



The comparative impact of acquisitions on the financial performance of acquiring companies across market segments of the JSE

A Research Report

by

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ABSTRACT

There is broad agreement in the literature that in general, mergers and acquisitions in both the short and long run are largely zero or negative, net present value exercises for the shareholders of the acquiring company. At the same time it is believed that significant returns are realised by the shareholders of the target companies. Despite this broad agreement and due to the complexity of the open market, there are still a large number of variables which can and could possibly account for many of the exceptions which have been highlighted in a range of studies. The aim of this study was to investigate whether there is any evidence to suggest that merger and acquisition activity in the different market sectors of the JSE are either, more or less successful than the average.

A total of 82 transactions were identified as meeting the strict requirements of the methodology. These included representatives from five sectors Basic Industries, Consumer Goods & Services, Financials, Information Technology and Resources. Event study methodology was used to investigate the abnormal returns of acquiring companies before and after the announcement of the event. It was established that in all but one of the market sectors there was statistically significant evidence that merger and acquisition transactions in different market sectors are either better or worse than the average at creating value for the acquiring company shareholders.

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.



Signed

2008/11/13

Date

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Dedication

I would like to dedicate this work to my three children

Calvin Luke Stevens, Jade Michaela Stevens and Lia Cheylene Stevens

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1. INTRODUCTION TO THE RESEARCH PROBLEM

A substantial body of literature exists to support the view that mergers and acquisitions provide little to no financial benefit to the acquiring firm and its shareholders (Wimberley & Negash, 2004; Healy *et al*, 1997; Moeller *et al*, 2005) in contrast to, significant financial benefit to the target firm and its shareholders (Campa & Hernando, 2004; Pilloff & Santomero, 1997).

These results are in direct contrast to some of the documented motives for pursuing mergers and acquisitions (Trautwein, 1990), namely that

- Efficiencies in the form of financial, operational or managerial synergies will result in the combined entity's value being greater than the sum of the parts.
- Market power through the pursuit of greater industry monopoly power will result in increased revenues and hence a more valuable combined entity.
- Management of the acquiring firms possesses better information than the markets, of the value of the potential targets and will be in a position to unlock this value post the acquisition.
- A transfer of wealth from either the target shareholders or the customers to the acquiring shareholders will be realised.

A review of 128 scientific studies (Bruner, 2002) highlights a number of the drivers of profitability which have been demonstrated in merger and acquisition activity. These include

- Diversification destroys value. Focus conserves it.
- Value acquiring pays, glamour acquiring does not.
- Mergers and acquisitions to build market power does not pay.
- Paying with stock is costly. Paying with cash is neutral.
- Mergers and acquisitions to use excess cash generally destroy value except when redeployed profitably.
- Tender offers create more value for bidders than friendly takeovers.
- When managers have more at stake, more value is created.

Local studies of merger and acquisition activities on the Johannesburg Securities Exchange (JSE) have supported many of these findings. A study (Smit, 2005) over a three year period provides evidence to suggest that large acquisition activity is on average a zero, net present value investment. In addition this same study also provides some evidence to support the view that acquisitions funded with cash are less costly than those funded primarily with stocks. Along similar lines Mushidzhi & Ward (2004) in a study over a five year period, determined that shareholders of acquiring companies do not earn significant positive returns, in contrast to the shareholders of the target companies.

A research limitation which is highlighted in the study of Smit (2005) is that, it was a multi-industry sector study and ignored the possibility that acquisitions may be value creating in some industry sectors and value destroying in others. At the same time, Andrade & Stafford (2004) have indicated that merger activity clusters through time, by industry. It would appear reasonable then, to question whether the general success of merger and acquisition activity, is in any way linked to the industry type or market sector? In other words, are some sectors or industry types more successful than others or less successful than others in creating value for the acquiring shareholders?

Many industry sectors exhibit unique characteristics which may or may not influence the outcome of a merger or acquisition. By example from the literature (Kohers & Kohers, 2000), two very noticeable characteristics of the High Technology sector, of which Information and Communication Technology (ICT) is a sub sector, are firstly their generally high-growth nature and secondly the inherent uncertainty of the technologies on which they rely, making them relatively high-risk ventures. The study by Kohers & Kohers, (2000) concluded that in contrast to much of the published literature, acquirers of high tech targets experience significantly positive abnormal returns at the time of the merger announcement regardless of whether the the merger was primarily cash or stock funded. The results indicate that high-tech acquisitions are value enhancing for both acquirers and targets.

In the international banking sector strong influences have included (Campa & Hernando, 2006) deregulation, technological advances and increased competition, yet despite these influences the results of a study of the European banking sector (Campa & Hernando, 2004) do not differ significantly from that of other more generalised studies and the target shareholders receive on average a positive and significant cumulative abnormal return from the announcement of the merger. Conversely, the mean cumulative abnormal return to shareholders of the acquiring firms is not significantly different from zero.

The aim of this research is to determine whether there is any evidence to suggest that acquiring companies, within individual market segments, are more or less likely than others to create or destroy value around the announcement date of the merger or acquisition (the event). In order to accomplish this goal, data of all mergers and acquisitions over the six year period 2000 to 2005 (inclusive) was collected. Acquiring companies were categorised according to the high level economic groups of the JSE. Using event study methodology, the share price performance of the acquiring companies around the announcement date was investigated for statistically significant variations.

This study is relatively unique in that it considers different market sectors in relation to each other. Studies have been concluded on individual market segments but little appears to exist by way of inter-sector comparison. Certainly no South African study has been published which consider this particular question.

This report adheres to the following structure; Chapter 2 details the relevant theory and prevailing understanding of the topic by way of a literature review; Chapter 3 formalises the experimental hypotheses which we are aiming to either prove or disprove; Chapter 4 details the methodology of the event study employed to extract the necessary data as well as the statistical analyses; Chapter 5 consolidates and presents the results of the study in a clear, concise and visually effective format; Chapter 6 analyses and discusses the results and Chapter 7 summarises and concludes the findings.

2. LITERATURE REVIEW

2.1. Reasons for mergers and acquisitions

A number of studies have been published which describe the many and varied reasons which drive merger and acquisition activity (Bower, 2001; Bruner, 2002). The primary reasons which are common in much of the literature are neatly summarised into the following categories (Bower, 2001):

- Dealing with overcapacity through consolidation in mature industries.
- Consolidating competitors in geographically fragmented industries.
- Extension into new products or markets.
- Substitution for R&D.
- Exploiting eroding industry boundaries by inventing an industry.

In the South African context some additional drivers of this activity have been identified (Ernst & Young, 2006; Ward & Muller, 2006) namely:

- Private Equity.
- BEE imperatives.
- Cross border transactions.

A significant body of the available literature (Bruner 2002; Dutta *et al.* 1992; Tichy 2001; Campa & Hernando 2004) support the findings that in both the short run as well as the long run, target company shareholders enjoy significant, positive, premium abnormal returns as a result of the merger or acquisition, that on average, abnormal returns to the shareholders of the acquiring companies is largely zero and lastly that the net economic gain of the transaction is generally positive i.e. the shareholders of the combined entity do in fact gain value from the transaction.

As could be expected in a complex environment such as the open markets there are of course many exceptions which can be found counter to the prevailing wisdom. Fuller *et al.* (2002) conclude that bidding firm's can in fact gain value when purchasing private firms or subsidiaries of public firms. Where a bidding firm acquires another complete public firm however, they conclude that they are unlikely to recognise significant value. In comparing domestic acquisitions and foreign acquisitions for transactions in Canada, Eckbo & Thorburn (2000) conclude that the domestic acquirers do in fact recognise significant positive abnormal returns in contrast to the foreign acquisitions which delivered insignificant abnormal returns. Loderer & Martin (1990) conclude that where the acquisition size and anticipation of the transaction are corrected for, the shareholders of the acquiring firms do in fact recognise financial benefits.

Fuller *et al.* (2002) and Hogarty (1970) forward a possible reason as to why in the face of such overwhelming evidence to the contrary, of value creation; firms

Table 1 : Categories and Motives for mergers and acquisitions as identified by Brouters, van Hastenburg, & van den Ven, (1998)

Category	Motives
Economic	Marketing economies of scale
	Increase profitability
	Risk spreading
	Cost Reduction
	Technical Economies of Scale
	Differential Valuation of Target
	Defence Mechanism
	Respond to Market Failures
	Create Shareholder Value
Personal	Increase Sales
	Managerial Challenge
	Acquisition of inefficient management
	Enhance Managerial Prestige
Strategic	Pursuit of Market Power
	Acquisition of a Competitor
	Acquisition of Raw Materials
	Creation of Barriers to Entry

continue to pursue acquisitions as a core strategic goal. They postulate that the large variation in value created or destroyed which can be found in the market

encourages firms to gamble with the hope of becoming one of those winning bidders with abnormally large returns.

An analysis of the motives behind mergers and acquisitions (Brouthers, van Hastenburg, & van den Ven, 1998) highlight three broad categories as illustrated in Table 1. These authors make use of non-financial, qualitative measures such as key success factors, synergy and image improvement to demonstrate why managers tend to view mergers as successful when the financial evidence is so overwhelmingly against it.

2.2. Determining Value

A number of methods are employed in the literature to determine the impact of the value creation or value destruction of an acquisitive transaction. In a survey of 130 studies, Bruner (2002) identifies four predominant methods of determining value namely:

- Event studies measuring abnormal returns to shareholders in a period surrounding the announcement of the transaction.
- Accounting studies examining the financial performance from the accounting statements of the acquirer before and after the transaction.

- Surveys of executives i.e. simply asking the management of the company's whether the transaction created value.
- Clinical studies focussing on a very small sample (normally a single firm) and studying it in great depth.

Of these methods, the latter two are more descriptive studies while the former two are more readily applicable to the testing of hypotheses utilising well known statistical methods. The research on which this report is based makes use of the first method described above and so this method will be expanded upon in some detail below and in the following chapters.

2.3. Event Studies

Event studies aim to determine how a particular event will impact on the value of the firm. The value of the company changes as a result of the event and this change is evident in an abnormal return of the stock price (Serra, 2002). Using the event study method, calculations are performed to determine whether there is an abnormal stock price effect around this event and if so, the significance of the event can be inferred (McWilliams & Siegel, 1997).

The popularity of event studies over measurements which rely on the study of accounting profits can be ascribed to the fact that share prices are much less prone to manipulation by companies than are accounting profits and are hence viewed as a more reliable measure.

2.3.1. Abnormal Returns

The standard approach to conducting an event study of this nature is to begin by estimating the abnormal share price returns (sometimes referred to as excess returns or residual returns) by making use of a model to determine the expected share price returns. Mushidzhi & Ward (2004) identify three underlying assumptions in the determination of abnormal returns. These are

- Market efficiencies assume the share price incorporates all available information.
- The event is not anticipated and the market only becomes aware on the day of the announcement.
- No major confounding event occurs during the window period of interest.

In one of the simplest versions a market model is employed for the purpose of estimating abnormal returns, for each firm, as follows (McWilliams & Siegel, 1997):

$$R_{it} = \alpha_j + \beta_i R_{mt} + \varepsilon_{it}$$

Equation 1

Where:

R_{it} = share price return of firm i on day t

R_{mt} = share price return on a particular choice of a portfolio
of stocks on day t

α_i = the intercept for stock i

β_i = the risk factor for stock i

ε_{it} = an error term

Following which, estimates of abnormal returns are calculated from the above
as:

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

Equation 2

Where:

α_i and β_i = least squares parameters obtained from a
regression of R_{it} and R_{mt} over a suitably
specified period of time prior to the event.

Fama & French (1992) however show that the simple relation between β and
average returns disappeared in studies of later years up to 1990 and that a
three factor asset pricing model (Fama & French, 1995) which includes a

market factor and a risk factor related to both size and book to market equity, effectively capture the cross sectional variations experienced. This three factor model (Fama & French, 1995) as described by Mordant & Muller (2003) can be expressed as follows:

$$(R_{it} - R_{ft}) = \alpha_i + \beta_{i,1}(R_{mt} - R_{ft}) + \beta_{i,2}SMB_t + \beta_{i,3}HML_t + \varepsilon_{it}$$

Equation 3

Where:

- R_{it} = actual return of stock i in period t
- R_{ft} = risk-free rate in period t
- α_i = the alpha intercept term
- $\beta_{i,1}$ = the market beta
- R_{mt} = the benchmark or market index return in period t
- SMB_t = small minus big: the return on the market portfolio of small stocks (measured by market capitalisation) minus the return on the portfolio of big shares
- HML_t = high minus low: the return on the market portfolio of value shares (high book-to-market ratio) minus the return on the portfolio of growth shares (low book-to-market ratio)
- $\beta_{i,2}$ = coefficient of tilt or factor sensitivity towards small companies and away from big companies.

$\beta_{i,3}$ = coefficient of tilt towards value companies and away
from growth companies

ε_{it} = the error term

A number of different approaches to estimating firms expected returns are documented in later studies by Binder (1998) and Mushidzi & Ward (2004).

These methods can be summarised as follows:

- Market Returns which incorporate the risk of the firms (β) with respect to the rest of the market as discussed above.
- Mean Adjusted Returns which utilises an average of returns generated over a suitable time period prior to the event
- Variants on Capital Asset Pricing Models
- Market Adjusted Returns utilising the same returns as the rest of the market during the event period.
- Control Portfolio Model where a suitable portfolio of firms is chosen based on certain criteria to represent the returns of the firm being analysed.

Control portfolio's are particularly powerful methods and these portfolio's can be constructed based on a wide range of criteria such as, similarly sized companies, companies with a similar β 's, companies with similar price to earnings ratios or companies with similar book to market equity ratios (Smit, 2005). The approach utilised in this study for estimating abnormal share price

returns is based on the three factor model of Fama & French (1996) as detailed above and adapted by Mordant & Muller (2003) and Smit (2004).

2.3.2. Average and Cumulative Abnormal Returns

Once the most suitable method for estimating the abnormal share price returns has been deployed. It is typical in the event study methodology to calculate a number of average and cumulative data against which statistical tests can be deployed to investigate a set particular hypotheses. While a number of variants of these data are common in the literature, only the popular variant on which this research report is based is discussed.

For each day of the event window of interest an average value for the abnormal returns can be calculated. This average abnormal return (AAR) is defined as (Binder, 1998; Brown & Warner, 1985) the standard average of all abnormal returns for each company in the sample for a particular day i . Having calculated the average abnormal returns, the cumulative values of these averages can also be determined. The cumulative average abnormal returns (CAAR) is defined (Binder, 1998) as the sum of the average return for day i with all the average returns for the days preceding day i in the event window of interest.

2.3.3. Local Event Studies

Smit (2005) utilised a combination of two methods to determine whether value was created or destroyed in all the large acquisitions (total value of the transaction greater than 20% of the market capitalisation of the acquiring company) on the JSE between 2000 and 2002. Firstly the impact on the short term share price returns and secondly the impact on the operating financial performance over the long term.

