	2.251	S	M	0.145	0.821	1.656	2.887	S	M
-17	3.846^{a}	0.243	1.010	2.615	S	M	0.380	0.692	1.821	2.941	S	M
-16	4.027^{a}	0.186	0.824	3.268	S	M	0.795	0.633	1.582	3.818	S	M
-15	4.219^{a}	0.428	0.925	3.363	S	M	1.206	0.870	1.614	4.103	S	M
-14	4.455^{a}	0.288	0.574	3.808	S	L	1.560	0.692	1.263	4.649^{c}	S	M
-13	4.072^{a}	0.177	0.585	3.296	S	M	1.381	0.558	1.276	4.322	S	M
-12	4.091^{a}	0.391	0.671	3.056	S	L	1.600	0.758	1.313	4.524	S	M
-11	3.306^{b}	0.445	0.694	1.523	S	L	1.073	0.773	1.284	2.523	S	M
-10	3.341^{a}	0.758	0.670	1.293	S	L	1.348	1.057	1.224	1.928	S	L
-9	2.546^{b}	0.238	0.727	0.312	S	L	0.816	0.523	1.240	0.874	S	L
-8	2.375^{b}	0.194	0.926	0.272	S	M	0.855	0.425	1.351	0.718	S	M
-7	2.057^{b}	0.351	0.967	0.192	S	M	0.681	0.505	1.312	0.351	S	M
-6	2.046^{b}	0.387	0.553	0.450	S	L	0.861	0.484	0.850	0.229	S	L
-5	1.777^{b}	0.525	0.639	0.091	S	L	0.838	0.612	0.824	0.207	S	L / M
-4	1.301	0.358	0.863	0.483	L	S	0.552	0.425	0.989^{c}	0.282	L	S
-3	1.058	0.208	1.000^{b}	2.674	L	S	0.484	0.258	1.063^{b}	1.567	L	M
-2	0382	0.190	0.791^{b}	2.326	L	S	-0.032	0.205	0.837^{b}	2.049	L	S
-1	-0.017	0.039	0.412	4.857^{c}	L	S	-0.205	0.020	0.453	5.126^{c}	L	S
0	1.593^{b}	0.405	-1.144^{b}	5.746^{c}	S	L	1.329^{c}	0.423	-1.142^{b}	5.242^{c}	M	L
+1	1.576^{a}	-0.111	-0.525	5.090^{c}	S	L	1.306^{b}	-0.087	-0.465	5.421^{c}	S	L
+2	1.464^{a}	0.039	-0.686	5.805^{c}	S	L	0.941	0.115	-0.600	5.496^{c}	S	L
+3	1.346^{b}	-0.424	-1.083^{c}	5.730^{c}	S	L	0.725	-0.354	-0.955	4.884^{c}	S	L
+4	1.111^{c}	-0.406	-1.395^{b}	6.458^{b}	S	L	0.324	-0.285	-1.232^{c}	5.735^{c}	S	L
+5	1.194	-0.555	-1.456^{b}	5.994^{b}	S	L	0.212	-0.411	-1.292^{c}	6.861^{b}	S	L
+6	1.515^{c}	-0.441	-1.564^{a}	7.027^{b}	S	L	0.426	-0.257	-1.326^{c}	8.318^{b}	S	L
+7	1.501^{c}	-0.212	-1.529^{b}	6.079^{b}	S	L	0.242	0.039	-1.272	7.886^{b}	S	L
+8	1.297	-0.272	-1.640^{b}	4.464	S	L	-0.208	-0.001	-1.333	5.157^{c}	S	L
+9	1.201	-0.024	-1.672^{b}	4.226	S	L	-0.502	0.200	-1.297	5.246^{c}	S	L
+10	1.486	-0.374	-1.924^{a}	5.013^{c}	S	L	-0.388	-0.092	-1.468	6.297^{b}	S	L
+11	1.716	-0.426	-1.973^{b}	6.738^{b}	S	L	-0.409	-0.143	-1.457	7.154^{b}	S	L
+12	1.509	-0.271	-1.825^{b}	6.016^{b}	S	L	-0.861	0.067	-1.306	6.534^{b}	S	L
+13	1.093	-0.142	-0.748	2.442	S	L	-1.396	0.265	-0.179	2.828	S	L
+14	1.693	-0.208	-0.573	3.982	S	L	-1.022	0.206	0.108	4.375	S	L
+15	1.857^{c}	-0.378	-0.648	6.397^{b}	S	L	-1.027	0.050	0.032	6.218^{b}	S	L
+16	1.594	-0.712	-0.240	3.203	S	M	-1.459	-0.288	0.504	4.230	S	M
+17	0.890	-0.384	-0.325	1.953	S	L	-2.328	0.066	0.598	2.872	S	L
+18	0.603	-0.898	-0.001	2.374	S	M	-2.813	-0.427	0.939	2.880	S	M
+19	0.709	-0.945	-0.124	2.384	S	M	-2.840	-0.454	0.795	2.750	S	M
+20	0.897	-1.315	0.197	3.489	S	M	-2.839	-0.774	1.118	3.523	S	M

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

studies of Higson and Elliott (1998) who documented that large firms post takeover returns are not significantly different from zero. For small liquidity stocks, CARs are significant up to day one and positive up to day seven. In contrast to small volume stocks, CARs for large liquidity stocks were negative up to day thirteen. The CARs obtained under the GJR-GARCH contradicts with those CARs under the OLS estimate for only small liquidity stocks. Thus shareholders' of small liquidity stocks suffered a significant decline in announcement returns under the GJR-GARCH estimates. However, for medium and large liquidity stocks shareholders announcement returns were somewhat improved under the GJR-GARCH estimates relative to the OLS estimates. Indeed, the evidence strongly supports market efficiency in the three liquidity stocks. These results are also confirmed by the Kruskal-Wallis test.

5.12 Trading Volume for Acquirer Firms and Carhart Model

Table 5.12 reports CARs for acquirer firms classified as small, medium and large trading volume stocks under the two estimation methods. The Carhart four-factor model was used for time series returns.

The results in Table 5.12 showed that, CARs on announcement day (t=0) for both small and large volume stocks are significant at the 5% levels under the OLS estimates. However, CAR of 0.342 percent under the OLS estimate on the announcement day for medium volume stocks is insignificant. For small volume stocks, CARs are significant up to seven continuous days and positive for the full twenty days. The significance of the CARs lasts much longer under the OLS method and the effect of event last rather shorter under the GJR-GARCH. Prior-event CARs

Table 5.12: CARs Grouped by TRADIND VOLUME Stocks for Acquirer Firms under Carhart

	OLS ESTIMATES						GJR-GARCH ESTIMATES					
	SMALL	MEDIUM	LARGE				SMALL	MEDIUM	LARGE			
DAYS	CAR%	CAR%	CAR%	K-W	Largest Rank	Smallest Rank	CAR%	CAR%	CAR%	K-W	Largest Rank	Smallest Rank
-20	3.966[a]	-0.663	1.143	4.777[c]	S	M	13.596	0.911	1.527	4.299	S	M
-19	3.717[b]	-0.026	0.610	3.833	S	M	12.877	1.603	0.904	3.830	S	L
-18	3.763[b]	0.252	0.786	2.561	S	M	12.449	1.826	1.064	2.487	S	L
-17	3.785[a]	0.153	1.032	3.016	S	M	12.015	1.663	1.131	2.581	S	L
-16	3.974[a]	0.141	0.889	3.462	S	M	11.754	1.563	1.105	3.149	S	L
-15	4.167[a]	0.381	1.022	3.381	S	M	11.470	1.706	1.155	3.705	S	L
-14	4.384[a]	0.258	0.669	3.615	S	M	11.105	1.483	0.789	4.680[c]	S	L
-13	3.980[a]	0.128	0.646	3.066	S	M	10.217	1.324	0.810	4.392	S	L
-12	4.010[a]	0.380	0.706	3.013	S	M	9.759	1.495	0.891	4.232	S	L
-11	3.216[b]	0.411	0.711	1.387	S	L	8.516	1.434	0.893	2.088	S	L
-10	3.254[a]	0.701	0.691	1.148	S	L	8.106	1.624	0.855	1.511	S	L
-9	2.452[b]	0.237	0.753	0.212	S	M	6.874	1.076	0.944	0.579	S	L
-8	2.280[c]	0.250	0.919	0.190	S	M	6.221	0.875	1.080	0.345	S	L
-7	1.990[c]	0.412	0.971	0.085	S	M	5.402	0.920	1.065	0.304	S	L
-6	2.007[b]	0.410	0.560	0.436	S	L	4.925	0.836	0.623	0.755	M	L
-5	1.757[b]	0.536	0.667	0.114	S	L	4.244	0.913	0.656	0.307	M	L
-4	1.308	0.367	0.896[c]	0.538	L	S	3.265	0.657	0.903[c]	0.530	M	S
-3	1.089	0.210	1.044[b]	2.968	L	M	2.518	0.419	0.998[b]	1.177	L	S
-2	0.393	0.193	0.822[b]	2.706	L	S	1.293	0.298	0.786[b]	2.169	L	S
-1	-0.016	0.013	0.407	4.912[c]	L	S	0.460	0.047	0.442	5.332[c]	L	S
0	1.606[b]	0.342	-1.178[b]	6.060[b]	S	L	1.997[b]	0.457	-1.217[a]	6.976[b]	S	L
+1	1.613[a]	-0.151	-0.503	5.592[c]	S	L	2.040[a]	-0.029	-0.458	4.619[c]	S	L
+2	1.536[a]	0.009	-0.639	6.039[b]	S	L	2.321[c]	0.261	-0.525	4.314	S	L
+3	1.416[b]	-0.461	-1.008	6.102[b]	S	L	2.764	-0.174	-0.819	3.955	S	L
+4	1.160[c]	-0.496	-1.328[b]	6.297[b]	S	L	3.026	-0.096	-1.239[c]	4.648[c]	S	L
+5	1.253[c]	-0.667	-1.395[b]	6.048[b]	S	L	3.584	-0.244	-1.264[c]	4.637[c]	S	L
+6	1.553[c]	-0.548	-1.550[a]	7.474[b]	S	L	4.458	-0.049	-1.440[b]	6.957[b]	S	L
+7	1.503[c]	-0.269	-1.525[b]	6.398[b]	S	L	4.922	0.294	-1.370[b]	6.517[b]	S	L
+8	1.266	-0.332	-1.651[b]	4.302	S	L	5.111	0.330	-1.462[c]	3.836	S	L
+9	1.164	-0.127	-1.648[b]	4.056	S	L	5.460	0.604	-1.465[c]	4.064	S	L
+10	1.444	-0.504	-1.875[b]	4.462	S	L	6.250	0.343	-1.626[b]	4.743[c]	S	L
+11	1.675	-0.581	-1.905[b]	5.744[c]	S	L	6.879	0.315	-1.648[c]	5.155[c]	S	L
+12	1.458	-0.441	-1.746[b]	5.154[c]	S	L	7.072	0.531	-1.464[c]	4.251	S	L
+13	1.031	-0.369	-0.675	1.917	S	L	7.212	0.701	-0.389	1.192	S	L
+14	1.643	-0.418	-0.514	3.693	S	L	8.245	0.685	-0.158	2.020	S	L
+15	1.811[c]	-0.615	-0.605	6.155[b]	S	L	8.923	0.562	-0.229	3.724	S	L
+16	1.555	-0.919	-0.241	3.135	S	M	9.160	0.254	0.168	1.849	S	L
+17	0.875	-0.654	-0.365	2.041	S	M	8.990	0.624	0.108	1.080	S	L
+18	0.569	-1.212	-0.024	2.722	S	M	9.166	0.183	0.469	1.109	S	M
+19	0.696	-1.252	-0.118	2.231	S	M	9.843	0.175	0.317	1.037	S	M
+20	0.889	-1.628	0.205	3.479	S	M	10.522	-0.147	0.553	1.507	S	M

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of CARs estimated using student t-statistics. K-W donates Kruskal-Wallis Test of the Chi-Square Value and Test Statistics.
LRank denotes Large Rank and SRank denotes Small Rank.
L, M, S, denote Large, Medium and Small Firms.

were positive and significant for sixteen days window (t=-5 up to t=-20) only in small volume stocks. Information by classification changes expectations and therefore information might have leaked that takeover announcement in the small volume stocks resulting in matchless rises in the share prices before the event date. Thus, these results were unconnected to the event date. Furthermore, the magnitudes of CARs generated under small liquidity stocks were higher than both the medium and large liquidity stocks under both sets of estimation methods. Pre- and post-announcement CARs immediately following the event for medium and large liquidity stocks are not significant at conventional levels. Large liquidity stocks generated negative CARs for nineteen consecutive days.

Table 5.12 also showed the estimated CARs for small, medium and large liquidity stocks under the GJR-GARCH model. The results revealed that on announcement day (t=0), CAR for medium liquidity stocks was not significant. However, CARs for small and large liquidity stocks are significant at the 5% and 1% level respectively. For small liquidity stocks, CARs are significant up to day two. The magnitudes of CARs under the GJR-GARCH contradict significantly with those under the OLS only in small liquidity stocks. For medium liquidity stocks, pre- and post CARs are not significant at conventional levels in the entire twenty days period. CARs for large liquidity stocks on the other hand are not significant both pre- and post immediately following the announcement.

Our liquidity measure under the two estimation methods showed that GJR-GAARCH estimates produced bigger announcement returns than the OLS estimates. Our liquidity measure also reveals interesting distinction between market capitalization and trading volume. The significance of CARs for medium market capitalization last much longer under the GJR-GARCH estimates than those CARs under the OLS estimates for the target firms.

We used the Kruskal-Wallis test, a nonparametric test, to compare the three CARs of both the target and acquirer firms grouped by market capitalization value as well as the trading volume for small, medium and large firms under the OLS and GJR-GARCH estimation to ascertain whether the CARs are significantly different. In our Kruskal-Wallis test, we assume that the CARs of each group are independent. Kruskal-Wallis test statistics is approximately a chi-square distribution with k-1 degree of freedom. We reported the Kruskal-Wallis test statistics of the chi-square value with associated significant level and the (mean ranks of each CAR) largest rank and smallest rank. Using the significant levels, the null hypotheses for the Kruskal-Wallis will be accepted or rejected. The results of these tests indicated that there are significant differences between the three CARs for small, medium and large firms.

From Tables 5.1, 5.2 and 5.3, using the Kruskal-Wallis test, CARs grouped by market capitalization value for target firms showed that after the announcement, medium firms had largest mean ranks above both small and large firms across the three methodologies that were applied in this empirical study; under the two estimation models. In other words, shareholders of medium firms had the highest rate of returns after the announcement, compared to small and large firms' shareholders, whilst the smallest mean ranks were predominantly recorded in large firms, suggesting shareholders of large firms had the least rate of returns. From the three tables, therefore there was evidence to reject the null hypotheses in favour of the alternatives hypotheses. We can therefore authoritatively say that there are statistically significant differences between the three CARs for small, medium and large firms.

Using Kruskal-Wallis test CARs grouped by market capitalization value for acquirer firms in Tables 5.4; 5.5 and 5.6 showed significant differences under the OLS and GJR-GARCH estimation methods. The largest mean ranks were seen in both small and medium firms with the small firms slightly above the medium firms after the announcement. These results convincingly indicated that shareholders of both small and medium firms substantially gained after the announcement. In contrast to the small and medium firms, smallest mean ranks were reported in large firms under the OLS and GJR-GARCH estimates after the announcement; however, few were also recorded for medium firms only in the GJR-GARCH models. These results commandingly show that the performance of large firms was not encouraging. As indicated above, the null hypotheses were rejected in favour of the alternative hypotheses. We can therefore confidently say that there are statistically significant differences between those CARs of small, medium and large firms.

Surprising results came from the analysis of Tables 5.7; 5.8 and 5.9 for CARs grouped by trading volume stocks for target firms under the two estimation methods. Both the largest and smallest mean ranks were in some cases under the OLS and GJR-GARCH was reported for the three firms after the announcement. For the target firms under the standard CAPM, largest mean rank were equally reported for both medium and large firms under the OLS estimate with largest rank mostly recorded for medium firms under the GJR-GARCH estimate. Smallest mean ranks were seen in small firms, meaning a small rate of returns went to shareholders of small firms after the announcement. For the target firms under the Fama-French model, the largest mean ranks were recorded for the three firms with the medium firms as the winner under the OLS estimate whilst under the GJR-GARCH was large firms.

As indicated in the tables, despite the smallest mean ranks reported in all the three categories of firms, small firms were seen as the losers after the announcement. The results for the target firms under the Carhart model for the largest mean ranks were opposite to the Fama-French model. Here the largest mean ranks were reported for large firms under the OLS estimate whilst the largest mean ranks under the GJR-GARCH went to medium firms. In contrast, smallest mean ranks are common in small firms. Based on the Kruskal-Wallis test we can convincingly conclude that there are statistically significant differences between these CARs for small, medium and large firms.

As depicted in Tables 5.10, 5.11 and 5.12, using the Kruskal-Wallis test, CARs grouped by trading volume stocks for acquirer firms indicated that, on announcement, largest mean ranks of small firms are more than medium firms, and also more than large firms. In other words, small firms gain considerably more than both medium and large firms. Whilst the smallest mean ranks were commonly pronounced in large firms, with a few also reported in medium firms. The results of the Kruskal-Wallis test statistics clearly show that there is a statistically significant difference among the CARs for small, medium and large stocks.

The findings presented here correspond to the Kruskal-Wallis test concerning the target and acquiring firm's shareholders. Using market capitalization value for investment purposes, acquiring firm shareholders will prefer to buy medium target firms when a takeover attempt is announced. Likewise, using trading volume stocks, rational investors will prefer to acquire small firms. These results suggest that liquidity measure has substantial influence in determining the size of the firm that must be acquired when a takeover is announced. The announcement returns for these small and medium stocks under the two liquidity measures were considerably impressive. The results here are consistent across all the methodologies that were used in this study.

5.13 Conclusion

This chapter investigates how stock liquidity measure by market capitalization and trading volume can impact shareholders' wealth. Firms are categorised as small, medium and large using market capitalization stock and trading volume as our liquidity measure. The chapter had revealed an important revelation concerning the liquidity measure and the two sets of firms that were engaged in the acquisition. Using market capitalization as our liquidity measure, medium liquidity firms significantly generate larger CARs under the two estimation methods as well as across all the methodologies that were used in this study for the target firms. However, small liquidity firms realised bigger CARs under acquirer firms for both OLS and GJR-GARCH models across all the methodologies applied. Our trading volume liquidity measure was not different. Specifically, we still observed large CARs for medium liquidity firms across all the methodologies for target firms. Whilst small liquidity firms persistently generate bigger CARs for acquirer firms under both the

OLS and GJR-GARCH models for all the three methodologies in this empirical study. One of the major facts in this chapter is that the size effect had substantial influence on our liquidity measure. Secondly, there is a clear distinction of the two set of firms; target firms and acquirer firms that were involved in takeover activities.

We found strong evidence in support of market efficiency in both small and large liquidity markets for target firms. We also persistently found the presence of market efficiency in medium and large liquidity markets for acquiring firms. We used the Kruskal-Wallis test, a nonparametric test, to compare the three CARs of both the target and acquirer firms for small, medium and large firms under the OLS and GJR-GARCH estimation to ascertain whether the CARs are significantly different. Our Kruskal-Wallis test showed that there are statistically significant differences between these CARs for small, medium and large firms. The CARs generated for small, medium and large liquidity stock correspond to the Kruskal-Wallis test for the target and acquiring firm's shareholders.

CHAPTER SIX

GJR-GARCH Estimates for Conditional Mean and Variance Equations

6.0 Introduction

This chapter evaluates the coefficient estimates of the GJR-GARCH-in-mean (GJR-GARCH-M) and variance equations when those estimates are for firms according to the size of market capitalization and trade volume. Under the trading volume, we report only the Carhart four-factor model of the GJR-GARCH-M and variance equations without reporting both the CAPM and Fama-French three-factor model. The value of the coefficient for each constituent of the conditional mean and variance is based on their simple average within each grouping. The GJR-GARCH is likely to capture both conditional volatility and asymmetry that might influence on the time series regression. We developed hypotheses to test the estimation of GJR-GARCH-in-mean (GJR-GARCH-M) and variance equations of the coefficients to ascertain which of our coefficient variables has predictive power in explaining our time series regression**.** The sample period used to estimate the GJR-GARCH method was ±250 days, prior to and after the announcement days.

6.1 Conditional Variance of Target Firms under Standard CAPM

The average coefficients for the GJR-GARCH-in-mean and variance equations grouped by market capitalization for target firms under the standard CAPM model are presented in Table 6.1 panel A and panel B. The ψ_i coefficient of the mean equation captures the relationship between the mean excess returns of the stock and its risk. As can be seen, the ψ_i coefficients for all firm sizes were small and only medium firms are significant. We can confidently say that there is a positive relationship between excess return and risk for the target firm shareholders. More specifically, the positive synergies will outweigh the risk associated with the M&As and thus potential increase in shareholders' wealth. The α_i coefficients for small, medium and large firms are highly negative and which are statistically significant. As expected, the β_i coefficients for the market on the stocks' excess returns for target firms are highly positive and significant across all firm sizes. Hence, target's wealth gain would be expected. The μ_i coefficients for the permanent component or average volatility of the conditional variance of the variance equation for all firm sizes were highly positive and both small and large firms are significant. Thus we document positive relation between average volatility and its conditional variance. The result shows that average volatility for target firms is positive and therefore we expect an increase in the share prices of target firms and that will increase shareholders' wealth. The ϕ_i coefficients for the past new had small positive and significant effects on the current conditional variance for all firm sizes. The δ_i coefficients which capture past conditional volatility were small for all firm sizes and therefore had no effect on the current volatility and significant only in large firms. The η_i coefficients which capture conditional asymmetry were very high and predominantly statistically significantly positive for small, medium and large firms. Notice that positive asymmetry-leverage effect and significant will have a positive impact on the share prices. Thus volatility asymmetries are present and therefore must be incorporated into the model. The conditional general error distributions were highly positive for the target firms under the CAPM.

Table 6.1 Conditional Mean and Variance Equations Grouped by Market Capitalization for Target Firms under CAPM

Panel A. Average Coefficients for Individual Firms in Sample according to Size of Market Capitalization

		MEAN EQUATION			VARIANCE EQUATION				
FIRMS	No.	$\psi_i h_i^2$	α_i	$\beta_i (R_{mt} - R_{ft})$	μ_i	$\varphi_i \varepsilon_{i\,t-1}^2$	$\delta_i h_{i\,t-1}^2$	$\eta_i K_{i,t-1} \varepsilon_{i,t-1}^2$	*GED*
Small Firms	66	-1.357 (5.691)	-0.014[a] (0.001)	0.005[a] (0.001)	0.001[a] (0.000)	0.175[a] (0.048)	0.100 (0.076)	0.531[a] (0.054)	0.969[a] (0.043)
Medium Firms	66	3.756[c] (2.175)	-0.014[a] (0.001)	0.007[a] (0.001)	0.001 (0.000)	0.086[a] (0.016)	0.034 (0.022)	0.674[a] (0.039)	1.258[a] (0.031)
Large Firms	66	14.093 (10.951)	-0.018[a] (0.005)	0.008[a] (0.001)	9.846[a] (1.688)	0.057[a] (0.010)	0.080[a] (0.018)	0.603[a] (0.054)	1.278[a] (0.031)
All	198								

a, b, c denote statistical significance at the 1-, 5-, or 10-percent significance level, respectively. The value of the coefficient for each parameter of the conditional mean and variance is based on their simple average of the corresponding parameter within each grouping. Test of statistical significance of the coefficient estimates is based on the standard deviation of the sample mean for each group of capitalization value. The Standard Errors are in parentheses.

Panel B .Frequency Count of Positive and Negative Coefficients that are Significant for Mean and Variance Equations

FIRMS	No.	$\psi_i h_i^2$		α_i		$\beta_i (R_{mt} - R_{ft})$		μ_i		$\varphi_i \varepsilon_{i\,t-1}^2$		$\delta_i h_{i\,t-1}^2$		$\eta_i K_{i,t-1} \varepsilon_{i,t-1}^2$		*GED*	
Small Firms	66	16+	5-	0+	60-	51+	2-	39+	1-	24+	11-	20+	4-	44+	4-	66+	0-
Medium Firms	66	9+	10-	0+	56-	62+	0-	36+	1-	25+	10-	19+	7-	50+	1-	66+	0-
Large Firms	66	12+	7-	0+	57-	64+	0-	47+	2-	16+	7-	26+	3-	49+	2-	66+	0-
ALL	198	37+	22-	0+	173-	177+	2-	122+	4-	65+	28-	65+	14-	143+	7-	198+	0

6.2 Conditional Variance of Target Firms under Fama-French Model

Table 6.2 indicates GJR-GARCH-in-mean and variance equations grouped by market capitalization for target firms under the Fama-French model. Panel A and panel B of Table 6.2 shows that the ψ_i coefficients of the mean equation for all the firms were small and medium firms are significant. This might suggest low risk in relation to the M&As for the target shareholders. Indeed, whilst the α_i coefficients in the mean equations are negatively significant for all firm sizes, the β_i coefficients for the market in the mean equations are positively significant, with the exception of small firms whose two individual firms were negatively significant. It is important to recognize that the stocks' excess returns of the market for target firms are significant and positive. One important finding is the explanatory power of SMB_t and HML_t in explaining the risk premium associates with time series regression in stock returns. For SMB_t 69.696% and 54.55% respectively for small and large firms were strongly able to explain the risk premium in time series regression in stock returns, whilst 34.848% for medium firms and that might be considered as weak explanatory power in explaining the time series regression in stock returns. This showed size effect in favour of small and large firms compared to medium firms. In the case of the HML_t, the explanatory power for small firms was 50.000%, medium firms was 60.606% and large firms 71.212% in explaining the time series regression in stock returns. In this subsection both the coefficients of SMB_t and HML_t are positive and significant in explaining stocks' excess returns. The μ_i coefficients for the permanent components of the conditional variance equation for all firm sizes are highly positive and significant only in large firms.

Table 6.2 Conditional Mean and Variance Equations Grouped by Market Capitalization for Target Firms under Fama-French

Panel A. Average Coefficients for Individual Firms in Sample according to Size of Market Capitalization

		MEAN EQUATION					VARIANCE EQUATION				
FIRMS	No.	$\psi_i h_i^2$	α_i	$\beta_i (R_{mt} - R_{ft})$	$\lambda_i SMB_t$	$\gamma_i HML_t$	μ_i	$\varphi_i \varepsilon_{i\,t-1}^2$	$\delta_i h_{i\,t-1}^2$	$\eta_i K_{i,t-1}\varepsilon_{i,t-1}^2$	GED
Small Firms	66	-1.659 (6.146)	-0.015[a] (0.001)	0.007[a] (0.001)	0.004[a] (0.001)	0.002[a] (0.001)	0.001 (0.000)	0.272[a] (0.084)	0.062 (0.049)	0.540[a] (0.050)	1.002[a] (0.042)
Medium Firms	66	4.374[b] (2.022)	-0.014[a] (0.001)	0.009[a] (0.001)	0.001[a] (0.001)	0.003[a] (0.001)	0.001 (0.000)	0.100[a] (0.019)	0.060[c] (0.031)	0.658[a] (0.042)	1.228[a] (0.030)
Large Firms	66	4.675 (11.082)	-0.015[a] (0.005)	0.009[a] (0.001)	-0.002[a] (0.000)	0.002[b] (0.001)	0.000[a] (1.671)	0.062[a] (0.011)	0.081[a] (0.018)	0.594[a] (0.049)	1.277[a] (0.031)
All	198										

a, b, c denote statistical significance at the 1-, 5-, or 10-percent significance level, respectively. The value of the coefficient for each parameter of the conditional mean and variance is based on their simple average of the corresponding parameter within each grouping. Test of statistical significance of the coefficient estimates is based on the standard deviation of the sample mean for each group of capitalization value. The Standard Errors are in parentheses.

