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JSE-LISTED FIRMS AND M&A'S: WHERE IS THE ECONOMIC VALUE?

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SCHOOL OF ECONOMIC AND BUSINESS SCIENCES

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ABSTRACT

This research empirically assesses the stock price reactions to mergers and acquisitions announcements by JSE-listed target and acquirer firms. The following is assessed over the defined windows: the target and acquirer firms, the method of funding (cash or stock) for both target and acquirer firms and lastly industry mergers with target and acquirer firms grouped together and separately. Data is collected for 87 merger deals, consisting of 87 target and acquirer firms. The period assessed is from 1990 to 2019. The event study methodology and hence the market model are employed as the primary methodology, with the net-market-return-model employed as a robustness check. T-tests, paired t-tests and a one-way ANOVA model are employed to test for relative significance.

The results in this study are unique and contribute to how the South African market views M&A announcements. Hence this will influence the contemporary understanding of the South African economy towards M&A's.

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1. INTRODUCTION

This study aims to evaluate the subsequent influence that merger and acquisition ("M&A" hereafter) activity has on the stock price of a firm, by observing the variations in a firm's stock price over different event windows. Hence, the following is assessed: the target and acquirer firms' stock price movements, the method of funding (cash or stock) for target and acquirer companies and the share price performance based on the underlying sector of the target/acquirer firms.

Importantly, this study is restricted to companies listed on the Johannesburg Stock Exchange (JSE). The study is ordered in the following manner: section 1.1 describes the framework of M&A's, section 1.2 states the core research question, section 1.3 defines the research objectives/questions that are assessed in this study, section 1.4 describes the need for the proposed study and hence the important contribution this study makes to the understanding of M&A's in South Africa. Section 1.5 puts forth any restrictions/limitations present in this research and section 1.6 provides classifications of the keywords employed within this research.

1.1. BACKGROUND

1.1.1. M&A CLASSIFICATIONS

One way to classify a merger is a situation where two firms agree to bond and hence become one firm (Momoh, 2018). M&A deals typically involve equity exchanges or monetary payments to the target firm (Momoh, 2018). Furthermore, a merger may result in a brand-new company name to denote the unification of the companies. An acquisition may be classified as an amalgamation of firms, where the proprietorship and employees of individualistically operating firms unite to become a single firm (Akamiokhor,1989).

While M&A is now an international term, the distinction between the terms "merger" and "acquisition" has developed into a somewhat unclear concept. As some believe a merger and acquisition are two different tactics and thus are two different notions. According to Sherman and Hart (2006), a merger can be defined as firms becoming equal partners, whereas acquisitions tend to occur when larger firms acquire smaller firms. Ullrich, Wieseke, and Dick, (2005) believe that the difference between mergers and acquisitions has become increasingly hazy. Dick *et al*, (2005) believe mergers are two separately owned firms, who become a single larger firm that is jointly owned. Whereas acquisitions are where one firm takes control of the

other exacting its power as a single owner – the stronger company usually absorbs the smaller firm and keeps its own identity whilst increasing in size. Moreover, with the phrase "M&A" being used so generically the distinction between the two terms must be made on a case-bycase basis. Within this study no distinction is made, rather the words "merger" and "acquisition" are used interchangeably.

1.1.2. TYPES OF M&A'S

According to studies such as Gaughan, (2002) and Chen and Findlay, (2003) there are several M&A types, namely:

1) Horizontal – firms merge that operate in the similar industries.
2) Vertical – companies' merger that produce the same products.
3) Conglomerate – companies in separate industries merge.
4) Congeneric – companies merge that are in the same general industry but do not combine their client or supplier relationships.

In the contemporary world, companies are often faced with multifaceted hurdles which if not overcome can ruin a firm. Therefore, companies need to continuously evolve and modernise owing to the multi-layered environment that they face. This can lead to companies paying large amounts of capital to assist development, expansion and product progression, through acquisition activity (Bradley, Desai and Kim, 1988).

Companies engage in mergers with the understanding that it will facilitate growth and thus raise the combined firm value. (fmaImportantly, in all cases where the word value is used it is referring to the share price of a company.) Although, such tactics can result in a reduction in company value rather than a rise and thus can be costly to the business. Additionally, large M&As can subsequently lead to formation of monopolies and/or oligopolies thus hampering the performance of smaller firms in similar industries. Consequently, merger activity must be supervised to aid in creating a competitive market – this is present in the absence of monopolies and/or oligopolies. From a legal perspective, the Companies Act, 2008 forms the basis of merger law in South Africa. The Act aids in monitoring and regulating important M&A's, through a board of decision-makers. Thus, preventing the creation of monopolistic and oligopolistic firms (Companies Act 71, 2008).