In order to evaluate the impact of short term share price returns, Smit (2005) considered amongst others two sub measures including Average Abnormal Returns (AAR) and Average Cumulative Abnormal Returns (ACAR) concluding that the shareholders of the acquiring companies do not earn statistically significant positive or negative abnormal returns in the window periods which were investigated around the announcement date.

Smit (2005) considered two measures to address the impact on the operating financial performance of the companies' pre and post the acquisitions. These measures are the median industry-adjusted cash flow return on tangible assets (IACRTA) and the industry adjusted cash flow return on all assets (IACRAA) and led to the conclusion that the companies tended to outperform their peers in the two years prior to the acquisition but failed to do so afterwards.

Similar measures of value to those described above were employed by Mushidzhi & Ward (2004) when evaluating the differences between

predominantly share and predominantly cash based acquisitions on the JSE. These authors concluded that based on the results of their studies, the shareholders of the acquisition targets earn positive returns and these returns are in general higher for largely cash based transactions. They determined that shareholders of the acquiring company do not enjoy a positive return.

Mordant & Muller (2003) used the event study methodology to investigate whether the director's of companies on the JSE earn abnormal returns from trading in the shares of their own companies. The results of this study concluded that the directors do in fact earn abnormal returns however this is largely attributable to the influence of market effects of size, value and resources.

Lastly, an event study to investigate the role of pre-announcement news reports as an explanation of the excess returns associated with take-over announcements of target companies listed on the JSE (Bhana, 1999) found that the market does indeed identify take-over target companies prior to the first public announcement but that insider trading is not a significant contributor to this effect.

2.4. Factors influencing value creation

A number of factors which have a significant effect on the potential value creation of a transaction are identified in the literature. Dutta *et al.* (1992) highlights five of these factors as of primary importance namely:

- Regulatory changes
- Number of bidders
- Bidders approach
- Mode of payment
- Type of acquisition

Other factors which have been identified as having an impact include the relative equity sizes of the bidder and the target (Eckbo & Thorburn, 2000), transactions that enhance or reduce focus (Healy *et al.*, 1997; Bruner, 2001) and finally the frequency with which firms tend to acquire (Loderer & Martin, 1990; Beitel *et al.* 2004).

In view of the nature of the proposed study and the local focus on the JSE we investigate some of these aspects in a little more detail.

2.4.1. Mode of Payment

The popular 'Signalling Hypothesis' asserts (Wansley, Lane, & Yang, 1987) that when management of an acquiring firm believes their stock to be overvalued, they are more likely to conclude merger and acquisition activity by means of stock transactions. On the other hand, when they believe their stock to be undervalued they are more likely to lean toward cash transactions. This hypothesis would indicate that cash transactions are more likely to generate a return to the acquiring shareholders than are stock transactions.

Tichy (2001) reports that from a review of a large body of published research, that most studies support the signalling hypothesis and indicate that bidders using cash as a means of payment tend to be more successful than those using stock. The results of these studies are however by no means unanimous, as demonstrated by that of Healy *et al.* (1997) which concluded that takeovers with payment by means of stock and debt outperformed cash transactions even though the acquiring companies did not generate any additional cash flow over and above that which was sufficient to cover the premium paid for the acquisition. The possibility that the research results of transactions which are predominantly either cash or stock are skewed is raised by Tichy's (2001) review of a number of publications, where it is observed that cash is more often used for tender offers which are primarily hostile and stock for mergers which are largely seen as friendly.

A local study of transactions on the JSE (Mushidzhi & Ward, 2004) found that there was no significant difference between the returns of acquiring company shareholders where either cash or shares were the dominant form of payment. This study did however consider the returns earned by the shareholders of the target companies and in this case the authors determined that cash transactions earn higher returns than largely stock transactions. Another local study which supports these findings (Smit, 2005) concludes that the average cumulative abnormal returns for share funded acquisitions were consistently lower than those of cash funded transactions over a number of event windows around the announcement date and in fact these were also negative over the shorter three and five day event windows.

2.4.2. Relative Equity Sizes

Some evidence has been presented (Eckbo & Thorburn, 2000; Loderer & Martin, 1990) to indicate that transactions are more successful where the total equity of the bidding firm is smallest in comparison to that of the targets. In a comparative study of domestic and foreign takeovers on the Canadian market, Eckbo & Thorburn (2000) demonstrate that the most profitable acquisitions to acquiring firms are those where both acquirer and target have similar equity sizes. It is noted that when the target firm is small in comparison to the bidder the ability of the event study methodology to register monetary gain is weak.

Jarrel & Poulson, (1989) demonstrate, in support of the above findings, that as the target firm's size increases relative to that of the bidder the abnormal returns earned by the acquirer increase significantly.

2.4.3. Type of Acquisition

Evidence exists to suggest that there are differences in the returns to the shareholders of acquiring firms based on the type of acquisition i.e. merger or tender offer and glamour or value acquisition. Glamour stocks are defined (Sudarsanam & Mahate, 2003) as those which have historically high price to earnings (PE) ratios or market-to-book values (MTBV) while value firms are defined as the opposite and have the potential under the right conditions for substantial value gains.

In a long run event study, Rau & Vermaelen (1998) conclude that acquirers in tender offers marginally outperform acquirers in mergers. They furthermore determine that the underperformance of the mergers is primarily as a result of the poor post-acquisition performance of low book to-market glamour acquirers independent of whether the transaction is largely share or cash financed. Sudarsanam & Mahate (2003) support this evidence with the conclusion that over a three year post-acquisition period value acquirers outperform glamour acquirers along with evidence of a link between value and cash funded transactions and glamour and share acquirers. Value acquirers are more likely

to fund their transactions primarily through cash while glamour acquirers are more likely to fund their transactions via shares.

2.5. Industry Sectors

To date no published studies, either international or local have been identified which compare the relative success or failure of merger and acquisition activity between different industry sectors. Many studies are available which focus on one specific sector or industry with mixed results. Following deregulation in the European insurance industry in the 1990's Cummins & Weiss (2004) used standard market model event study methodology to investigate the stock price impact of merger and acquisition transactions on bidding and target firms. Their analysis showed that acquirers recognised small, negative cumulative average abnormal returns across various windows surrounding the transaction date.

The European financial sector was studied over a five year period by Campa & Hernando (2006) and twelve large transactions in the telecommunications industry by Trillas (2002). Both studies demonstrated that returns to the acquirer shareholders were essentially zero around the announcement date. Lastly in a study on the European retail sector by Dragun & Howard (2003), on average a 4.5% abnormal loss for the shareholders of the acquiring companies was observed within a month of the event.

3. RESEARCH HYPOTHESES

In mid 2002 the JSE adopted a new classification system based on the FTSE Global Classification system (FTSE/JSE Africa Index Series, 2002). This system consists of a hierarchy of 10 Economic Groups, 36 Industry Sectors and 102 Industry Sub Sectors. This proposal will investigate the hypotheses described below.

3.1. Hypothesis 1

The null hypothesis states that the shareholders of acquiring companies in the economic group 'Basic Industries (BI)' do not earn higher or lower Cumulative Average Abnormal Returns ($CAAR_{BI}$) around the announcement dates than in the remaining economic groups ($CAAR_{EG-BI}$). The alternative hypothesis states that the shareholders of acquiring companies in the economic group 'Basic Industries (BI)' ($CAAR_{BI}$) earn higher or lower Cumulative Average Abnormal Returns around the announcement dates than in the remaining economic groups ($CAAR_{EG-BI}$)

$$H_0: CAAR_{BI} - CAAR_{EG-BI} = 0$$

$$H_1: CAAR_{BI} - CAAR_{EG-BI} \neq 0$$

3.2. Hypothesis 2

The null hypothesis states that the shareholders of acquiring companies in the economic group 'Consumer Goods & Services (CGS)' do not earn higher or lower Cumulative Average Abnormal Returns ($CAAR_{CGS}$) around the announcement dates than in the remaining economic groups ($CAAR_{EG-CGS}$). The alternative hypothesis states that the shareholders of acquiring companies in the economic group 'Consumer Goods & Services (CGS)' ($CAAR_{CGS}$) earn higher or lower Cumulative Average Abnormal Returns around the announcement dates than in the remaining economic groups ($CAAR_{EG-CGS}$)

$$H_0: CAAR_{CGS} - CAAR_{EG-CGS} = 0$$

$$H_1: CAAR_{CGS} - CAAR_{EG-CGS} \neq 0$$

3.3. Hypothesis 3

The null hypothesis states that the shareholders of acquiring companies in the economic group 'Financials (F)' do not earn higher or lower Cumulative Average Abnormal Returns ($CAAR_F$) around the announcement dates than in the remaining economic groups ($CAAR_{EG-F}$). The alternative hypothesis states that the shareholders of acquiring companies in the economic group 'Financials (F)' ($CAAR_F$) earn higher or lower Cumulative Average Abnormal Returns around the announcement dates than in the remaining economic groups ($CAAR_{EG-F}$)

$$H_0: CAAR_F - CAAR_{EG-F} = 0$$

$$H_1: CAAR_F - CAAR_{EG-F} \neq 0$$

3.4. Hypothesis 4

The null hypothesis states that the shareholders of acquiring companies in the economic group 'Information Technology (IT)' do not earn higher or lower Cumulative Average Abnormal Returns ($CAAR_{IT}$) around the announcement dates than in the remaining economic groups ($CAAR_{EG-IT}$). The alternative hypothesis states that the shareholders of acquiring companies in the economic group 'Information Technology (IT)' ($CAAR_{IT}$) earn higher or lower Cumulative Average Abnormal Returns around the announcement dates than in the remaining economic groups ($CAAR_{EG-IT}$)

$$H_0: CAAR_{IT} - CAAR_{EG-IT} = 0$$

$$H_1: CAAR_{IT} - CAAR_{EG-IT} \neq 0$$

3.5. Hypothesis 5

The null hypothesis states that the shareholders of acquiring companies in the economic group 'Resources (R)' do not earn higher or lower Cumulative

Average Abnormal Returns ($CAAR_R$) around the announcement dates than in the remaining economic groups ($CAAR_{EG-R}$). The alternative hypothesis states that the shareholders of acquiring companies in the economic group 'Resources (R)' ($CAAR_R$) earn higher or lower Cumulative Average Abnormal Returns around the announcement dates than in the remaining economic groups ($CAAR_{EG-R}$).

$$H_0: CAAR_R - CAAR_{EG-R} = 0$$

$$H_1: CAAR_R - CAAR_{EG-R} \neq 0$$

4. RESEARCH METHODOLOGY

4.1. Unit of Analysis

The unit of analysis for this study was any acquisition or merger announcement by a company listed on the JSE, where the purchase value was greater than 5% of the total market capitalisation of the acquiring entity, between and inclusive of, the years 2000 to 2005.

4.2. Population of Relevance

The population of relevance consisted of all acquisitions or mergers effected by companies listed on the JSE between and including the years 2000 to 2005.

The year 2000 was chosen as the starting point of this study based on the availability of data from a variety of sources including the Ernst & Young Mergers and Acquisitions database, the McGregor BFA-Net Analyser database of historical share price information, company ratios and indices and finally the I-Net Bridge, I-Financials collection of company annual reports and circulars. 2005 was chosen as the cut-off year for the study in order to ensure that data was available for at least one year following the studied events.

The requirement that the value of the transactions be at least 5% of the total market capitalisation of the acquiring company was imposed in order to firstly limit the volume of data to be processed and secondly to ensure that the transaction is sufficiently large enough to increase the probability that any economic gains are detectable.

The population of relevance was extracted from the database compiled and maintained by Ernst & Young, South Africa as input to their annual publication, which reviews the merger and acquisition activities of corporate South Africa.

Data was extracted from this database based on the following criteria:

- The “Feature” item of the event in the Ernst & Young database was one of the following, acquisition of related business, hostile takeover, merger of related businesses, tender offer for shares or unconditional offer for shares.
- The “Description” item of the event in the Ernst & Young database indicated the event was the merger with or the acquisition of a business as a going concern or a significant stake therein. Items such as the acquisition of single non commercial properties, mineral rights, trademarks and intellectual property were discarded.
- Transactions were between or initiated by any company listed on the JSE and could be reasonably classified as a member of one of the FTSE Global Classification System, Economic Groups
 - Resources
 - Basic Industries
 - General Industrials

- Cyclical Consumer Goods
 - Non Cyclical Consumer Goods
 - Cyclical Services
 - Non Cyclical Services
 - Utilities
 - Financials
 - Information Technology
- The transaction size equated to at least 5% of the market capitalisation of the acquiring company.
 - The acquiring company was listed on the bourse for at least one year prior to the acquisition and one year post the acquisition to ensure the availability of the necessary share price and published financial information.
 - The acquiring company did not embark on any significant actions one year prior or one year post the acquisition which could reasonably be expected to influence the data.

In order to successfully extract the transactions which matched the above criteria, a number of individual steps were required utilising different sources of information and tools. These included:

- Raw data copies of the Ernst & Young database were provided by Ernst and Young in six separate, comma delimited text files. These text files were imported into Microsoft Excel, consolidated into one master

spreadsheet and the data was manually inspected and cleaned where obvious errors in formatting were apparent.

- Data fields which were not relevant to this study were deleted from the master spreadsheet. For example since we were not investigating the differences between share and cash funded acquisitions the fields delimiting the breakdown into these components were deleted and only the total value field retained.
- Using the Excel sort functionality, all transactions where the “Feature” item was not of the type, acquisition of related business, hostile takeover, merger of related businesses, tender offer for shares or unconditional offer for shares were discarded.
- Using the Excel sort functionality, all transactions where the “Description” item was neither the merger with, nor the acquisition of, a business as a going concern or a significant stake therein were discarded.
- A first iteration to remove transactions influenced by confounding events was manually accomplished by removing any transactions by the same acquiring company that occurred within a twelve month period of each other.
- For the remaining data set, the JSE ticker symbols for the acquiring companies were manually inserted into the spreadsheet as a new field.
- Using the McGregor BFA-Net, BLINK v2 database extraction utility the following additional fields pertaining to the acquiring company were added to the remaining transactions namely sub sector, sector, super sector and industry.

- Based on the categorisation of the acquiring company by the fields of the preceding step, the additional field of the FTSE Economic Groups was manually created and populated.
- Using the McGregor BFA-Net, BLINK v2 database extraction utility the market capitalisation of the acquiring companies at the end of the year preceding the acquisition was extracted and added as an additional field.
- The transaction value as percentage of the market capitalisation of the acquiring company was calculated and all of those less than 5% were discarded using the Excel sort functionality.
- Using the McGregor BFA-Net, BLINK v2 database extraction utility the share price of the acquiring company was extracted for the date exactly preceding the acquisition by one year and the date exactly post the acquisition by one year. Where the utility returned no value these transactions were flagged as potentially not meeting the criteria that the acquiring company be listed for at least one year prior to and one year post the acquisition. Further investigations were manually carried out to determine the listing and/or delisting dates of these flagged transactions and those not meeting the criteria were discarded.
- Consulting the I-Net Bridge, I-Financials database which contains historical company annual reports and circulars, each of the remaining transactions were investigated to eliminate confounding events. Where circulars were issued or mention was made in the annual report of additional significant mergers or acquisitions, disposals, restructurings or delisting to name a few, these transactions were discarded.