Panel B .Frequency Count of Positive and Negative Coefficients that are Significant for Mean and Variance Equations

FIRMS	No.	$\psi_i h_i^2$		α_i		$\beta_i (R_{mt} - R_{ft})$		$\lambda_i SMB_t$		$\gamma_i HML_t$		μ_i		$\varphi_i \varepsilon_{i\,t-1}^2$		$\delta_i h_{i\,t-1}^2$		$\eta_i K_{i,t-1}\varepsilon_{i,t-1}^2$		GED	
Small Firms	66	13+	9-	0+	59-	51+	2-	41+	5-	26+	7-	40+	1-	25+	11-	17+	6-	46+	6-	66+	0-
Medium Firms	66	12+	7-	0+	58-	62+	0-	16+	7-	34+	6-	38+	1-	24+	11-	15+	6-	51+	2-	66+	0-
Large Firms	66	8+	6-	0+	54-	62+	0-	5+	31-	36+	11-	45+	2-	15+	9-	22+	7-	52+	2-	66+	0-
All	198	33+	22-	0+	171-	175+	2-	62+	43-	96+	24-	123+	4-	64+	31-	54+	19-	149+	10-	198+	0-

It appears the ϕ_i coefficients of past news have a small effect (47.98%) on the current conditional variance and are significant. This suggests that past news ϕ_i has positive and small effects on the conditional variance of target firms aggregate stocks' excess returns. The δ_i coefficients which capture past conditional volatility were slightly small (36.87%) for firm sizes and therefore appears to have no effects on current volatility of the stocks, excess returns. The η_i coefficients which capture conditional asymmetry were very high and mostly positive significant for all firm sizes. This implies that, there was evidence to suggest that conditional asymmetry – leverage effects were present in small, medium and large firms.

6.3 Conditional Variance of Target Firms under Carhart Model

Table 6.3 presents the results of GJR-GARCH-in-mean and variance equations grouped by market capitalization for target firms under the Carhart four-factor model. As indicated in panel A and panel B that the ψ_i coefficient of the mean equations are very small. This showed that the risk associated with the firms aggregate excess returns were very low. The α_i coefficients in the mean equation for all firm sizes were highly negatively significant. Thus α_i coefficients have negative and significant effects on the aggregate target firms' sizes. As expected, the β_i coefficients for the markets were highly positively significant for all firm sizes. Indeed, the stocks' excess returns of the market for target firms are positive and significant.

Both SMB_t and HML_t have greater exposure in explaining the time series regression in stock returns and which are significant for all firm sizes, except small firms under the HML_t. It appears both SMB_t and HML_t has more power than the MOM_t in explaining time series in stocks' excess returns. With regard to MOM_t , 36.364%, 43.939% and 59.091% respectively for small, medium and large firms in explaining time series regression in stock excess returns. The μ_i coefficients for the permanent component for conditional variance of aggregate stocks' excess returns for target firms are highly positive and significant for small, medium and large firms. Past news φ_i coefficients appears to have not much effects on the current conditional variance for aggregate stocks' excess returns for target firms, especially for small and large firms and significant across all firm sizes. Thus the stocks' excess returns of the target firms respond more positive volatility than negative volatility. The δ_i coefficients which capture past conditional volatility have moderate effect on the current volatility of the stocks' excess return across all firm sizes and which are significant. The η_i coefficients which capture conditional asymmetry in the conditional variance equation were highly positive and significant for all firm sizes. Thus, there is evidence for positive conditional asymmetry-leverage effect for target firms' share prices. The conditional generalized error distribution of the variance equation is positive and significant for all firm sizes.

In this subsection, the results achieved for target firms' shareholders do not showed many discrepancies but rather similar results under the CAPM, Fama-French and Carhart models. However, HML_t has strong exposure in explaining the time series variation on stock's excess returns than the SMB_t under both Fama-French and Carhart model.

Table 6.3 Conditional Mean and Variances Equation Grouped by Market Capitalization for Target Firms under Carhart

Panel A. Average Coefficients for Individual Firms in Sample according to Size of Market Capitalization

		MEAN EQUATION						VARIANCE EQUATION				
FIRMS	No.	$\psi_i h_i^2$	α_i	$\beta_i(R_{mt} - R_{ft})$	$\lambda_i SMB_t$	$\gamma_i HML_t$	$\delta_i MOM_t$	μ_i	$\varphi_i \varepsilon_{i\,t-1}^2$	$\delta_i h_{i\,t-1}^2$	$\eta_i K_{i,t-1}\varepsilon_{i,t-1}^2$	GED
Small Firms	66	-2.418 (6.672)	-0.015[a] (0.002)	0.007[a] (0.001)	0.004[a] (0.001)	0.008 (0.007)	0.001 (0.001)	0.001[c] (0.001)	0.186[a] (0.043)	0.071[b] (0.034)	0.538[a] (0.048)	1.013[a] (0.040)
Medium Firms	66	3.357 (2.488)	-0.014[a] (0.001)	0.009[a] (0.001)	0.001[a] (0.000)	0.003[a] (0.001)	-0.000 (0.000)	0.000[a] (3.261)	0.098[a] (0.020)	0.060[c] (0.031)	0.557[a] (0.054)	1.199[a] (0.029)
Large Firms	66	-4.548 (7.716)	-0.008[a] (0.003)	0.009[a] (0.000)	-0.002[a] (0.000)	0.002[a] (0.001)	-0.001 (0.000)	0.000[a] (2.719)	0.068[a] (0.012)	0.076[a] (0.019)	0.486[a] (0.059)	1.273[a] (0.030)
All	198											

a, b, c denote statistical significance at the 1-, 5-, or 10-percent significance level, respectively. The value of the coefficient for each parameter of the conditional mean and variance is based on their simple average of the corresponding parameter within each grouping. Test of statistical significance of the coefficient estimates is based on the standard deviation of the sample mean for each group of capitalization value. The Standard Errors are in parentheses.

Panel B. Frequency Count of Positive and Negative Coefficients that are Significant for Mean and Variance Equations

FIRMS	No.	$\psi_i h_i^2$		α_i		$\beta_i(R_{mt} - R_{ft})$		$\lambda_i SMB_t$		$\gamma_i HML_t$		$\delta_i MOM_t$		μ_i		$\varphi_i \varepsilon_{i\,t-1}^2$		$\delta_i h_{i\,t-1}^2$		$\eta_i K_{i,t-1}\varepsilon_{i,t-1}^2$		GED	
Small Firms	66	10+	5-	0+	57-	52+	3-	42+	3-	22+	7-	13+	11-	39+	1-	21+	10-	17+	3-	40+	3-	66+	0-
Medium Firms	66	11+	7-	1+	57-	63+	0-	19+	9-	34+	7-	10+	19-	40+	0-	23+	10-	17+	9-	46+	2-	66+	0-
Large Firms	66	9+	4-	0+	58-	64+	0-	6+	28-	33+	11-	15+	24-	47+	1-	15+	9-	20+	7-	45+	5-	66+	0-
All	198	30+	16-	1+	172-	179+	3-	67+	40-	89+	25-	38+	54-	126+	2-	59+	29-	54+	19-	131+	10-	198+	0-

6.4 Conditional Variance of Acquirer Firms under Standard CAPM

Table 6.4 reports the GJR-GARCH-in-mean and variance equations grouped by market capitalization for acquirer firms under the CAPM model. In Panel A and panel B the estimation results of the ψ_i coefficients of the mean equation for acquirer firms stocks' excess returns were very small and insignificant. This might suggest that the ψ_i coefficients of the stocks' excess returns in relation to its risk are very small. The α_i coefficients of the mean equation are negative and significant, across all firm sizes. The β_i coefficients of the market for stocks' excess returns for acquirer firms are highly positive and significant across all firms. The effect appears larger in both medium and large firms. The μ_i coefficients for the permanent component in the conditional variance equation of the stocks, excess returns are highly positive and significant. Thus μ_i coefficients are positive and significant for all firm sizes, except three firms which is negative and significant. The φ_i coefficients for past period news have significant effect on the current conditional variance for all aggregate stocks' excess returns for all firm sizes. The δ_t coefficients which capture past conditional volatility were very small (32.02%) and does not seem to impact on the current volatility. Here the δ_t coefficients which are significant were small and medium firms. There was evidence that the coefficients η_i for asymmetry-leverage effect are highly positive and significant, implying that good news generates less volatility than bad news (see e.g. Black 2006).

Table 6.4 Conditional Mean and Variance Equations Grouped by Market Capitalization for Acquirer Firms under CAPM

Panel A. Average Coefficients for Individual Firms in Sample according to Size of Market Capitalization

		MEAN EQUATION			VARIANCE EQUATION				
FIRMS	No.	$\psi_i h_i^2$	α_i	$\beta_i (R_{mt} - R_{ft})$	μ_i	$\varphi_i \varepsilon_{i\,t-1}^2$	$\delta_i h_{i\,t-1}^2$	$\eta_i K_{i,t-1} \varepsilon_{i,t-1}^2$	GED
Small Firms	67	-0.062 (8.308)	-0.010[b] (0.004)	0.006[a] (0.001)	0.000[a] (9.626)	0.140[a] (0.021)	0.041[b] (0.019)	0.517[a] (0.049)	1.139[a] (0.042)
Medium Firms	68	-5.623 (6.134)	-0.010[a] (0.001)	0.007[a] (0.000)	8.696[a] (1.289)	0.084[a] (0.011)	0.068[a] (0.016)	0.585[a] (0.043)	1.252[a] (0.027)
Large Firms	68	-5.493 (4.222)	-0.011[a] (0.001)	0.009[a] (0.000)	9.441[a] (1.915)	0.078[a] (0.011)	0.023 (0.016)	0.628[a] (0.049)	1.389[a] (0.025)
All	203								

a, b, c denote statistical significance at the 1-, 5-, or 10-percent significance level, respectively. The value of the coefficient for each parameter of the conditional mean and variance is based on their simple average of the corresponding parameter within each grouping. Test of statistical significance of the coefficient estimates is based on the standard deviation of the sample mean for each group of capitalization value. The Standard Errors are in parentheses.

Panel B. Frequency Count of Positive and Negative Coefficients that are Significant for Mean and Variance Equations

FIRMS	No.	$\psi_i h_i^2$		α_i		$\beta_i (R_{mt} - R_{ft})$		μ_i		$\varphi_i \varepsilon_{i\,t-1}^2$		$\delta_i h_{i\,t-1}^2$		$\eta_i K_{i,t-1} \varepsilon_{i,t-1}^2$		GED	
Small Firms	67	7+	10-	0+	58-	56+	1-	51+	1-	26+	4-	12+	5-	45+	4-	67+	0-
Medium Firms	68	11+	7-	0+	58-	67+	1-	52+	0-	25+	4-	20+	5-	47+	0-	68+	0-
Large Firms	68	8+	7-	0+	61-	67+	0-	42+	2-	27+	6-	11+	12-	52+	1-	68+	0-
All	203	26+	24-	0+	177-	190+	2-	145+	3-	78+	14-	43+	22-	144+	5-	203+	0-

6.5 Conditional Variance of Acquirer Firms under Fama-French Model

The average coefficients for the GJR-GARCH-in-mean and variance equations grouped by market capitalization for acquirer firms under the Fama-French three-factor models are evaluates in Table 6.5, panel A and panel B. The ψ_i coefficient of the mean equation that captures the relationship between the mean excess returns and its risk is small and significant only in large firms. Thus, there is evidence for a negative but insignificant relation between stocks' excess returns and risk for acquirer firms. Indeed, this might be in line with the literature that the Fama-French (1993) three-factor model is capable of capturing the risk associated with stock's excess returns. The α_i coefficients are highly negative and significant for stocks' excess returns. The β_i coefficients of the market of the mean equation are positive and significant across all firm sizes. The time series regression in stock returns have greater exposure to both the SMB_t and HLM_t. Thus 65.52% and 62.07% are significant in explaining the time series regression in stocks' excess returns for SMB_t and HLM_t respectively for acquirer firms. The coefficients for both SMB_t and HML_t have strong positive effects more than negative effect on the stocks' excess returns.

The μ_i coefficients for the permanent component for conditional variance of the aggregate stocks excess returns are highly positive and significant across all firm sizes. The φ_i coefficients for prior period news had 42.36% significant effect on all firm sizes. It appears the past news have small effects on the current conditional variance for stocks' excess returns across all firm sizes. There was strong evidence

Table 6.5 Conditional Mean and Variance Equations Grouped by Market Capitalization for Acquirer Firms under Fama-French

Panel A. Average Coefficients for Individual Firms in Sample according to Size of Market Capitalization

		MEAN EQUATION					VARIANCE EQUATION				
FIRMS	No.	$\psi_i h_i^2$	α_i	$\beta_i(R_{mt} - R_{ft})$	$\lambda_i SMB_t$	$\gamma_i HML_t$	μ_i	$\varphi_i \varepsilon^2_{i\,t-1}$	$\delta_i h^2_{i\,t-1}$	$\eta_i K_{i,t-1}\varepsilon^2_{i,t-1}$	GED
Small Firms	67	-0.155 (8.576)	-0.009[b] (0.005)	0.008[a] (0.001)	0.005[a] (0.000)	0.003[a] (0.001)	0.000[a] (4.465)	0.130[a] (0.017)	0.033[c] (0.017)	0.494[a] (0.048)	1.133[a] (0.039)
Medium Firms	68	1.846 (3.586)	-0.012[a] (0.001)	0.009[a] (0.000)	0.002[a] (0.000)	0.005[a] (0.001)	0.000[a] (1.920)	0.078[a] (0.010)	0.075[a] (0.016)	0.548[a] (0.048)	1.240[a] (0.032)
Large Firms	68	-11.389[c] (5.816)	-0.010[a] (0.001)	0.009[a] (0.000)	-0.001[c] (0.000)	0.002[c] (0.001)	0.000[a] (2.604)	0.067[a] (0.011)	0.031[a] (0.013)	0.571[a] (0.056)	1.371[a] (0.026)
All											

a, b, c denote statistical significance at the 1-, 5-, or 10-percent significance level, respectively. The value of the coefficient for each parameter of the conditional mean and variance is based on their simple average of the corresponding parameter within each grouping. Test of statistical significance of the coefficient estimates is based on the standard deviation of the sample mean for each group of capitalization value. The Standard Errors are in parentheses.

Panel B. Frequency Count of Positive and Negative Coefficients that are Significant for Mean and Variance Equations

FIRMS	No.	$\psi_i h_i^2$		α_i		$\beta_i(R_{mt} - R_{ft})$		$\lambda_i SMB_t$		$\gamma_i HML_t$		μ_i		$\varphi_i \varepsilon^2_{i\,t-1}$		$\delta_i h^2_{i\,t-1}$		$\eta_i K_{i,t-1}\varepsilon^2_{i,t-1}$		GED	
Small Firms	67	6+	12-	0+	55-	60+	0-	51+	2-	31+	6-	52+	1-	27+	5-	12+	6-	44+	4-	67+	0-
Medium Firms	68	10+	7-	0+	61-	68+	0-	28+	12-	42+	2-	50+	1-	23+	4-	15+	3-	45+	2-	68+	0-
Large Firms	68	9+	9-	2+	54-	67+	0-	11+	30-	31+	15-	43+	1-	21+	7-	18+	7-	47+	4-	68+	0-
All	203	25+	28-	2+	169-	194+	0-	89+	44-	104+	22-	144+	3-	70+	16-	45+	15-	136+	10-	203+	0-

that the δ_t coefficient which captures past conditional volatility had a very small (29.56%) significant impact on the current volatility. The η_i coefficients for conditional asymmetry are highly positive and significant. Thus positive asymmetry-leverage effect will generate less volatility and that will have a positive impact on the share prices on acquirer firms.

6.6 Conditional Variance of Acquirer Firms under Carhart Model

Table 6.6 GJR-GARCH-in-mean and variance equations grouped by market capitalization for acquirer firms under Carhart model. In panel A and panel B, the estimation results of the ψ_i coefficients of the mean equations on stocks' excess returns are very small (24.14%) and significant in large firms. We report negative relation between stocks' excess returns and its risk for acquirer firms. This results is similar to the one achieved under Fama-French model. Thus both Fama-French and Carhart model capture additional pricing elements that may affect stock returns. The α_i coefficients on the stocks' excess returns are negative and significant. As expected, the β_i coefficients of the market on the stocks' excess returns are positive and significant across all firm sizes. Both the SMB_t and HLM_t were strongly significant in explaining the time series regression on stocks' excess returns relative to the MOM_t, which predictive power is insignificant in explaining the time series regression. The μ_i coefficients for the permanent component of the conditional variance on aggregate stocks' returns are highly positive and significant across all firms. The φ_i coefficients for prior period news have very moderate significant effect on the current conditional variance for all firm sizes.

Table 6.6 Conditional Mean and Variance Equations Grouped by Market Capitalization for Acquirer Firms under Carhart

Panel A. Average Coefficients for Individual Firms in Sample according to Size of Market Capitalization

		MEAN EQUATION						VARIANCE EQUATION				
FIRMS	No.	$\psi_i h_i^2$	α_i	$\beta_i(R_{mt} - R_{ft})$	$\lambda_i SMB_t$	$\gamma_i HML_t$	$\delta_i MOM_t$	μ_i	$\varphi_i \varepsilon_{i\,t-1}^2$	$\delta_i h_{i\,t-1}^2$	$\eta_i K_{i,t-1} \varepsilon_{i,t-1}^2$	GED
Small Firms	67	7.587 (10.042)	-0.019[a] (0.006)	0.008[a] (0.001)	0.004[a] (0.000)	0.003[a] (0.001)	-0.000 (0.000)	0.000[a] (9.258)	0.138[a] (0.019)	0.028[c] (0.016)	0.579[a] (0.043)	1.140[a] (0.041)
Medium Firms	68	3.154 (3.192)	-0.012[a] (0.001)	0.009[a] (0.000)	0.002[a] (0.000)	0.005[a] (0.001)	8.006 (0.000)	9.025[a] (1.398)	0.077[a] (0.011)	0.065[a] (0.016)	0.600[a] (0.043)	1.259[a] (0.028)
Large Firms	68	-9.326[c] (5.171)	-0.009[a] (0.002)	0.009[a] (0.000)	-0.001[b] (0.000)	0.002[c] (0.001)	1.098 (0.001)	0.000[a] (2.551)	0.066[a] (0.010)	0.030[b] (0.014)	0.561[a] (0.055)	1.372[a] (0.027)
All	203											

a, b, c denote statistical significance at the 1-, 5-, or 10-percent significance level, respectively. The value of the coefficient for each parameter of the conditional mean and variance is based on their simple average of the corresponding parameter within each grouping. Test of statistical significance of the coefficient estimates is based on the standard deviation of the sample mean for each group of capitalization value. The Standard Errors are in parentheses.

Panel B .Frequency Count of Positive and Negative Coefficients that are Significant for Mean and Variance Equations

FIRMS	No.	$\psi_i h_i^2$		α_i		$\beta_i(R_{mt} - R_{ft})$		$\lambda_i SMB_t$		$\gamma_i HML_t$		$\delta_i MOM_t$		μ_i		$\varphi_i \varepsilon_{i\,t-1}^2$		$\delta_i h_{i\,t-1}^2$		$\eta_i K_{i,t-1} \varepsilon_{i,t-1}^2$		GED	
Small Firms	67	5+	13-	0+	58-	58+	0-	50+	1-	29+	5-	7+	12-	48+	1-	28+	5-	9+	6-	51+	0-	67+	0-
Medium Firms	68	11+	5-	0+	60-	68+	0-	24+	9-	42+	2-	13+	10-	44+	1-	21+	5-	19+	4-	47+	2-	68+	0-
Large Firms	68	6+	9-	0+	56-	66+	0-	8+	33-	35+	10-	15+	21-	39+	2-	26+	5-	13+	8-	45+	4-	68+	0-
All	203	22+	27-	0+	174-	192+	0-	82+	43-	106+	17-	35+	43-	131+	4-	75+	15-	41+	18-	143+	6-	203+	0-

The δ_t coefficients which capture past conditional volatility do not appear to influence the current volatility. The coefficients η_i for conditional asymmetry-leverage effect are highly positive significant for all firm sizes.

6.7 Conditional Variance by Trading Volume for Target Firms under Carhart Model

Tables 6.7 presents the GJR-GARCH-in-mean and variance equations grouped by trading volume for target firms under Carhart four-factor models. In panel A and panel B, the ψ_i coefficients of the mean equation are very small for all firms. Thus we document insignificant positive relationship between stocks' excess returns and risk for target firms. The α_i coefficients generate 0.51% positive and 87.37% negative respectively which are significant. The β_i coefficients of the market of the mean equation on stocks' excess returns are highly positive and significant for all firm sizes. The predictive power in explaining the times series regression are significant for SMB_t (54.55%) whilst the HML_t (57.07%) are significant for medium and large firms. Thus the aggregate stocks' excess returns which are significantly exposed to SMB_t and HML_t were high, except for small firms under the HML_t which is insignificant. The MOM_t lacks power in explaining the time series variation on stocks' excess returns and only large firms are significant. The μ_i coefficients for permanent component of the conditional variance are highly positive significant for all firm sizes. The φ_i coefficients for prior news have small significant influence on the current conditional variance for the target excess returns. The δ_i coefficients which capture past conditional volatility on stocks' excess returns for the target firms are very small and significant and seem not to influence the current volatility.

Table 6.7 Conditional Mean and Variance Equations Grouped by Trading Volume for Target Firms under Carhart

Panel A. Average Coefficients for Individual Firms in Sample according to Size of Trading Volume

		MEAN EQUATION						VARIANCE EQUATION				
FIRMS	No	$\psi_i h_i^2$	α_i	$\beta_i(R_{mt} - R_{ft})$	$\lambda_i SMB_t$	$\gamma_i HML_t$	$\delta_i MOM_t$	μ_i	$\varphi_i \varepsilon_{i\,t-1}^2$	$\delta_i h_{i\,t-1}^2$	$\eta_i K_{i,t-1} \varepsilon_{i,t-1}^2$	GED
Small Firms	66	-2.174 (6.641)	-0.015[a] (0.002)	0.007[a] (0.001)	0.003[a] (0.001)	0.009 (0.007)	0.001 (0.001)	0.001[c] (0.001)	0.167[a] (0.043)	0.087[a] (0.034)	0.561[a] (0.049)	1.072[a] (0.041)
Medium Firms	66	0.831 (2.947)	-0.013[a] (0.001)	0.009[a] (0.001)	0.001[a] (0.000)	0.003[a] (0.001)	-0.000 (0.000)	0.000[a] (3.294)	0.121[a] (0.021)	0.054[c] (0.031)	0.560[a] (0.053)	1.160[a] (0.034)
Large Firms	66	-2.152 (7.608)	-0.009[a] (0.003)	0.010[a] (0.000)	-0.001[b] (0.000)	0.002[a] (0.001)	-0.001[c] (0.000)	0.000[a] (2.984)	0.064[a] (0.014)	0.069[a] (0.017)	0.473[a] (0.058)	1.259[a] (0.027)
All	198											

a, b, c denote statistical significance at the 1-, 5-, or 10-percent significance level, respectively. The value of the coefficient for each parameter of the conditional mean and variance is based on their simple average of the corresponding parameter within each grouping. Test of statistical significance of the coefficient estimates is based on the standard deviation of the sample mean for each group of sales value. The Standard Errors are in parentheses.

Panel B .Frequency Count of Positive and Negative Coefficients that are Significant for Mean and Variance Equations

FIRMS	No	$\psi_i h_i^2$		α_i		$\beta_i(R_{mt} - R_{ft})$		$\lambda_i SMB_t$		$\gamma_i HML_t$		$\delta_i MOM_t$		μ_i		$\varphi_i \varepsilon_{i\,t-1}^2$		$\delta_i h_{i\,t-1}^2$		$\eta_i K_{i,t-1} \varepsilon_{i,t-1}^2$		GED	
Small Firms	66	9+	4-	0+	57-	52+	3-	38+	5-	24+	5-	13+	11-	44+	1-	21+	14-	22+	4-	50+	2-	66+	0-
Medium Firms	66	11+	8-	1+	59-	62+	0-	21+	12-	34+	7-	12+	16-	38+	0-	25+	6-	12+	9-	47+	2-	66+	0-
Large Firms	66	8+	4-	0+	57-	65+	0-	10+	22-	32+	11-	16+	27-	47+	1-	16+	11-	21+	7-	43+	5-	66+	0-
All	198	28+	16-	1+	173-	179+	3-	69+	39-	90+	23-	41+	54-	129+	2-	62+	31-	55+	20-	140+	9-	198+	0-

About 75.25% of the η_i coefficients of conditional variance on stocks' excess returns show conditional asymmetry-leverage effects which are highly positive and significant for all firm sizes.

6.8 Conditional Variance by Trading Volume for Acquirer Firms under Carhart Model

Table 6.8 shows the GJR-GARCH-in-mean and variance equations grouped by trading volume for acquirer firms under Carhart four-factor models. The results in panel A and panel B indicated that, the ψ_i coefficients of the mean equation are very small and only large firms are significant. Indeed, the stocks, excess returns in relation to its risk is negative, however, is very trivial. The α_i coefficients are highly negative and significant across all firms. As expected, the β_i coefficients of the market on stocks' excess returns are positive and significant for all firm sizes. Both SMB_t and HML_t have strong exposure in explain the time series regression on stocks' excess returns and in both cases small and medium firms are significant, compared to the MOM_t which is insignificant and lacked power in explaining time series variation on stocks' excess returns for acquirer firms. The μ_i coefficients for permanent component of the aggregate stocks' excess returns have 67.49% significant. The φ_i coefficients for prior news have 43.83% significant influence on the current conditional variance for all firm sizes. The δ_i coefficients which capture past conditional volatility on stocks' excess returns are very small but significant and appear not to impact the current volatility. The η_i coefficients which capture conditional asymmetry-leverage effects are highly positive and significant across all firms.

Table 6.8 Conditional Mean and Variance Equations Grouped by Trading Volume for Acquirer Firms under Carhart

Panel A. Average Coefficients for Individual Firms in Sample according to Size of Trading Volume

		MEAN EQUATION						VARIANCE EQUATION				
FIRMS	No	$\psi_i h_i^2$	α_i	$\beta_i(R_{mt} - R_{ft})$	$\lambda_i SMB_t$	$\gamma_i HML_t$	$\delta_i MOM_t$	μ_i	$\varphi_i \varepsilon^2_{i\,t-1}$	$\delta_i h^2_{i\,t-1}$	$\eta_i K_{i,t-1}\varepsilon^2_{i,t-1}$	GED
Small Firms	67	8.780 (10.142)	-0.019[a] (0.006)	0.007[a] (0.000)	0.003[a] (0.000)	0.004[a] (0.000)	-0.000 (0.000)	0.000[a] (3.881)	0.119[a] (0.019)	0.040[a] (0.016)	0.596[a] (0.044)	1.168[a] (0.040)
Medium Firms	68	1.266 (2.771)	-0.012[a] (0.001)	0.010[a] (0.000)	0.002[a] (0.000)	0.003[a] (0.001)	-0.000 (0.000)	0.000[a] (8.434)	0.088[a] (0.011)	0.043[a] (0.014)	0.582[a] (0.045)	1.294[a] (0.033)
Large Firms	68	-8.614[c] (5.227)	-0.009[a] (0.002)	0.010[a] (0.000)	-2.616 (0.001)	0.002 (0.001)	0.001 (0.001)	0.000[a] (3.239)	0.074[a] (0.012)	0.040[a] (0.017)	0.562[a] (0.053)	1.311[a] (0.027)
All	203											

a, b, c denote statistical significance at the 1-, 5-, or 10-percent significance level, respectively. The value of the coefficient for each parameter of the conditional mean and variance is based on their simple average of the corresponding parameter within each grouping. Test of statistical significance of the coefficient estimates is based on the standard deviation of the sample mean for each group of sales value. The Standard Errors are in parentheses.