Kariuki *et al,* (2016) posits, the absence of faith in global markets has resulted in a noteworthy rise in M&A activity, in the African region. An example is the acquisition between AB InBev and SABMiller which was labelled as the "third largest corporate takeover deal" by Joffe and Bloomberg (2015). AB InBev attempted to acquire SAB Miller with the intention of enhancing AB InBev's expansion and growth. However, owing to insufficient capital they failed to successfully acquire SAB Miller. The first few offers by AB InBev were not accepted, until an arrangement was reached between the two firms. Thus, leading the largest merger arrangement recorded in South African history (Hopkins, Le, Mandim, Ries and Vergara 2016).

M&A's have developed into a very popular business tactic in the new era (Hitt *et al,* 2001). It is argued that M&A's give firms rapid access to growth, development, and different markets. Furthermore, the potential increase in overall firm value and hence profit makes M&A's an enticing tactic for firm growth (Cartwright and Schoenberg, 2006). Several studies confirm that the failure rate of M&A's is from 50% to 83% (Weber *et al,* 2014). The high failure rate, in theory, should give companies probable cause to consider other growth tactics to accomplish their objectives. However, in the contemporary market M&A's are a very popular growth strategy.

1.1.3. THE METHOD OF PAYMENT

There are multiple empirical studies such as those by Agrawal *et al,* (1992) and Franks *et al,* (1988), which propose that cash (as a method of funding) produces larger returns for acquiring firm stockholders than stock-backed acquisitions. Furthermore, evidence confirms that on the announcement of an acquisition stock prices consistently respond better to monetary proposals than equity proposals – for both target and acquirer firms. The conclusions above are in line with the following hypotheses, that offer a theoretical basis behind this idea.

The *Information Content* hypothesis by Myers and Majluf (1984). This hypothesis posits that acquirers proposing to acquire firms with stock, indicate to the market that the firm's stock is overestimated.

The *Free Cash Flow* hypothesis by Jensen (1986). This hypothesis posits that monetary proposals for a merger result in a decrease in the agency cost of free-cash-flow. The misappropriation of resources by mangers may well lead to sub-optimal investment choices and hence reduce firm value.

In contrast to these, two hypotheses contest the idea that stock bids are a signal of overvaluation, or that they are seen as negative.

The *Investment Opportunity hypothesis* by Myers (1977). This hypothesis emphasizes the fact that stock bids are not always an indication of their overvaluation. Myers (1977) clarifies that firms with profitable future investment prospects are less probable to bid with cash or debt. Thus, allowing these firms to invest in future prospects. Furthermore, Myers (1977) proposed that managers with high growth prospects prefer to raise money through stock because it gives managers more flexibility on the future uses of the firm's cash flows.

The *Risk Sharing hypothesis* by Hansen (1987). This hypothesis suggests that acquirers may face many hurdles when calculating the exact value of target firms – particularly in quantifying the worth of synergies that will be formed. Furthermore, this hypothesis suggests that there is an issue of information asymmetry when computing the exact value of the target firm. Thus, stock bids are preferred to monetary bids as the target firm is forced to partake in any post-merger effects.

1.1.4. FACTORS INFLUENCING VALUE CREATION

Modern literature identifies several factors that have a drastic impact on the value of an acquisition. Dutta, Pinches, Narayanan, (1992) posit 5 factors as being of main importance. These factors are: supervisory changes; number of buyers, buyers tactics, the funding method; and the kind of merger.

Eckbo and Thornburn, (2000) posit that the comparative stock size of the bidder and the target, is a factor that impacts M&A deal value. Healy and Palepu (1997) and Bruner (2002) suggest that deals that change the focus of the firm will have a significant impact on value. Lastly Loderer and Martin, (1990) and Beitel, Schiereck, and Wahrenburg, (2004) suggest that a main factor in M&A success is the rate at which companies attempt to acquire.

1.2. CORE RESEARCH QUESTION

This study investigates whether: M&A activity in South Africa generates value for the target and acquirer firms on and around the announcement date of the merger, whether target and/or acquirer firms outperform, whether cash or share funded mergers outperform for target and acquirer firms and if there are differences in share price performance based on the underlying sector of the target/acquirer?