4.3. Sampling

From a total of 8539 transactions recorded in the Ernst & Young database for the period 2000 to 2005, a total of 83 transactions met the strict criteria described in the preceding sections. These 83 transactions were divided into eight Economic Groups but due to the extremely limited number of transactions in some of the economic groups, it was decided to group the following four under the single umbrella of “Consumer Goods and Services.

- Cyclical Consumer Goods
- Non Cyclical Consumer Goods
- Cyclical Services
- Non Cyclical Services

A breakdown of the number of transactions as a function of economic group is presented in Table 2 below and a detailed list of the transactions are presented in the appendices.

The constraints imposed on selecting a suitable sample were relatively severe. This was largely as a result of the need to discard those transactions which could reasonably be expected to have their data influenced by confounding events. As a result of this the sample can only be described as a judgemental sample.

Table 2 : Breakdown of total sample into Economic Groups

	FTSE Economic Group	Number of Transactions
1	Basic Industries	24
2	Consumer Goods & Services	15
3	Financials	21
4	Information Technology	5
5	Resources	15

As with Smit, (2005) this places limitations on the statistical inferences made insofar as random sampling being a prerequisite of the Central Limit Theorem. Small sample sizes in the different economic groups with the smallest $n=5$ and the largest $n=24$ also place the normality of the distribution into question and therefore on the statistical inferences made. Normality of the distributions will be carefully verified at each stage of the statistical analysis of the data and the necessary steps will be taken to correct for any non-normal distributions.

4.4. Data Collection

Once the sample of transactions had been extracted from the population of relevance as per section 4.2, daily share prices for each were extracted. For purposes of regression of the share price performance, historical share prices for a period of 378 trading days prior to the announcement date of the acquisition were extracted to ensure approximately 18 months of trading data, where on average there are 21 trading days in any given month. For the

purposes of the evaluation of the actual returns on the share price in and around the announcement date, daily share price data was extracted for 20 days post the acquisition announcement as well.

4.5. Data Analysis

Analysis of the sample of the 82 transactions was performed in a number of steps as detailed below

4.5.1. Actual Share Price Returns

For each transaction in the sample of 82 the actual daily share price return was calculated for each of ten days preceding and ten days post the announcement date [-10;10] for a total of 21 share price returns using Equation 4 below

$$R_{i,t} = \ln(P_{i,t} / P_{i,t-1})$$

Equation 4

Where:

$R_{i,t}$ = the daily actual share price return for security i on day t

$P_{i,t}$ = the daily closing share price for security i on day t

$P_{i,t-1}$ = the daily closing share price for security i on day $(t-1)$
 \ln = the standard natural logarithm function

4.5.2. Expected Share price Returns

In order to calculate the expected share price returns for each of the 82 transactions of the sample the methodology of (Smit, 2005) using a Control Portfolio Model, was employed. This control portfolio model was based on the work of Mordant & Muller (2003) and Fama & French (1996) as discussed in more detail in section 2.3.1.

Smit (2005) and Mordant & Muller (2003) divided all shares listed on the JSE into eight individual portfolios taking into account their price to book value ratios, company size and the resource effect. The eight control portfolio's are detailed in Table 3 below.

Classification of listed securities into each of the portfolios was accomplished by means of the procedures detailed below.

1. Resource / Non Resource – each share was reclassified under one of the two options based on the super sector classification extracted for each share via the BFA-Net Blink v2 database extraction utility. Where the super sector classification was one of basic resources or oil & gas, the share was classified as Resource. All other super sector classifications were classified as Non Resource.

Table 3 : Control Portfolios (Smit, 2005)

Portfolio	Resource / Non Resource	Value / Growth	Large / Small
NGL	Non Resource	Growth	Large
NGS	Non Resource	Growth	Small
NVL	Non Resource	Value	Large
NVS	Non Resource	Value	Small
RGL	Resource	Growth	Large
RGS	Resource	Growth	Small
RVL	Resource	Value	Large
RVS	Resource	Value	Small

2. Value / Growth – each share was classified by extracting the total assets, total liabilities and intangible assets for each security at the end of each calendar year using the BFA-Net Blink v2 database extraction utility and calculating the price to book value ratios of each company via Equation 5 below

$$PB_i = TA_i / (IA_i + TL_i)$$

Equation 5

Where:

PB_i = price to book value ratio for security i

TA_i = total assets for security i

IA_i = intangible assets for security i

TL_i = total liabilities for security i

The price to book value ratios were arranged in order of value and the median value was calculated. All those shares with price to book value ratios larger than the median were classified as Growth and those smaller as Value.

3. Large / Small – each share was classified by extracting the total market capitalisation at the end of the calendar year in which the transaction occurred, using the BFA-Net Blink v2 database extraction utility. These values were ordered from largest to smallest and the top one hundred classified as Large and remainder as Small (Smit, 2005).

For each of the years inclusive of, 1999 to 2006 all of the shares listed on the JSE in a particular year were classified into their control portfolios by the procedures described above. Following this reorganisation the following procedures were initiated

1. The closing share price was extracted for each share, for every trading day of the calendar year using the BFA-Net Blink v2 database extraction utility.
2. The share price return was then calculated, again for each share for every trading day of the calendar year using the same calculation as Formula 1.

3. The daily return for each trading day for each portfolio was then calculated as the average for each share in the portfolio.

As with Smit (2005) certain returns were treated as missing data and excluded from the calculations. These included cases where the return on a particular day was zero, in order to exclude the effects of thin trading on the average returns. Where a share was either newly listed or delisted during the course of the year, these were also treated as missing data prior to a listing or post the de-listing. Where previous research (Smit, 2005 and Mordant & Muller, 2003) rebalanced the control portfolios on a monthly basis to account for new listings and de-listings, an analysis of the potential impact determined that such a level of fine tuning did not significantly alter the final values of the average daily returns in each portfolio. As a result, the portfolio rebalancing was maintained at the calendar year timeframe.

Following the methodology of Smit (2005) and Mordant & Muller (2003) a regression analysis of the daily share price returns against the daily returns of each of the control portfolio's was conducted. This regression analysis was completed for each of the securities within the sample of 82 using the model of Equation 6 below. The regression analysis was completed for between 12 and 18 months prior to the announcement date depending on the availability of data i.e. each member of the sample was chosen, ensuring that the share was listed for a minimum of 12 months prior to the announcement date and in instances where data was not available for the full 18 months the maximum number of trading days was utilised.

$$\begin{aligned}
 ER_{i,t} = & \alpha_i + \beta_{1i}R(\text{NGL})_t + \beta_{2i}R(\text{NGS})_t \\
 & + \beta_{3i}R(\text{NVL})_t + \beta_{4i}R(\text{NVS})_t + \beta_{5i}R(\text{RGL})_t \\
 & + \beta_{6i}R(\text{RGS})_t + \beta_{7i}R(\text{RVL})_t + \beta_{8i}R(\text{RVS})_t + \varepsilon_i
 \end{aligned}$$

Equation 6

Where:

- $ER_{i,t}$ = the expected return for security i on day t
- α_i = the regression constant coefficient for security i
- β_{xi} = the regression coefficients for security i ; $x = 1,2,3,\dots,8$
- $R(x)_t$ = the average portfolio return for day t ; $x = \text{NGL},$
 $\text{NGS},\dots,\text{RVS}$
- ε_i = the regression error (noise) term

After extracting the alpha and beta coefficients for each security in the sample, the expected return (ER) for each security was calculated for each of the ten days prior to the announcement, the day of the announcement and each of the ten days post the announcement. The expected returns were calculated by utilising Formula 3 and inserting the relevant coefficients and parameters for each security.

4.5.1. Abnormal Returns (AR)

Abnormal returns were calculated for each of the days described above by means of Equation 7.

$$AR_{i,t} = R_{i,t} - ER_{i,t}$$

Equation 7

Where:

$AR_{i,t}$ = the abnormal return for security i on day t

$R_{i,t}$ = the actual return for security i on day t

$ER_{i,t}$ = the expected return for security i on day t

4.5.2. Outliers

Abnormal returns for each security are expected to display a random pattern around zero. Prior to commencing with further analysis the abnormal returns for each of the ten data sets were individually plotted as a function of the event day. These plots were visually inspected for any indication of non randomness and where detected these series were eliminated from the study.

This method does not rely on any accurate mathematical analysis of randomness and as such care was taken to err on the side of caution. Only those series which clearly did not fit the expected pattern were eliminated and all others were retained.

4.5.3. Average Abnormal Returns (AAR)

Once the abnormal returns had been calculated as detailed in the section above, the full data set of 82 transactions was split into five sets of data pairs. Each data pair consisted of all transactions of one economic sector along with all the transactions of all the remaining economic sectors.

For each of the ten data sets in the five pairs the abnormal returns for the full 21 day period allowed for the construction of a 21 x N matrix of abnormal returns (event days by the number of companies (N) in the data set). For each of the 21 days in the event window, an average of the abnormal return was calculated using Equation 8 below

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it}$$

Equation 8

Where:

- AAR_t = the AAR for day t
- AR_{it} = the abnormal return for security i on day t
- N = the number of firms in the sector sample

4.5.4. Cumulative Average Abnormal Returns (CAAR)

Finally the cumulative average abnormal returns (CAAR) for each day of the event window was calculated for each of the ten data sets as the sum of the current and all preceding average abnormal returns (AAR) within the event window as per Equation 9 below.

$$CAAR_t = \sum_{t=0}^T AAR_t$$

Equation 9

Where:

- $CAAR_t$ = the cumulative average abnormal return on day t
- AAR_t = the AAR for day t
- T = the number of periods being summed

4.5.5. Statistical Analysis

For each of the hypotheses 1 to 5 a paired t-test was conducted to determine if the difference between the CAAR of the sector and the remainder of the sample was statistically significantly different from zero. The paired t-test in general requires the following assumptions to be true in order to retain confidence in the power and significance levels of the test

- The data are continuous (not discrete).
- The data, i.e. the differences for the matched-pairs, follow a normal probability distribution.
- The sample of pairs is a simple random sample from its population. Each individual in the population has an equal probability of being selected in the sample.

Abnormal returns and hence both the average and cumulative average abnormal returns are calculated in percentages which ensures that the first assumption is satisfactorily met. Normality of the data set is tested and where not met an alternative test to account for the skewness of the data was employed. A study of the properties of daily stock returns (Brown & Warner, 1985) and how the characteristics of the data affect event study methodologies indicates that daily stock returns depart from normality more than monthly returns. Results from the study (Brown & Warner, 1985) indicate that non-normality of daily returns has little impact on event study methodologies. In addition, parametric tests for significance of the mean abnormal returns are well

specified and even with small samples of only 5 securities the tests typically have the appropriate probability of a Type I error.

The third assumption is the only one which is not met however this has been discussed in section 4.3 where the data is recognised as a judgemental sample rather than a random sample. This restriction is duly noted and due care is taken when interpreting the statistical inferences as a result.

4.6. Research Limitations

- No weighting of the sample was implemented. Studies have shown (Binder, 1998) that weighting the portfolio of abnormal returns can assist in mitigating statistical errors in the event study methodology.
- The sample was limited in scope due to the availability of all the necessary secondary data and the necessity to limit the volume of data to manageable proportions given the time limits of the research. Greater sub samples for the different economic sectors could be achieved by extending the data over a greater number of years.
- This research does not distinguish between acquisitions or mergers of related or non related businesses. In other words no variable is introduced to determine whether diversification of the acquirer is any way a factor influencing the results. A study

between 1986 and 1991 (Berger & Ofek, 1995) determined that firms which diversified experienced a reduction in value of between 13% – 15% mitigated however, when diversification occurred within related industries. Graham *et al.* (2002) however dispute some of the earlier findings and indicate that because target firms are acquired at significant relative discounts, accounting for this significantly reduces the reduction in value.

- This study was a short term study whereas there is evidence to suggest (Rau & Vermaelen, 1998) that these short term measurements of abnormal share price performance do not fully capture the reaction to the event and that they should be complimented with longer term studies.
- Due to the nature of the sample and difficulty in obtaining the necessary data, investigations into the operating financial performance of the acquirers as was intended in the original proposal was not possible. It would significantly compliment this study if such investigations were concluded on the sample.

5. RESULTS

5.1. Review of the Data

The population of relevance consisted of 8539 mergers and acquisitions on the Johannesburg Securities Exchange captured in the Ernst & Young database between and including the years 2000 to 2005 for the purposes of their annual publication on this topic. Data was extracted based on a number of criteria such as transaction size as a percentage of market capitalisation of acquiring entity, type of acquisition or merger and the absence of any confounding events prior to and post the event.

Of the full sample a total of 83 transactions were identified as having met the criteria. These 83 transactions were further divided into five major market segments namely Basic Industries (24), Consumer Goods & Services (18), Financials (21), Information Technology (5) and Resources (15). Of these sub samples, following visual identification of a number of outliers in the data a further 1 was removed from Basic Industries, 1 from Consumer Goods & Services, 1 from Financials and 2 from Resources. These outliers were identified visually from a plot of their average abnormal returns where they did not satisfy the expected random nature.

5.2. Abnormal Returns

While this study did not specifically include any analysis or hypothesis testing of average abnormal returns (AAR) across the different industry sectors, these were tested for statistical significance in order to provide better insight into the results from the analysis of the cumulative average abnormal returns (CAAR). Interpretation of the results detailed below, are provided in the following Chapter 6.

Table 4 below shows the average abnormal returns (AAR) for the full window period of 21 days starting ten days before the event, the event day itself and ending ten days post the event for 'All Sectors' combined as well as for the sector 'Basic Industries' only. The table includes the actual AAR value along with the median value of the AAR and the standard t-statistic for evaluation of significance from zero.