Panel B .Frequency Count of Positive and Negative Coefficients that are Significant for Mean and Variance Equations

FIRMS	No	$\psi_i h_i^2$		α_i		$\beta_i(R_{mt} - R_{ft})$		$\lambda_i SMB_t$		$\gamma_i HML_t$		$\delta_i MOM_t$		μ_i		$\varphi_i \varepsilon^2_{i\,t-1}$		$\delta_i h^2_{i\,t-1}$		$\eta_i K_{i,t-1}\varepsilon^2_{i,t-1}$		GED	
Small Firms	67	6+	13-	1+	58-	59+	0-	44+	5-	34+	1-	7+	12-	43+	1-	25+	5-	11+	7-	51+	0-	67+	0-
Medium Firms	68	10+	6-	0+	60-	66+	0-	26+	9-	41+	4-	12+	11-	42+	1-	30+	3-	13+	7-	47+	3-	68+	0-
Large Firms	68	8+	6-	0+	56-	67+	0-	12+	29-	29+	14-	17+	19-	48+	2-	19+	7-	17+	4-	47+	2-	68+	0-
All	203	24+	25-	1+	174-	192+	0-	82+	43-	104+	19-	36+	42-	133+	4-	74+	15-	41+	18-	145+	5-	203+	0-

6.9 Conclusion

This chapter has presented the GJR-GARCH-in- mean and variance equations. The ψ_i coefficients of the mean equation for all firms are low and predominantly insignificant across all the methodologies used in this study. Using both market capitalization and trading volume we document positive but insignificant relation between stocks' excess returns and risk for target firms. In contrast to negative and insignificant relationship between stocks' excess returns and risk for acquirer firms. While the α_i coefficients are highly negatively significant, those of the β_i coefficients are highly positively significant on stocks' excess returns for all firm sizes in the models. We found strong evidence that SMB_t and HML_t had much more explanatory power than MOM_t in explaining time series regression in returns, especially for acquirer firms. The μ_i coefficients for the permanent component have highly positive and significant for all firm sizes. We document that φ_i coefficients for past news have small positive and significant effects on the current conditional variance for all firms. It seems the δ_i coefficients for past conditional volatility do not have an effect on the current volatility on stocks' excess returns for all firms across all the methodologies applied in this empirical study. Finally, the η_i coefficients for the conditional asymmetry-the leverage effect are highly positive significant for all firms across all three methodologies. Indeed, positive asymmetry-leverage effect generated less volatility for both firms across all methodologies. In all our GJR-GARCH-M and variance equations under the three methodologies did not show substantial differences in our results.

CHAPTER SEVEN

BOOTSTRAPPING SIMULATION ON CARS

7.0 Introduction

One of the major setbacks of long-run event studies is the problem associated with data mining for the CARs obtained. Empirical evidence had shown that stock returns are non-normality distributed exhibit and heteroskedasticity (Malliaropulos, 1996; Hein and Westfall, 2004) and positive skewness (Barber and Lyon, 1997). These stylized features will affect estimation efficiency particular in event studies that rely on high frequency data. The main aim of using a nonparametric bootstrapping simulation is to solve the bias in standard errors estimation because no assumptions are made about the underlying sample data of the distribution. This chapter evaluates whether the CARs obtained under the various pricing models are statistically different from a bootstrapping simulation of the CARs themselves. Any difference in the two estimates will affect the reliability of the actual CARs.

7.1 Experiment

We used the bootstrapping simulation method to generate a sample of 401 (that is, a sample of 198 target firms and 203 acquirer firms) CARs for each stock in the sample by re-sampling with replacement from the actual CARs (see e.g. Conrad and Kaul, 1998). The bootstrapping is performed in simulation runs of 150, 500 and 1000 with replacement of the actual CARs. We use different replications to assess the reliability of the simulations. Statistical significance is based on the standard t-test, using a 90% confidence level. Some studies use different size draws. For example, Sullivan, Timmermann and White (1999) and Jegadeesh and Titman (2002) use 500 draws, whilst Barber and Lyon (1997) Kothari and Warner (1997) and Ahern (2008) used 1000 drawings. The literature has not been able to explain the assumption behind the use of drawings or replications when performing bootstrapping simulation. However, a snap look at the bootstrapping results in table 6.1 and 6.2 suggest that, the more consistent estimates for the skewness, kurtosis and Jarque-Bera are obtained at 1000 draws. As expected, at 1000 draws (compared with smaller draws), the standard errors are smaller and the distribution of the CARs tend to normality. Also, most of the skewness, kurtosis and Jarque-Bera were statistically significant when 1000 replications were performed, which indeed outperform 150 and 500 simulations.

The use of the non-parametric bootstrapping method has been suggested to arrest these methodological issues (Lyon, Barber and Tsai, 1999; Byun and Rozeff, 2003). Again, Kothari and Warmer (2006) noted that bootstrapping based on test statistics could solve cross-correlations leading to efficiency conclusions.

However, the literature has suggested that bootstrapping simulation might not solve most of the statistical issues associated with event studies (Mitchell and Stafford, 2000). Brav (1998, p.5) suggested that the bootstrapping methodology had two deficiencies. First, ''if the two samples have systematically different residual variation then the resulting empirical distribution will be biased''. Second, ''if the original sample ARs are cross-sectionally correlated the replacement with random sample, which are by construction uncorrelated, may lead to false inferences''. Furthermore, Kothari and Warner (2006) documented that the bootstrapping method had failed to rectify the bias in standard errors due to cross-correlated data. Based on these studies the bootstrapping is no panacea of the problems associated with the long-run studies. Appendix II shows the Statistics for Sample Skewness, Kurtosis and Jarque-Bera..

7.2 ROBUSTNESS of CARs for Target Firms under Standard CAPM

Table 7.1 and 7.2 reports the result of the bootstrapping simulation of the target firms' CARs using the standard CAPM. The simulations are performed for the CARs estimated under both the OLS and GJR-GARCH method. For comparison, the actual CARs are also shown in the tables. The simulation was limited to ± ten days around the event date since the actual CARs are effectively zero beyond this interval. Table 6.1 shows the bootstrapping simulation using the OLS method to evaluate the reliability of the performance of the actual CARs. On the event day, target firm shareholders realised statistically significant positive actual mean CAR under the OLS estimate. Under the GJR-GARCH in Table 6.2, a positive actual mean CAR was generated and is significant. The results of the simulated mean CARs on the event date are also significant under both estimation methods. The pre-event actual mean CARs are not significant for either estimation method. After the announcement, actual mean CARs under the OLS and the GJR-GARCH are statistically different. In contrast to actual mean CARs, our results in Table 6.1 and Table 6.2 indicated that bootstrapping mean CARs were statistically significant at 1% levels throughout the entire event window.

Table 7.1 Bootstrapping Simulation for Target Firms' CARs under the CAPM using OLS

	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0059*	0.0057[a]	-0.1055	0.0306	0.2842	*0.0059*	0.0057[a]	0.0899	-0.1346	1.0512	*0.0059*	0.0057[a]	0.0894	0.3886[b]	7.6249[b]
-9	*0.0087*[c]	0.0081[a]	0.4122[b]	0.9144[b]	9.4726[a]	*0.0087*[c]	0.0087[a]	0.1057	-0.1057	1.1632	*0.0087*[c]	0.0087[a]	0.0371	-0.0729	0.4510
-8	*0.0089*[c]	0.0090[a]	-0.0175	-0.1245	0.1045	*0.0089*[c]	0.0094[a]	0.0571	0.2471	1.5432	*0.0089*[c]	0.0087[a]	0.1957[b]	0.2678[c]	9.3737[a]
-7	*0.0093*[c]	0.0098[a]	0.0942	-0.0181	0.2241	*0.0093*[c]	0.0088[a]	0.2280[b]	0.0682	4.4274	*0.0093*[c]	0.0095[a]	0.0661	0.0877	1.0491
-6	*0.0062*	0.0062[a]	0.0689	0.0925	0.1722	*0.0062*	0.0061[a]	0.0639	0.0186	0.3473	*0.0062*	0.0062[a]	0.1542[b]	-0.0265	3.9929
-5	*0.0070*	0.0069[a]	0.4147[b]	0.0756	4.3346	*0.0070*	0.0070[a]	0.5518[a]	0.5022[b]	30.6322[a]	*0.0070*	0.0069[a]	0.3926[a]	0.2471	28.2304[a]
-4	*0.0056*	0.0052[a]	0.3869[c]	0.6119	6.0832[b]	*0.0056*	0.0057[a]	0.3810[a]	0.5718[a]	18.9100[a]	*0.0056*	0.0058[a]	0.3254[a]	-0.0064	17.6456[a]
-3	*0.0044*	0.0038[a]	0.3864[c]	0.2565	4.1431	*0.0044*	0.0045[a]	0.1793	0.7757[a]	15.2164[a]	*0.0044*	0.0044[a]	0.1971[b]	0.0804	6.7449[b]
-2	*0.0045*	0.0042[a]	-0.2701	-0.5650	3.8189	*0.0045*	0.0045[a]	0.2051[c]	-0.0286	3.5228	*0.0045*	0.0045[a]	0.3267[a]	0.1918	19.3197[a]
-1	*0.0012*	0.0012[a]	-0.3984[c]	-0.3698	4.8222[c]	*0.0012*	0.0012[a]	-0.0818	-0.0681	0.6540	*0.0012*	0.0012[a]	0.0208	0.0410	0.1421
0	*0.0400*[a]	0.0396[a]	-0.3288	0.5790	4.7974[c]	*0.0400*[a]	0.0398[a]	0.2262[b]	0.3260	6.4761[b]	*0.0400*[a]	0.0399[a]	0.2385[a]	0.2406	11.8942[a]
1	*0.0111*[b]	0.0105[a]	0.2652	0.1120	1.8366	*0.0111*[b]	0.0110[a]	0.4038[a]	0.2779	15.1966[a]	*0.0111*[b]	0.0111[a]	0.3062[a]	0.0178	15.6356[a]
2	*0.0117*[b]	0.0106[a]	0.5881[a]	0.1831	8.8551[b]	*0.0117*[b]	0.0118[a]	0.2610[b]	0.4304[b]	9.5357[a]	*0.0117*[b]	0.0118[a]	0.2601[a]	-0.0242	11.2982[a]
3	*0.0127*[b]	0.0128[a]	0.0528	-0.1626	0.2350	*0.0127*[b]	0.0127[a]	0.2329[b]	-0.2147	5.4797[c]	*0.0127*[b]	0.0124[a]	0.2517[a]	0.4488[a]	18.9555[a]
4	*0.0127*[b]	0.0126[a]	-0.0076	-0.0408	0.0119	*0.0127*[b]	0.0128[a]	0.2980[a]	0.2715	8.9347[b]	*0.0127*[b]	0.0132[a]	0.1437[c]	0.2267	5.5834[c]
5	*0.0108*[b]	0.0108[a]	0.2863	0.5777	4.1359	*0.0108*[b]	0.0105[a]	0.3134[a]	0.1350	8.5621[b]	*0.0108*[b]	0.0111[a]	0.3021[a]	0.4536[a]	23.7810[a]
6	*0.0140*[b]	0.0139[a]	0.4916[b]	0.2318	6.3768[b]	*0.0140*[b]	0.0141[a]	0.2355[b]	0.2056	5.5043[b]	*0.0140*[b]	0.0139[a]	0.2774[a]	0.2364	15.1522[a]
7	*0.0129*[b]	0.0128[a]	0.0879	-0.2881	0.7119	*0.0129*[b]	0.0126[a]	0.1834[c]	-0.4097[c]	6.3016[b]	*0.0129*[b]	0.0131[a]	0.1202	0.0546	2.5319
8	*0.0115*[c]	0.0114[a]	0.0601	-0.0775	0.1277	*0.0115*[c]	0.0121[a]	0.2709[b]	0.0956	6.3059[b]	*0.0115*[c]	0.0115[a]	0.3164[a]	0.3361[b]	21.3886[a]
9	*0.0119*[b]	0.0123[a]	0.0498	0.1939	0.2969	*0.0119*[b]	0.0120[a]	0.2008[c]	0.2167	4.3392	*0.0119*[b]	0.0119[a]	0.2311[a]	-0.0669	9.0851[b]
10	*0.0103*	0.0096[a]	0.0687	-0.3894	1.0654	*0.0103*	0.0097[a]	0.0227	-0.0729	0.1536	*0.0103*	0.0105[a]	0.1654[b]	0.1300	5.2618[b]

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

Table 7.2: Bootstrapping Simulation for Target Firms' CARs under the CAPM using GJR-GARCH Estimation															
	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0043*	0.0037[a]	-0.0976	-0.0587	0.2597	*0.0043*	0.0044[a]	-0.2240[b]	0.1492	4.6447[c]	*0.0043*	0.0042[a]	-0.1400[c]	0.2203	5.2900[c]
-9	*0.0071*	0.0067[a]	-0.0856	-0.5428	2.0246	*0.0071*	0.0066[a]	0.1944[c]	0.2284	4.2353	*0.0071*	0.0067[a]	-0.0276	0.2629[c]	3.0059
-8	*0.0071*	0.0064[a]	-0.1289	-0.3502	1.1822	*0.0071*	0.0075[a]	0.0221	-0.1791	0.7090	*0.0071*	0.0074[a]	-0.0038	0.0913	0.3498
-7	*0.0073*	0.0078[a]	-0.1094	-0.2520	0.6961	*0.0073*	0.0070[a]	-0.0368	-0.2826	1.7765	*0.0073*	0.0073[a]	0.0930	-0.0574	1.5775
-6	*0.0041*	0.0040[a]	0.0214	0.1901	0.2374	*0.0041*	0.0042[a]	-0.0111	0.1162	0.2915	*0.0041*	0.0042[a]	-0.1320[c]	0.5287[a]	14.5517[a]
-5	*0.0049*	0.0045[a]	-0.0636	-0.1513	0.2443	*0.0049*	0.0046[a]	0.1390	0.0004	1.6109	*0.0049*	0.0052[a]	0.1666[b]	0.0468	4.7161[c]
-4	*0.0034*	0.0036[a]	0.4767[b]	0.1507	5.8224[b]	*0.0034*	0.0031[a]	0.4531[a]	0.6836[a]	26.8459[a]	*0.0034*	0.0034[a]	0.1533[b]	-0.2148	5.8387[b]
-3	*0.0024*	0.0026[a]	0.0292	0.2498	0.4112	*0.0024*	0.0025[a]	0.2318[b]	-0.0054	4.4781	*0.0024*	0.0024[a]	0.0754	0.0970	1.3399
-2	*0.0027*	0.0027[a]	0.0246	-0.3073	0.6052	*0.0027*	0.0027[a]	0.3271[a]	0.3966[b]	12.1918[a]	*0.0027*	0.0027[a]	-0.0684	0.1407	1.6037
-1	*0.0007*	0.0004[a]	-0.0337	0.7246[c]	3.3099	*0.0007*	0.0006[a]	0.1906[b]	0.1143	3.3004	*0.0007*	0.0006[a]	-0.1445[c]	-0.0142	3.4908
0	*0.0399[a]*	0.0396[a]	0.0591	-0.5548	2.0113	*0.0399[a]*	0.0399[a]	0.2198[b]	0.2403	5.2295[c]	*0.0399[a]*	0.0401[a]	0.1187	0.1199	2.9480
1	*0.0110[b]*	0.0105[a]	0.3213	0.1303	2.6876	*0.0110[b]*	0.0109[a]	0.2738[b]	0.3197	8.3781[b]	*0.0110[b]*	0.0113[a]	0.2487[a]	0.0539	10.4282[a]
2	*0.0115[b]*	0.0106[a]	0.4301	0.0638	4.6495	*0.0115[b]*	0.0113[a]	0.1931[c]	-0.3589	5.7897[b]	*0.0115[b]*	0.0115[a]	0.3589[a]	-0.0022	21.4700[a]
3	*0.0125[b]*	0.0123[a]	0.1208	-0.0302	0.3707	*0.0125[b]*	0.0127[a]	0.2471[b]	0.3055	7.0323[b]	*0.0125[b]*	0.0125[a]	0.1370[c]	-0.2823[c]	6.4466[b]
4	*0.0126[b]*	0.0122[a]	-0.0304	-0.0185	0.0253	*0.0126[b]*	0.0111[a]	0.1818[c]	0.0381	2.7854	*0.0126[b]*	0.0126[a]	0.0625	0.0317	0.6922
5	*0.0107[c]*	0.0106[a]	-0.0681	0.5714	2.1563	*0.0107[c]*	0.0107[a]	0.0569	0.4418[b]	4.3351	*0.0107[c]*	0.0105[a]	0.1210	-0.0419	2.5139
6	*0.0142[b]*	0.0138[a]	0.2090	0.1556	1.2436	*0.0142[b]*	0.0141[a]	0.1567	0.0094	2.0471	*0.0142[b]*	0.0140[a]	0.1009	0.1782	3.0190
7	*0.0131[b]*	0.0121[a]	0.1331	0.0378	0.4516	*0.0131[b]*	0.0135[a]	0.2909[a]	0.6868[a]	16.8776[a]	*0.0131[b]*	0.0131[a]	0.1885[b]	0.1529	6.8931[b]
8	*0.0118*	0.0111[a]	0.2117	-0.3753	2.0008	*0.0118*	0.0118[a]	0.0410	-0.1759	0.7846	*0.0118*	0.0118[a]	-0.0074	0.2405	2.4197
9	*0.0124*	0.0111[a]	0.0459	0.2847	0.5592	*0.0124*	0.0128[a]	0.0145	-0.3200	2.1503	*0.0124*	0.0124[a]	0.0441	-0.1031	0.7662
10	*0.0109*	0.0112[a]	0.0278	0.6449	2.6191	*0.0109*	0.0107[a]	0.1848[c]	0.2062	3.7326	*0.0109*	0.0109[a]	-0.1008	0.0479	1.7882

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics..

Ten days to the announcement, the actual means CARs indicate that the market is efficient under both estimation methods whereas the bootstrapping mean CARs suggest that the market is not efficient. There is considerable evidence that most people will rely on the bootstrapping mean results more than the actual mean results, because they are simulated.

Despite variation of the level of significance of means, there are no considerable differences between the actual CARs and the bootstrapping CARs. However, it is interesting to note that the standard errors for the bootstrapping means were slightly smaller compared to the actual means (see also e.g. Mozouz et al. 2009). The results achieved from the means simulation of 150, 500 and 1000 replications showed no substantial discrepancy. The pre announcement actual means which are statistically different from the bootstrapping means, the post-announcement actual means are consistent with the bootstrapping means.

The results of the simulated CARs under both OLS and GJR-GARCH estimations were not materially different. Nevertheless, the skewness, kurtosis and Jarque-Bera were more significant under the OLS than the GJR-GARCH estimation, especially under the 1000 draws. The Jarque-Bera statistic under the OLS estimation showed that CARs were not normally distributed compared to the GJR-GARCH estimation.

7.3 ROBUSTNESS of CARs for Target Firms under Fama-French Model

The results indicated in Table 7.3 and Table 7.4 represent bootstrapping simulation for target firms' CARs under the Fama-French where the CARs are generated from the OLS and GJR-GARCH estimation methods. The results show that the simulated mean CARs generated over the entire ten days are statistically significant at 1% levels under both the OLS and GJR-GARCH estimates, with day t=-1 mean CAR using 150 draws under the GJR-GARCH estimate is insignificant. Following the announcement, the significance of the actual mean CARs under the OLS estimate contradicts considerable with those of the GJR-GARCH estimate. Here the significance of the actual CARs lasts a much shorter period relative to the standard CAPM which lasts much longer. The difference between the actual mean CARs and the simulated mean CARs was predictably small but significantly different.

Most of the simulated CARs were positively skewed under both estimation methods. However, the immense positive skewness occurred under the OLS estimates. It appears the returns on excess kurtosis are normally distributed under both estimation methods. The Jarque-Bera statistics show that using 150 replications are normally distributed under the GJR-GARCH estimates than the OLS estimates. Notice that the Jarque-Bera statistics under the OLS estimate were not normally distributed when 1000 simulations run; only three out of 21 returns are normally distributed.

The t-statistic rejects the null hypothesis that the two set of CARs are statistically different. Prior announcement simulated CARs are normally small compared to post announcement simulated CARs under both the OLS and GJR-GARCH method. Thus, given its potential impact the share prices of the target increase after the announcement for the economic benefit of the shareholders.

Table 7.3: Bootstrapping Simulation for Target Firms' CARs under the FF using OLS Estimation

	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0042*	0.0046[a]	0.1997	0.0709	1.0288	*0.0042*	0.0044[a]	0.3018[a]	0.0119	7.5916[b]	*0.0042*	0.0044[a]	0.1379[c]	0.0201	3.1866
-9	*0.0072*	0.0069[a]	0.0956	-0.3554	1.0177	*0.0072*	0.0071[a]	0.0469	-0.0412	0.2189	*0.0072*	0.0073[a]	0.0167	-0.0310	0.0869
-8	*0.0071*	0.0061[a]	0.2796	0.5241	3.6706	*0.0071*	0.0075[a]	0.1600	0.0041	2.1337	*0.0071*	0.0071[a]	0.1556[b]	0.0563	4.1676
-7	*0.0081[c]*	0.0087[a]	0.4116[b]	0.6189	6.6296[b]	*0.0081[c]*	0.0077[a]	0.3424[a]	0.5267[b]	15.5498[a]	*0.0081[c]*	0.0079[a]	0.1647[b]	0.0356	4.5748
-6	*0.0050*	0.0046[a]	0.3717[c]	0.1981	3.6992	*0.0050*	0.0050[a]	0.1621	0.0152	2.1933	*0.0050*	0.0046[a]	0.3548[a]	0.1124	21.5033[a]
-5	*0.0061*	0.0059[a]	0.4575[b]	0.1578	5.3871[c]	*0.0061*	0.0060[a]	0.4803[a]	0.5112[b]	24.6673[a]	*0.0061*	0.0062[a]	0.3535[a]	0.2207	22.8605[a]
-4	*0.0052*	0.0052[a]	0.2678	0.1734	1.9810	*0.0052*	0.0053[a]	0.3894[a]	0.4738[b]	17.3102[a]	*0.0052*	0.0051[a]	0.3828[a]	0.1187	25.0069[a]
-3	*0.0038*	0.0036[a]	0.3351[c]	0.3534	3.5874	*0.0038*	0.0038[a]	0.0913	0.2268	1.7653	*0.0038*	0.0038[a]	0.3272[a]	0.1019	18.2732[a]
-2	*0.0046*	0.0044[a]	0.0267	-0.3015	0.5859	*0.0046*	0.0048[a]	0.2084[b]	-0.2291	4.7113[c]	*0.0046*	0.0046[a]	0.2313[a]	0.1389	9.7192[a]
-1	*0.0009*	0.0008[a]	0.0147	-0.1581	0.1617	*0.0009*	0.0009[a]	0.1158	-0.1293	1.4654	*0.0009*	0.0008[a]	-0.0125	0.0098	0.0299
0	*0.0404[a]*	0.0404[a]	0.0311	-0.0964	0.0822	*0.0404[a]*	0.0403[a]	0.1812[b]	-0.0640	2.8229	*0.0404[a]*	0.0404[a]	0.2101[a]	-0.1521	8.3203[b]
1	*0.0107[b]*	0.0109[a]	0.5173[b]	0.2921	7.2235[b]	*0.0107[b]*	0.0109[a]	0.3496[a]	0.3966[c]	13.4629[a]	*0.0107[b]*	0.0105[a]	0.2202[a]	-0.1172	8.6549[b]
2	*0.0113[b]*	0.0111[a]	0.2014	-0.3762	1.8981	*0.0113[b]*	0.0107[a]	0.1674	0.1345	2.7107	*0.0113[b]*	0.0113[a]	0.4316[a]	0.4014[a]	37.7605[a]
3	*0.0127[b]*	0.0127[a]	0.2866	-0.1500	2.1949	*0.0127[b]*	0.0126[a]	0.3734[a]	0.4447[b]	15.7404[a]	*0.0127[b]*	0.0127[a]	0.2369[a]	0.0166	9.3689[a]
4	*0.0128[b]*	0.0129[a]	0.3309	0.8360[b]	7.1061[b]	*0.0128[b]*	0.0126[a]	0.1827[c]	-0.2869	4.4965	*0.0128[b]*	0.0128[a]	0.2565[a]	-0.0830	11.2562[a]
5	*0.0100[c]*	0.0099[a]	0.3057	-0.2130	2.6200	*0.0100[c]*	0.0100[a]	0.2964[a]	0.4484[b]	11.5096[a]	*0.0100[c]*	0.0097[a]	0.3370[a]	0.6908[a]	38.8048[a]
6	*0.0128[b]*	0.0134[a]	0.0580	0.1835	0.2946	*0.0128[b]*	0.0124[a]	0.1490	-0.1201	2.1504	*0.0128[b]*	0.0128[a]	0.0477	-0.3143[b]	4.4953
7	*0.0110[c]*	0.0110[a]	0.3902[b]	0.3781	4.7008[c]	*0.0110[c]*	0.0113[a]	0.3888[a]	0.5375[b]	18.6174[a]	*0.0110[c]*	0.0129[a]	0.3381[a]	0.3591[b]	24.4204[a]
8	*0.0095*	0.0100[a]	-0.2629	0.5230	3.4374	*0.0095*	0.0095[a]	0.1361	0.1736	2.1706	*0.0095*	0.0092[a]	0.1703[b]	0.1701	6.0378[b]
9	*0.0098*	0.0107[a]	0.4437[b]	0.4385	6.1231[b]	*0.0098*	0.0100[a]	-0.0268	-0.0859	0.2137	*0.0098*	0.0097[a]	0.0411	-0.0902	0.6207
10	*0.0083*	0.0076[a]	-0.0509	-0.5488	1.9473	*0.0083*	0.0083[a]	0.0943	-0.1547	1.2396	*0.0083*	0.0084[a]	0.1832[b]	0.2757[c]	8.7630[b]