Table 4 : Average abnormal returns (AAR) and statistical significance test results for 'All Combined Sectors' and the sector 'Basic Resources'

All Sectors Combined				Sector – Basic Industries			
Day	AAR	Median	t-stat ¹	Day	AAR	Median	t-stat ¹
-10	0.189%	0.080%	1.3625	-10	-0.199%	0.013%	-0.7779
-9	-0.121%	-0.049%	0.5454	-9	0.132%	0.114%	0.8294
-8	-0.258%	-0.024%	1.0000 **	-8	-0.190%	-0.091%	-0.6936
-7	-0.019%	0.085%	-0.2254	-7	-0.074%	0.072%	-0.4284
-6	0.017%	0.044%	0.4159	-6	0.329%	0.162%	1.8276 **
-5	0.011%	0.079%	0.8343	-5	-0.245%	-0.102%	-0.9653
-4	-0.098%	0.008%	0.2067	-4	-0.361%	-0.006%	-0.9346
-3	-0.164%	0.012%	0.8319	-3	-0.620%	-0.185%	-1.4255
-2	0.061%	-0.005%	0.0125	-2	0.282%	0.019%	0.6656
-1	-0.403%	-0.036%	1.0000	-1	-0.908%	-0.001%	-1.5352
0	-0.142%	0.060%	0.0224	0	-0.382%	-0.080%	-0.5224
1	-0.197%	-0.031%	0.8044	1	-0.269%	-0.391%	-0.5671
2	-0.157%	0.020%	0.0797	2	0.154%	0.131%	0.3971
3	0.019%	0.052%	0.6899	3	0.340%	0.114%	1.3091 **
4	0.191%	0.122%	1.0000	4	0.441%	0.357%	1.2734 **
5	-0.162%	-0.001%	0.6700	5	-0.526%	0.091%	-1.0703
6	-0.046%	0.034%	0.0672	6	-0.091%	-0.025%	-0.2640
7	0.471%	0.116%	2.2589 *	7	0.725%	0.085%	1.2456
8	0.163%	0.115%	1.6562 **	8	0.488%	0.267%	1.3674
9	-0.104%	0.022%	0.8343	9	0.229%	0.129%	1.3971
10	-0.032%	0.016%	0.2067	10	-0.055%	0.326%	-0.1464

¹ Where normality assumptions fail, the z statistic of a Wilcoxon Signed-Rank test is displayed
* Statistically significant at the 5% level
** Statistically significant at the 10% level

Table 5 below shows the average abnormal returns (AAR) for the full window period of 21 days starting ten days before the event, the event day itself and ending ten days post the event for the two sectors 'Consumer Goods & Services' and 'Financials' respectively. The table includes the actual AAR value along with the median value of the AAR and the standard t-statistic for evaluation of significance from zero.

Table 5 : Average abnormal returns (AAR) and statistical significance test results for the sector ‘Consumer Goods & Services’ and the sector ‘Financials’

Sector – Consumer Goods & Services				Sector - Financials			
Day	AAR	Median	t-stat ¹	Day	AAR	Median	t-stat ¹
-10	-0.050%	-0.045%	-0.2562	-10	0.408%	0.170%	1.3398
-9	-0.215%	-0.180%	-1.7531**	-9	-0.642%	-0.284%	-2.7010*
-8	0.041%	0.043%	0.7107	-8	-0.153%	-0.058%	-0.9776
-7	0.174%	0.169%	2.3035*	-7	-0.158%	-0.056%	0.8589
-6	-0.507%	-0.113%	1.0000	-6	-0.066%	-0.005%	0.2988
-5	0.553%	0.155%	2.6730*	-5	0.128%	-0.101%	0.8081
-4	0.069%	0.002%	0.8571	-4	-0.096%	-0.063%	0.2240
-3	-0.166%	0.017%	-1.0687	-3	0.202%	0.016%	0.6722
-2	0.000%	0.084%	0.5208	-2	-0.078%	-0.084%	-0.7847
-1	-0.044%	0.017%	0.0947	-1	-0.186%	-0.015%	-1.3424
0	-0.118%	0.014%	-0.9254	0	-0.302%	-0.136%	0.9520
1	-0.267%	0.065%	-0.8393	1	0.068%	-0.058%	0.5019
2	0.053%	0.083%	1.0000**	2	-0.273%	-0.123%	1.0000
3	0.067%	0.055%	0.4538	3	0.028%	0.057%	0.2244
4	0.081%	0.171%	0.4281	4	-0.255%	-0.116%	1.0000
5	0.102%	0.034%	0.4734	5	-0.167%	-0.075%	1.0000
6	0.086%	0.172%	0.5993	6	0.049%	-0.011%	0.3223
7	0.241%	-0.086%	0.1894	7	0.486%	0.428%	3.1161*
8	0.268%	0.101%	1.5775	8	-0.113%	-0.059%	-1.0813
9	0.103%	0.086%	0.8998	9	-0.375%	-0.027%	0.2241
10	-0.199%	-0.011%	0.6156	10	0.084%	-0.025%	0.3735

¹ Where normality assumptions fail, the z statistic of a Wilcoxon Signed-Rank test is displayed
* Statistically significant at the 5% level
** Statistically significant at the 10% level

Table 6 below shows the average abnormal returns (AAR) for the full window period of 21 days starting ten days before the event, the event day itself and ending ten days post the event for the two sectors ‘Information Technology’ and ‘Resources’ respectively. The table includes the actual AAR value along with the median value of the AAR and the standard t-statistic for evaluation of significance from zero.

Table 6 : Average abnormal returns (AAR) and statistical significance test results for the sector 'Information Technology' and the sector 'Resources'

Sector – Information Technology				Sector - Resources			
Day	AAR	Median	t-stat ¹	Day	AAR	Median	t-stat ¹
-10	0.733%	0.179%	1.2748	-10	0.641%	0.673%	1.7586**
-9	0.623%	0.599%	1.5589	-9	0.070%	0.498%	0.9440
-8	-0.918%	-1.137%	-2.0381*	-8	-0.674%	-0.512%	-1.7030
-7	-0.027%	-0.260%	-0.0481	-7	0.041%	0.246%	0.7687
-6	0.773%	0.302%	2.1521**	-6	-0.009%	0.054%	-0.0217
-5	-0.827%	-0.775%	-1.0282	-5	-0.103%	0.140%	-0.2946
-4	0.100%	0.680%	0.0660	-4	0.068%	0.014%	0.2097
-3	-0.267%	-0.952%	-0.3178	-3	0.122%	0.128%	0.4794
-2	-0.150%	-0.409%	-0.2824	-2	0.046%	0.044%	0.1483
-1	0.051%	-0.637%	0.0581	-1	-0.489%	-0.355%	-1.3730
0	0.308%	0.216%	0.5112	0	0.326%	0.421%	1.1251
1	-0.192%	1.161%	-0.1379	1	-0.387%	0.098%	-1.2414
2	-1.555%	-0.006%	-0.9610	2	-0.267%	-0.207%	-0.7961
3	-1.726%	-0.615%	-1.5427	3	0.043%	-0.132%	0.1722
4	0.446%	0.035%	0.8509	4	0.480%	0.176%	1.1397
5	-0.703%	-0.397%	-2.1893**	5	0.355%	-0.116%	0.8667
6	0.054%	-0.185%	0.1861	6	-0.326%	0.149%	-0.9636
7	0.682%	0.275%	1.2465	7	0.217%	-0.078%	0.4197
8	-0.498%	0.035%	-0.6324	8	0.126%	0.365%	0.4040
9	-0.606%	-0.026%	-1.2112	9	-0.351%	0.447%	-0.5777
10	-0.641%	-0.139%	-0.9323	10	0.281%	0.167%	0.9404

¹ Where normality assumptions fail, the z statistic of a Wilcoxon Signed-Rank test is displayed
* Statistically significant at the 5% level
** Statistically significant at the 10% level

Table 7 below shows a summary of the number of days of positive average abnormal return data by sector. Six window periods are detailed, namely the full window period of ten days prior to the event, the event day and ten days post the event [-10;+10] as well as the window period of one day prior to the event, the event day itself and ten days post the event [-1;+10], the window period prior to the event [-10,-1], the window period post the event [+1;+10], the 11 day window period [-5;+5] and the 5 day window period [-2;+2].

Table 7 : Summary of the number of days of positive AAR for each sector in comparison to that of the combined sectors

Number of Days of Positive AAR						
Window	All Sectors	Basic Industries	Consumer G&S	Financials	Information Technology	Resources
[-10;+10]	8	9	13	8	9	13
[-1;+10]	4	6	8	5	5	7
[-10;-1]	4	3	5	3	5	6
[+1;+10]	4	6	8	5	3	6
[-5;+5]	4	4	7	4	4	7
[-2;+2]	1	2	2	1	2	2

Figure 1 below illustrates the average abnormal returns (AAR) for all sectors as well as for all the sectors combined for comparative purposes. For purposes of clarity, Figure 2 to Figure 6 illustrates the same data as that of Figure 1 on a sector by sector basis.

Figure 2 compares average abnormal returns (AAR) of the industry sector 'Basic Industries' to that of all of the sectors combined for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 1 : Comparison of average abnormal returns (AAR) by sector

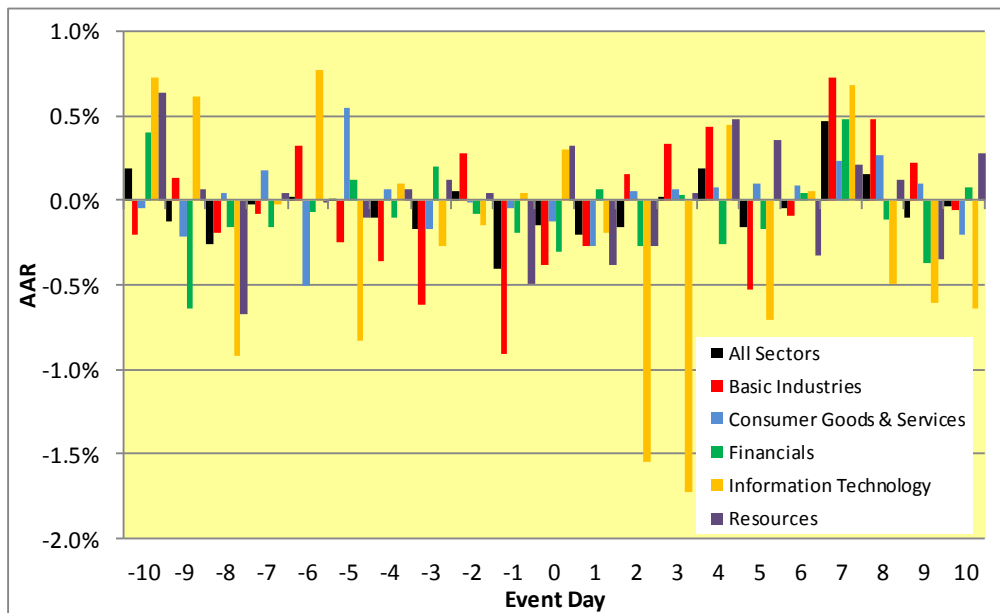


Figure 2 : Comparison of average abnormal returns (AAR) for the sector 'Basic Industries' against all sectors combined, across the full event window

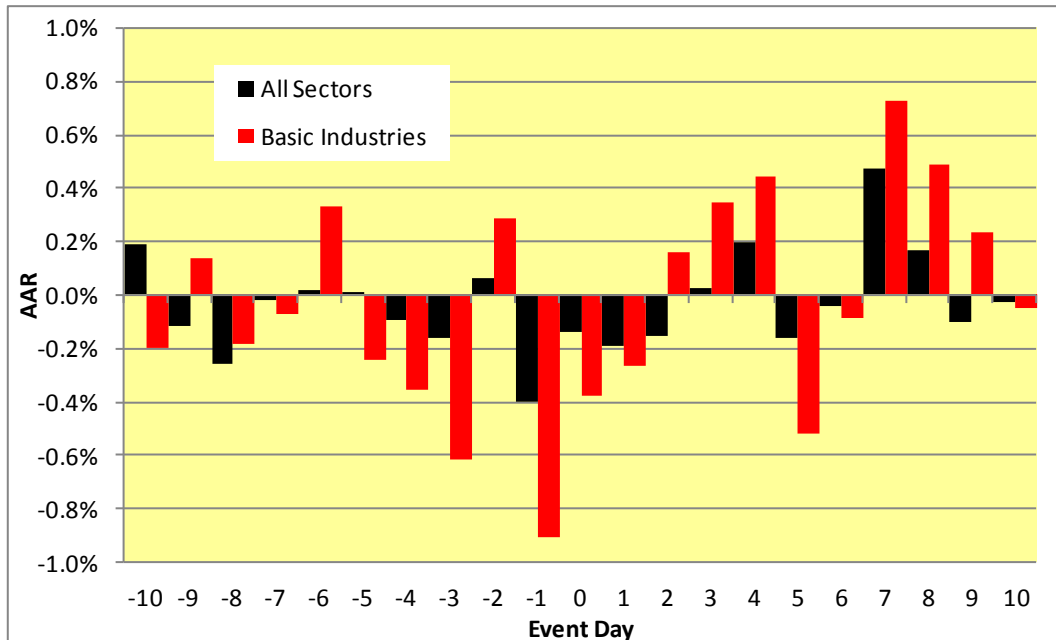


Figure 3 compares average abnormal returns (AAR) of the industry sector 'Consumer Goods & Services' to that of all of the sectors combined for the full

21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 3 : Comparison of average abnormal returns (AAR) for the sector 'Consumer Goods & Services' against all sectors combined, across the full event window

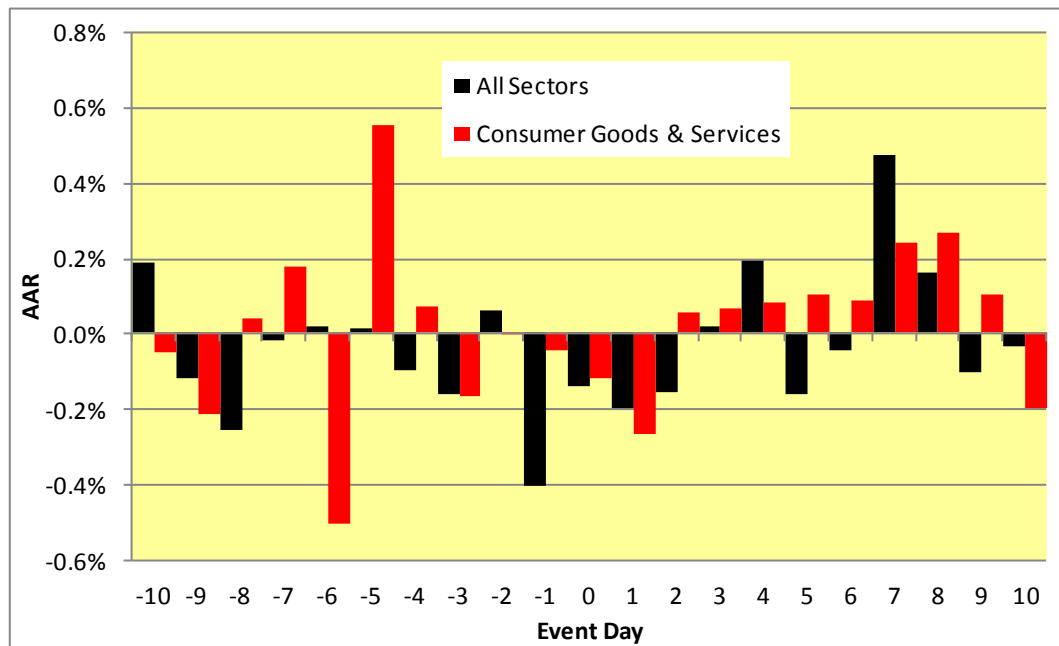


Figure 4 compares average abnormal returns (AAR) of the industry sector 'Financials' to that of all of the sectors combined for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 4 : Comparison of average abnormal returns (AAR) for the sector 'Financials' against all sectors combined, across the full event window

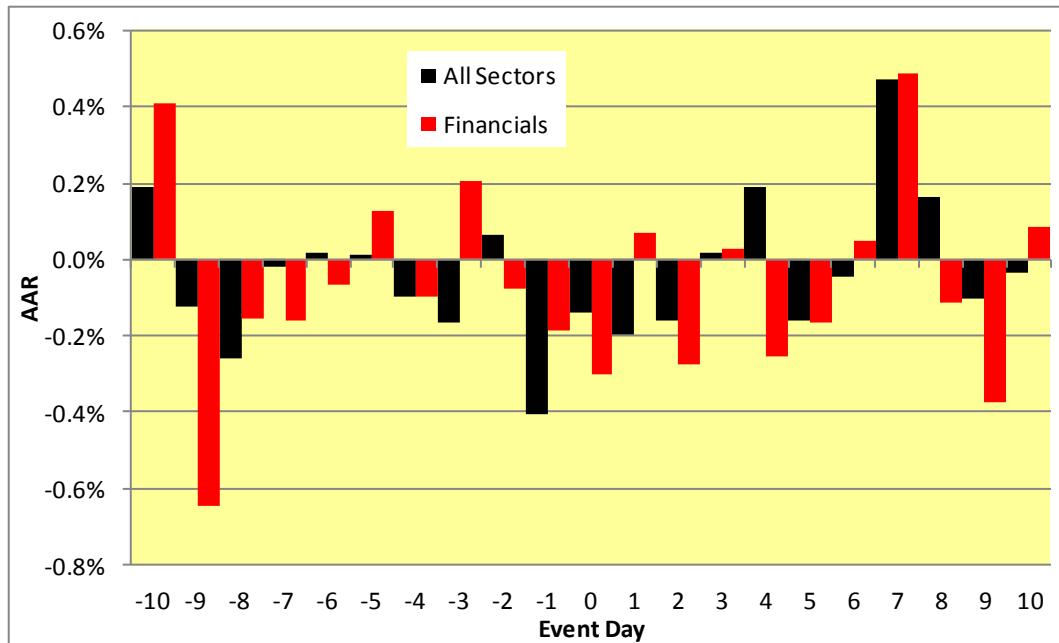


Figure 5 compares average abnormal returns (AAR) of the industry sector 'Information Technology' to that of all of the sectors combined for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 6 compares average abnormal returns (AAR) of the industry sector 'Resources' to that of all of the sectors combined for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 5 : Comparison of average abnormal returns (AAR) for the sector 'Information Technology' against all sectors combined, across the full event window

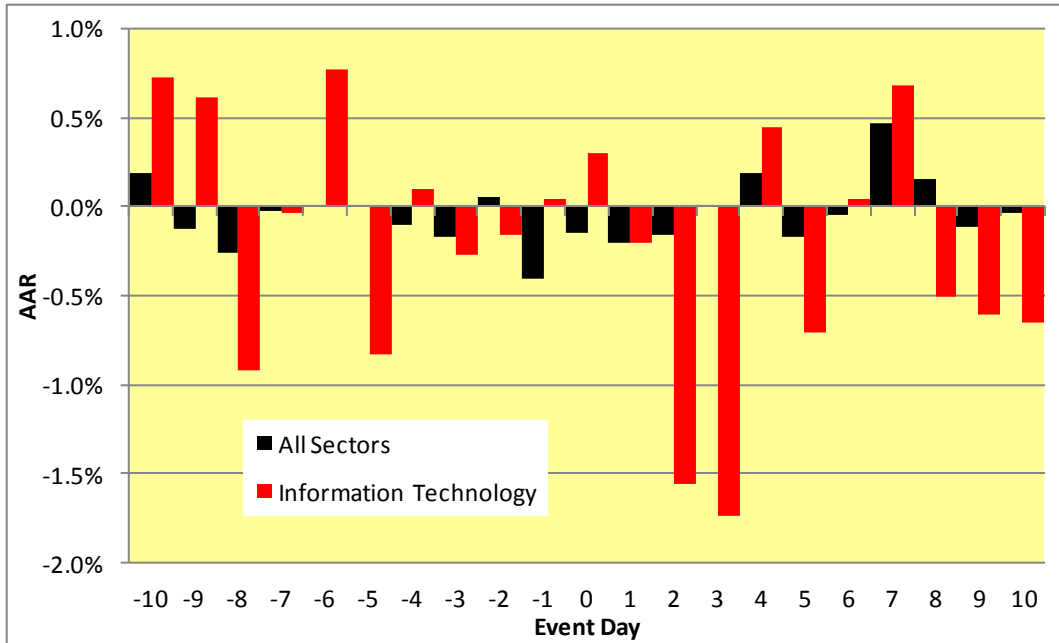
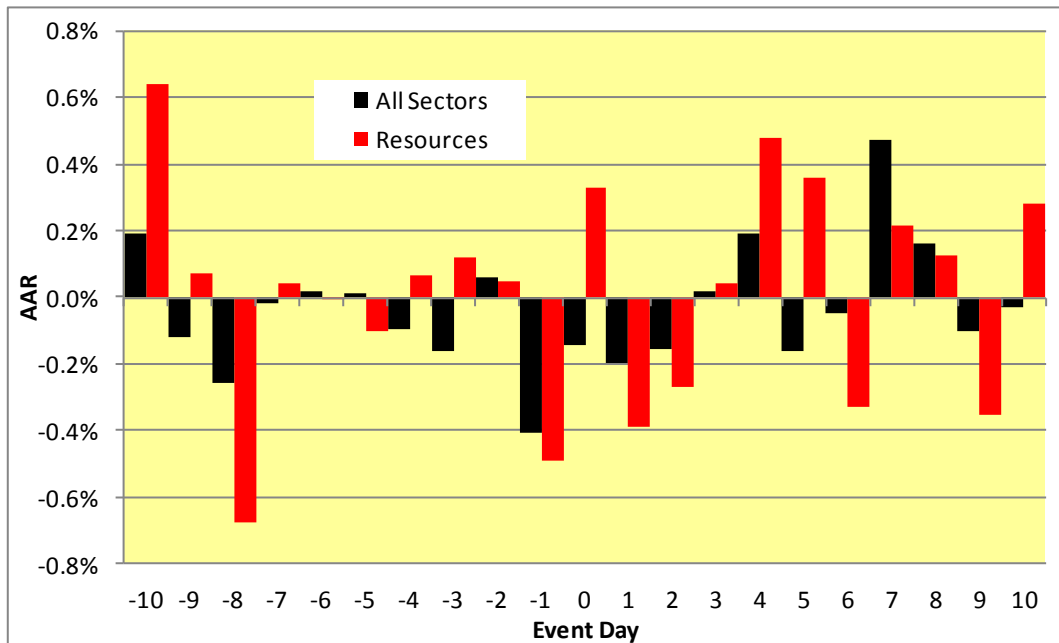


Figure 6 : Comparison of average abnormal returns (AAR) for the sector 'Resources' against all sectors combined, across the full event window



5.3. Cumulative Average Abnormal Returns

Cumulative average abnormal returns for the acquiring companies were analysed for the 21 day window period [-10,+10] i.e. ten days prior to the event, the day of the event (announcement date) and ten days post the event for each of the five sectors discussed in section 4.3. The results of each of the sectors are detailed below.

Figure 7 illustrates the cumulative average abnormal returns (CAAR) overlaid with the average abnormal returns (AAR) for all of the five sectors combined for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 7 : Cumulative average abnormal returns and average abnormal returns for all the sectors combined across the full event window [-10;+10]

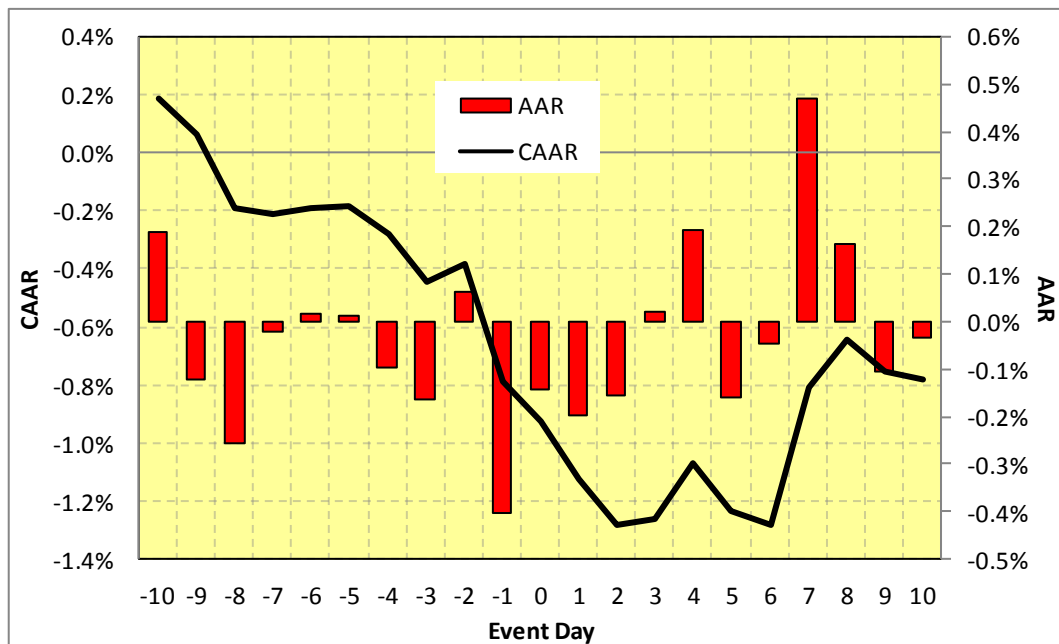


Figure 8 illustrates the cumulative average abnormal returns (CAAR) overlaid with the average abnormal returns (AAR) for the sector 'Basic Industries' for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 8 : Cumulative average abnormal returns and average abnormal returns for the sector 'Basic Industries' across the full event window [-10;+10]

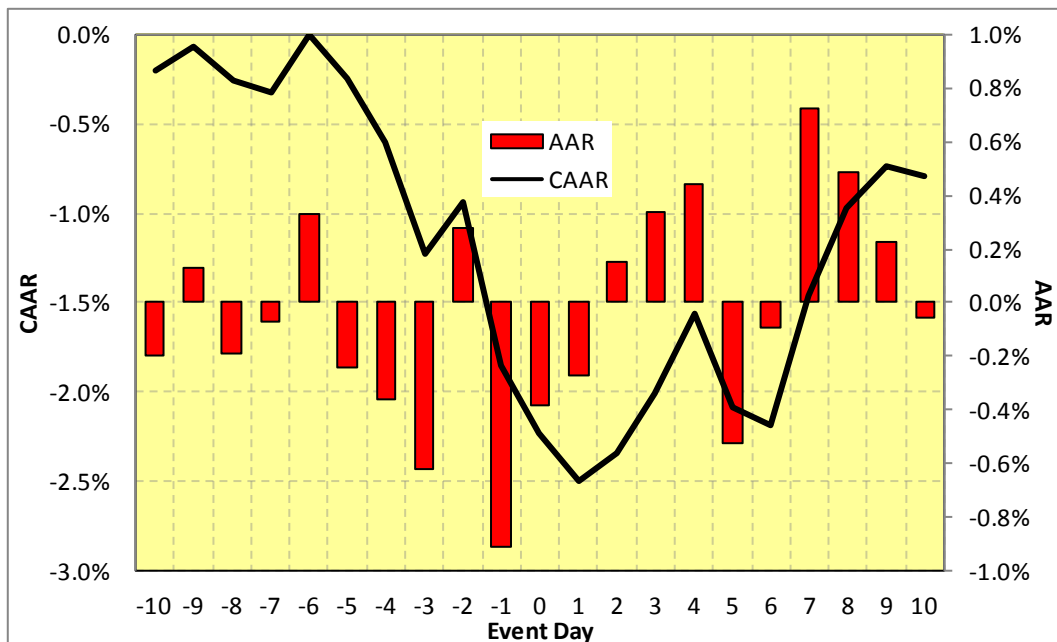


Figure 9 illustrates the cumulative average abnormal returns (CAAR) overlaid with the average abnormal returns (AAR) for the sector 'Consumer Goods & Services' for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 9 : Cumulative average abnormal returns and average abnormal returns for the sector 'Consumer Goods & Services' across the full event window [-10;+10]

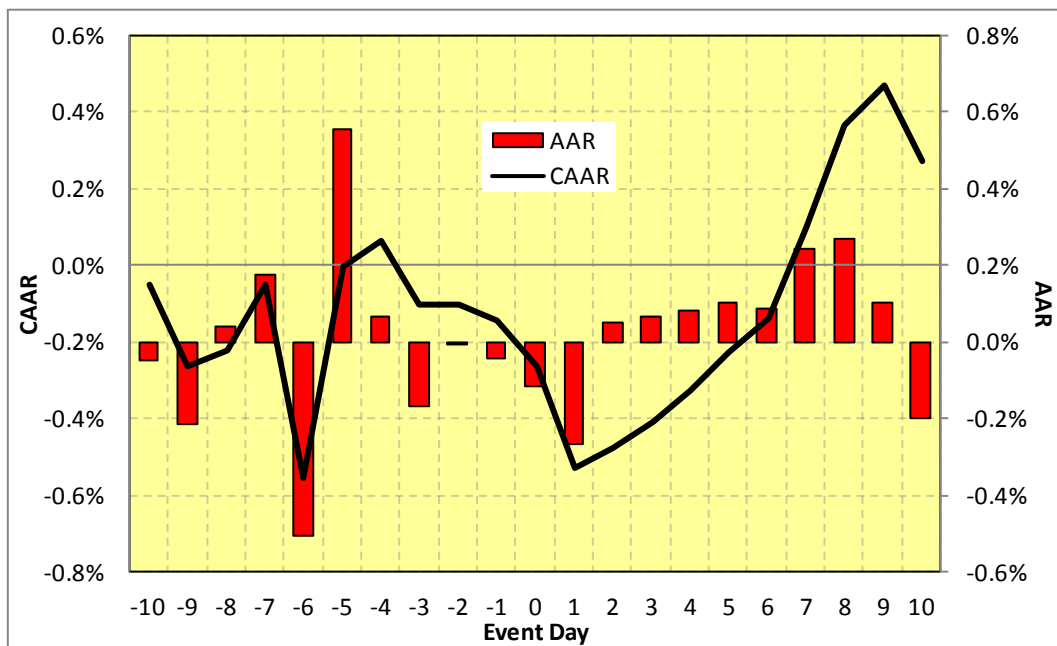


Figure 10 illustrates the cumulative average abnormal returns (CAAR) overlaid with the average abnormal returns (AAR) for the sector 'Financials' for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 11 illustrates the cumulative average abnormal returns (CAAR) overlaid with the average abnormal returns (AAR) for the sector 'Information Technology' for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 10 : Cumulative average abnormal returns and average abnormal returns for the sector 'Financials' across the full event window [-10;+10]