Note: a, b, c indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

Table 7.4: Bootstrapping Simulation for Target Firms' CARs under the FF using GJR-GARCH Estimation															
	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0019*	0.0014^{b}	-0.1583	-0.0049	0.6264	*0.0019*	0.0022^{a}	-0.5380^{a}	0.3843^{c}	27.1933^{a}	*0.0019*	0.0022^{a}	-0.1440^{c}	0.0083	3.4569
-9	*0.0049*	0.0050^{a}	-0.2394	0.4028	2.4474	*0.0049*	0.0047^{a}	-0.2090^{b}	-0.0135	3.6445	*0.0049*	0.0052^{a}	-0.2511^{a}	0.3847^{b}	16.6788^{a}
-8	*0.0049*	0.0049^{a}	-0.2211	-0.3331	1.9157	*0.0049*	0.0048^{a}	-0.0015	0.0601	0.0755	*0.0049*	0.0049^{a}	-0.0818	0.2281	3.2841
-7	*0.0056*	0.0061^{a}	0.3832^{b}	0.0760	3.7067	*0.0056*	0.0062^{a}	-0.0883	0.0826	0.7924	*0.0056*	0.0056^{a}	0.1226	0.0699	2.7095
-6	*0.0027*	0.0023^{a}	-0.0929	-0.3711	1.0763	*0.0027*	0.0029^{a}	0.0639	-0.0141	0.3440	*0.0027*	0.0026^{a}	0.0618	0.2411	3.0588
-5	*0.0040*	0.0038^{a}	-0.0749	-0.7442^{c}	3.6019	*0.0040*	0.0042^{a}	0.1857^{c}	0.4637^{b}	7.3536^{b}	*0.0040*	0.0041^{a}	0.3031^{a}	0.4314^{a}	23.0721^{a}
-4	*0.0029*	0.0032^{a}	-0.1980	0.2557	1.3890	*0.0029*	0.0030^{a}	0.4440^{a}	0.5707^{a}	23.2143^{a}	*0.0029*	0.0028^{a}	0.2129^{a}	0.1061	8.0272^{b}
-3	*0.0020*	0.0019^{a}	0.1187	0.2791	0.8393	*0.0020*	0.0019^{a}	0.0710	0.4781^{b}	5.1827^{c}	*0.0020*	0.0019^{a}	0.1150	0.0666	2.3906
-2	*0.0027*	0.0027^{a}	0.1858	-0.3673	1.7067	*0.0027*	0.0027^{a}	0.1357	0.3158	3.6122	*0.0027*	0.0027^{a}	-0.0515	0.0135	0.4505
-1	*0.0002*	0.0002	0.0614	0.2298	0.4244	*0.0002*	0.0001^{c}	-0.1700	-0.1898	3.1580	*0.0002*	0.0002^{a}	0.0689	-0.0611	0.9470
0	*0.0399*^{a}	0.0397^{a}	-0.0242	-0.3855	0.9434	*0.0399*^{a}	0.0404^{a}	0.0175	0.0377	0.0550	*0.0399*^{a}	0.0399^{a}	0.0604	-0.1255	1.2646
1	*0.0108*^{b}	0.0116^{a}	0.1861	-0.0786	0.9049	*0.0108*^{b}	0.0105^{a}	0.2978^{a}	0.3890^{c}	10.5424^{a}	*0.0108*^{b}	0.0106^{a}	0.2369^{a}	0.1431	10.2041^{a}
2	*0.0109*^{b}	0.0114^{a}	0.3134	0.2934	2.9927	*0.0109*^{b}	0.0111^{a}	0.2020^{b}	0.1630	3.9526	*0.0109*^{b}	0.0113^{a}	0.2222^{a}	-0.0725	8.4506^{b}
3	*0.0121*^{b}	0.0120^{a}	0.6411^{a}	1.5797^{a}	25.8702^{a}	*0.0121*^{b}	0.0122^{a}	0.0564	-0.3292	2.5228	*0.0121*^{b}	0.0121^{a}	0.0897	-0.2631^{c}	4.2239
4	*0.0121*^{b}	0.0118^{a}	0.3135	-0.1939	2.6915	*0.0121*^{b}	0.0130^{a}	0.4196^{a}	0.1603	15.2063^{a}	*0.0121*^{b}	0.0119^{a}	0.1953^{b}	0.1904	7.8650^{b}
5	*0.0096*	0.0098^{a}	0.0589	0.0952	0.1433	*0.0096*	0.0095^{a}	0.0997	-0.3001	2.7033	*0.0096*	0.0094^{a}	0.0841	-0.0393	1.2439
6	*0.0127*^{b}	0.0131^{a}	0.3810^{b}	0.4220	4.7416^{c}	*0.0127*^{b}	0.0133^{a}	0.2138^{b}	0.0552	3.8715	*0.0127*^{b}	0.0128^{a}	0.2028^{a}	-0.0090	6.8593^{b}
7	*0.0112*	0.0100^{a}	0.0377	-0.2900	0.5612	*0.0112*	0.0114^{a}	-0.0671	0.0071	0.3765	*0.0112*	0.0113^{a}	-0.0553	-0.0856	0.8150
8	*0.0095*	0.0120^{a}	-0.0369	-0.0260	0.0382	*0.0095*	0.0095^{a}	0.0482	-0.1367	0.5827	*0.0095*	0.0094^{a}	-0.0016	0.2238	2.0870
9	*0.0099*	0.0120^{a}	0.3163	-0.4042	3.5221	*0.0099*	0.0100^{a}	0.0687	0.0518	0.4491	*0.0099*	0.0100^{a}	-0.0209	-0.1722	1.3089
10	*0.0086*	0.0116^{a}	0.1222	-0.3985^{a}	1.3654^{a}	*0.0086*	0.0085^{a}	-0.0360	-0.2544	1.4566	*0.0086*	0.0085^{a}	0.0581	-0.2409	2.9800

Note: a, b, c indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

7.4 ROBUSTNESS of CARs for Target Firms under Carhart Model

In Table 6.5 and Table 6.6 simulation were performed on the actual CARs for the target firms under the Carhart using the two estimation methods. The simulations were executed on the actual CARs with replacement using the same replications. The results show that under both the OLS and GJR-GARCH methods, on the event date t=0 positive actual mean CAR and simulated mean CAR are obtained which are both significant at 1% levels. Moreover, the simulated mean CARs are significant at 1% conventional levels for ten days (-10, +10), pre- and post-announcement under both estimation methods. Interestingly, following the announcement, the actual mean CARs under both the OLS and GJR-GARCH estimations are statistically significant up to seven continuous days.

There was no extensive difference between the actual mean CARs and the bootstrapping mean CARs using the same replications, but rather we obtained closer results whatever drawings we made. As already indicated, the bootstrapping simulated standard errors are typically small and that might have the bootstrapping simulated mean CARs statistically significant before the announcement. Most positive skewed were pronounced under the OLS estimates than the GJR-GARCH estimates. Furthermore, the returns of skewness were mostly significant under the OLS estimates than the GJR-GARCH estimate using 500 and 1000 draws. The results of kurtosis suggested that the returns are normally distributed under both estimation methods. The Jarque-Bera statistics are normally distributed when 150 simulations run but mostly not statistically significant.

Table 7.5: Bootstrapping Simulation for Target Firms' CARs under the Carhart using OLS Estimation

	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0046*	0.0051[a]	-0.0441	0.1019	0.1135	*0.0046*	0.0047[a]	0.0061	0.0038	0.0034	*0.0046*	0.0043[a]	0.0914	0.2024	3.1001
-9	*0.0075*	0.0074[a]	-0.0392	-0.6103	2.3666	*0.0075*	0.0079[a]	0.2142[b]	0.6985[a]	13.9857[a]	*0.0075*	0.0075[a]	0.1434[c]	-0.1070	3.9052
-8	*0.0070*	0.0068[a]	0.0073	-0.0763	0.0377	*0.0070*	0.0073[a]	0.1949[c]	0.3782[c]	6.1459[b]	*0.0070*	0.0070[a]	0.2492[a]	0.0437	10.4282[a]
-7	*0.0076*	0.0077[a]	0.3273	-0.1846	2.8914	*0.0076*	0.0081[a]	0.2647[b]	0.2742	7.4036[b]	*0.0076*	0.0076[a]	0.1519[b]	-0.1177	4.4244
-6	*0.0044*	0.0046[a]	0.2474	0.1491	1.6693	*0.0044*	0.0046[a]	0.3894[a]	0.3203	14.7720[a]	*0.0044*	0.0044[a]	0.1415[b]	0.1190	3.9249
-5	*0.0055*	0.0049[a]	0.3391[c]	0.4539	4.1619	*0.0055*	0.0056[a]	0.5837[a]	0.4556[b]	32.7184[a]	*0.0055*	0.0055[a]	0.3992[a]	0.4030[a]	33.3252[a]
-4	*0.0047*	0.0047[a]	0.4916[b]	0.3477	6.7966[b]	*0.0047*	0.0046[a]	0.5344[a]	0.4517[b]	28.0467[a]	*0.0047*	0.0047[a]	0.3772[a]	0.0355	23.7643[a]
-3	*0.0036*	0.0034[a]	0.2381	-0.1950	1.6545	*0.0036*	0.0035[a]	0.1521	0.1634	2.4832	*0.0036*	0.0036[a]	0.1645[b]	-0.0678	4.7013[c]
-2	*0.0042*	0.0039[a]	0.2320	-0.0538	1.3640	*0.0042*	0.0043[a]	0.3408[a]	-0.1075	9.9210[a]	*0.0042*	0.0043[a]	0.2447[a]	0.1256	10.6347[a]
-1	*0.0009*	0.0008[a]	0.0550	0.0672	0.1039	*0.0009*	0.0009[a]	-0.0029	0.0734	0.1130	*0.0009*	0.0010[a]	0.0292	0.0290	0.1774
0	*0.0396[a]*	0.0407[a]	0.0126	-0.2715	0.4646	*0.0396[a]*	0.0396[a]	0.1461	-0.1096	2.0288	*0.0396[a]*	0.0400[a]	0.2618[a]	0.3826[b]	17.5206[a]
1	*0.0108[b]*	0.0108[a]	-0.0755	-0.0743	0.1769	*0.0108[b]*	0.0105[a]	0.2702[b]	-0.2037	6.9486[b]	*0.0108[b]*	0.0105[a]	0.2562[a]	-0.1837	12.3423[a]
2	*0.0114[b]*	0.0112[a]	0.3974[b]	0.0128	3.9489	*0.0114[b]*	0.0114[a]	0.1080	-0.4072[c]	4.4260	*0.0114[b]*	0.0116[a]	0.1902[b]	0.2409	8.4502[b]
3	*0.0127[b]*	0.0125[a]	0.1511	-0.0006	0.5707	*0.0127[b]*	0.0126[a]	0.2762[b]	0.1147	6.6319[b]	*0.0127[b]*	0.0127[a]	0.2640[a]	-0.0940	11.9801[a]
4	*0.0127[b]*	0.0132[a]	0.3183	0.6041	4.8144[c]	*0.0127[b]*	0.0125[a]	0.1992[c]	-0.0348	3.3315	*0.0127[b]*	0.0128[a]	0.1217	0.1844	3.8844
5	*0.0099[c]*	0.0102[a]	0.1512	-0.1739	0.7604	*0.0099[c]*	0.0095[a]	0.2190[b]	-0.0228	4.0060	*0.0099[c]*	0.0101[a]	0.2126[a]	0.1666	8.6878[b]
6	*0.0128[b]*	0.0131[a]	0.2661	0.3072	2.3599	*0.0128[b]*	0.0101[a]	0.2275[b]	-0.0605	4.3883	*0.0128[b]*	0.0130[a]	0.2848[a]	0.3449[b]	18.4742[a]
7	*0.0108[c]*	0.0110[a]	0.2572	-0.4643	3.0014	*0.0108[c]*	0.0104[a]	0.2594[b]	0.0937	5.7896[b]	*0.0108[c]*	0.0107[a]	0.3046[a]	0.1378	16.2526[a]
8	*0.0091*	0.0084[a]	0.4221[b]	-0.0741	4.4879	*0.0091*	0.0092[a]	0.2377[b]	0.0766	4.8307[c]	*0.0091*	0.0090[a]	0.4157[a]	0.3273[b]	33.2648[a]
9	*0.0096*	0.0100[a]	0.3905[b]	0.0875	3.8593	*0.0096*	0.0097[a]	0.3418[a]	0.3606	12.4439[a]	*0.0096*	0.0093[a]	0.2070[a]	0.4550[a]	15.7661[a]
10	*0.0081*	0.0087[a]	0.4148[b]	0.0407	4.3113	*0.0081*	0.0084[a]	0.3465[a]	0.0607	10.0792[a]	*0.0081*	0.0079[a]	0.1208	0.1771	3.7382

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

Table 7.6: Bootstrapping Simulation for Target Firms' CARs under the Carhart using GJR-GARCH Estimation															
	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0028*	0.0037[a]	0.1069	-0.5835	2.4136	*0.0028*	0.0028[a]	-0.2129[b]	-0.2497	5.0782[c]	*0.0028*	0.0028[a]	-0.1909[b]	-0.1783	7.3992[b]
-9	*0.0056*	0.0053[a]	-0.4166[b]	0.4020	5.3492[c]	*0.0056*	0.0053[a]	-0.1802	0.0038	2.7057	*0.0056*	0.0051[a]	-0.2311[a]	0.1560	9.9128[a]
-8	*0.0058*	0.0058[a]	-0.1509	0.4772	1.9920	*0.0058*	0.0055[a]	0.1253	-0.2376	2.4833	*0.0058*	0.0058[a]	-0.0254	-0.0514	0.2170
-7	*0.0061*	0.0062[a]	-0.0441	-0.2368	0.3991	*0.0061*	0.0060[a]	-0.0815	0.0442	0.5935	*0.0061*	0.0060[a]	-0.1020	0.0001	1.7326
-6	*0.0032*	0.0040[a]	0.2989	0.6518	4.8884[c]	*0.0032*	0.0030[a]	0.0388	-0.1133	0.3927	*0.0032*	0.0032[a]	-0.0321	0.2582[c]	2.9502
-5	*0.0036*	0.0031[a]	0.0194	-0.0221	0.0124	*0.0036*	0.0040[a]	0.1483	0.4020[c]	5.1990[c]	*0.0036*	0.0038[a]	0.2946[a]	0.3336[b]	19.1062[a]
-4	*0.0030*	0.0033[a]	-0.0182	0.0560	0.0278	*0.0030*	0.0033[a]	-0.1037	-0.1633	1.4509	*0.0030*	0.0032[a]	0.2542[a]	0.2806[c]	14.0498[a]
-3	*0.0021*	0.0022[a]	-0.0932	0.0004	0.2173	*0.0021*	0.0019[a]	0.2267[b]	-0.0412	4.3188	*0.0021*	0.0020[a]	-0.0124	0.0034	0.0261
-2	*0.0026*	0.0026[a]	-0.0357	-0.0359	0.0399	*0.0026*	0.0022[a]	-0.0569	0.5193[b]	5.8882[b]	*0.0026*	0.0025[a]	-0.0922	-0.0333	1.4639
-1	*0.0003*	0.0002	-0.0525	-0.1162	0.1534	*0.0003*	0.0004[a]	-0.0939	-0.2495	2.0316	*0.0003*	0.0003[a]	-0.0737	0.2332	3.1728
0	*0.0396[a]*	0.0396[a]	-0.1077	-0.0226	0.2931	*0.0396[a]*	0.0395[a]	0.3535[a]	0.2247	11.4674[a]	*0.0396[a]*	0.0396[a]	0.1661[b]	0.0577	4.7386[c]
1	*0.0110[b]*	0.0110[a]	0.2416	-0.2146	1.7466	*0.0110[b]*	0.0111[a]	0.1533	0.2461	3.2200	*0.0110[b]*	0.0110[a]	0.2423[a]	0.0688	9.9843[a]
2	*0.0113[b]*	0.0110[a]	0.4230[b]	0.3261	5.1381[c]	*0.0113[b]*	0.0115[a]	0.1534	0.1968	2.7667	*0.0113[b]*	0.0114[a]	0.3338[a]	0.1953	20.1650[a]
3	*0.0132[b]*	0.0138[a]	0.0936	-0.3002	0.7822	*0.0132[b]*	0.0130[a]	0.3960[a]	0.6457[a]	21.7571[a]	*0.0132[b]*	0.0130[a]	0.2216[a]	0.2384	10.5537[a]
4	*0.0139[b]*	0.0139[a]	-0.3289	-0.0946	2.7602	*0.0139[b]*	0.0137[a]	0.2227[b]	0.4854[b]	9.0415[b]	*0.0139[b]*	0.0142[a]	0.0909	-0.1431	2.2295
5	*0.0114[c]*	0.0113[a]	-0.0676	0.7077[c]	3.2443	*0.0114[c]*	0.0113[a]	0.2794[b]	0.0612	6.5817[b]	*0.0114[c]*	0.0113[a]	0.2173[a]	-0.2042	9.6089[a]
6	*0.0139[b]*	0.0147[a]	0.1176	0.2453	0.7215	*0.0139[b]*	0.0140[a]	0.2588[b]	0.5878[a]	12.7772[a]	*0.0139[b]*	0.0136[a]	0.0793	-0.0812	1.3232
7	*0.0121[c]*	0.0120[a]	0.1905	0.0167	0.9091	*0.0121[c]*	0.0121[a]	0.0125	0.1503	0.4836	*0.0121[c]*	0.0123[a]	0.1263	-0.1470	3.5587
8	*0.0105*	0.0107[a]	-0.0767	-0.0526	0.1643	*0.0105*	0.0109[a]	0.1348	-0.0105	1.5173	*0.0105*	0.0104[a]	0.1888[b]	0.4178[a]	13.2140[a]
9	*0.0105*	0.0114[a]	0.1800	0.4398	2.0190	*0.0105*	0.0106[a]	-0.0989	0.1353	1.1963	*0.0105*	0.0104[a]	0.0809	-0.1569	2.1169
10	*0.0090*	0.0083[a]	0.1312	-0.4368	1.6230	*0.0090*	0.0090[a]	-0.1645	0.3880[c]	5.3917[c]	*0.0090*	0.0087[a]	-0.0361	0.1811	1.5838

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

In this subsection, it can be seen that the CARs for the target firms are not significant prior to the announcement date signifying that the market is efficient across all three methodologies used in this study. To summarise our model specifications, it is important to know that the bootstrapping mean CARs generated under the three methodologies are not significantly different. However, under the OLS and GJR-GARCH estimation methods, we observed somewhat discrepancies in terms of the statistical significance of skewness, kurtosis and Jarque-Bera statistics. For target firms, most of the skewness, kurtosis and Jarque-Bera under the OLS method are significant relative to the GJR-GARCH method especially for 500 and 1000 replications. The results achieved for the target firms for statistical significance of skewness, kurtosis and Jarque-Bera statistics under the two estimation methods are directly opposite to the acquirer firms.

7.5 ROBUSTNESS of CARs for Acquirer Firms under Standard CAPM

Table 6.7 and Table 6.8 shows bootstrapping simulation for acquirer firms' CARs under the standard CAPM where the CARs are generated from the OLS and GJR-GARCH estimation methods. The simulations were executed on sample of 203 on the actual CARs with replacement by using 150, 500 and 1000 replications. The actual mean CARs at the event date (t=0) for the acquirer firms are insignificant for both estimation methods. The actual mean CARs over the window of nine days (t=-10 up to t-2) are statistically significant under the OLS estimation for all drawing. It appears the significance of those actual mean CARs were unrelated to the event. On the contrary, the results under the GJR-GARCH produced unequal results, with

Table 7.7: Bootstrapping Simulation for Acquirer Firms' CARs under the CAPM using OLS Estimation															
	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0174*[a]	0.0174[a]	0.1036	-0.2487	0.6550	*0.0174*[a]	0.0171[a]	0.1104	0.5049[b]	6.3283[b]	*0.0174*[a]	0.0175[a]	0.1804[b]	0.3859[b]	11.6304[a]
-9	*0.0133*[b]	0.0133[a]	0.1913	0.7335[c]	4.2771	*0.0133*[b]	0.0136[a]	0.0397	-0.1252	0.4579	*0.0133*[b]	0.0137[a]	0.0064	0.1204	0.6110
-8	*0.0133*[b]	0.0122[a]	0.2183	-0.0171	1.1933	*0.0133*[b]	0.0135[a]	0.2164[b]	0.0909	4.0741	*0.0133*[b]	0.0135[a]	0.1119	-0.1970	3.7036
-7	*0.0124*[b]	0.0121[a]	0.2318	0.1937	1.5772	*0.0124*[b]	0.0124[a]	0.0806	0.1753	1.1820	*0.0124*[b]	0.0126[a]	0.0689	-0.2371	3.1320
-6	*0.0108*[b]	0.0111[a]	0.2303	0.3099	1.9259	*0.0108*[b]	0.0109[a]	0.1917[c]	-0.2280	4.1452	*0.0108*[b]	0.0106[a]	0.2058[a]	0.0779	7.3091[b]
-5	*0.0104*[b]	0.0107[a]	0.2793	0.0660	1.9775	*0.0104*[b]	0.0101[a]	0.0669	-0.2562	1.7403	*0.0104*[b]	0.0103[a]	0.2721[a]	0.0778	12.5924[a]
-4	*0.0088*[b]	0.0087[a]	0.1099	-0.3617	1.1195	*0.0088*[b]	0.0088[a]	0.2861[a]	0.0549	6.8823[b]	*0.0088*[b]	0.0089[a]	0.2197[a]	0.1682	9.2241[a]
-3	*0.0079*[b]	0.0081[a]	0.4936[b]	1.3177[a]	16.9421[a]	*0.0079*[b]	0.0078[a]	0.2050[c]	0.5321[b]	9.4011[a]	*0.0079*[b]	0.0077[a]	0.3190[a]	0.0890	17.2906[a]
-2	*0.0048*[b]	0.0004[b]	0.0745	0.4734	1.5393	*0.0048*[b]	0.0048[a]	0.0512	-0.1744	0.8522	*0.0048*[b]	0.0047[a]	0.0985	-0.0868	1.9308
-1	*0.0014*	0.0014[a]	0.3616[b]	0.4059	4.2982	*0.0014*	0.0013[a]	0.1162	0.4547[b]	5.4312[c]	*0.0014*	0.0014[a]	0.1113[c]	0.2956[b]	5.7057[b]
0	*0.0025*	0.0017[a]	-0.1899	-0.3127	1.5132	*0.0025*	0.0027[a]	0.2078[b]	0.1957	4.3952	*0.0025*	0.0024[a]	0.1329	-0.0248	2.9678
1	*0.0035*	0.0040[a]	0.0892	0.1754	0.3913	*0.0035*	0.0035[a]	0.0211	-0.2133	0.9846	*0.0035*	0.0033[a]	0.0027	0.0688	0.1985
2	*0.0031*	0.0035[a]	0.0222	-0.0184	0.0144	*0.0031*	0.0031[a]	0.1941[c]	0.5528[b]	9.5062[a]	*0.0031*	0.0030[a]	0.0016	0.1250	0.6511
3	*0.0001*	0.0002	-0.1787	0.2165	1.0914	*0.0001*	0.0001	-0.0867	0.1531	1.1141	*0.0001*	0.0001	-0.0514	0.1684	1.6223
4	*-0.0021*	-0.0022[a]	-0.0124	0.2333	0.3441	*-0.0021*	-0.0001	-0.1362	-0.0532	1.6052	*-0.0021*	-0.0020[a]	-0.0527	-0.0502	0.5677
5	*-0.0019*	-0.0017[a]	0.0480	0.6721	2.8813	*-0.0019*	-0.0020[a]	0.0055	-0.1899	0.7535	*-0.0019*	-0.0019[a]	0.0261	0.0661	0.2960
6	*-0.0003*	-0.0004	0.0929	0.0431	0.2274	*-0.0003*	-0.0002	0.0863	0.3043	2.5501	*-0.0003*	-0.0003[b]	0.0255	0.0091	0.1122
7	*0.0013*	0.0014[a]	0.0098	-0.0276	0.0071	*0.0013*	0.0012[a]	-0.0357	0.2094	1.0194	*0.0013*	0.0013[a]	-0.0238	-0.1192	0.6863
8	*0.0000*	0.0046[a]	-0.0323	-0.6196	2.4251	*0.0000*	0.0003	0.1719	0.0058	2.4640	*0.0000*	0.0002	0.1008	0.1944	3.2683
9	*0.0006*	0.0007[c]	0.1443	0.4296	1.6735	*0.0006*	0.0011[a]	-0.1470	-0.0817	1.9387	*0.0006*	0.0009[a]	-0.1228	0.2049	4.2602
10	*-0.0002*	-0.0002	-0.1915	-0.0811	0.9578	*-0.0002*	-0.0002	-0.0217	-0.0680	0.1356	*-0.0002*	-0.0003[c]	0.0174	-0.1319	0.7749

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

Table 7.8: Bootstrapping Simulation for Acquirer Firms' CARs under the CAPM using GJR-GARCH Estimation															
	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0070*	0.0075[a]	-0.6273[a]	0.8441[b]	14.2919[a]	*0.0070*	0.0075[a]	-0.7418[a]	0.8881[a]	62.2823[a]	*0.0070*	0.0069[a]	-0.7643[a]	0.8053[a]	124.3836[a]
-9	*0.0041*	0.0041[a]	-0.5879[a]	0.0642	8.6663[b]	*0.0041*	0.0040[a]	-0.5471[a]	0.3478	27.4627[a]	*0.0041*	0.0052[a]	-0.6540[a]	0.2871[c]	74.7262[a]
-8	*0.0049*	0.0032[a]	-0.9331[a]	1.8162[a]	42.3835[a]	*0.0049*	0.0047[a]	-0.5725[a]	0.2144	28.2707[a]	*0.0049*	0.0046[a]	-0.5703[a]	0.9250[a]	89.8698[a]
-7	*0.0048*	0.0051[a]	-0.9000[a]	0.8306[b]	24.5632[a]	*0.0048*	0.0049[a]	-0.4093[a]	0.0091	13.9634[a]	*0.0048*	0.0045[a]	-0.5058[a]	0.1826	44.0332[a]
-6	*0.0042*	0.0042[a]	-0.2825	-0.2681	2.4442	*0.0042*	0.0046[a]	-0.3786[a]	0.0945	12.1299[a]	*0.0042*	0.0037[a]	-0.6071[a]	0.6897[a]	81.2478[a]
-5	*0.0050*	0.0040[a]	-0.5204[a]	0.0941	6.8259[a]	*0.0050*	0.0050[a]	-0.6066[a]	1.1899[a]	60.1657[a]	*0.0050*	0.0051[a]	-0.4115[a]	0.3533[b]	33.4181[a]
-4	*0.0044*	0.0049[a]	-0.7054[a]	1.5166[a]	26.8167[a]	*0.0044*	0.0045[a]	-0.4202[a]	0.2458	15.9721[a]	*0.0044*	0.0042[a]	-0.5722[a]	0.7054[a]	75.3054[a]
-3	*0.0045*	0.0040[a]	-0.1959	0.6797[c]	3.8470	*0.0045*	0.0044[a]	-0.3304[a]	0.0797	9.2275[a]	*0.0045*	0.0046[a]	-0.4640[a]	0.3534[b]	41.0943[a]
-2	*0.0024*	0.0026[a]	0.0037	-0.0201	0.0029	*0.0024*	0.0023[a]	-0.2558[b]	-0.1572	5.9680[b]	*0.0024*	0.0024[a]	-0.4403[a]	0.2651[c]	35.2322[a]
-1	*0.0001*	0.0000	-0.1345	0.1068	0.5237	*0.0001*	0.0001	-0.3652[a]	0.7427[a]	22.6100[a]	*0.0001*	0.0000	-0.2925[a]	-0.1386	15.0580[a]
0	*0.0012*	0.0007[b]	0.2145	0.3465	1.9003	*0.0012*	0.0013[a]	0.2589[b]	0.2165	6.5639[b]	*0.0012*	0.0012[a]	0.0822	-0.1727	2.3687
1	*0.0020*	0.0024[a]	0.0977	-0.1418	0.3641	*0.0020*	0.0020[a]	-0.1091	0.0467	1.0367	*0.0020*	0.0021[a]	-0.0328	-0.0050	0.1802
2	*0.0006*	0.0010[a]	-0.2829	0.0376	2.0090	*0.0006*	0.0003	-0.4155	0.6328	22.7311	*0.0006*	0.0004[a]	-0.2421[a]	0.0900	10.1040[a]
3	*-0.0033*	-0.0043[a]	-0.3175	0.3543	3.3050	*-0.0033*	-0.0031[a]	-0.3273[a]	-0.1283	9.2704[a]	*-0.0033*	-0.0033[a]	-0.3177[a]	0.0280	16.8591[a]
4	*-0.0062*	-0.0066[a]	-0.5578[a]	0.8556[b]	12.3531[a]	*-0.0062*	-0.0063[a]	-0.3962[a]	-0.0750	13.1975[a]	*-0.0062*	-0.0060[a]	-0.4000[a]	0.3809[b]	32.7141[a]
5	*-0.0072*	-0.0075[a]	-0.3490[c]	0.1048	3.1143	*-0.0072*	-0.0073[a]	-0.5972[a]	0.4441[b]	33.8323[a]	*-0.0072*	-0.0071[a]	-0.6959[a]	0.6290[a]	97.1917[a]
6	*-0.0063*	-0.0077[a]	-0.7187[a]	0.3298	13.5921[a]	*-0.0063*	-0.0067[a]	-0.8023[a]	1.0707[a]	77.5226[a]	*-0.0063*	-0.0061[a]	-0.7448[a]	1.2998[a]	162.8415[a]
7	*-0.0057*	-0.0068[a]	-0.4129[a]	-0.0936	4.3161	*-0.0057*	-0.0058[a]	-0.6473[a]	0.6734[a]	44.3696[a]	*-0.0057*	-0.0070[a]	-0.7210[a]	0.5851[a]	100.9057[a]
8	*-0.0081*	-0.0070[a]	-0.8442[a]	0.7080[c]	20.9485[a]	*-0.0081*	-0.0080[a]	-0.3410[a]	-0.0667	9.7812[a]	*-0.0081*	-0.0076[a]	-0.7831[a]	0.9812[a]	142.3115[a]
9	*-0.0086*	-0.0055[a]	-0.5768[a]	-0.0037	8.3188[b]	*-0.0086*	-0.0079[a]	-0.8104[a]	0.5516[b]	61.0720[a]	*-0.0086*	-0.0091[a]	-0.6995[a]	1.0157[a]	124.5275[a]
10	*-0.0104*	-0.0093[a]	-0.8225[a]	0.5044	18.5045[a]	*-0.0104*	-0.0114[a]	-0.7385[a]	0.4157[b]	49.0487[a]	*-0.0104*	-0.0105[a]	-0.7479[a]	0.4287[a]	100.8957[a]

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

actual mean CARs over the same window are insignificant. The pre- and post-event simulated mean CARs under the OLS estimate over the window of thirteen days (t=-10 up to t=+2) are significant at 1% conventional levels. Post-announcement simulated mean CARs under the GJR-GARCH estimate using 150 and 1000 drawings are statistically significant at 1% levels for ten days (t=+1 up to t=+10). Furthermore, day t=-2 to t=-10 simulated mean CARs are also significant. Using 500 draws, the simulated mean CARs over two day window (t=0 up to t=1) centred on the event, are significant. Again, as noted, the pre- and post-announcement date simulated mean CARs are not significant immediately following the event date. The significant mean CARs are for t=-2 and earlier and t=+3 and afterwards nevertheless only for GJR-GARCH method using 500 draws.