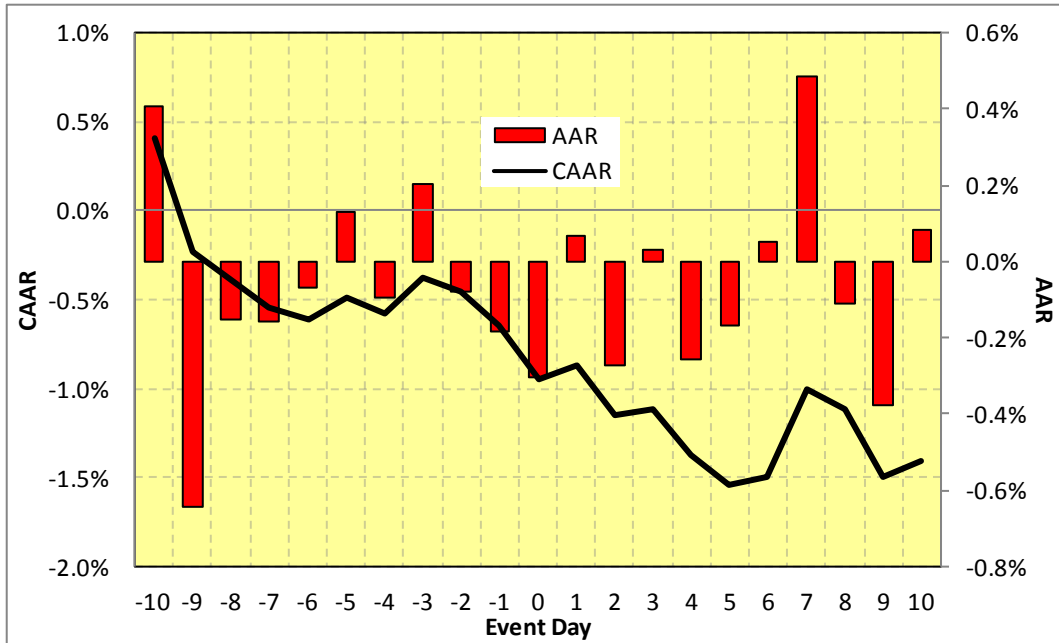


Figure 11 : Cumulative average abnormal returns and average abnormal returns for the sector 'Information Technology' across the full event window [-10;+10]

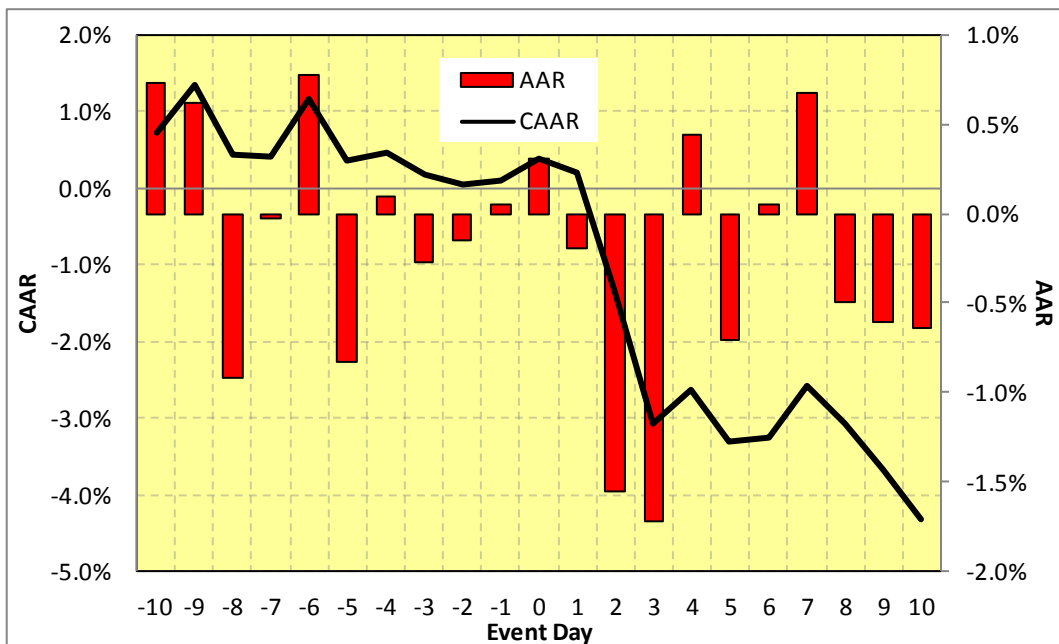
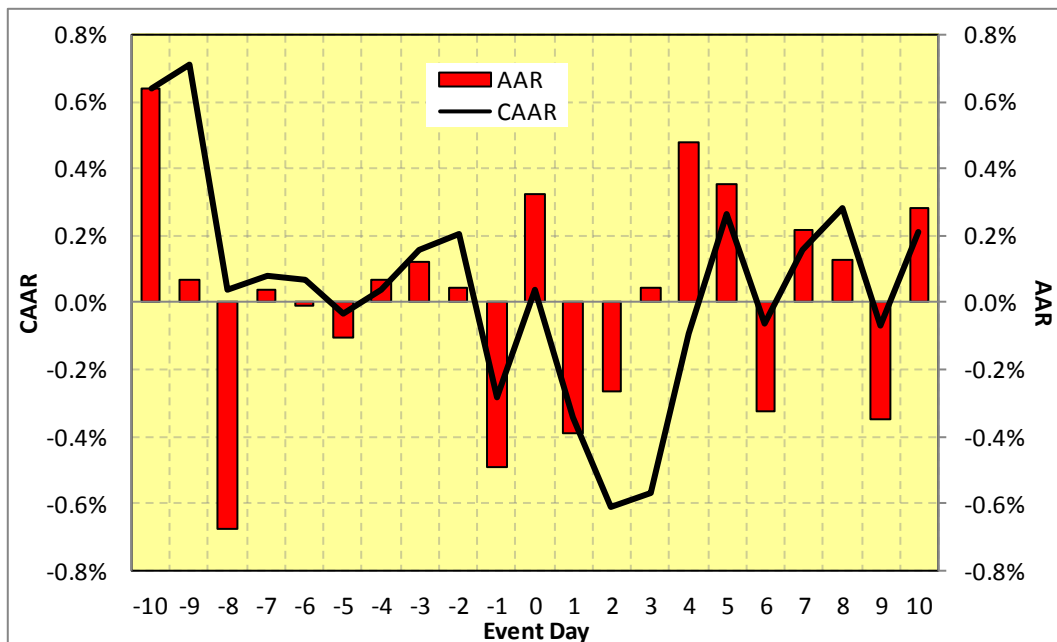


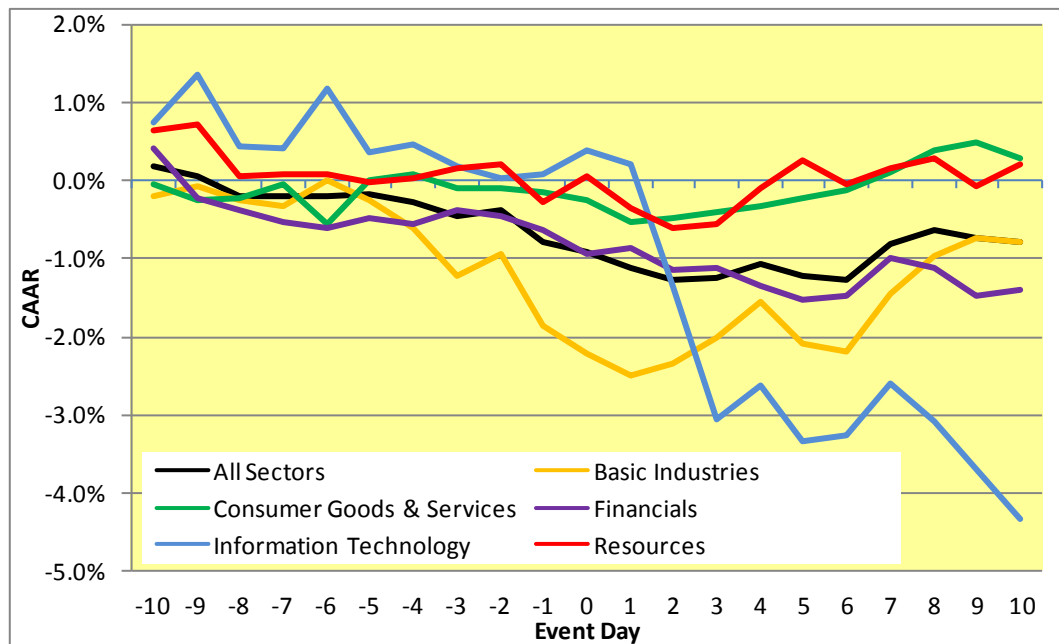
Figure 12 illustrates the cumulative average abnormal returns (CAAR) overlaid with the average abnormal returns (AAR) for the sector 'Resources' for the full 21 day event period of ten days prior to the event, the event day itself and ten days post the event [-10;+10].

Figure 12 : Cumulative average abnormal returns and average abnormal returns for the sector 'Resources' across the full event window [-10;+10]



In order to easily compare the cumulative average abnormal returns of each of the sectors with each other, the final figure in the series Figure 13 illustrates these values on the same set of axes. The plot of the cumulative average abnormal returns (CAAR) for all of the sectors combined is displayed by the black line as a reference point.

Figure 13 : Cumulative average abnormal returns for all sectors including all sectors combined



5.1. Statistical Analysis

Table 8 details the results of the two single sample t-test of the cumulative average abnormal returns (CAAR) conducted using the Student Edition of the NCSS statistical analysis and graphics package for each of the five sectors as well as for all the sectors combined using an alpha value of 0.050 or in other words a confidence interval of 95%. The table includes the results of the test for normality of the data, the final t-statistic, the probability level, the power value and the decision on whether to reject the null hypothesis or not.

Table 8 : Results of the single sample t-test for significance of the individual CAAR for each sector as well as all sectors combined

$\alpha = 0.050$ (95% Confidence Interval)					
Sector	Test for Normality	t-stat	Probability Level	Reject H0	Power
All Sectors	Cannot reject normality	-6.3337	0.000004	Yes	0.999974
Basic Industries	Cannot reject normality	-6.3802	0.000003	Yes	0.999979
Consumer Goods & Services	Cannot reject normality	-2.0521	0.053484	No	0.497348
Financials	Cannot reject normality	-7.5270	0.000000	Yes	1.000000
Information Technology	Reject Normality	1.2687	0.204564	No	
Resources	Cannot reject normality	0.5333	0.599677	No	0.080071

Table 9 details the results of the two sample paired t-test conducted using the Student Edition of the NCSS statistical analysis and graphics package for each of the five sectors of the total sample using an alpha value of 0.050 or in other words a confidence interval of 95%. The test compares the CAAR's of the specific sector in relation to the CAAR's of all the remaining sectors. The table includes the results of the test for normality of the data, the final t-statistic, the probability level, the power value and the decision on whether to reject the null hypothesis or not.

Table 9 : Results of the paired sample t-test for each of the five sectors against the combination of the remaining sectors at the 95% confidence interval

$\alpha = 0.050$ (95% Confidence Interval)					
Sector	Test for Normality	t-stat	Probability Level	Reject H0	Power
Basic Industries	Cannot reject normality	-5.2848	0.000036	Yes	0.998884
Consumer Goods & Services	Cannot reject normality	4.8598	0.000095	Yes	0.996041
Financials	Cannot reject normality	-3.0534	0.006273	Yes	0.827417
Information Technology	Cannot reject normality	-1.0781	0.293841	No	0.176792
Resources	Cannot reject normality	8.9931	0.000000	Yes	1.000000

Table 10 details the results of the two sample paired t-test conducted using the Student Edition of the NCSS statistical analysis and graphics package for each of the five sectors of the total sample using an alpha value of 0.100 or in other words a confidence interval of 90%. The test compares the CAAR's of the specific sector in relation to the CAAR's of all the remaining sectors. The table includes the results of the test for normality of the data, the final t-statistic, the probability level, the power value and the decision on whether to reject the null hypothesis or not.

Table 10 : Results of the paired sample t-test for each of the five sectors against the combination of the remaining sectors at the 90% confidence interval

$\alpha = 0.10$ (90% Confidence Interval)					
Sector	Test for Normality	t-Value	Probability Level	Reject H0	Power
Basic Industries	Cannot reject normality	-5.2848	0.000036	Yes	0.998884
Consumer Goods & Services	Cannot reject normality	4.8598	0.000095	Yes	0.996041
Financials	Cannot reject normality	-3.0534	0.006273	Yes	0.827417
Information Technology	Cannot reject normality	-1.0781	0.293841	No	0.176792
Resources	Cannot reject normality	8.9931	0.000000	Yes	1.000000

6. DISCUSSION OF RESULTS

6.1. Average Abnormal Returns (AAR)

6.1.1. All Sectors Combined

Table 4 reveals that for the full sample which includes a combination of all the sectors, across the full event window of ten days prior to the event, the event day itself and ten days post the event [-10;+10], there is one average abnormal return (AAR) for the acquiring companies at $D = +7$ which is statistically significant at the 5% level. In addition two AAR's are statistically significant at $D = +8$ and $D = -8$ at the 10% level.

In relative agreement with Mushidzhi & Ward (2004) and Smit (2005) these results show statistically insignificant average abnormal returns for the majority of the 21 day window period [-10;+10]. The single strong statistically significant positive AAR result at $D = +7$ would appear to originate from the 'Financials' economic sector as can be seen in section 6.1.4 below. There is little evidence in the literature to explain why such an effect might occur in this sector but Andrade (2001) found in a non sector specific study, evidence of significant negative AAR's for acquisitions funded primarily by stock while in a similar study, Smit (2005) reported a single statistically significant positive AAR at $D = -3$.

The AAR's for all the sectors combined fluctuated between positive and negative across the full event window [-10;+10] as illustrated in Figure 2. A breakdown of the number of days of positive AAR is recorded in Table 7 for different event windows. The AAR's for 4 of the 10 days prior to the event were positive as were 4 of the 10 days post the event. The actual event day did not return a positive AAR. The 11 day window period of five days prior to the event and 5 days post the event [-5;+5] returned 4 days of positive AAR's and the 5 day event window of two days prior to and 2 days post the event [-2;+2] returned only 1 day of positive AAR. It is evident from Figure 2 that the window period of 1 day prior to and 2 days post the event returned the most consistent negative AAR.

Figure 1 which illustrates the AAR for all the sectors combined contrasted on a sector by sector basis clearly shows that the absolute values of the AAR's for individual sectors are in some cases significantly greater or smaller than that of the all the sectors combined.

6.1.2. Basic Industries

Table 4 reveals that for the sector 'Basic Industries', across the full event window of ten days prior to the event, the event day itself and ten days post the event [-10;+10], there are no statistically significant average abnormal returns

(AAR) at the 5% level. There are however three statistically significant AAR's at the 10% level on $D = -6$, $D = +3$ and $D = +4$.

The AAR's for this sector track the trend of those of all the sectors combined relatively closely as can be seen in Figure 2 and the AAR's fluctuate in relative synchronisation except for three or four of the days, primarily at the extremities of the event window. This close similarity to all of the sectors combined is re-enforced in Table 7 where the AAR's for 3 of the 10 days prior to the event were positive as were 6 of the 10 days post the event. The actual event day did not return a positive AAR. The 11 day window period of five days prior to the event and 5 days post the event $[-5;+5]$ returned 4 days of positive AAR's and the 5 day event window of two days prior to and 2 days post the event $[-2;+2]$ returned 2 days of positive AAR.

Exactly as with the AAR's of all the sectors combined, Figure 2 shows that the window period of 1 day prior to and 2 days post the event returned the most consistent negative AAR. In absolute value terms, Figure 2 shows that the AAR's for this economic sector are significantly greater in magnitude than that of all the sectors combined. The majority of the Positive AAR's i.e. 6 out of 9, occurred in the 12 day event window $[-1;+10]$ which would indicate that there should be a fairly rapid recovery of the negative trend after the announcement date.

6.1.3. Consumer Goods & Services

Table 5 reveals that for the sector 'Consumer Goods & Services', across the full event window of ten days prior to the event, the event day itself and ten days post the event [-10;+10], there are two statistically significant average abnormal returns (AAR) at the 5% level. These occur at $D = -7$ and $D = -5$. In addition, there are two statistically significant AAR's at the 10% level on $D = -9$ and $D = +2$

The AAR's for this sector fluctuate between positive and negative values over the full event window [-10;+10] as illustrated in Figure 3. Unlike with the previous sectors these AAR's do not closely track the trend of all the sectors combined. A breakdown of the number of days of positive AAR is recorded in Table 7 for different event windows. The AAR's for 5 of the 10 days prior to the event were positive and a large percentage of the days post the event were positive i.e. 8 of the 10 days. The actual event day did not return a positive AAR. The 11 day window period of five days prior to the event and 5 days post the event [-5;+5] returned 7 days of positive AAR's and the 5 day event window of two days prior to and 2 days post the event [-2;+2] returned 2 days of positive AAR.

In keeping with the data from the previous sector as well as all the sectors combined, Figure 3 shows that the window period of 2 days prior to and 1 day post the event returned the most consistent negative AAR. In absolute value

terms this is followed by a consistent positive set of AAR from day $D = +2$ to $D = +9$ and Figure 3 shows that the AAR's for this economic sector are significantly different in magnitude than that of all the sectors combined. The majority of the Positive AAR's i.e. 8 out of 13, occurred in the 12 day event window $[-1;+10]$ which would also indicate that there should be a fairly rapid recovery of the negative trend after the announcement date.

6.1.4. Financials

Table 5 reveals that for the sector 'Financials', across the full event window of ten days prior to the event, the event day itself and ten days post the event $[-10;+10]$, there are two statistically significant average abnormal returns (AAR) at the 5% level. These occur at $D = -9$ and $D = +7$. There are no additional statistically significant AAR's at the 10% level.

The AAR's for this sector fluctuate between positive and negative values over the full event window $[-10;+10]$ as illustrated in Figure 4. As with the sector 'Basic Industries' these AAR's appear to track the trend of all the sectors combined. A breakdown of the number of days of positive AAR is recorded in Table 7 for different event windows. The AAR's for 3 of the 10 days prior to the event were positive and a larger percentage of the days post the event were positive i.e. 5 of the 10 days. The actual event day did not return a positive AAR. The 11 day window period of five days prior to the event and 5 days post the event $[-5;+5]$ returned 4 days of positive AAR's and the 5 day event window

of two days prior to and 2 days post the event [-2;+2] returned only 1 day of positive AAR.

Breaking from the trend of the previous sectors as well as all the sectors combined, Figure 4 shows that the window period of 1 day prior to and 2 days post the event while strongly negative for the most part, returned a positive AAR at $D = +1$. In absolute value terms, Figure 4 shows that the AAR's for this economic sector are again different in magnitude than that of all the sectors combined although from visual inspection it would appear that this is not as pronounced as previous sectors. The majority of the Positive AAR's i.e. 5 out of 8, occurred in the 12 day event window [-1;+10] which would also indicate that there should be a recovery of the negative trend after the announcement date.

6.1.5. Information Technology

Table 6 reveals that for the sector 'Financials', across the full event window of ten days prior to the event, the event day itself and ten days post the event [-10;+10], there is one statistically significant average abnormal return (AAR) at the 5% level at $D = -8$. In addition, there are two statistically significant AAR's at the 10% level at $D = -6$ and $D = +5$.

The AAR's for this sector fluctuate between positive and negative values over the full event window [-10;+10] as illustrated in Figure 5. As with the sector

'Consumer Goods and Services' these AAR's do not appear to track the trend of all the sectors combined. A breakdown of the number of days of positive AAR is recorded in Table 7 for different event windows. The AAR's for 5 of the 10 days prior to the event were positive and a smaller percentage of the days post the event were positive i.e. 3 of the 10 days. The actual event day did return a positive AAR. The 11 day window period of five days prior to the event and 5 days post the event [-5;+5] returned 4 days of positive AAR's and the 5 day event window of two days prior to and 2 days post the event [-2;+2] returned 2 days of positive AAR.

Figure 5 shows that there is no clear window period which shows either consistent positive or negative AAR's. In absolute value terms, Figure 5 shows that the AAR's for this economic sector are significantly different in magnitude than that of all the sectors combined. Slightly more than half of the Positive AAR's i.e. 5 out of 9, occurred in the 12 day event window [-1;+10].

6.1.6. Resources

Table 6 reveals that for the sector 'Resources', across the full event window of ten days prior to the event, the event day itself and ten days post the event [-10;+10], there are no statistically significant average abnormal returns (AAR) at the 5% level and only one at the 10% level at D = -10.

The AAR's for this sector fluctuate between positive and negative values over the full event window [-10;+10] as illustrated in Figure 6. As with the sector 'Consumer Goods and Services' and 'Information Technology' these AAR's do not appear to track the trend of all the sectors combined very closely. A breakdown of the number of days of positive AAR is recorded in Table 7 for different event windows. The AAR's for 6 of the 10 days prior to the event were positive and an equal percentage of the days post the event were positive i.e. 6 of the 10 days. The actual event day did return a positive AAR. The 11 day window period of five days prior to the event and 5 days post the event [-5;+5] returned 7 days of positive AAR's and the 5 day event window of two days prior to and 2 days post the event [-2;+2] returned 2 days of positive AAR.

Figure 6 shows that there is no clear window period which shows either consistent positive or negative AAR's. In absolute value terms, Figure 6 shows that the AAR's for this economic sector are different in magnitude than that of all the sectors combined but not necessarily as extreme as some of the previous sectors. Slightly more than half of the Positive AAR's i.e. 7 out of 13, occurred in the 12 day event window [-1;+10].

6.2. Cumulative Average Abnormal Returns

6.2.1. All Sectors Combined

Figure 7 illustrates the cumulative average abnormal returns (CAAR) for all of the sectors combined against the backdrop of their respective average abnormal returns (AAR). The CAAR begins to drop significantly from around day $D = -4$ which would indicate that the market is aware of the transaction at least a few days prior to the impending announcement date (the event). The CAAR continues to drop until a brief period of stabilisation at approximately day $D = +2$ to $D = +6$ after which it begins to recover but it does not exit the negative values before the end of the window period at $D = +10$.

Table 8 shows the results of the statistical analysis conducted on the individual CAAR's for all the sectors combined as well as for sector by sector. This table indicates that the CAAR's are statistically significantly different from zero for all of the sectors combined. This result stands in direct contrast to the the studies of Ward & Muller (2008) and Smit (2005), where the authors did not detect any significance in their tests of the CAAR's. The first study (Ward & Muller, 2008) however was limited to black economic empowerment transactions on the JSE and may not be a good comparative study for our purposes. The second of these studies (Smit, 2005) is more suitable for comparison however minor differences in the values on which the analysis was conducted may impact the results.

6.2.2. Basic Industries

Figure 8 illustrates the cumulative average abnormal returns (CAAR) for the sector 'Basic Industries' against the backdrop of their respective average abnormal returns (AAR). The CAAR begins to drop steeply from around day $D = -6$ which would indicate that the market is aware of the transaction even earlier than that of the average. The CAAR continues to drop until day $D = +1$ after which it begins to recover but it does not exit the negative values before the end of the window period at $D = +10$.

The comparison of the CAAR's for each sector as well as all the sectors combined is provided in Figure 13 where it is evident that the CAAR's for this sector drop off much more rapidly than the average and to a lower negative value. In fact the lowest CAAR value is approximately twice that of the average of all the sectors combined. The CAAR's however do begin to recover at about the same point in time as the average and by the end of the window period at day $D = +10$ have reached the same level as that of all the sectors combined. The CAAR's for this sector perform more poorly in comparison to the average for the sustained period of the event window.

Table 8 indicates that the CAAR's are statistically significantly different from zero for this sector. This result stands in direct contrast to the studies referred to in the previous section (Ward & Muller, 2008; Smit, 2005) however as we are dealing with only a subset of the data this difference is worth noting but

potentially not comparable. No studies either local or international have been found with which direct comparison of the results are possible.

6.2.3. Consumer Goods & Services

Figure 9 illustrates the cumulative average abnormal returns (CAAR) for the sector 'Consumer Goods & Services' against the backdrop of their respective average abnormal returns (AAR). The CAAR begins to drop into negative territory from around day $D = -3$, again indicating that the market has prior knowledge of the transaction, however this does not occur as early as with the previous sector and the average. The CAAR continues to drop until day $D = +1$ after which it begins to recover and it reaches positive territory relatively quickly at around day $D = +7$ due to sustained positive AAR's after day $D = +1$.

The comparison of the CAAR's for each sector as well as all the sectors combined is provided in Figure 13 where in contrast with that of the previous sector, it is evident that the CAAR's for this sector drop off much more gently than the average and do not lose as much in absolute value terms. In fact in this instance the lowest CAAR value is approximately half that of the average of all the sectors combined. The CAAR's do begin to recover a little earlier than the average and remain higher than the average for the duration of the window period. The CAAR's for this sector perform better in comparison to the average for the sustained period of the event window.

Table 8 indicates that the CAAR's are not statistically significantly different from zero for this sector. This result agrees with the studies referred to in the previous section (Ward & Muller, 2008; Smit, 2005) however comparisons may be difficult as noted previously.

6.2.4. Financials

Figure 10 illustrates the cumulative average abnormal returns (CAAR) for the sector 'Financials' against the backdrop of their respective average abnormal returns (AAR). The CAAR begins to drop slowly into negative territory very early from around day $D = -8$ although only at day $D = -3$ does it increase the pace of the drop, yet again potentially indicating that the market has prior knowledge of the transaction. The CAAR continues to drop until day $D = +5$ after which it begins to show some form of stabilisation but does not give any indication of increasing before the end of the window period.

The comparison of the CAAR's for each sector as well as all the sectors combined is provided in Figure 13 where it is evident that the CAAR's for this sector track that of the average quite closely. The CAAR's do appear to drop a little earlier than the average and then fluctuate either greater or lower than the average for the duration of the window period.

Table 8 indicates that the CAAR's are statistically significantly different from zero for this sector.

6.2.5. Information Technology

Figure 11 illustrates the cumulative average abnormal returns (CAAR) for the sector 'Information Technology' against the backdrop of their respective average abnormal returns (AAR). The CAAR in this instance does not appear to drop off in any manner until one day after the announcement date. This seems to indicate that the market has no prior knowledge of the transaction. The CAAR continues to drop steeply into negative territory and does not show any sign of recovery by the end of the window period.

The comparison of the CAAR's for each sector as well as all the sectors combined is provided in Figure 13 where in contrast with that of the previous sectors, it is evident that the CAAR's for this sector remain above that of the average for the period prior to the event, drop off rapidly immediately after the event and loses much more in absolute value terms. In fact in this instance the lowest CAAR value is approximately three times that of the average of all the sectors combined. The CAAR's do not show any sign of recovery by the end of the window period.

Table 8 indicates that the CAAR's are not statistically significantly different from zero for this sector. This result agrees with the studies referred to in the previous section (Ward & Muller, 2008; Smit, 2005) however comparisons may be difficult as noted previously and it is important to note that the sample size for this sector was extremely small. Care must therefore be taken with any statistical inferences from this sample.

6.2.6. Resources

Figure 12 illustrates the cumulative average abnormal returns (CAAR) for the sector 'Resources' against the backdrop of their respective average abnormal returns (AAR). The CAAR only shows movement to negative territory at approximately day $D = +1$ which seems to indicate that the market has little prior knowledge of the transaction. The CAAR drops until day $D = +3$ after which it begins to recover and it rapidly reaches positive territory at around day $D = +4$.

The comparison of the CAAR's for each sector as well as all the sectors combined is provided in Figure 13 where it show similarities with the sector 'Consumer Goods & Services'. It is evident that the CAAR's for this sector drop off much more gently than the average and do not lose as much in absolute value terms. In fact in this instance the lowest CAAR value is approximately half that of the average of all the sectors combined. The CAAR's recover more rapidly than any of the other sectors and the effect appears to have 'washed

out' by day $D = +5$. The CAAR's for this sector perform better in comparison to the average for the sustained period of the event window.

Table 8 indicates that the CAAR's are not statistically significantly different from zero for this sector. This result agrees with the studies referred to in the previous section (Ward & Muller, 2008; Smit, 2005) however comparisons may be difficult as noted previously.

6.3. Hypothesis Testing

Hypotheses 1 through 5 of section 3 were tested to establish whether the shareholders of acquiring companies in the five different economic groups earn higher or lower Cumulative Average Abnormal Returns (CAAR) around the announcement dates than in the remaining economic groups.

The results of these statistical hypothesis tests for the 21 day window period around the event $[-10;+10]$ are detailed at the 5% error level in Table 9 and at the 10% error level in Table 10. In four of the five different economic sectors the results indicate that the null hypothesis must be rejected. In other words where the null hypothesis states that there is no statistical difference in the CAAR's between the average and the individual sector, it is found to be untrue.

The only sector where the null hypothesis could not be rejected at either the 5% or the 10% level was that for 'Information Technology'. It must however be noted that this particular sector contained the fewest number of data points and as mentioned previously any statistical inferences from this sub sample must be treated with due caution.

It would appear from Figure 13 that in general (with exceptions) most of the sectors experience some negative drop in CAAR a few days before the announcement date, followed by a continued downward trend followed at varying intervals by an upward trend towards positive values following the announcement date.

Whilst not explicitly tested for statistical significance Figure 13 indicates that the sectors 'Consumer Goods & Services' and 'Resources' experience a lesser overall drop in CAAR across the full window period than that of the average from which could be inferred that these sectors demonstrate a more successful return to shareholders than do the other sectors. In the same vein the sector 'Basic Industries' and 'Information Technology' demonstrate poorer returns than the average with the last sector 'Financials' showing very similar returns to the average.

7. CONCLUSIONS

This research has demonstrated that shareholders of acquiring companies can expect to experience significantly different abnormal returns in the short run when compared to the average, around the announcement date of the transaction, depending on the economic sector in which they operate. It has been shown that the reaction of the economic sector differs both in magnitude and trend from the average insofar as the cumulative average abnormal returns (CAAR) are concerned.