Under the GJR=GARCH estimates, returns are normally negatively skewed and mostly statistically significant compared to the OLS estimates which are positively skewed and less statistically significant. The measure of kurtosis indicates that returns are normally distributed but less significant under both the OLS and GJR-GARCH estimates. The Jarque-Bera statistics under both estimation methods show a different pattern. Under the OLS estimates returns are normally distributed but less significant, whilst under the GJR-GARCH estimates returns are not normally distributed but mostly significant.

The magnitude of those CARs do not seem to materially different with those of the Fama-French model. Nevertheless, the significance of the simulated mean CARs under the CAPM model contradicts considerable with those of the simulated mean CARs of the Fama-French model.

7.6 ROBUSTNESS of CARs for Acquirer Firms under Fama-French Model

The results presented in Table 7.9 and Table 7.10 show bootstrapping simulation for acquirer firms' CARs under Fama-French three-factor where the CARs are generated from the same estimation methods. The results reported in Table 6.9 and Table 6.10 indicate that the simulated mean CARs are statistically significant at 1% conventional levels over the window of twenty-one days (-10 up to +10) under both the OLS and GJR-GARCH, but day t=+7 is insignificant when 150 draws are made only under the OLS estimates.

As can be seen, the post-event actual mean CARs and bootstrapping mean CARs from t=+3 and onwards for acquirer firms' are negative across all the three methodologies and the two estimation methods that were applied in this present study. Furthermore, pre-event actual mean CARs and bootstrapping mean CARs are bigger than post-event actual mean CARs and bootstrapping mean CARs. These results are in harmony with the literature that the share price of the acquirer firms generally decreases at announcement of a takeover. Our results are similar to Rosen (2006) and Le and Schultz (2007) who documented either insignificant or negative ARs for acquirer firms after announcement of takeover. There was an interesting revelation in relation to the skewness, kurtosis and Jarque-Bera returns under the OLS and GJR-GARCH methods demonstrate similar results as one achieved under the CAPM model.

Table 7.9: Bootstrapping Simulation for Acquirer Firms' CARs under the FF using OLS Estimation

	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0158*[a]	0.0155[a]	0.0704	0.1251	0.2215	*0.0158*[a]	0.0153[a]	-0.0238	-0.1957	0.8448	*0.0158*[a]	0.0154[a]	0.2159[a]	0.1794	9.1073[b]
-9	*0.0116*[b]	0.0115[a]	0.0115	0.0063	0.0035	*0.0116*[b]	0.0116[a]	-0.0316	0.0040	0.0834	*0.0116*[b]	0.0116[a]	0.0794	-0.1448	1.9245
-8	*0.0116*[b]	0.0116[a]	0.3190	-0.0466	2.5576	*0.0116*[b]	0.0117[a]	0.0448	-0.1553	0.6694	*0.0116*[b]	0.0117[a]	0.0603	-0.1845	2.0235
-7	*0.0112*[b]	0.0111[a]	0.1891	0.0292	0.8989	*0.0112*[b]	0.0109[a]	0.0858	0.4899[b]	5.6136[c]	*0.0112*[b]	0.0114[a]	0.0378	0.0640	0.4084
-6	*0.0099*[b]	0.0100[a]	0.2728	-0.0839	1.9039	*0.0099*[b]	0.0099[a]	0.0962	-0.0266	0.7864	*0.0099*[b]	0.0099[a]	0.1739[b]	-0.1869	6.4931[b]
-5	*0.0098*[b]	0.0093[a]	0.5926[a]	0.8460[b]	13.2535[a]	*0.0098*[b]	0.0096[a]	0.0556	0.7303[a]	11.3688[a]	*0.0098*[b]	0.0096[a]	0.1071	-0.0240	1.9363
-4	*0.0084*[b]	0.0087[a]	0.3095	0.0812	2.4367	*0.0084*[b]	0.0084[a]	0.0558	-0.1162	0.5405	*0.0084*[b]	0.0083[a]	0.2304[a]	0.1750	10.1234[a]
-3	*0.0075*[b]	0.0074[a]	0.5725[a]	1.4851[a]	21.9786[a]	*0.0075*[b]	0.0073[a]	0.4817[a]	0.7657[a]	31.5505[a]	*0.0075*[b]	0.0076[a]	0.0792	-0.3220[b]	5.3657[c]
-2	*0.0045*[b]	0.0048[a]	0.2447	0.5270	3.2335	*0.0045*[b]	0.0044[a]	-0.0720	0.0864	0.5879	*0.0045*[b]	0.0046[a]	-0.0023	0.0013	0.0009
-1	*0.0015*	0.0014[a]	-0.0106	0.0476	0.0170	*0.0015*	0.0014[a]	0.2247[b]	-0.0979	4.4067	*0.0015*	0.0015[a]	0.1023	0.3112[b]	5.7776[b]
0	*0.0028*	0.0029[a]	0.2102	-0.4502	2.3714	*0.0028*	0.0027[a]	-0.0037	0.1974	0.8129	*0.0028*	-0.0028[a]	-0.0425	0.0346	0.3513
1	*0.0031*	0.0026[a]	-0.2911	-0.1441	2.2488	*0.0031*	0.0031[a]	-0.2131[b]	0.2990	5.6467[b]	*0.0031*	0.0028[a]	0.0497	-0.0030	0.4115
2	*0.0027*	0.0028[a]	0.1236	0.3075	0.9730	*0.0027*	0.0026[a]	-0.0582	0.3131	2.3249	*0.0027*	0.0030[a]	0.1437[c]	-0.2842[c]	6.8065[b]
3	*-0.0006*	-0.0007[b]	-0.0572	-0.4594	1.4006	*-0.0006*	-0.0005[a]	0.1691	-0.0616	2.4611	*-0.0006*	-0.0005[a]	0.0353	-0.1533	1.1870
4	*-0.0024*	-0.0021[a]	0.1712	-0.2637	1.1675	*-0.0024*	-0.0018[a]	-0.0052	-0.4863[b]	4.9281[c]	*-0.0024*	-0.0024[a]	-0.0510	0.2481	2.9982
5	*-0.0028*	-0.0024[a]	-0.1570	-0.0023	0.6164	*-0.0028*	-0.0028[a]	-0.2563[b]	0.0787	5.6013[c]	*-0.0028*	-0.0028[a]	-0.1067	0.1643	3.0222
6	*-0.0017*	-0.0017[a]	-0.0600	-0.0181	0.0920	*-0.0017*	-0.0018[a]	0.0525	0.1430	0.6556	*-0.0017*	-0.0016[a]	0.1002	-0.0027	1.6721
7	*-0.0009*	-0.0005	-0.2135	0.3326	1.8303	*-0.0009*	-0.0009[a]	-0.0576	0.0339	0.3003	*-0.0009*	-0.0011[a]	0.0725	-0.1738	2.1342
8	*-0.0021*	-0.0020[a]	-0.4337[b]	-0.2054	4.9661[c]	*-0.0021*	-0.0022[a]	-0.0547	-0.4293[b]	4.0880	*-0.0021*	-0.0020[a]	-0.0105	-0.1669	1.1795
9	*-0.0017*	-0.0013[a]	0.1303	-0.4505	1.6926	*-0.0017*	-0.0015[a]	0.0481	-0.0933	0.3745	*-0.0017*	-0.0018[a]	-0.1654[b]	0.1526	5.5301[c]
10	*-0.0028*	-0.0028[a]	-0.0405	0.1897	0.2661	*-0.0028*	-0.0025[a]	0.0597	0.1011	0.5098	*-0.0028*	-0.0024[a]	0.0723	0.0675	1.0619

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

Table 7.10: Bootstrapping Simulation for Acquirer Firms' CARs under the FF using GJR-GARCH Estimation															
	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0121*	0.0122[a]	-0.4356[b]	0.3612	5.5590[c]	*0.0121*	0.0123[a]	-0.4045[a]	0.2578	15.0181[a]	*0.0121*	0.0120[a]	-0.5632[a]	0.6933[a]	72.8986[a]
-9	*0.0086*	0.0087[a]	-0.1323	-0.1462	0.5714	*0.0086*	0.0097[a]	-0.3225[a]	0.1645	9.2311[a]	*0.0086*	0.0082[a]	-0.5039[a]	0.5336[a]	54.1813[a]
-8	*0.0088*	0.0081[a]	-0.5303[a]	-0.0609	7.0532[b]	*0.0088*	0.0087[a]	-0.2991[a]	-0.0714	7.5632[b]	*0.0088*	0.0088[a]	-0.4057[a]	0.3263[b]	31.8679[a]
-7	*0.0083*	0.0079[a]	-0.3823[b]	0.0035	3.6536	*0.0083*	0.0082[a]	-0.4307[a]	0.4199[b]	19.1284[a]	*0.0083*	0.0083[a]	-0.3010[a]	0.1328	15.8370[a]
-6	*0.0073*	0.0071[a]	-0.2672	-0.3566	2.5798	*0.0073*	0.0075[a]	-0.3017[a]	0.2450	8.8385[b]	*0.0073*	0.0073[a]	-0.3710[a]	0.3465[b]	27.9419[a]
-5	*0.0076*	0.0086[a]	-0.3955[b]	0.6639	6.6646[b]	*0.0076*	0.0074[a]	-0.3079[a]	0.4149[c]	11.4847[a]	*0.0076*	0.0076[a]	-0.4071[a]	0.7786[a]	52.8741[a]
-4	*0.0066*	0.0059[a]	-0.1587	-0.6575	3.3318	*0.0066*	0.0067[a]	-0.4763[a]	0.5147[b]	24.4260[a]	*0.0066*	0.0064[a]	-0.4532[a]	0.8123[a]	61.7301[a]
-3	*0.0060*	0.0057[a]	-0.1074	0.4784	1.7189	*0.0060*	0.0062[a]	-0.1025	0.4227[b]	4.5995	*0.0060*	0.0061[a]	-0.0513	0.1519	1.4007
-2	*0.0034*	0.0034[a]	-0.2243	0.1461	1.3913	*0.0034*	0.0033[a]	-0.5707[a]	1.2212[a]	58.2106[a]	*0.0034*	0.0034[a]	-0.3352[a]	0.3050[b]	22.6003[a]
-1	*0.0009*	0.0009[a]	-0.1666	-0.5410	2.5226	*0.0009*	0.0009[a]	-0.2811[b]	0.0962	6.7769[b]	*0.0009*	0.0009[a]	-0.3654[a]	0.5037[a]	32.8291[a]
0	*0.0020*	0.0020[a]	0.0461	0.1078	0.1258	*0.0020*	0.0020[a]	0.1877[c]	0.4047[c]	6.3498[b]	*0.0020*	0.0021[a]	0.2070[a]	0.1108	7.6521[b]
1	*0.0025*	0.0022[a]	-0.0062	-0.1687	0.1788	*0.0025*	0.0025[a]	-0.0905	0.2103	1.6041	*0.0025*	0.0024[a]	-0.1142	0.1013	2.6024
2	*0.0015*	0.0021[a]	0.0108	-0.3795	0.9030	*0.0015*	0.0017[a]	0.0258	0.4175[b]	3.6874	*0.0015*	0.0012[a]	-0.2165[a]	0.0458	7.9014[b]
3	*-0.0020*	-0.0018[a]	-0.0937	0.3325	0.9103	*-0.0020*	-0.0019[a]	-0.0916	0.2464	1.9648	*-0.0020*	-0.0021[a]	-0.3440[a]	0.7588[a]	43.7185[a]
4	*-0.0040*	-0.0040[a]	-0.5265[a]	0.8624[b]	11.5774[a]	*-0.0040*	-0.0038[a]	-0.3976[a]	0.4027[c]	16.5547[a]	*-0.0040*	-0.0037[a]	-0.3676[a]	0.1676	23.6959[a]
5	*-0.0050*	-0.0049[a]	-0.6335[a]	1.4219[a]	22.6694[a]	*-0.0050*	-0.0054[a]	-0.4588[a]	0.6574[a]	26.5439[a]	*-0.0050*	-0.0049[a]	-0.3186[a]	0.1358	17.6836[a]
6	*-0.0039*	-0.0035[a]	-0.5055[b]	-0.1843	6.6018[b]	*-0.0039*	-0.0037[a]	-0.2878[a]	0.0559	6.9677[b]	*-0.0039*	-0.0038[a]	-0.4102[a]	0.2467	30.5785[a]
7	*-0.0033*	-0.0042[a]	-0.5047[b]	0.0117	6.3686[b]	*-0.0033*	-0.0031[a]	-0.6326[a]	0.8629[a]	48.8638[a]	*-0.0033*	-0.0031[a]	-0.3824[a]	0.1691	25.5576[a]
8	*-0.0052*	-0.0062[a]	-0.7212[a]	0.5601	14.9629[a]	*-0.0052*	-0.0056[a]	-0.4665[a]	0.5037[b]	23.4186[a]	*-0.0052*	-0.0052[a]	-0.5592[a]	0.5547[a]	64.9459[a]
9	*-0.0053*	-0.0050[a]	-0.2773	-0.3913	2.8801	*-0.0053*	-0.0056[a]	-0.7019[a]	0.6148[a]	48.9251[a]	*-0.0053*	-0.0055[a]	-0.5879[a]	1.0481[a]	103.3759[a]
10	*-0.0065*	-0.0061[a]	-0.4665[b]	0.4771	6.8625[b]	*-0.0065*	-0.0063[a]	-0.5570[a]	0.0210	25.8611[a]	*-0.0065*	-0.0066[a]	-0.4373[a]	0.7562[a]	55.7043[a]

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statist

7.7 ROBUSTNESS of CARs for Acquirer Firms under Carhart Model

Table 6.11 and 6.12 show the results of the bootstrapping simulation of the acquirer firms' CARs using the Carhart model. The simulations are performed for the CARs estimated under the same estimation methods. In order to compare the two set of CARs, we also indicated the actual CARs in the table. Our results show a slight difference between the OLS and GJR-GARCH methods. Under the GJR-GARCH estimate, the bootstrapping mean CARs are statistically significant throughout the entire period (-10, +10). The results of the OLS estimate exhibit a similar trend. The simulated mean CARs over the period of twenty-one days are significant, using 500 draws. Whilst simulated mean CARs when 150 and 1000 were drawn are significant for thirteen days (t=-10 up to t=+2). Notice that day t=+3 up t=+10 simulated mean CARs under the OLS are also significant using 150 and 1000 replications. The actual mean CARs are for day t=-2 and earlier before the announcement are significant under both the OLS and GJR-GARCH estimation methods. Under the GJR-GARCH method, the actual mean CARs under CAPM and Fama-French three-factor models contrast to a large extent with those of the Carhart four-factor model for t=-2 and earlier. Whilst the window of t=-2 to t=-10 are statistically significant under the Carhart model, those of CAPM and Fama-French are statically insignificant.

The test statistics of skewness, kurtosis and Jarque-Bera should be considered and commented on to see how they perform under the Carhart model. First, skewness under the GJR-GARCH estimates are normally positive and significant relative to the OLS estimates which are normally positive but less than that achieved under the GJR-GARCH estimates are normally not significant.

Table 7.11: Bootstrapping Simulation for Acquirer Firms' CARs under the Carhart using OLS Estimation															
	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0154*[a]	0.0157[a]	0.5865[a]	0.9234[b]	13.9284[a]	*0.0154*[a]	0.0154[a]	0.2136[b]	-0.0616	3.8803	*0.0154*[a]	0.0155[a]	0.0524	0.0161	0.4693
-9	*0.0114*[b]	0.0116[a]	-0.1603	0.1152	0.7254	*0.0114*[b]	0.0109[a]	0.1655	-0.3528	4.8767[c]	*0.0114*[b]	0.0113[a]	0.0862	-0.2268	3.3803
-8	*0.0114*[b]	0.0115[a]	0.4666[b]	-0.0813	5.4841[c]	*0.0114*[b]	0.0117[a]	-0.0926	-0.2838	2.3917	*0.0114*[b]	0.0114[a]	0.1670[b]	0.1531	5.6228[c]
-7	*0.0112*[b]	0.0111[a]	0.1094	-0.2529	0.6991	*0.0112*[b]	0.0108[a]	0.2810[b]	0.1735	7.2059[b]	*0.0112*[b]	0.0112[a]	0.2090[a]	0.0283	7.3132[b]
-6	*0.0099*[b]	0.0095[a]	0.4020[b]	0.1238	4.1359	*0.0099*[b]	0.0101[a]	0.1086	-0.0116	0.9854	*0.0099*[b]	0.0099[a]	0.2584[a]	0.0840	11.4198[a]
-5	*0.0098*[b]	0.0096[a]	0.0071	0.0260	0.0055	*0.0098*[b]	0.0101[a]	0.2454[b]	0.2363	6.1825[b]	*0.0098*[b]	0.0098[a]	0.1669[b]	-0.0459	4.7276[c]
-4	*0.0085*[b]	0.0086[a]	0.4314[b]	0.1321	4.7622[c]	*0.0085*[b]	0.0085[a]	0.2558[b]	0.0473	5.5012[c]	*0.0085*[b]	0.0087[a]	0.2231[a]	0.0217	8.3180[b]
-3	*0.0078*[b]	0.0081[a]	0.4587[b]	1.3764[a]	17.1006[a]	*0.0078*[b]	0.0081[a]	0.3111[a]	0.8361[a]	22.6307[a]	*0.0078*[b]	0.0078[a]	0.2583[a]	-0.0690	11.3162[a]
-2	*0.0047*[b]	0.0049[a]	-0.0095	-0.1439	0.1316	*0.0047*[b]	0.0048[a]	-0.0480	-0.1482	0.6496	*0.0047*[b]	0.0047[a]	0.0742	-0.0316	0.9589
-1	*0.0014*	0.0011[a]	-0.1629	0.2853	1.1723	*0.0014*	0.0014[a]	0.0968	0.1362	1.1680	*0.0014*	0.0014[a]	0.0621	-0.0894	0.9745
0	*0.0025*	0.0027[a]	0.0949	0.0315	0.2315	*0.0025*	0.0029[a]	0.1611	-0.0613	2.2409	*0.0025*	0.0025[a]	0.1536[b]	0.1944	5.5066[c]
1	*0.0031*	0.0027[a]	0.2022	-0.1051	1.0910	*0.0031*	0.0031[a]	-0.0606	-0.2671	1.7920	*0.0031*	0.0030[a]	0.0213	-0.2743[c]	3.2116
2	*0.0030*	0.0027[a]	0.1453	-0.3773	1.4182	*0.0030*	0.0029[a]	0.0135	-0.1473	0.4670	*0.0030*	0.0028[a]	-0.0442	0.2301	2.5315
3	*-0.0002*	-0.0000	-0.1142	0.0223	0.3294	*-0.0002*	-0.0006[a]	-0.1357	-0.0072	1.5353	*-0.0002*	0.0000	-0.0302	-0.2013	1.8419
4	*-0.0023*	-0.0019[a]	-0.0348	-0.1259	0.1294	*-0.0023*	-0.0025[a]	-0.1307	-0.2803	3.0611	*-0.0023*	-0.0025[a]	-0.0510	-0.0729	0.6543
5	*-0.0028*	-0.0023[a]	0.1571	-0.2754	1.0911	*-0.0028*	-0.0028[a]	-0.0635	0.1428	0.7613	*-0.0028*	-0.0029[a]	-0.1665[b]	-0.0268	4.6478[c]
6	*-0.0019*	-0.0018[a]	0.0363	0.1102	0.1088	*-0.0019*	-0.0020[a]	-0.2336[b]	0.1789	5.2121[c]	*-0.0019*	-0.0019[a]	0.0496	0.1022	0.8452
7	*-0.0011*	-0.0010[a]	-0.3577[c]	0.3568	3.9946	*-0.0011*	-0.0012[a]	0.0886	-0.3818[c]	3.6901	*-0.0011*	-0.0009[a]	0.0567	-0.0490	0.6362
8	*-0.0025*	-0.0026[a]	0.1709	0.6003	2.9824	*-0.0025*	-0.0024[a]	-0.0696	0.2938	2.2022	*-0.0025*	-0.0024[a]	-0.0251	-0.1033	0.5499
9	*-0.0021*	-0.0021[a]	0.0530	-0.0422	0.0812	*-0.0021*	-0.0020[a]	-0.0423	-0.1527	0.6352	*-0.0021*	-0.0024[a]	-0.0317	0.0240	0.1914
10	*-0.0032*	-0.0030[a]	0.1463	-0.4572	1.8416	*-0.0032*	-0.0029[a]	-0.0918	0.2149	1.6639	*-0.0032*	-0.0031[a]	-0.1234	0.0602	2.6895

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics.