Whilst no statistical tests were concluded in support, it would appear that two of the sectors display marginally better returns (or smaller losses) to the shareholders of the acquiring companies namely Consumer Goods & Services and Resources. Two sectors have been shown to deliver marginally worse returns (or greater losses) to the shareholders of acquiring companies namely Basic Industries and Information Technology. Lastly the Financials sector has been shown to produce very similar returns (losses) as that of the average.

It has furthermore been determined that in-line with other local studies (Mushidzhi & Ward, 2004; Smit, 2005) the full sample, including all the economic sectors, do not in general exhibit statistically significant average abnormal returns (AAR) in the full 21 day window period [-10;+10] around the

date of the announcement of the transaction. In contrast however statistical tests of the CAAR's of the full sample do reveal significance at the 5% error level.

The overall conclusion of this study is that different economic sectors do in fact experience different degrees of success or failure in the conclusion of merger and acquisition transactions in the short run. This study is a significant contribution to the body of knowledge around the relative success of merger and acquisition activity on both local and international securities exchanges. Further research however is recommended in many different aspects. It is recommended that this work be extended to a larger data set incorporating as many years as reliable data is available and that the research be extended to incorporate longer windows around the announcement date particularly for the period following the event as was demonstrated in the study of Ward & Muller, (2008).

As has been mentioned previously a concurrent study of the operating financial performance of the acquiring companies at least two years post the announcement date would provide an excellent verification of the findings of this study as was concluded by Smit, (2005) where the author indicates that it is possible the synergies of the transactions may only be fully realised a number of years after the event.

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9. APPENDIX

9.1. Sample Details

9.1.1. Basic Industries

	Date	Acquirer	Ticker	Target	Value (R'm)	Market Cap (R'm)	% of MC	Announce Date	Effective Date
1	2000	ADCORP HOLDINGS LTD	ADR	Acumen business	143	838.22	17.06	23/05/2000	01/04/2000
2	2000	AVENG LTD	AEG	LT A LTD	1300	2688.76	48.35	10/07/2000	01/07/2000
3	2002	ASTRAPAK LTD	APK	Master Plastics (Pty) Ltd	123.8	324.32	38.17	07/05/2002	01/03/2002
4	2004	ASTRAPAK LTD	APK	Master Plastics (Pty) Ltd	44.5	789.17	5.64	04/05/2004	01/03/2004
5	2005	ASTRAPAK LTD	APK	Hilfort Plastics (Pty) Ltd	85	1259.42	6.75	17/01/2005	01/03/2005
6	2005	ARGENT INDUSTRIAL LTD	ART	Xpanda Security (Pty) Ltd	49.3	670.23	7.36	28/02/2005	01/04/2005
7	2000	CONTROL INSTRUMENTS GROUP LTD	CNL	Conlog (Pty) Ltd's Automotive Division	10	72.91	13.72	01/03/2000	01/03/2000
8	2001	CARGO CARRIERS LTD	CRG	Two Inc Consulting business	2.4	16.60	14.46	23/10/2001	01/09/2001
9	2004	DISTRIBUTION & WAREHOUSING NETWORK LTD	DAW	Cobra Watertech (Pty) Ltd	145.4	304.70	47.72	29/07/2004	23/11/2004
10	2000	DISTRIBUTION & WAREHOUSING NETWORK LTD	DAW	Stock and certain assets	8.8	138.78	6.34	05/09/2000	05/09/2000
11	2004	ENVIROSERV HOLDINGS LTD	ENV	Chargold	19	317.82	5.98	18/02/2005	01/10/2004
12	2004	HUDACO INDUSTRIES LTD	HDC	Powermite businesses	65	669.61	9.71	24/03/2005	01/12/2004
13	2003	ILIAD AFRICA LTD	ILA	Corpbuidl business	263	189.68	138.66	06/08/2003	01/07/2003
14	2000	INVICTA HOLDINGS LTD	IVT	BEARING MAN LTD	91.8	223.41	41.09	13/07/2000	01/07/2000
15	2001	NAMPAK LTD	NPK	MALBAK LTD ORD	1649	5679.26	29.04	13/12/2001	13/12/2001
16	2001	ONELOGIX GROUP LTD	OLG**	Customer base	19	116.89	16.25	06/12/2001	27/08/2001
17	2001	REMGRO LTD	REM	FIRSTRAND LTD	5677.7	25200.37	22.53	06/12/2000	01/01/2001
18	2001	REUNERT	RLO	Nashua Nedtel Communications (Pty) Ltd	224.6	2652.26	8.47	21/11/2001	01/12/2001
19	2005	SEKUNJALO INVESTMENTS LTD	SKJ	Bioclones (Pty) Ltd	25	155.54	16.07	28/06/2005	28/06/2005
20	2003	SET POINT TECHNOLOGY HOLDINGS LTD	STO	Flowmax Investments (Pty) Ltd	18	49.25	36.55	04/03/2003	01/03/2003
21	2005	SET POINT TECHNOLOGY HOLDINGS LTD	STO	Seran business	62	127.60	48.59	27/05/2005	01/07/2005
22	2005	TRANSPACO LTD	TPC	Britepak Trading	18.5	168.81	10.96	10/03/2005	10/03/2005
23	2000	VENTER LEISURE & COMMERCIAL TRAILERS	VTL	CITI business	6.4	8.58	74.56	08/04/2000	01/01/2000
24	2001	WINHOLD LTD	WNH	Secotrade business	7	13.85	50.55	12/06/2002	01/10/2001

** Removed as outlier

9.1.2. Consumer Goods and Services

	Date	Acquirer	Ticker	Target	Value (R'm)	Market Cap (R'm)	% of MC	Announce Date	Effective Date
1	2004	ASTRAL FOODS LTD	ARL	Earlybird Farm (Pty) Ltd	250	1219.56	20.50	05/03/2004	01/03/2004
2	2003	CROOKES BROTHERS LTD	CKS	Sugar Cane Farming Enterprise	30	162.00	18.52	04/08/2003	01/09/2003
3	2003	CONAFEX HOLDINGS SOCIETE ANONYME	CNX	Accord Services	4.8	45.94	10.45	27/11/2003	27/11/2003
4	2004	THE DON GROUP LTD	DON**	Property Portfolio	41	20.61	198.89	03/09/2004	03/09/2004
5	2003	GOLD REEF CASINO RESORTS LTD	GDF	Pinnacle Point Casino	31.8	587.24	5.42	30/09/2003	30/09/2003
6	2001	ILLOVO SUGAR LTD	ILV	Zambia Sugar Plc	90	1650.05	5.45	16/02/2001	16/02/2001
7	2002	JD GROUP LTD	JDG	Profurn businesses	989	2929.84	33.76	08/10/2002	08/10/2002
8	2001	MASSMART HOLDINGS LTD	MSM	Jumbo Cash & Carry (Pty) Ltd	490	2030.88	24.13	30/05/2001	01/04/2001
9	2002	NEW CLICKS HOLDINGS LTD	NCL	UPD business	281	1929.09	14.57	16/07/2002	16/07/2002
10	2001	NICTUS LTD	NCS	Corporate Guarantee Ltd	20	6.58	303.81	12/10/2001	01/04/2001
11	2004	NICTUS LTD	NCS	Futuni Collections (Pty) Ltd	2.6	37.41	6.95	28/04/2004	28/04/2004
12	2001	PICK N PAY STORES LTD	PIK	60 Franklins No Frills stores and 20 Fresco stores	500	6892.48	7.25	28/05/2001	28/05/2001
13	2001	REX TRUEFORM CLOTHING	RTO	Queenspark Australia	0.8	8.28	9.66	08/10/2001	08/10/2001
14	2002	S A BREWERIES PLC	SAB	Miller Brewing Company	53943.6	66400.55	81.24	30/05/2002	30/05/2002
15	2000	SEARDEL INVESTMENT CORP LTD	SER	FRAME GROUP HLDG LTD ORD	533	47.42	1123.97	16/08/2000	08/12/2000

** Removed as outlier

9.1.3. Financials

	Date	Acquirer	Ticker	Target	Value (R'm)	Market Cap (R'm)	% of MC	Announce Date	Effective Date
1	2005	APEXHI PROPERTIES LTD	APA	Prima business	996.2	1888.22	52.76	21/07/2005	01/10/2005
2	2005	BONATLA PROPERTY HOLDINGS LTD	BNT**	Eagle Creek Investments (Pty) Ltd	20	1.85	1079.06	10/03/2005	10/03/2005
3	2000	CAPITAL PROPERTY FUND	CPL	Commercial development in Menlyn Pretoria	39	352.41	11.07	04/02/2000	04/02/2000
4	2003	CAPITAL PROPERTY FUND	CPL	2 Long Street	59	286.34	20.61	09/08/2002	01/01/2003
5	2003	DISCOVERY HOLDINGS LTD	DSY	Destiny Health Inc.	167.9	2890.63	5.81	26/08/2003	07/07/2003
6	2001	INDEQUITY GROUP LTD	IDQ	Indequity Specialised Insurance Ltd	5.2	35.96	14.46	07/05/2001	07/05/2001
7	2000	INVESTEC GROUP LTD	INL	Financial services and insurance businesses	4592	21980.08	20.89	22/11/2000	22/11/2000
8	2004	JOHNNIC HOLDINGS LTD	JNC	Fabcos Investment Holding Company Ltd	295	2213.79	13.33	05/10/2004	05/10/2004
9	2000	LIBERTY INTERNATIONAL PLC	LBT	Capital Shopping Centres	4095	15143.58	27.04	15/09/2000	15/09/2000
10	2002	LIBERTY GROUP LTD	LGL	STANLIB LTD	1773	15037.50	11.79	26/02/2002	01/01/2002
11	2000	LONDON FINANCE & INVESTMENT GROUP PLC	LNF	Marylebone Warwick Balfour Group Plc	5.2	102.35	5.08	14/08/2000	14/08/2000

12	2003	MUTUAL & FEDERAL INSURANCE COMPANY LTD	MAF	Credit Guarantee Insurance Corporation	198	3589.27	5.52	24/04/2003	24/04/2003
13	2001	M CUBED HOLDINGS LTD	MCU	Assets and Liabilities	315	243.00	129.63	20/04/2001	01/08/2001
14	2002	NEDCOR LTD	NED	BOE LTD ORD	7619	30342.81	25.11	22/04/2002	01/01/2003
15	2000	PANGBOURNE PROPERTIES LTD	PAP	Grove PLS business	191.4	355.12	53.90	02/03/2000	02/03/2000
16	2004	PANGBOURNE PROPERTIES LTD	PAP	Property portfolio	439	1391.61	31.55	17/06/2004	17/06/2004
17	2001	RMB HOLDINGS LTD	RMH	FIRSTRAND LTD	2987.7	10735.96	27.83	06/12/2000	01/01/2001
18	2000	SABLE HOLDINGS LTD	SBL	Residential units in Melrose Estate - Johannesburg	1.9	17.53	10.84	21/09/2000	21/09/2000
19	1999	SANTAM LTD	SNT	GUARDIAN NATIONAL INS CO	1691	4069.15	124.67	11/01/2000	30/12/1999
22	2001	SYCOM PROPERTY FUND	SYC	Fourways Crossing Retail Centre	113.4	817.70	13.87	15/08/2001	15/08/2001
23	2005	VUKILE PROPERTY FUND LTD	VKE	MICC PROPERTY INCOME FUND LTD	238.4	1679.33	14.20	07/09/2004	14/01/2005

** Removed as outlier

9.1.4. Information Technology

	Date	Acquirer	Ticker	Target	Value (R'm)	Market Cap (R'm)	% of MC	Announce Date	Effective Date
1	2003	ALLIED TECHNOLOGIES LTD	ALT	NamTech Holdings Ltd	522.5	2522.80	20.71	06/05/2003	06/05/2003
2	2000	PARACON HOLDINGS LTD	PCN	Dimension Data SilverLine	67.5	470.32	14.35	14/09/2000	30/06/2000
3	2004	PINNACLE TECHNOLOGY HOLDINGS LTD	PNC	Explic Technologies (Pty) Ltd	9.3	52.17	17.83	25/10/2004	01/07/2004
4	2000	SPESCOM LTD	SPS	Altris Software Inc.	55	529.26	10.39	21/01/2000	21/01/2000
5	2005	UCS GROUP LTD	UCS	CEB Business	48	311.39	15.41	13/07/2005	30/09/2005

** Removed as outlier

9.1.5. Resources

	Date	Acquirer	Ticker	Target	Value (R'm)	Market Cap (R'm)	% of MC	Announce Date	Effective Date
1	2000	ANGLO AMERICAN PLC	AGL	Tarmac PLC	12312.6	161835.34	7.61	02/03/2000	02/03/2000
2	2003	ANGLOGOLD LTD	ANG	Ashanti Goldfields Company Ltd	9847	64671.17	15.23	01/08/2003	01/08/2003
3	2004	AFRICAN RAINBOW MINERALS LTD	ARI	Nkomati Nickel	260	4803.98	5.41	09/02/2004	01/02/2004
4	2003	DURBAN ROODEPOORT DEEP LTD	DRD**	Mineral Resources Porgera Ltd and Orogen Minerals (Porgera) Ltd	513	6019.19	8.52	14/10/2003	30/06/2003
5	2001	GOLD FIELDS LTD	GFI	WMC gold assets	2016	11670.49	17.27	21/09/2001	21/09/2001
6	2005	GOLD FIELDS LTD	GFI	Bolivar Gold Corporation	2200	34193.51	6.43	22/11/2005	22/11/2005
7	2000	IMPALA PLATINUM HLGS LD	IMP	Platexco Inc	898	16406.07	5.47	08/06/2000	08/06/2000
8	2005	LONMIN PLC	LON	Lonmin Platinum Limpopo FORMERLY Southern Platinum Corp	1305	14020.34	9.31	15/06/2005	15/06/2005



9	2005	MERAFE RESOURCES LTD	MRF	Wonderkop Joint Venture	235	940.82	24.98	04/05/2005	04/05/2005
10	2003	METOREX LTD	MTX	ETC assets	255	430.96	59.17	17/02/2003	15/06/2003
11	2002	MVELAPHANDA RESOURCES LTD	MVL	TRANS HEX GROUP LTD	32.4	259.39	12.49	11/06/2002	31/03/2002
12	2004	NORTHAM PLATINUM LTD	NHM**	Khumama Platinum (Pty) Ltd	460.3	2292.23	20.08	12/02/2004	12/02/2004
13	2003	OMNIA HOLDINGS LTD	OMN	Prochem business	541.6	733.00	73.89	05/06/2003	01/09/2003
14	2002	SAPPI LTD	SAP	Potlatch business AND Pulp and paper mill	5600	28688.63	19.52	18/03/2002	13/05/2002
15	2005	SIMMER & JACK MINES LTD	SIM	Buffelsfontein Gold Mines Ltd	45	44.96	100.08	28/10/2005	22/10/2005

** Removed as outlier