Table 7.12: Bootstrapping Simulation for Acquirer Firms' CARs under the Carhart using GJR-GARCH Estimation

	150 simulations					500 simulations					1000 simulations				
Days	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera	*Actual Mean*	Bootstrap Mean	Skewness	Kurtosis	Jarque-Bera
-10	*0.0351*[b]	0.0347[a]	0.8125[a]	0.7885[b]	20.3877[a]	*0.0351*[b]	0.0353[a]	0.9063[a]	0.6767[a]	77.9909[a]	*0.0351*[b]	0.0350[a]	0.7926[a]	0.3783[b]	110.6757[a]
-9	*0.0295*[c]	0.0293[a]	0.7070[a]	0.5676	14.5114[a]	*0.0295*[c]	0.0298[a]	0.7330[a]	0.7849[a]	57.6070[a]	*0.0295*[c]	0.0305[a]	0.8157[a]	0.8101[a]	138.2477[a]
-8	*0.0271*[c]	0.0250[a]	0.7232[a]	1.0922[a]	20.5306[a]	*0.0271*[c]	0.0264[a]	0.6511[a]	0.3092	37.3213[a]	*0.0271*[c]	0.0264[a]	0.8379[a]	0.9530[a]	154.8635[a]
-7	*0.0245*[b]	0.0241[a]	0.5575[a]	-0.0677	7.7986[b]	*0.0245*[b]	0.0241[a]	0.6523[a]	0.1313	35.8198[a]	*0.0245*[b]	0.0242[a]	0.7155[a]	0.6979[a]	105.6065[a]
-6	*0.0211*[b]	0.0212[a]	0.7041[a]	0.4334	13.5664[a]	*0.0211*[b]	0.0209[a]	0.7281[a]	0.5162[b]	49.7346[a]	*0.0211*[b]	0.0208[a]	0.6978[a]	0.2543	83.8422[a]
-5	*0.0193*[b]	0.0200[a]	0.5453[a]	0.0643	7.4585[b]	*0.0193*[b]	0.0196[a]	0.7542[a]	0.6860[a]	57.2100[a]	*0.0193*[b]	0.0193[a]	0.7017[a]	1.0048[a]	124.1335[a]
-4	*0.0160*[b]	0.0162[a]	0.8322[a]	0.4701	18.6961[a]	*0.0160*[b]	0.0161[a]	0.8086[a]	1.8166[a]	123.2457[a]	*0.0160*[b]	0.0158[a]	0.6654[a]	0.7328[a]	96.1579[a]
-3	*0.0130*[b]	0.0126[a]	0.9280[a]	2.1361[a]	50.0486[a]	*0.0130*[b]	0.0132[a]	0.5147[a]	0.1074	22.3140[a]	*0.0130*[b]	0.0131[a]	0.6872[a]	0.7416[a]	101.6238[a]
-2	*0.0079*[c]	0.0076[a]	0.1678	-0.2751	1.1769	*0.0079*[c]	0.0078[a]	0.5577[a]	0.3584	28.5920[a]	*0.0079*[c]	0.0079[a]	0.4825[a]	0.0967	39.1896[a]
-1	*0.0032*	0.0034[a]	0.1753	-0.3464	1.5183	*0.0032*	0.0033[a]	0.3171[a]	0.1002	8.5890[b]	*0.0032*	0.0032[a]	0.4233[a]	0.2558[c]	32.5904[a]
0	*0.0040*	0.0034[a]	-0.0308	-0.5639	2.0110	*0.0040*	0.0040[a]	-0.0500	-0.1872	0.9379	*0.0040*	0.0041[a]	0.1495[b]	0.1222	4.3490
1	*0.0051*	0.0054[a]	0.3582[c]	0.2093	3.4807	*0.0051*	0.0049[a]	0.4322[a]	0.3102	17.5694[a]	*0.0051*	0.0052[a]	0.2854[a]	0.1326	14.3110[a]
2	*0.0068*	0.0071[a]	0.5308[a]	-0.0409	7.0548[b]	*0.0068*	0.0066[a]	0.6596[a]	0.5752[a]	43.1469[a]	*0.0068*	0.0066[a]	0.4114[a]	-0.0276	28.2372[a]
3	*0.0057*	0.0062[a]	0.8719[a]	1.2383[a]	28.5884[a]	*0.0057*	0.0055[a]	0.6517[a]	0.4287[b]	39.2236[a]	*0.0057*	0.0056[a]	0.6956[a]	1.0433[a]	126.0028[a]
4	*0.0055*	0.0060[a]	0.1017	-0.7294[c]	3.5834	*0.0055*	0.0058[a]	0.6666[a]	0.6978[a]	47.1789[a]	*0.0055*	0.0051[a]	0.5831[a]	0.1174	57.2323[a]
5	*0.0068*	0.0072[a]	0.8128[a]	0.5506	18.4091[a]	*0.0068*	0.0070[a]	0.6983[a]	0.5644[b]	47.2741[a]	*0.0068*	0.0069[a]	0.8103[a]	0.8206[a]	137.4774[a]
6	*0.0097*	0.0091[a]	0.5339[a]	0.1083	7.2006[b]	*0.0097*	0.0092[a]	1.1509[a]	2.1195[a]	203.9755[a]	*0.0097*	0.0098[a]	0.7156[a]	0.2920[c]	88.8945[a]
7	*0.0126*	0.0131[a]	1.1796[a]	1.1796[a]	55.5239[a]	*0.0126*	0.0129[a]	0.6167[a]	0.2028	32.5542[a]	*0.0126*	0.0132[a]	0.7159[a]	0.5867[a]	99.7585[a]
8	*0.0131*	0.0113[a]	0.4247[b]	-0.3000	5.0721[c]	*0.0131*	0.0132[a]	0.7238[a]	0.2131	44.6055[a]	*0.0131*	0.0135[a]	0.7209[a]	0.8013[a]	113.3714[a]
9	*0.0151*	0.0141[a]	0.8171[a]	0.2898	17.2156[a]	*0.0151*	0.0155[a]	0.7014[a]	0.1208	41.3056[a]	*0.0151*	0.0156[a]	0.9090[a]	1.0104[a]	180.2618[a]
10	*0.0163*	0.0158[a]	0.8209[a]	0.5527	18.7541[a]	*0.0163*	0.0173[a]	0.7785[a]	0.1894	51.2552[a]	*0.0163*	0.0162[a]	0.8591[a]	1.1318[a]	176.3846[a]

Note: a, b, c, indicate statistical significance at the 1%, 5% and 10% level respectively. The statistical significance of skewness, kurtosis and Jarque-Bera are estimated using student t-statistics

Second, the kurtosis under both the OLS and GJR-GARCH estimates are normally distributed with the GJR-GARCH estimates normally positive compared to the OLS estimates. Third, comparing the results of the Jarque-Bera under the GJR-GARCH and OLS methods, it seems that the GJR-GARCH estimates are not normally distributed yet normally significant, whilst the OLS estimates are normally distributed but mostly insignificant. That is to say, the Jarque-Bera statistic for acquirer firms under the GJR-GARCH method for all three methodologies show that most values cause possible rejection of the normality assumption when replications of 500 and 1000 are drawn. In addition, 150 draws under the Carhart four models also cause possible rejection of the normality assumption. These are direct opposite to target firms which mostly reject normality assumption under the OLS estimates using 1000 replications.

7.8 Conclusion

In this chapter, we perform bootstrapping simulation to determine the robustness of the actual mean CARs. In all specifications, the simulation appears to exhibit some sort of change from the earlier analyses. We are not sure why this result has arisen. The pre-event simulated CARs were statistically significant, which contradicts the original actual CARs obtained before the announcement. However, the post-events simulated CARs appear to be consistent with the actual CARs. In other words, the bootstrap result after the announcement confirmed our earlier analyses. As the simulation increases (e.g. 1000 draws) the standard errors are typically small and the distribution of the CARs tends to normality. It is widely recognised that bootstrapping simulation in particular has been reliable. Thus, our actual CARs or earlier analyses cannot be disputed or these concerns cannot influence our earlier results. But, this provides a review of the main idea that has shaped the event studies with respect to M&As, namely that when people estimate CARs they should perform bootstrapping simulation to determine its robustness.

Test statistics of the skewness show that CARs are normally negatively skewed under the GJR-GARCH estimates compared to the OLS estimates for acquirer firms under both the standard CAPM and Fama-French four-factor models. This result follows because the CARs are more efficiently estimated under the GJR-GARCH. The measures of kurtosis indicate that returns are normally distributed under both the OLS and GJR-GARCH estimates for the two sets of companies. The target firms' and acquirer firms' test statistics of Jarque-Bera are opposite to each other. Particularly, the Jarque-Bera under the OLS estimates for target firms are not normally distributed but mostly significant compared to the GJR-GARCH estimates. Similarly, under the acquirer firms, the OLS and GJR-GARCH methods show considerable differences in terms of normally distributed and significant levels.

CHAPTER EIGHT

8.0 SUMMARY AND CONCLUSIONS

In this thesis we have investigated the theoretical and empirical evidence on the wealth effect of both target and acquiring firms on M&As. It has been established theoretically that M&As can result in economic benefit for both the target and acquiring firms thereby increasing shareholders' wealth. This is particularly apparent where failing firms are rescued via M&As bring economic benefits for shareholders as well as the government for tax purposes. De Bondt and Thompson (1992) used macro-economic variables in their U.S. studies and found a correlation between takeovers and economic efficiency. Using U.S. firms our empirical results suggest positive return continuations for target firms whilst for acquirer firms we document negative return continuations after the announcement. These results are consistent with earlier studies in the U.S. who documented positive returns for target firms and negative returns for acquirer firms. These findings have both theoretical and practical importance to the M&As industry.

Prior researchers used different methodologies in estimating shareholders' wealth effect. However, the results of such studies may be unreliable if certain risk factors are not adequately captured. For this reason we estimate our pricing models using the standard CAPM, the Fama-French three-factor and Carhart four-factor models. Since the results from these models might be affected by ARCH and asymmetric effects in the data, we estimate the models using the GJR-GARCH estimation method. To verify that the GJR-GARCH estimates are to be preferred, we also estimate the models using the standard OLS method. This makes our study different from earlier studies. In this analysis, evidence has shown that model specification has a significant effect in determining shareholder wealth on announcement. In Tables 4.1, 4.2 and 4.3, under the OLS method, empirical evidence on M&As has shown that before the announcement CARs were substantially bigger for acquiring firms relative to target firms across all three methodologies. However, after the announcement, CARs for shareholder of acquiring firms declined significantly compared to acquired firms for the three methodologies applied in this empirical study. In other words, shareholders of target firms gain considerable returns after the announcement. The deterioration or depreciation of the share price of shareholders of acquiring firms after the announcement might have happened because there was a transfer of capital in the form of stock or cash to target shareholders.

Interestingly, in contrast to the OLS method, CARs under the GJR-GARCH method showed a clear distinction for each of the methodologies. The CARs under CAPM and Fama-French three-factor models follow a similar pattern when estimated under the OLS estimation. That is, post-announcement returns to shareholders of acquirer firms' degenerated**.** However, as noted in Table 4.3 the result obtained under the CAPM and Fama-French three-factor models was directly opposite to that of the Carhart four-factor model for acquiring companies. Under the Carhart four-factor model, acquiring firm shareholders had substantially higher CARs before and after the announcement relative to the target firms. Even though, pre-event CARs were not big as post-event CARs. Whilst there is circumstantial evidence that returns to target firms are higher than acquired firms after the announcement, these results are directly contradictory to this hypothesis and this evidence might have occurred because of the model specification.

Using both market capitalization and trading volume as a measure of liquidity, we observed strong return continuations in the medium firms relative to the small and large firms for target shareholders under both the OLS and GJR-GARCH methods across all the three methodologies. Pre- and post-event CARs under the GJR-GARCH estimation were large for target firms compare to the OLS method. The large CARs under the GJR-GARCH method might be the result of increased estimation efficiency relative to the OLS method. This finding is opposite to that of Hong and Stein (1999), who estimated the standard OLS model and found that short run return continuations should be manifested in small stocks. We found resilient support for the existence of momentum in medium stocks. Under the target firms, the evidence for market efficiency (overreaction) is consistently found in both small and large firms across the three methodologies used in the study. This implies that target firms for small and large firms overreact to new information resulting to market efficiency.

For the acquirer firms, after announcement small liquidity stocks exhibit larger CARs compared to both the medium and large liquidity stocks under the OLS method for both CAPM and Fama-French three-factor models. However, the returns were not as strong as that achieved under the medium stocks for the target firms. For Carhart four-factor model, post-event CARs were bigger for small liquidity stocks under both the OLS and GJR-GARCH methods. For acquiring firms, the evidence is consistent with market efficiency for small, medium and large liquid stocks under the GJR-GARCH method, mostly for CAPM and Fama-French methodologies. Overall, the

CARs are insignificant in most cases under the GJR-GARCH method relative to the OLS method based on our measures of liquidity.

This empirical study proves that liquidity measure has considerable impact in determining the size of firm that must be acquired on announcement of takeover. Using both market capitalization and trading volume for investment purposes, acquirer firms' shareholders would like to buy medium target firms.

We used Wilcoxon signed rank test and to test the differences in the magnitude of the two CARs to see whether the CARs are statistical different from zero under both the OLS and GJR-GARCH estimation methods for target and acquirer firms. The results of the Kruskal-Wallis test statistics clearly show that there is a statistically significant difference among the CARs for small, medium and liquidity stocks. Based on the estimation of GJR-GARCH mean and variance equations of the coefficient variables**,** there is strong evidence to suggest that SMB_t and HML_t had much more explanatory power than MOM_t in explaining time series regression in returns, especially for acquirer firms.

We execute bootstrapping simulation to establish the robustness of the actual CARs generated in the original data to make certain that the CARs are dependable and that our results are not affected by data mining. The negative skewness can be related with negative asymmetry. The results achieved from the means simulation of 150, 500 and 1000 replications showed no substantial discrepancy. Our results suggest that the pre-event simulated CARs are significant, which contradicts the original CARs realised before the event. Nevertheless, post-announcement simulated CARs confirmed our earlier results. The test statistics of the skewness indicate that returns are negatively skewed under the GJR-GARCH method relative to the OLS method for both companies. Nevertheless, as the replications increases, for example 1000, we observed less non-normality in the test statistics of skewness, kurtosis and Jarque-Bera. The measure of kurtosis reveals that returns are normally distributed under the two estimation methods for both sets of firms. The Jarque-Bera test statistics mostly reject the normality assumption for bootstrapping simulation under both the OLS and GJR-GARCH estimates for target and acquirer firms respectively.

8.1 LIMITATIONS OF THE PRESENT STUDY

We examined how the acquirer's payment method will impact the ARs by using the announcement dates for the analyses. However, we have not examined whether the form of payment in these situations has an effect on the ARs. If this is the case, then this might affect our results.

8.2 RECOMMENDATION FOR FUTURE RESEARCH

The current study employed a relatively small sample size of 401 firms in relation to the total population of target and acquirer firms in the U.S. This might have had a significant influence on the result. Therefore, in future, a large sample size is intuitively demanded or is encouraged to assess the situation under consideration or the ongoing research analysis. Also future research needs to do the estimate for other countries to determine if the U.S. results are universal. Studies have indicate that the GJR-GARCH model might not capture all the non-linearity and asymmetry in data (Nam, Pyun and Arize, 2002), so the asymmetric non-linear smooth-transition

(ANST) GARCH might also be used in future research. According to Nam et al., (2002), ANST GARCH model is efficient and parsimonious that allows a non-linear specification to capture an asymmetry in both the conditional mean and variance processes.

One area that would be interesting for future research is how the shareholders proposal (e.g. antitakeover devices) outcome affects the stock price. There are a lot of different shareholder proposals that shareholders can apply for corporate control. Because these proposals affect the firm in diverse ways, it is an important area that might affect the share price or their growth strategies, hence future research is advocated.

Given the discrepancy of financing (cash, stock or both) decisions on M&As between target and acquirer firms, there are still opposing views as to which of the methods of payment is best. We do not know when the payment was made or the effective date of payment. I therefore suggest that future studies should endeavour to acquire the data on the date at which the payment was effective to measure its impact on the ARs on the shareholders' wealth.

References:

Agrawal, A., Jaffe, F. J., Mandelker, N. G., 1992. The Post-Merger Performance of Acquiring Firms: A Re-examination of an Anomaly. The *Journal of Finance* Vol. **XLVII**, No.4, 1605-1621.

Ahern, R. K., 2008. Sample Selection and Event Study Estimation. Working Paper.

Ahn, D-H., Boudoukh, J., Richardson, M., Whitelaw, F. R., 2002. Partial Adjustment or Stale Prices? Implications from Stock Index and Futures Returns Autocorrelations. *The Review of Financial Studied*, Vol.**15.** No. 2.

Aivazian, V., Qiu, J., 2006. How Do Creditors Value Corporate Diversification? Evidence from Bank loan Contracting. Working Paper.

Akhigbe, A., Johnston, J., Madura J., 2004. Consolidation in the Financial Services Industry: Are there Industry Gains for Acquisitions of Security Firms. *Journal of Economics and Finance* Vol. **28**, No. 1.

Akhigbe, A., Madura, J. 2001. Intra-Industry Signals resulting from Insurance Company Mergers. *The Journal of Risk and Insurance*, Vol. **68**, No.3, Pp. 489-505.

Albert, A., Cannella, J., Hambrick, C. D., 1993. Effects of Executive Departures on the Performance of Acquired Firms. *Strategic Management Journal* Vol. **14**, pp. 137-152.

Alexandridis, G., Antoniou, A., Zhao, H., 2006. Valuation Effects of Short Sale Constraints: The Case of Corporate Takeovers. *European Financial Management,* Vol. **12**, No. 5, 747-762.

Allen, P. R., Sirmans C. F., 1987. An Analysis of Gains to Acquiring Firm's Shareholders: The Special Case of REITs." *Journal of Financial Economics* **18**, 175-84.

Al-Sharkas, A. A., Hassan, K. M., Lawrence, S., 2008. The Impact of mergers and Acquisitions on the Efficiency of the US Banking Industry: Further Evidence. *Journal of Business Finance and Accounting*, **35** (1) & (2), 50-70, 0306-686X.

Ambrose, B. W., Megginson, W. L., 1992. The Role of Asset Structure, Ownership Structure, and Takeover Defenses in Determining Acquisition Likelihood. *Journal of Financial and Quantitative Analysis*, Vol. **27**, No. 4

Amihud, Y., 2002. Illiquidity and Stock Returns: Cross-Section and Time Series Effects. *Journal of Financial Markets* **5**, 31-56.

Amihud, Y., Mendelson, H., 1986. Asset Pricing and the Bid-Ask Spread. *Journal of Economics* **17**, 223-249.

Andersen, G. T., Bollerslev, T. 1997. Heterogeneous Information Arrival and Return Volatility Dynamics: Uncovering the Long-Run in High Frequency Returns. *The Journal of Finance* Vol. **IJI**, No. 3.

Andrade, C. S., Chang, C., Seasholes, S. M., 2008. Trading Imbalances, predictable Reversals, and Cross-Stock Price Pressure. *Journal of Financial Economics* **88**, 406-423.

Andrade**,** G., Stafford, E., 2004. Investigating the Economic Role of Mergers. *Journal of Corporate Finance* **10**, 1-36.

Andrikopoulos, P., Daynes, A., Latimer, D., Pagas, P., 2008. Size Effect, Methodological issues and Risk-to-Default: Evidence from the UK Stock Market. *The European Journal of Finance*

Andreoni, J., Che, Y-K., Kim J., 2007. Asymmetric Information About Rivals' Types in Standard Auctions: An experiment. *Games and Economic Behavior* **59**, 240-259.

Auerbach, J. A., Reishus, D., 1986. Taxes and the Merger Decision: An Empirical Analysis. Working Paper No. 1855. National Bureau of Economic Research.

Avramov, D., Chordia, T., 2006. Asset Pricing Models and Financial Market Anomalies. *The Review of Financial Studies* I Vol. **19** No. 3

Aw, M.S.B., Chatterjee, R. A., 2004. The performance of UK firms acquiring large cross-border and domestic takeover targets. *Applied Financial Economics* **14**, No. 5, 337-349.

Bae, J., Kim, C-J., Nelson, R. C., 2007. Why are Stock Returns and Volatility Negatively Correlated? *Journal of Empirical Finance* **14**, 41-58.

Balaban, E., Constantinou, T. C., 2006. Volatility Clustering and ERvent-induced Volatility: Evidence from UK Mergers and Acquisitions. *The European Journal of Finance* **12**: 5, 449-453.

Banz, R.W., 1981.The Relationship Between Return and Market Value of Common Stocks. *Journal of Financial Economics***, 9,** 3−18.

Barber, M. B., Lyon, D. J., 1997. Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics. *Journal of Financial Economics* **43**, 341-372.

Barberis, N., Huang, M., Santos T., 2001. Prospect Theory an Asset Prices. *Quarterly Journal of Economics* Vol. **CXVI**, Issue 1.

Barberis, N., Shleifer, A., Vishny, R., 1998. A Model of Investor Sentiment. *Journal of Financial Economics* **49**, 307-343.

Barnes, P., 1990. The Predicting of Takeover Targets in the UK. By Means of Multiple Discriminant Analysis. *Journal of Business Finance & Accounting*, **17(**1).

Barnes, P., 1999. Predicting UK Takeover Targets: Some Methodological Issues and Empirical Study, *Review of Quantitative Finance and Accounting* **12**, 283-301.

Becher A. D., 2000. The Valuation Effects of Bank Mergers, *Journal of Corporate Finance* **6**, 189-214.

Behr, A., Heid, F., 2011. The Success of Bank Mergers Revisited. An Assessment Based on a Matching Strategy. *Journal of Empirical Finance* **18**, 117-135.

Bekaert, G., Wu, G., 2000. Asymmetric Volatility and Risk in Equity Markets. *The Review of Financial Studies*, Vol.**13**, No. 1. pp. 1-42.

Ben-Amar, W., Andre, P., 2006. Separation of Ownership from Control and Acquiring Firm Performance: The Case of Family Ownership in Canada. *Journal of Business Finance & Accounting,* **33** (3) & (4), 517-543.

Berger, A. N., Demsetz, R. S., Strahan, P. E., 1999. The Consolidation of the Financial Services industry: Causes, Consequences and Implications for the Future. *Journal of Banking and Finance* **23,** 135-195.

Bergh D.D., 2001. Executive Retention and Acquisition Outcomes: A Test of Opposing Views on the Influence of Organizational Tenure. *Journal of Management* **27**:5, 603-622.

Berk, B. J., 1995. A Critique of Size-Related Anomalies. *The Review of Financial Studies* Summer. Vol. **8,** No. 2. pp.275-286.

Berkovitch, E., Narayanan, P. M., 1990. Competition and Medium of Exchange in Takeovers. *Review of Financial Studies*, Vol. **3** No. 2, 153-174.

Berkovitch, E., Narayanan, P. M., 1993. Motives for Takeovers: An Empirical Investigation. *Journal of Financial and Quantitative Analysis,* Vol. **28,** No. 3.

Bethel E. J., Leibeskind, J., 1993. The Effects of Ownership Structure on Corporate Restructuring. *Strategic Management journal* Vol. **14**, 15-31.

Bigelli, M., Mengoli, S., 2004. Sub-Optimal Acquisition Decision Under a Majority Shareholder System. *Journal of Management and Governance* Vol. **8,** pp. 373-405.

Billett, T. M., King, D., Mauer, C. D., 2002. Bondholder Wealth Effects in Mergers and Acquisitions: New Evidence from the 980s and 1990s. Seminar Paper.

Binder, J. J., 1998. The Event Methodology Since 1969. *Review of Quantitative Finance and Accounting*, 11: 111-137.

Biswas, R., Fraser, R. D., Mahajan, A., 2001. The International Market for Corporate Control: Evidence from Acquisitions of Financial Firms. *Global Finance Journal*, **8** (1), 33-54.

Black, J. A., 2006. Macroeconomic Risk and the Fama-French Three-Factor Model. *Managerial Finance*, Vol. **32.** No. 6, pp. 505-517.

Boehmer, E., 2000. Buisness Group, Bank Control and Large Shareholders: An Analysis of German Takeovers. *Journal of Financial Intermediation* Vol. **9**, pp. 117-148.

Bollerslev, T., 1986. Generalized Autoregressive Conditional Heteroskedascity. *Journal of Econometrics*, **31**, pp. 307-327.

Boots, A., 1992. Why Hang on to Losers. Divestitures and Takeovers. *Journal of Finance,* Vol**. 47**, 1401-1423*.*

Bornholt, G., 2006. Extending the CAPM: The Reward Beta Approach. Working Paper.

Bosveld, R., Meyer, P., Vorst, T., 1997. Takeover premiums in Netherlands. Financieringen an Beleggingen deel 20. Erasmus University Rotterdam, pp. 125-158.

Bradbury**,** E. M., Mak, T. Y., 2000. Ownership Structure, Board Composition and The Adoption of Charter Takeover Procedures. *Journal of Corporate Finance* **6**, 165-188.

Brav, A., 1998. Inference in Long-Horizon Event Studies: A Bayesian Approach with Application to Initial Public Offerings. Working Paper. Duke University.

Brav, A., Heaton, B. J., 2002. Competing Theories of Financial Anomalies. *The Review of Financial Studies*, Vol.**15,** No. 2.

Bremer, M., Sweeney, J. R., 1991. The Reversal of Large Stock Price Decreases. *The Journal of Finance* Vol**. XLNL**. No. 2.

Brennan, J. M., Chordia, T., Subrahmanyam, A., 1998. Alternative Factor Specifications, Security Characteristics, and The Cross-Section of Expected Stock Returns. *Journal of Financial Economics* **49**, 345-373.

Brennan, M., Subrahmanyam, A., 1996. Market Microstructure and Asset Pricing: On the Compensation for Illiquidity in Stock Returns, *Journal of Financial Economics* **41**, 441-464.

Brock, A. W., LeBaron, D. B., 2001. A Dynamic Structural Model for Stock Return Volatility and Trading Volume. Working Paper.

Brockman P., Chung, Y. D., 2000. An Empirical Investigation of Trading on Asymmetric Information and Heterogeneous Prior Beliefs. *Journal of Empirical Finance* **7**, 417-454.

Brookman T. J., Chang S. and Rennie G. C., 2007, CEO Cash and Stock-Based Compensation Changes, Layoof Decisions, and Shareholder Value. *The Financial Review* **42**, 99-119.

Brooks, C., 2002. *Introductory Econometrics for Finance*. Cambridge University Press.

Brooks, C., 2008. *Introductory Econometrics for Finance*. Second Edition, Cambridge University Press.

Brown, T. D. and Ryngaert, D. M., 1991, The Mode of Acquisition in Takeovers: Taxes and Asymmetric Information. *The Journal of Finance,* Vol. **XLVI,** No. 2.0

Brown, J. S., Warner, J. B., 1980. Measuring Security Price Performance. *Journal of Financial Economics* **8**, 205-258.

Brown, J. S., Warner, J. B., 1985. Using Daily Returns: The Case of Event Studies. *Journal of Financial Economies* **14**, 3-31.

Bruce, A. B., Christopher, T.T., 2000. R&D Intensity and Acquisitions in High-Technology Industries: Evidence from the US Electronic and Electrical Equipment Industries. *Journal of Industrial Economics*, Vol**. 48**, No.1, pp. 47-70.

Bruner, R. F., 2002. Does Mergers and Acquisition Pay? A Survey of Evidence for the Decision Maker. *Journal of Applied Corporate Finance* **12,** 48-68.

Bruslerie, D. L. H., 2007. Acquisition Bid price: Is There an Optimal Cash Equity Payment Mix? Working Paper Series.

Byun, J., Rozeff, M., 2003. Long-Run Performance after Stock Splits: 1972 to 1996. *The Journal of Finance* Vol. **LVIII**, No. 3.

Campa**,** M. J., Hernando I., 2004. Shareholder Value Creation in European M&As. *European Financial Management*, Vol. **10**. No. 1, 47-81.

Campa**,** M. J., Hernando I., 2006. Mergers and Acquisitions Performance in the European Financial in Industry. *Journal of Banking & Finance* **30**, 3367-3392.

Campa, M. J., Kedia, S., 2002. Explaining the Diversification Discount. Journal of Finance (in preparation). Caves, R., Porter, M., Spence, A. M., 1980. Competition in the Open Economy: A model Applied to Canada. Harvard University Press, Cambridge, MA.

Campbell, J. Y., Hentschel, L.,1992. No news is good news: An Asymmetric Model of Changing Volatility in Stock Returns. *Journal of Financial Economics*, **31**, 281–318.

Cannella, A., Hambrick, D., 1993. Effects of Executive Departure on the Performance of Acquired Firms. *Strategic Management Journal,* Vol**. 14**,137– 52.

Cao, H. H., Coval, D. J., Hirshleifer, D., 2002. Sidelined Investors, Trading-Generated News, and Security Returns. *The Review of Financial Studies* **15**, No. 2.

Capron, L., 1999. The Long-Term Performance of Horizontal Acquisitions. *Strategic Management Journal*, Vol. **20**, No. 11, pp.987-1018.

Capron, L., Mitchell, W., Swaminathan, A., 2001. Asset Divestiture Following Horizontal Acquisitions: A Dynamic View. *Strategic Management journal,* Vol. **22**, pp. 817-844.

Carhart, M. M., 1997. On Persistence in Mutual Fund Performance. *The Journal of Finance*. Vol**.LII**. No. 1.

Carletti, E., Hartmann, P., Ongena, S., 2008. The Economic Impact of Mergers Control Legislation. Working Paper, TILEC Discussion Paper.

Carlile, R. P. 2004. Transferring, Translating and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries. *Organization Science* Vol. **15,** No. 5.

Carpenter E. R., 1994. Finance Constraints of Free Cash Flow? The Impact of Asymmetric Information on Investment. Department of Economics, Emory University, Atlanta, GA 30322, 404-727-7834.

Cebenoyan, S. A., Papaioannou, J. G., Travlos G. N., 2001. Foreign takeover Activity in the U.S. and Wealth Effects for Target Firm Shareholders. *Journal of Financial Management*.

Clarke E. J., Fee, E, C., Thomas, S., 2004. Corporate Diversification and Asymmetric Information: Evidence from Stock market Trading Characteristics. *Journal of Corporate Finance* **10**, 105-129.

Clayton, J. M., Ravid, A. S., 2002. The Effect of Leverage on Bidding Behavior: Theory and Evidence from the FCC Auctions. *The Review of Financial Studies,* **15**, No. 3.

Chan, C. K. L., Lakonishok, J., 1992. Robust Measurement of Beta Risk. The *Journal of Financial and Quantitative Analysis*, Vol.**27**, No.2.

Chan, K., Hameed, A., Tong, W., 2000. Profitability of Momentum Strategies in the International Equity Markets. *Journal of Financial Quantitative Analysis* **35**, 153-172.

Chang**,** S., 1998. Takeovers of Privately-held Targets, Method of Payment and Bidder Returns. *Journal of Finance* **53**, 773-84.

Chang, S., Mais, E., 2000. Managerial Motives and Merger Financing**.** *The Financial Review* **35,** 139-152

Chatterjee, S., !986. Types of Synergy and Economic Value: The Impact of Acquisitions on Merging and Rival Firms. *Strategic Management Journal* **7**, 119-39.

Chen, H., Singal, V., 2004. All Things Considered, Taxes Drive the January Effect. *The Journal of Financial Research* Vol. **XXVII**, No. 3, pp. 351-372.

Chen, J., Hong, H., 2002. Discussion of ''Momentum and Autocorrelation in stcok Returns''. *The Review of Financial Studies*, Vol.**15**, No. 2.

Chiao, C., Hueng, J. C., 2005. Overreaction Effects Independent of Risk and Characteristics: Evidence from the Japanese Stock Market. *Japan and the World Economy* **17**, 431-455.

Cho M-H., 1998. Ownership Structure, Investment and the Corporate Value: An empirical Analysis. *Journal of Financial Economics* **47**, 103-121.

Cho, M-H., Cohen A. M., 1997. The Economic Causes and Consequences of Corporate Divesture. *Managerial and Decision Economics* Vol. **18**, No. 5 pp. 367-374.

Chollete, L., Pena, D. I. V., Lu, C-C., 2011. International Diversification: A Copula Approach. *Journal of Banking and Finance* **35**, 403-417.

Chordia, T., Roll, R., Subrahmanyam, A., 2001. Market Liquidity and Trading Activity. *The Journal of Finance* Vol. **LVI**, No. 2

Chordia, T., Subrahmanyam, A., Anshuman, R. V., 2001. Trading Activity and Expected Stock Returns. *Journal of Financial Economics* **59**, 3-32.

Chopra, N., Lakonishok, J., Ritter, J. R., 1992. Measuring Abnormal Performance: Do Stocks Overreact? *Journal of Financial Economics*, Vol. **31**, pp. 235-268.

Comment, R., Schwert, G. W., 1995. Poison or Placebo? Evidence on the Deterrent and Wealth Effects of Modern Antitakeover Measures, *Journal of Financial Economics* **39**, 3-44.

Conn, L. R., 1985. A Re-examination of Merger studies that Use The Capital Asset Pricing Model Methodology. *Cambridge Journal of Economics* **9**, 43–56.

Conn, L. R., Cosh, A., Guest, M. P., Hughes, A., 2005. The Impact on U.K. Acquisitions of Domestic, Cross-Border, Public and Private Acquisitions. *Journal of Business Finance and Accounting*, **32** (5) & (6), 0306-686X.

Conrad, J., Kaul, G., 1998. An Anatomy of Trading Strategies. *The Review of Financial Studies*, Vol. **11**, No. 3, pp.489-519.

Conyon, M. J., Clegg, P., 1994. Pay at the Top: A Study of the Sensitivity of Top Director Remuneration to Company Specific Shocks. *National Institute Economic Review* **149**, 83-92.

Conyon, M. J., Girma, S., Thompson, S., Wright, W. P., 2002. The Impact of Mergers and Acquisitions on Company Employment in the United Kingdom. *European Economic Review* **46**, 31-49.

Cook, W.A., 1992. Time to Levy a ''Syn'' Tax. *Journal of Advertising Research.*

Copeland, E. T., Weston, F. J., Shastri, K., 2005. Fnancial Theory and Corporate Policy. International Edition, Fourth Edition. Pearson Addison Wesley.

Corhay, A., Rad, A., 1996. Conditional heteroskedasticity adjusted market model and an event study. *The Quarterly Review of Economics and Finance* **36;** 529-538.

Cox, R.D., Peterson, R.D., 1994. Stock Returns Following Large One-Day Declines: Evidence on Short-Term Reversals and Longer-Term Performance. The Journal of Finance Vol. 49, No.1, pp. 255-267.

Cramton, P., Gibbons, R., Klemperer, P., 1987. Dissolving a Partnership Efficiently. *Econometrica* **55** (3), 615-632.

Dahya, J., McConnell, J. J., Travlos, G. N., 2002. The Cadbury Committee, Corporate Performance and top Management Turnover. *The Journal of Finance* Vol. **LVII**, No. 1.

Danielson, G. M. and Karpoff, M. J. 2006, Do Pills Poison Operating Performance. *Journal of Corporate Finance* **12**, 536-559.

Datta S., Iskandar-Datta E. M., 1995. Corporate partial Acquisitions, Total Firm Valuation and the Effect of Financing Method. *Journal of Banking & Finance* **19,** 97-115.

Davis R. J., Hillier David and McColgan Patrick 2005, Qwnership Strucure, Managerial behaviour and Corporate Value. *Journal of Corporate Finance* **11**, 645-660.

De Bondt, F. M. W., 2002. Discussion of ''Competing Theories of Financial Anomalies''*. The Review of Financial Studies*, Vol. **15.** No. 2.

De Bondt, F. M. W., Thaler, R., 1985. Does The Stock Market Overreact. *The Journal of Finance* Vol. **XL**, No. 3.

De Bondt, F. M. W., Thaler, R., 1987. Further Evidence On Investor Overreaction and Stock Market Seasonality. *The Journal of Finance* Vol. **XLII**, No. 3.

De Bond**t**, F. M. W., Thompson, E. H. 1992. Is Economic Efficiency the Driving Force behind Mergers? *Managerial and Decision Economics* Vol. **13**, No. 1, pp. 31-44.

Demsetz, H., Villalonga, B.,2001. Ownership Structure and Corporate Performance. *Journal of Corporate Finance* **7**, 209-233.

Daniel, K., Titman, S., 1997. Evidence on the Characteristics of Cross Sectional Variation in Stock Returns. *The Journal of Finance* Vol. **LIL**, No. 1.

Denis, J. D., Denis, K. D., Atulya, S., 1997. Ownership Structure and Top Executive Turnover. *Journal of Financial Economics* **45**, 193-221.

De Young, R. 1997, Bank Mergers, X-Efficiency, and the Market for Corporate Control. *Managerial Finance*, **23** ,1.

Dickerson, P. A., Gibson D. H., Tsakalotos, E., 2002. Takeover Risk and the Market for Corporate Control: The Experience of British Firms in the 1970s and 1980s. *International Journal of Industrial Organization* **20**, 1167-1195*.*

Dimson, E., Marsh, P., 1999. Murphy's Law and Market Anomalies. *Journal of Portfolio Management* **25,** No.2: 53-69*.*

Dissanaike, G., 1997. Do Stock Market Investors Overreact? *Journal of Business Finance and Accounting,* Vol. **24,** pp 27-47.

Doukas J., Travlos G. N., 1988. The Effect of Corporate Multinationalism on Shareholders' Wealth: Evidence from International Acquisitions. *The Journal of Finance* Vol. **XLIII**, No. 5

Dutta, S., Jog, V., 2009. The Long-term Performance of Acquirer Firms: A Re-examination of an Anomaly. *Journal of Banking and Finance* **33,** 1400-1412.

Dutz, M. A., 1989.Horizontal Mergers in Declining Industries. *International Journal of Industrial Organisation* **7** (1), 11-37.

Eckbo, B. E., Thorburn, S. K., 2000. Gains to Bidder Firms Revisited: Domestic and Foreign Acquisitions in Canada. *Journal of Financial and Quantitative Analysis* **35**, 1-25.

Engle, F. R., 1982. Autoregressive Conditional Heteroscedasticity with estimates of the variance of UK Inflation. *Econometrica* Vol. **50,** pp 987-1007.

Engle, F. R., 2001. GARCH 101. The use of ARCH/GARCH models in applied econometrics. *Journal of Economic Perspectives* **15**, 157-168.

Engle, F. R., Ng, K. V., 1993. Measuring and Testing the Impact of News on Volatility. *The Journal of Finance,* Vol. **XLVIII**. No. 5.

Evi, N., Cecilio, M. M., 2004. Predicting Corporate Failure in the UK: A Multidimensional Scaling Approach. *Journal of Business Finance and Accounting* **31,** (5) & (6).

Faccio, M., Masulis, R.W., 2005. The Choice of Payment Method in European Mergers and Acquisitions. *Journal of Finance* **60**, 1345-1388.

Faff, R. W., 2001. An Examination of the Fama-French Three-Factor Model Using Commercially Available Factor. *Australian Journal of Management*, Vol.**26**, No.1.

Faff, R. W., 2003. Creating Fama-French Factors with Style. *The Financial Review* **38**, 311-322.

Faff, R. W., 2004. A Simple Test of the Fama-French Model Using Daily Data: Australian Evidence. *Applied Financial Economics,* **14**, 83-92.

Falaschetti, D. 2002. Golden Parachutes: Credible Commitments or Evidence of Shirking. *Journal of Corporate Finance* **8**, 159-178.

Fama, F. E., 1998. Market Efficiency, Long-term Returns and Behavioral Finance. *Journal of Financial Economics* **49,** 283-306.

Fama, F. E., French R. K., 1987. Dividend Yields and Expected Stock Returns. Working Paper. Chicago: University of Chicago.

Fama, F. E., and French R. K., 1988. Permanent and Temporary Components of Stock Prices. *The Journal of Political Economy*, Vol**. 96**, No. 2, pp. 246-273.

Fama, F. E., and French R. K., 1992. The Cross-Section of Expected Stock Returns. *The Journal of Finance*, Vol. **XLNIL**. No. 2.

Fama, F. E., and French R. K., 1993. Factors in the Returns of Stocks and Bonds. *Journal of Financial Economics* **33**, 3-56.

Fama, F. E., and French R. K., 1995. Size and Book-t-Market Factors in Earnings and Returns. *The Journal of Finance*, Vol. **1**, No. 1.

Fama, F. E., and French R. K., 1996. Multifactor Explanations of Asset Pricing Anomalies. *The Journal of Finance,* Vol**. LI,** No. 1.

Fama, F. E., and French R. K., 1997. Industry costs of Equity. *Journal of Financial Economics* **43**, 153-193.

Fama, F. E., and French R. K., 2005. Financing Decisions: Who issues Stock? *Journal of Financial Economics* **76,** 549-582.

Fama, F. E., and French R. K., 2006. Profitability, Investment and Average Returns. *Journal of Financial Economics* **82**, 491-518.

Feld, A.J. 1982.Tax Policy and Corporate Concentration. Lexington, Mass. D.C. Health and Company.

Ferreira, D., Ornelas, E., Turner L. J., 2005. Ownership structure and the Market for Corporate Control. Working Paper.

Ferson, E. W., Harvey, R. C., 1999. Conditioning Variables and the Cross Section of Stock Returns. *The Journal of Finance* Vol**. LIV**, No. 4,

Field, L. C., Karpoff, M. J., 2002. Takeover Defences of IPO Firms. *Journal of Finance* **57**, 1857-1889.

Firth, M., 1991. Corporate Takeovers, Stockholders returns and Executive returns and Executive Rewards. *Managerial and Decision Economies* **12**, 421-8.

Fishman, M., 1989. Pre-emptive Bidding and the Role of Medium of Exchange. *Journal of Finance* **44**, 41-57.

Foucault, T., Gehrig, T., 2008. Stock Price Informativeness , Cross-Listings and Investment Decisions. *Journal of Financial Economics* **88,** 146-168.

Frank, J., Mayer, C., 1996. Hostile Takeovers and the Correction of Managerial Failure. *Journal of Financial Economics,* Vol. **40**, pp. 163-181.

Frank, M. Z., Goyal, V. K., 2003. Testing the Pecking Order Theory of Capital Structure*. Journal of Financial Economics*. Vol. **67**, 217 – 248.

Frankel**,** R., Li, X., 2004.Characteristics of A Firm's Information Environment and The Information Asymmetry Between Insiders and Outsiders. *Journal of Accounting and Economics* **37**, 229-259.

Gasper, J-M., Massa, M., Matos, P., 2005. Shareholder Investment Horizons and the Market for Corporate Control. *Journal of Financial Economics* **76**, 135-165.

Gharghori, P., Chan, H., Faff, R. W., 2007. Are the Fama-French Factors Proxying Default RisK. *Australian Journal of Management*, Vol. **32**, No. 2.

Gibbons, M., Hess, P., 1981. Day of the Week Effects and Asset Returns. *Journal of Business* **54**, 579-596.

Glenn, N. P., John, M.C., 2001. Estimating Expected Returns in an Event Study Framework: Evidence from the Dartboard Column*. Quarterly Journal of Finance and Accounting*

Goergen, M., Renneboog, L., 2004, Shareholder Wealth Effects of European Domestic and Cross-Border Takeover Bids. *European Financial Management*, Vol. **10**, No.1, 9-45.

Gomes, J., Kogan, L., Zhang, L., 2003. Equilibrium Cross Section of Returns. *Journal of Political Economy* Vol**. III**. No. 4.

Gordon, M., 2002. Takeover Defenses Work. Is That Such a Bad Thing? *Stanford Law Review* **55**, 105.

Gregory, A., 1997. An Examination of The Long Run Performance of UK Acquiring Firms. *Journal of Business Finance & Accounting*, **24**(7) & (8), 0306-686X.

Gregory, A., McCorriston, S., 2005. Foreign Acquisitions by UK Limited Companies: Short and Long-run Performance. *Journal of Empirical Finance* **12**, 99-125.

Gross, H. K. S., Lindstadt, H., 2006. Horizontal and Vertical Takeover and Sell-off Announcements: Abnormal Returns Differ by Industry. *Corporate Ownership and Control*, Vol. **3**, Issue 2.

Grossman, S., Hart, O., 1980. Takeover Bid, Free-rider Problem, and The Theory of the Corporation. *Bell Journal of Economics* **11**, 42-64.

Gujarati, N. D., 2006. Essentials of Econometrics. Third Edition. McGraw-Hill *International Edition.*

Gupta, A., LeCompte, R. and Misra, L., 1997. Acquisitions of Solvent Thrifts: Wealth Effects and Managerial Motivations. *Journal of Banking and Finance* **21**, 1431-1450.

Halil, K., 2004. International Mergers and Acquisitions: A Jump Diffusion Model Application. *Journal of Economics and Finance.*

Harford, J., Jenter, D., Li, K., 2011. Institutional Cross-holdings and their Effect on Acquisition Decisions. *Journal of Financial Economics* **99**, 27-39.

Harris S. Robert and Revenscraft (1991), The Role of Acquisitions in Foreign Direct Investment: Evidence from the U.S. Stock Market. *The Journal of Finance* Vol. **XLVI**, No. 3.

Haugen, R., Jorion, P., 1996. The January Effect: Still There After all These Years. *Financial Analysts Journal* **52**, 27-31.

Hayward, M. L. A., Hambrick, C. D., 1997. Explaining the Premiums paid for Large Acquisitions: Evidence of CEO Hubris. *Administrative Science Quarterly*, Vol. **42**, No. 1.

He, T. L., Reichert, K. A., 2003. Time Variation Paths of Factors Affecting Financial Institutions and Stock Returns. *Atlantic Economic Journal*, **31** (1), pp.71-86.

Healy, P. M., Palepu, K. G., 2001. Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature. *Journal of Accounting* & *Economics*, ***31***, 405–440.

Hein, E. S., Westfall, P., 2004. Improving Tests of Abnormal Returns by Bootstrapping the Multivariate Regression Model with Event Parameters. *Journal of Financial Econometrics*, Vol. **2** No. 3, 451-471.

Helwege, J., Liang, N., 1996. Is There a Pecking Order? Evidence From a Panel of IPO Firms. *Journal of Financial Economics* **40**, 429–458.

Hermalin E. B., Weisbach S. M., 1991. The Effects of Board Composition and Direct Incentives on Firm Performance. *Financial Managemen*t **20**, 101-112.

Heron, R., Lie, E., 2002. Operating Performance and the Method of Payment in Takeovers. Journal of Financial and Quantitative Analysis Vol. 37, No. 1.

Higson, C., Elliott, J., 1998. Post-Takeover Returns: The UK Evidence. *Journal of Empirical Finance* **5**, 27-46.

Hijzen, A., Gorg, H., Manchin, M., 2006. Cross-Border Mergers and Acquisitions and the Role of Trade Costs. The University of Nottingham,. Research Paper 2005/17.

Himmerlberg P. C., Hubbard R. G., Darius, P.,1999, Understanding the Determinants of Managerial Ownerssship and the link Between Ownership and Performance. *Journal of Financial Economics* **53**, 353-384.

Hodrick, J. R., 1992. Dividend Yields and Expected Stock Returns: Alternative Procedures for Inference and Measurement. *The Review of Financial Studies*, Vol.**5**, No.3, pp.357-386.

Hogan, S., Jarrow, R., Teo, M., Warachka, M., 2004. Testing Market Efficiency using Statistical Arbitrage with Applications to Momentum and Value Strategies. *Journal of Financial Economics* **73**, 525-565.

Holl, P. and Kyriazis, D. 1997, Wealth Creation and Bid Resistance in UK Takeover Bids. *Strategic Management Journal* Vol. **18**, No. 6, pp. 483-498.

Hong, H., Stein, J., 1999. A Unified Theory of Underraction, Momentum Trading and Overreaction in Asset Markets. *Journal of Finance* **54**, 2143-2184

Hopner, M. and Jackson G. 2006, Revisiting the Mannesmann Takeover: How Markets for Corporate Control Emerge. *European Management Review* **3,** 142-155.

Horowitz, J., Loughran, T., Savin, N., 2000. Three Analyses of the Firms Size Premium. *Journal of Empirical Finance* **7**, 143-153.

Hu, O., 2007. Applicability of The Fama-French Three-Factor Model in Forecasting Portfolio Returns. *The Journal of Financial Research*, Vol. **XXX**, No. **1**, pp. 111-127.

Ikenberry, L. D., Ramnath, S., 2002. Under reaction to Self-Selected News Events: The Case of Stock Splits. *The Review of Financial Studies,* Vol. **15,** No. **2**.

Inoue, K., Uchida, K., Bremer, M., 2010. Post-restructuring Performance in Japan. *Pacific-Basin Finance Journal* **18**, 494-508.

Jagannathan, R., Wang, Z., 1996. The Conditional CAMP and the Cross-Section of Expected Returns. *The Journal of Finance* Vol. **LJ**, No. 1.

Jarrell**,** A. G., Brickley, A. J., Netter, M. J., 1988. The Market for Corporate Control: The Empirical Evidence since 1980. *Journal of Economic perspectives* **2,** 49-68**.**

Jegadeesh, N., 1990. Evidence of Predictable Behaviour of Security Returns. *Journal of Finance* Vol. **45**, pp. 881-898.

Jegadeesh, N., Titman, S., 1993. Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *The Journal of Finance* Vol. **XLVIII**, No. 1.

Jegadeesh, N., Titman, S., 2001. Profitability of Momentum Strategies: An Evaluation of Alternative Explanations. *Journal of Finance* **LVI,** No. 2.

Jegadeesh, N., Titman, S., 2002. Cross-Sectional and Time-Series Determinants of Momentum Returns. *The Review of Financial Studies*, Vol. **15**, No.1.pp. 143-157

Jensen C. Michael (1986), Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review* Vol. **76**, No. 2, pp. 323-**329.**

Jensen M. C., 1987. The Free Cash Flow Theory of Takeovers: A Financial Perspective of Mergers ad Acquisitions and the Economy. Available at http://papers.ssrn.com/ABSTRACT =350422.

Jensen M. C., 1988. Takeovers: Their Causes and Consequences. *The Journal of Economic Perspectives*, Vol. **2**, No.1.

Jensen C. M., Ruback S. R., 1983. The Market for Corporate Control: The scientific Evidence. *Journal of Financial Economics*, Vol. **11** pp. 5-50.

Jones, M. C., 2002. A Century of Stock market Liquidity and Trading Costs. Working Paper.

Joseph, L. N., 2008. Price Reaction to Large Changes: Over-Reaction or Return Continuation. Working Paper.

Kane, E., 2000. Incentives for Banking Megamergers: What Motives might Regulators Infer from Event-study Evidence?. *Journal of Money, Credit and Banking* ***32*****.0**

Karim, S., Mitchell, W., 2000. Path-Dependent and Path-Breaking Change: Reconfiguring Business Resources Following Acquisitions in the US Medical Sector, 1978-1995. *Strategic Management Journal*, Vol. **21**, No. 10/11, pp. 1061-1081.

Kesner, I.F., Shapiro, D.L., Sharma, A., 1994. Brokering Mergers: An Agency Theory Perspective on the Role of Representatives. *Academy of Management Journal* **37**, No.3, 703–721.

Kim, S. W., 2000. Does FDI Increase Firm Value in Emerging Markets? Working Paper Series 00-03

Kini, O., Kracaw, W., Shehzad, M., 1995. Corporate Takeovers, Firm Performance and Board Composition. *Journal of Corporate Finance* **1**, 383-412.

Kiymaz, H., 2003. Cross-Border Acquisitions of U.S. Financial Institutions: Impact of Macroeconomic Factors. *Journal of Banking and Finance*. Forthcoming.

Kiymaz, H., Kilic, O., 2004. International Mergers and Acquisitions: A Jump Diffusion Model Application. *Journal of Economic and Finance*, Vol. **28**, No.2.

Kohers, T., 2001. Domestic Versus Cross-Border Takeovers of U.S. Targets: Why Do Foreign Bidders Pay More? *Financial Management Association* meeting in Toronto, Canada.

Kohers, N., 2004. Acquisitions of Private Targets: The unique Shareholder Wealth Implications. *Applied Financial Economics*, **14,** 1151-1165.

Köke, J., 2004. The Market for Corporate Control in a Bank-based Economy: A Governance device? *Journal of Corporate Finance* **10**, 53-80.

Kothari, P. S., Shanken, J., Sloan, R., 1995. Another Look at the Cross-Section of Expected Stock Returns, *Journal of Finance* **50**, !85-224.

Kothari, P. S., Warner, B. J., 1997. Measuring Long-Horizon Security Price Performance. *Journal of Financial Economics* **43**, 301-339.

Kothari, P.S., Warner, B. J., 2006. Econometrics of Event Studies. Forthcoming in B. Espen Eckbo (ed), Handbook of Corporate Finance: *Empirical Corporate Finance*, Volume A (Handbooks in Finance Series) Ch. 1.

Krishnan, H.A., Miller, A., Judge, W.Q., 1997. Diversification and Top Management team Complementarity: Is Performance Improved by Merging Similar or Dissimilar Teams? *Strategic Management Journal*, Vol. **18**, 361–374.

Kroll, M., Wright, P., Toombs, L., Leavell, H., 1997. Form of Control: A Critical Determinant of Acquisition Performance and CEO Rewards. *Strategic Management Journal* **18**(2): 85–96.

Lasfer, A. M., Melnik, A., Thomas C. D., 2003. Short-term Reaction of Stock Markets in Stressful Circumstances. *Journal of Banking and Finance* **27**, 1959-1977.

Lamont, O., Polk, C., Saa'-Requejo, J., 2001. Financial Constraints and Stock Returns. *The Review of Financial Studies*, Vol. **14**, No.2.

Lang, L. H. P., Stulz, M. R., 1994. Tobin's q, Corporate Diversification, and Firm Performance. *The Journal of Political Economy,* Vol. **102,** No.6, pp. 1248-1280.

Lang, L. H. P.; Stulz, M. R., Walkling, R. A., 1989. Management Performance, Tobin's q, and the Gains from Successful Tender Offers. *Journal of Financial Economics* **24**, 137-154.

Lang, L. H. P.; Stulz, M. R., Walkling, R. A., 1991, A Test of the Free Cash Flow Hypothesis: The Case of Bidder Return. *Journal of Financial Economics* **29** (2), 315-336.

Le, T. H.; Schultz, E. 2007. Toeholds and the Bidder Shareholder Wealth Effects of Takeover Announcements. *Australian Journal of Management*, Vol. **32**, No. 2

Lee, C. M. C., Swaminathan, B., 2000. Price Momentum and Trading Volume. *The Journal of Finance,* Vol. **55**, No.5.

Lefanowicz E. Craig., Robinson R. John., Smith R., 2000. Golden Parachutea and Managerial Incentives in Corporate Acquisitions: Evidence from the 1980s and 1990s. *Journal of Corporate Finance* **6**, 215-239.

Lettau, M., Ludvigson, S., 2001. Resurrecting the (C)CAMP: A Cross-Sectional Test When Risk Premia Are Time-Varying. *Journal of Political Economy* Vol**.** 1**09**, No. 61.

Lewellen, J., 2002. Momentum and Autocorrelation in Stock Returns. *The Review of Financial Studies*, Vol. **15,** No. 2.

Levy, H., Levy, M., 2004. Prospect Theory and Mean-Variance Analysis. *The Review of Financial Studies*, Vol. **17**, No. 4.

Lewis, D. and Webb, R. J., 2007, Potential Cost Synergies from Banks Acquiring Real Estate Brokerage Services. *Journal of Banking & Finance* **31**, 2347-2363.

Li, K. W., Ling, S., Wong, H., 2001. Estimation for Partially Nonstationary Multivariate Autoregressive Models with Conditional Heteroscedasticity.. *Biometrika*, Vol**. 88**, No.4, pp. 1135-1152.

Limmack, R., 2003. Discussion of Glamour Acquirers, Method of Payment and Post-Acquisition Performance: The UK Evidence. *Journal of Business Finance & Accounting,* **30** (1) & (2).

Lin, W., Madura, J. J., Picou, A., 1994. The Wealth Effects of International Acquisitions and the Impact of the EEC Integration. *Global Finance Journal* **5** (1), 65-74.

Lo, W. A., MacKinlay, C. A., 1988. Stock Market Prices Do Not Follow Random Walks: Evidence from a Simple Specification Test. *The Review of Financial Studies* Vol. **1**, No. 1, pp. 41-66.

Lo**,** A., MacKinlay, C., 1990. Data –Snooping Biases in Tests of Financial Asset Pricing Models. *Review of Financial Studies* **3**, 431-467.

Lo, W**.** A., MacKinlay, C. A., 1990. When Are Contrarian Profits Due to Stock Market Overreaction. *The Review of Financial Studies* Vol. **3**, No. 2, pp. 175-205.

Loughran, T., Vijh*, M. A., 1997. Do Long-term Shareholders Benefit from Corporate Acquisitions?, *Journal of Finance* vol**. 52**, No. 5, 1765-1790.

Lyon, D. J., Barber, M. B., Tsai, C-L., 1999. Improved Methods for Tests of Long-Run Abnormal Stock Returns. *The Journal of Finance* Vol. **LIV**, No.1

MacKinlay, C. A., 1997. Event Studies in Economics and Finance. *Journal of Economic Literature* Vol. **XXXV**, pp. 13-39.

MacKinlay, C. A., Richardson, P. M., 1991. Using Generalised Method of Moments to Test Mean-Variance Efficiency. *The Journal of Finance,* Vol. **XLVI**. No. 2.

Malatesta, P.H., Thompson, R., 1993. Government Regulation and Structural Change in the Corporate Acquisitions Market: The impact of the Williams Act, *Journal of Financial and Quantitative Analysis* **28**, 363-379.

Malliaropulos, D., 1996. Are Long-Horizon Stock Returns Predictable? A Bootstrap Analysis. *Journal of Business Finance & Accounting*, **23** (1), 0306-686x.

Maloney, M. T., McCormick, R.E., Mitchell, M. 1993. Managerial Decision Making and Capital Structure. *Journal of Business* **66**, 189-217.

Manasakis, C., 2006. Shareholder Wealth Effects from Mergers and Acquisitions in the Greek Banking Industry. Working paper 2006-12.

Manry, D., Nathan, K., 1999. Greenmail Premia, Board Composition and Management Shareholdings. *Journal of Corporate Finance* **5**, 369-382.

Martin, J. K.,1996. The Method of Payment in Corporate Acquisitions, Investment Opportunities and Management Ownership. *The Journal of Finance* Vol. LI, No. 4.

Martynova, M., Renneboog, L., 2006. Mergers and Acquisitions in Europe. Forthcoming in 'Advances in Corporate Finance and Asset Pricing'. Working Paper N, 114/2006.

Mayfield, S., 2004. Estimating the market risk premium. *Journal of Financial Economics* **73**, 465–496*.*

Mazouz, K., Joseph, L. N., Joulmer, J., 2009. Stock Price Reaction Follwing Large One-day Price Changes: UK Evidence. *Journal of Banking & Finance* 33, 1481-1493.

McCann, M., 2004. Motives for Acquisitions in the UK. Discussion Papers in *Applied Economics and Policy.* No. 2004/1.

McQueen, G., Vorkink, K., 2004. Whence GARCH? A Preference-Based Explanation for Conditional Volatility. *The Review of Financial Studies*, Vol. **17**, No. 4, pp. 915-949.

Megginson, L.W., Morgan, A., Nail, L., 2004. The Determinants of Positive Long-term Performance in strategic Mergers: Corporate Focus and Cash. *Journal of Banking and Finance* **28,** 523-552.

Merton, C. R., 1973. An Intertemporal Capital Asset Pricing Model. *Econometrica,* Vol**.41**, No.5, pp. 867-887.

Mitchell, L. M., Stafford E., 2000. Managerial Decisions and Long Term Stock Price Performance. *Journal of Business*, Vol. **73**, No. 3.

Moeller B. S., Schlingemann P. F., Stulz M. R., 2004. Firm size and the gains from Acquisitions. *Journal of Financial Economics* **73**, 201-228.

Moeller B. S., Schlingemann P. F., Stulz M. R., 2003. Do Shareholders of Acquiring Firms gain from Acquisition? NBER Working Paper No. 9523.

Mueller, D. C., Sirower, M. L., 2003. The Causes of Mergers: Tests Based on the Gains to Acquiring Firm's Shareholders and Size of Premia. *Managerial and Decision Economics* **24**, 373-391.

Mukherjee, K. T., Kiymaz, H., Baker, K. H., 2004. Working Paper, American University, Kogod School of Business.

Myers, R. J., 1991. Estimating Time-varying Optimal Hedge Ratios on Futures Markets. *Journal of Future Markets* **11**, 39-53.

Myers, S.C., 1984. The capital structure puzzle. *Journal of Finance* **39**, 575–592.

Myers, S.C., Majluf, N.S., 1984. Corporate Financing and Investment Decisions When Firms have Information that Investors Do not Have. *Journal of Financial Economics*, **13** (2): 187-221.

Nam, K., Pyun, S. C., Arize, C. A., 2002. Asymmetric Mean-Reversion and Contrarian Profits: ANST-GARCH Approach. *Journal of Empirical Finance* **9**, 563-588.

Nam, K., Pyun, S. C., Kim, S.-W., 2003. Is asymmetric mean-reverting pattern in stock returns systematic? Evidence from Pacific-basin markets in the short-horizon. *International Financial Markets, Institutions and Money* **13**, 481–502.

Nelson, D., 1991. Conditional Heteroscedasticity in Asset Returns: A new approach. *Econometrica* **59**, 347-370.

North S. D., 2001. The Role of Managerial Incentives in Corporate Acquisitions: The 1990s evidence. *Journal of Corporate Finance* **7**, 125-149.

Pastor, L., Stambaugh, F. R., 2003. Liquidity Risk and Expected Stock Returns. *Journal of Political Economy*, Vol**. III,** No. 3.

Palepu, K. G., 1986. Predicting Takeover Targets. Methodological and Empirical Analysis. *Journal of Accounting and Economics* **8**, 3-35.

Platt D. H., Platt B. M., 2002. Predicting Corporate Financial Distress: Reflections on Choice-based Sample Bias. *Journal of Economics and Finance* Vol. **26** No. 2.

Pham, V. T. L., 2007. Constructing Fama-French Factors from Style Indexes: Japanese Evidence. *Economic Bulletin*.

Pham, T. L. V., Nguyen, D.Q.T., To, T-D., 2007. Abnormal Retturns after Large Stock Price Changes: Evidence from Asia-Pacific Markets. Asia-Pacific Financial Markets: Integration, Innovation and Challenges, Vol**. 8,** 2007.

Pontiff, J., Schall, D. L., 1998. Book-to-Market ratios as Predictors of Market Returns. *Journal of Financial Economics* **49**, 141-160.

Pontiff, J., Schill, J. M., 2001. Long-run Seasoned-Equity Offering Returns: Data Snooping, Model Misspecification, or Mispricing? A costly Arbitrage Approach. Working Paper.

Pound, J., 1992. On the motives for Choosing a Corporate Governance Structure: A Study of Corporate Reaction to the Pennsylvania Takeover Law. *Journal of law, Economics and Organisation* **8**, No. 3, 656-672.

Powell, G. R. 2001. Takeover Prediction and Portfolio Performance: A Note. *Journal of Business Finance & Accounting* **28** (7).

Powell, G. R., Stark, W. A., 2005. Does Operating Performance Increase Post-Takeover for UK Takeovers? A Comparison of Performance Measures and Benchmarks. *Journal of Corporate Finance* **11**, 293-317.

Powell, G. R., Yawson, A., 2005. Are Corporate Restructuring Events Driven by Common Factors? Implications for Takeover Prediction. Forthcoming *Journal of Business Finance and Accounting*

Ranft, L. A., Lord D. M., 2000. Organisational Learning about new International Market: Exploring the Internal Transfer of local Market Knowledge. *Journal International Business Studies* **31**, No.4, 1-17.

Ranft, L. A., Lord D. M., 2002. Acquiring New Technologies and Capabilities: A Grounded model of Acquisition Implementation. *Organisation Science*, Vol. **13**, No.4, pp. 420-441.

Rege, P. U., 1984. Accounting Ratios to Locate Take-over Targets. *Journal of Business Finance and Accounting* **11**, 3.

Reinganum, M. R., 1999. The Significance of Market Capitalisation in Portfolio Management over Time. *Journal of Portfolio Management* **25**, 39-50.

Roll R., 1986. The Hubris Hypothesis of Corporate Takeovers. *Journal of Business*, **59**, 197-216.

Rosen, J. R., 2006. Merger Momentum and Investor Sentiment: The Stock Market Reaction to Merger Announcements. Working Paper.

Sarig, H. O., Talmor, E., 1997. In Defence of Defence Measures. *Journal of Corporate Finance* **3**, 277-297.

Schlingemann, P. F., 2004. Financing Decision and Bidder Gains. *Journal of Corporate Finance* **10**, 683-701.

Schrimpf, A., 2010. International Stock Return Predictability under Model Uncertainty. *Journal of International Money and Finance* **29**, 1256-1282.

Schwert, G. W., 1989. Why Does Stock Market Volatility Change Over Time. *The Journal of Finance* Vol. **XIIV**, No. 5

Schwert, G. W., 2000. Hostility in Takeovers: In the Eyes of the Beholder? *Journal of Finance* **55** (6), 2599-2640.

Serra, P. A., 2002. Event Study Test: A Brief Survey. Working Paper FEP. No. 117.

Servaes, H., 1991. Tobin's Q and the Gains from Takeovers. *The Journal of Finance.* Vol. **LXVI,** No. 1.

Shaked, I., Michel A., McClain 1991. The Foreign Acquirer Bonanza: Myth or Reality. *Journal of Business Finance & Accounting*, **18** (3).

Sharpe, F. W., Alexander, J. G., Bailey, V. J., 1999. Investments. Prentice-Hall International, Inc.

Shih, S. H. M., 1994. Corporate Tax Incentives for Conglomerate Mergers: Model Development and Empirical Evidence. *Contemporary Accounting Research*, Vol. **10**, No. 2, pp. 453-481.

Shivdasani, A., 1993. Board Composition, Ownership Structure and Hostile Takeovers. *Journal of Accounting and Economics* **16**, 167-198.

Shyam-Sunder, L., Myers, S.C., 1999. Testing Static Tradeoff Against Pecking Order Models of Capital Structure. *Journal of Financial Economics* **51**, 219-244.

Siddique, R. A., 2003. Common Asset Pricing Factors in Volatilities and Returns in Future Markets. *Journal of Banking and Finance* **27**, 2347-2368.

Sinha, R., 2006. Regulation: The Market for Corporate Control and Corporate Governance. *Journal of Global Finance* Vol. **16**, 3, pp. 264-282.

Siriopoulos, C., Georgopoulos, A., Tsagkanos, A., 2006. Does the Market for Corporate Control Hypothesis Explain Takeover Targets? *Applied Financial Economics* Forthcoming.

Sirower, M. L., 1997. The Synergy Trap. Working Paper.

Small, K., Smith J., Yildirim, S., 2007. Ownership Structure and Golden Parachutes: Evidence of Credible Commitment or Incentive Alignment. *Journal of Economics and Finance* Vol. **31** No. 3

Smith, K. L., Bracker, K., 2003. Forcasting changes in Copper Futures volatility with GARCH Model using an Iterated Algorithm. *Review of Quantitative Finance and Accounting* 20, 245-265.

Song H. M., Walkling A. R., 1993. The Impact of Managerial Ownership on Acquisition Attempts and Target Shareholder Wealth. *Journal of Financial Quantitative Analysis* Vol. **28** No. 4.

Sorbonne, I., 2006. Acquisition Bid Price: Is There an Optimal Cash-Equity Payment Mix? Working paper, Professor Universite Paris.

Sorensen, D. E., 2000. Characteristics of Merging Firms. *Journal of Economies and Business* Vol.**52,** Issues 5, Pages 423-433.

Stout, L.A., 2002. Do Antitakeover Defenses Decrease Shareholder Wealth? The ex ante and ante Valuation Problem. *Stanford Law Review* **55**, 845–861.

Stulz, R. M., 1988. Managerial Control of Voting Rights; Financing Policies and the market for Corporate Control. *Journal of Financial Economics* **20**, 1&2, 25-54.

Subramaniam, C., Daley A. L., 2000. Free Cash Flow, Golden Parachutes, and the Discipline of Takeover Activity. *Journal of Business Finance & Accounting,* ***27*** *(1) & (2).*

Subramanian, R., Gondhalekar, V., Narayanaswamy, R. C. 2006. Technology and Marketing Alliances, 1996-2003. Working Paper.

Sudarsanam, P. S., 1995. The Role of Defensive Strategies and Ownership Structure of Target Firms: Evidence from UK Hostile Takeover Bids. *European Financial Management,* Vol. **1**, No.3, pp.223-240.

Sudarsanam, P. S., 2004. Discussion of Increasing Market Share as a Rationale for Corporate Acquisitions .*Journal of Business Finance & Accounting*, **31,**1 & 2.

Sudarsanam, S., Mahate, A. A., 2003. Glamour Acquirers, Method of Payment and Post-Acquisition Performance: The UK Evidence. *Journal of Business Finance and Accounting* **30** (1) & (2), 299-341.

Sudarsanam, S., Mahate, A. A., 2006. Are Friendly Acquisition Too Bad For Shareholders and Managers? Long-Term Value Creation and Top Management Turnover in Hostile and Friendly Acquirers. *British Journal of Management,* Vol. **17**, S7-S30.

Sullivan, R., Timmermann, A., White, H., 1999. Data-Snooping, Technical Trading Rule Performance, and the Bootstrap. *The Journal of Finance*, Vol.**LIV**. NO. 5.

Thompson, J. E., 1988. More Methods that Make Little Difference in Event Studies, *Journal of Business Finance and Accounting* **15**: 77-86.

Thorburn, K. S., 2000. Bankruptcy Auctions: Costs, Debt Recovery and Firm Survival. *Journal of Financial Economics* **58**, 337-368.

Titman, S., Discussion of ''Under reaction to Self Selected News Events''. *The Review of Financial Studies,* Vol. **15,** No. 2.

Travlos, G. N., 1987. Corporate Takeover Bids, Methods of Payment and Bidding Firms' Stock Returns. *The Journal of Finance*, Vol. **42**, No.4, pp. 943-963.

Travlos, G. N. and Waegelein, F. J. 1992, Executive Compensation, Method of Payment and Abnormal Returns to Bidding Firms at Takeover Announcements. *Managerial and Decision Economics*, Vol. **13,** 493-501

Tsai, I-C., Chen, M-C., 2009. The Asymmetric Volatility of House Price in the UK. www.emeraldinsight.com/reprints.

Tuch, C., O'Sullivan, N., 2007. The Impact of Acquisitions on Firm Performance: A Review of the Evidence. *International Journal of Management Reviews,* Vol. **9**, Issue 2, pp. 141-170.

Ushijima, T., 2010. Understanding Partial Mergers in Japan. *Journal of Banking and Finance* **34,** 2941-2953

Van Dijk, M. A., 2007. Is Size Dead? A Review of the Size Effect in Equity Returns. Available at SSRN: http// ssrn.com/ abstract=879282

Van de Ven, H. A. 2007, Engaged Scholarship: A Guide for Organizational and Social Research. Oxford University Press, Forthcoming.

Veronesi, P. 2002. Discussion of ''Sidelined Investors, Trading-Generated News, and Security Returns''. *The Review of Financial Studies*, Vol. **15**, No. 2.

Villalonga, B., 2004. Does Diversification Cause the 'Diversification Discount'? *Financial Management* **33**, 5-27.

Vogelvang, B., 2005>Econometrics Theory and Applications with EViews. Pearson Education Limited.

Wahal, S., Wiles, K. W., Zenner, M., 1995. Who opts out of State Antitakeover Protection? The Case of Pennsylvania's SB 1310. *Financial Management* **24**, No. 3, 22-39.

Waheed, A., Mathur, I., 1995. Wealth Effects of Foreign Expansion by U.S. Banks. *Journal of Banking & Finance* **19**, 823-842.

Walker, M. M., 2000. Corporate Takeovers, Strategic Objectives, and Acquiring Firm Shareholder Wealth. *Financial Management* Vol. **29**, No1., pp.53-66.

Wang, X., 2000. Size Effect, Book-to-Market Effect and Survival. *Journal of Multinational Management* **10**, 257-273.

Weir, C., Laing, D., 2003. Ownership Structure, Board Composition and the Market for Corporate Control in the UK: An Empirical Analysis. *Applied Economics* **35**, 1747-1759.

Weir, C., Laing, D., Wright, M., 2005. Incentive Effects, Monitoring Mechanisms and the Threat from the Market for Corporate Control: An Analysis of the Factors Affecting Public to Private Transactions in the UK. *Journal of Business Finance and Accounting* **32**, 909–944.

Weston, F. J., 1994. Divestiture: Mistakes or Learning? In Readings in Mergers and Acquisitions. Blackwell: Oxford.

Weston J. F., Siu, J. A., Johnson, B. A., 2001. *Takeovers, Restructuring & Corporate Governance*, Third Edition-Prentice-Hall, Inc.

Wooldridge, M. J., 2002. Econometric Analysis of Cross Sectionand Panel Data. The MIT Press. Cambridge, Massachusetts.

Wu, X., Wang, Z., 2005. Equity Financing in a Myers-Majluf Framework with Private Benefits of Control. *Journal of Corporate Financie* **11**, 915-945.

Xing, X., Howe, S. J., 2003. The empirical relationship Between Risk and Reurn: Evidence from the UK Stock Market. *International Review of Financial Analysis* **12**, 329-346.

Yang, M-J., Lai, Y-C., 2009. An out-of-sample Comparative Analysis of Hedging Performance of Stock Index Futures: Dynamic versus Static Hedging. *Applied Financial Economics* Vol. **19**, 1059-1072.

Appendix I

TARGET FIRMS	ACQUIRER FIRMS
1. Texaco	1. May Dept. Stores
2. United Television	2. Centel
3. Public Service NWH	3. Cablevision System
4. CSX	4. Transco Energy
5. American Brands	5. Ford Motor
6. Sun Electric	6. Bristol Myers Squibb
7. May Dept. Stores	7. Procter & Gamble
8. Viacom	8. Mccaw Cellular Communications
9. Cigna INVS. SECS.	9. CIGNA
10. Primerica	10. West Coast Energy
11. Affiliated Pubs	11. Whirlpool
12. Texaco Canadaus	12. Merck & Cos.
13. Transco	13. Atlantic Richfield
14. RJR Nabisco	14. Heinz HJ
15. Squibb	15. Textron
16. Noxellb	16. Weyerhaeuser
17. McCaw cellular Commmunications	17. Emerson
19. Whirlpool	18. Schlumberger
19. Dennison Manufacturing	19. General Electric
20. Enserch Exploration	20. Lockheed Corp.
21. Ford Motor WTS.	21. CIN. Gas Electric
22. Whitman ED. GP.	22. United Airlines
23. Oryx energy	23. Citizens Utilities
24. USX Corp. PF. ART	24. Eaton Corp.
25. Continental	25. Litton Industries
26. United Artists Entertainment	26. Northrop Grumman
27. Occident PTL.	27. LDDS. Communications
28. Rockwell International	28. Lilly Eli & Co.
29. American Tel.& Communication	29. Johnson & Johnson
30. PSI Resources	30. Forstmann & Co.
31. Weyerhaeuser	31. Colgate-Palm

32. Kemper	32. Union Pacific
33. Amax Gold	33. General GW. PROS.
34. Litton Industries	34. First Data
35. GTE	35. Tenneco
36. Ahmanson HF	36. TJX Cos.
37. HCA	37. Service Master
38. Motorola	38. Travelers Cos.
39. Varity Corporation	39. Northrop Grumman
40. Grumman	40. Nuevo Energy
41. Chevron	41. Tejas Gas
42. Nynex	42. Foundation Health
43. Kmart	43. Tosco
44. Madison BCSH	44. Sherwin-Williams
45. Lockheed Corporation	45. Raytheon
46. Gen. Care Health System	46. America Waste Services
47. American MED. HDG	47. Honeywell International
48. Merck & Co.	48. PG & E
49. Allstate	49. Marsh & Mclennan
50. Quaker Oats	50. Valero Energy
51. Marion Merrell	51. Edison INTL.
52. Unisys	52. Knight Ridder
53. MFS Communication	53. Tyco International
54. Travellers CO.	54. Pan American Beverages
55. Patrick Industries	55. Dow Chemical
56. Pacific Aerospace	56. Xerox
57. GEICO Corporation	57. Safeco
58. Fort Howard	58. Cablevision System
59. Masco	59. Inter media Communications
60. Marshall IND	60. Lyondell Chemicals
61. Baxter International	61. Breed Technologies
62.Unitedstate Cellular	62. WorldCom GP
63. Textron	63. Intersoll –Rand
64. Millennium Chemical	64. Ameritech

65. Corning	65. Intel
66. AFLAC	66. Integrated Health
67. Monterey Gourmet	67. AES
68. Ryder System	68. Caterpillar
69. Marathon Oil	69. Duke Energy
70. Centerior Energy	70. Ball Corp.
71. Nynex	71. Telephone & Data System
72. Unocal	72. Matrix Resources
73. Johnson Controls	73. FPL Group
74. Kimberly Clark	74. Halliburton
75. Genetics Institute	75. Aetna
76. Texas Institute	76. Health South
77. Measurex	77. Boston Scientific
78. Valero Nat. Gas	78. Micro Technology
79. Lockheed Martin	79. AT&T
80. Rockwell Automation	80. Stryker
81. Edison International	81. Albertsons
82. Walt Disney	82. AES
83. Merck & Co.	83. Kerr-Mcgee
84. Ashland	84. Newell Rubbermaid
85. Cablevision System	85 GMS Energy
86. Compuserve	86. Rita Aid
87. Xerox	87. Info Seek
88. GPU	88. AEP Industries
89. Digital Equipment	89. Concord
90. Dow Chemical	90. Southern Energy
91. Health South	91. Omnicom GP
92. Browning-Ferris	92. SBC Communications
93. PG&E	93. Whitman ED
94. Ashland	94. Lear
95. Reynolds Metals	95. GTE
96. Dresser Industries	96. Comcast
97. Stone Containers	97. Avis Budget Group

98. Pfizer	98. Lamar Advertising
99. American Stores	99. Allstate
100. Vanguard Cellular System	100. General Dynamics
101. Rubbermaid	101. Century Communication
102. Bellsouth	102. Cox Communications
103. GPU	103. Rayonier
104. Dover	104. Alcoa
105. Union Pacific	105. Carolina Power Light
106. Ocean Energy	106. Cabot
107. Safeco	107. Gemstar TV Guide Intl.
108. UTD Industries	108. Westvaco
109. United Technologies	109. Microsoft
110. American Tech	110. AGL Resources
111. Fort James	111. Celestica SBVTG SHS.
112. Avondale Industries	112. Chevron
113. Honeywell Industries	113. Global Crossing
114. Dynegy	114. Newell Rubbermaid
115. Baxter Industries	115. Plum Creek Timber
116. Smurfit Stone CTNR	116. Computer Sciences
117. Fairchild	117. McGraw Hill
118. Tenet Health Care	118. Dominion Resources
119. Temple Inland	119. Boeing
120. Time Warner	120. Jacor Communication
121. Ingersoll-Rand	121. Bell South
122. Qualcomm	122. Ford Motor
123. Clear CHL. Communication	123. International Flavours
124. Raytheon	124. Entergy
125. Gillette	125. Fedex
126. Potomac Elec. Power	126. Apache
127. Pacific Gulf Props.	127. Univision Communications
128. Verizon Communication	128. Constellation Energy
129. Northeast Utilities	129. Allegheny Energy
130. Infinity Broadcast	130. Domtar

131. Bush Boake Allen	131. Affiliated CMP Services
132. Georgia Pac Com-Timber	132. General Dynamics
133. Alcoa	133. Collins & Alkman New
134. Penney JC	134. America Electric Power
135. Rohm & Haas	135. J. M. Smucker
136. Dean Food	136. Aquila
137. Bristol Myers Squibb	137. Alltel
138. Entergy	138. Tesoro PTL PIESCV
139.Textron	139. Household International
140. CMS Energy	140. Clayton Williamsen
141. El Paso	141. Ameren
142. Conagra Foods	142. Newfield Exploration
143. EEX	143. Goodrich
144. TRW	144. Pfizer
145. Pharmacia	145. Enterprise Production Partners
146. Qwest Communication Int.	146. Mace Rich
147. Dole Food	147. 3M
148. Thermo Electron	148. Energizer HDG
149. Wallace CMP. Service	149. Chesapeake Energy
150. Pfizer	150. Southern Union
151. Alltel	151. Pilgrims
152. Beacon Properties	152. Dobson Communications
153. Airborne	153. Lockheed Martin
154. OM Group	154. Mead Corporation
155. Conagra Foods	155. Caremark Rx
156. Office Max	156. Anthem EQU SEC
157. Centex	157. R. R. Donnelley & Son
158. Marathon Oil	158. Pentair
159. Advance PCS	159. NGC Corporation
160. WellPoint	160. XTO Energy
161. CIGNA	161. Atomos Energy
162. Duke Energy	162. Johnson Controls
163. Westport Resources	163. RH Donnelley

164. Dow Chemical	164. Mills
165. Dana	165.Ingram Micro
166. Westinghouse Electric	166. Dynegy
167. Cox Communications	167. Loews
168. Anadarko Petroleum	168. Marriott Corporation
169. Bethlehem Steel	169. Pepsi Co.
170. Harrahs Entertainment	170. Sprint
171. Sears Roebuck	171. Eastman Kodak
172. CSX	172. Energy Transfer Partners
173. Genencor International	173. Chiquita Brands International
174. Cinergy	174. Conoco Phillips
175. Reebok International	175. General Binding
176. York International	176. Well Point
177. Shopko Stores	177. Boston Sciences
178. Engel Hard	178. Seagate Tech.
179. Guidant	179. Home Depot
180. Burlington Resources	180. Cedar Fair
181. Hughes Supply	181. Anadarko Petroleum
182. Albertsons	182. Hercules
183.Keyspan	183. Great Atlantic & Pacific Tea
184. Aramark	184. Atlantis Internet Group
185. AON	185. Community Health Systems
186. Lyondell Chemical	186. Occidental PTL
187. Caremark RX	187. Tyson Foods
188.Pillsbury	188. Maytag
189. AMFAC	189. Sybase
190. Stop & Shop	190. Sunward Technologies
191. Emhart	191. URS Corporation
192. Ogilvy Group	192. Avery International
193. Singer	193. Rochester Gas Electric
194. MCA	194. Allied Signal
195. NERCO	195. Columbia Health Care
196. Baroid	196. BAT Industries

197. IDB Communications 198. Hill Haven Nevada	197. Coles Myer 198. Martin Marietta 199. Paine Webber Group 200. Monsanto Co. 201. CPC International 202. Jefferson Pilot 203. NEC Corporation

Appendix II

The Statistics for Sample Skewness, Kurtosis and Jarque-Bera

Before proceeding further, we briefly consider the skewness, kurtosis and Jarque-Bera statistics of the simulation to determine whether these statistical features lead to potential rejection of the normality assumption (see. e.g. Vogelvang, 2005).

Sample Skewness: Skewness is a measure of the degree of asymmetry of a distribution. The statistic for a sample of n series, the sample skewness is:

$$\text{Skewness} = \frac{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^3}{n}}{\left[\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}\right]^{\frac{3}{2}}} \qquad (3.1)$$

where x_i is the series under investigation, $\bar{x}$ is the sample mean and n denotes the number of observation.

Sample Kurtosis: Kurtosis is a measure tallness of distribution (Gujarati, 2006). The statistic for a sample of n values the sample kurtosis is:

$$\text{Kurtosis} = \frac{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^4}{n}}{\left[\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}\right]^{2}} - 3 \qquad (3.2)$$

where the constituents of the equation are the same as before, as in equation 3.1.

Jarque-Bera: The statistic Jarque-Bera is a chi-square distribution with two degrees of freedom which can be used to test null hypothesis to prove that the data are from a normal distribution. The Jarque-Bera test is articulated in terms of the third and fourth moment of the disturbances (Vogelvang, 2005). This makes the third moment of a symmetric distribution zero. From equation 3.3, if a variable is normally distributed, then S is zero and ($K-3$) is also zero, hence the value of Jarque-Bera statistic is zero (Gujarati, 2006). The Jarque-Bera test statistics is:

$$\text{Jarque-Bera} = \frac{n}{6}\left[S^2 + \frac{(K-3)^2}{4}\right] \approx \chi_2^2 \qquad (3.3)$$

where S is a measure of skewness and K is a measure of kurtosis and n represents the sample observation.

Appendix III

Definitions

Residual-The difference between the actual and the fitter (predicted) is the residual

Acquisition-The purchase of a company through tender offer for the target share.

Acquirer- A company which are interested buying other company

Bidder- The acquiring firm in a tender.

Target company- Is the company being purchased

Takeover- Is a term use to indicate or include both mergers and tender offers.

The following terms or words have been used interchangeably

Firm and Company

Acquired firms and Target firms

Acquirer firms and Bidding or Bidder firms

Acquisition and Takeover

Small market capitalization stocks and Small liquidity stocks

Medium market capitalization stocks and Medium liquidity stocks

Large market capitalization stocks and Large liquidity stocks