1.3. RESEARCH OBJECTIVES

This study assesses whether acquisition activity in South Africa, does indeed add value to target and/or acquirer companies involved in a merger deal, focusing on stock returns.

This study examines the target and acquirer firms stock price responses, over the merger announcement period. This establishes whether value is created for either the stockholders of the acquirer and target firms.

This study assesses whether target or acquirer firms outperform. This is executed by looking at whether the target or acquirer firms generate significant larger abnormal returns than the other – over different windows.

The study further investigates whether the type of funding (cash or equity) effects the abnormal returns generated by the target and acquirer firms and whether certain types of sectors mergers outperform in terms of overall sector performance and in terms of target and acquirer firms, respectively.

1.4. IMPORTANCE AND BENEFITS OF THE PROPOSED RESEARCH

Firms undertake acquisitions with the purpose of enhancing the combined firm's value. However, present-day literature like the research by Dodd (1980), Asquith (1983), Malatesta (1983) and Jarrell & Poulsen (1989) presents conflicting results - with studies reporting value creating and value destroying acquisitions.

According to Andrade and Stafford (2001), the market for M&A's evolves over time thus confirming the need for updated literature. This study is significant as it exposes the manner in which the South African market reacts to the announcement of M&A's (i.e. is it viewed as value-creating or value-destroying) and thus significantly enhances the current understanding of M&A's, in a South African framework. Moreover, inferences made from this study may affect the general procedures, practises and strategies active at the both the firm and individual levels.

This research assesses if acquisition activity leads to the creation or destruction of firm value. In a South African context, the current body of knowledge that pertains to M&A's is in short supply. There is very little empirical work having been conducted on M&A's in a South African

context, and even less work focusing on the consequence that M&A's have on target and acquiring companies. There is also little to no research focusing on industry merger and acquisition performance. Further, there is a particular lacking when it comes to studies that analyse the longer-term share prices of firms involved in M&A's – since most M&A studies in a South African context only focus on short term stock price movements. However, according to Smit and Ward (2007) synergetic benefits may only be entirely realised in the longer-run. Thus, confirming the need for updated literature which focuses on longer-term stock returns.

Additionally, within a South African context, there is a short supply of M&A data, thus reconciling the need to update the current body of literature when new data is available. This research aims to fill knowledge gaps and therefore significantly add to the current understanding pertaining to M&A's in South Africa. Hence, which may aid the financial community in making inferences about relationship between the JSE and merger deal announcements and thus how the South African economy responds to mergers deal announcements.

This research will contribute to the current body of knowledge that pertains to M&A's within South Africa, since it tackles aspects such as: do acquisitions in South Africa create value for the target and acquirer firms during and around the announcement date? Do target and/or acquirer firms outperform? Do cash or share funded mergers outperform for target and acquirer firms? and are there differences in share price performance based on the underlying sector of the target/acquirer?

1.5. DELIMITATIONS

The following limitations have been constructed to aid in this research. Firstly, only JSE-listed acquirer and target companies are considered. Secondly, this study is limited to data available on the Bloomberg. Thirdly, all values presented in table form have been rounded to three decimal places.

1.6. DEFINITION OF KEY TERMS

- An acquisition may be classified as an amalgamation of firms where the proprietorship and employees of individualistically operating firms unite to become a single firm (Akamiokhor, 1989).
- A merger is an arrangement where two companies combine into a single business (Momoh, 2018).
    - It is important to note that for the purpose of this study, the terms "merger" and "acquisition" are utilized interchangeably.

The Abbreviations Used in this Research

Abbreviation	Meaning
AR	Abnormal Return
AAR	Average Abnormal Return
CAAR	Cumulative Average Abnormal Return
ACAAR	Average Cumulative Average Abnormal Return
ACAR	Average Cumulative Abnormal Return
M&A's	Mergers and Acquisitions
SA	South Africa
US	United States
CRSP	Centre for Research in Security Prices
OLS	Ordinary Least Squares
CAPM	The Capital Asset Pricing Model
SARB	South African Reserve Bank
JSE	Johannesburg Stock Exchange
IACRTA	Industry Adjusted Cash Flow Return on Tangible Assets
ANOVA	Analysis of Variance
NPV	Net Present Value

2. HYPOTHESIS FORMULATION

This study assesses several hypotheses which are formulated below. The window periods that assessed within each hypothesis are described below.

Hypothesis 1, 2 and 3 are assessed over the following window periods:

- (-25; +25); • (-10; +10) and
- (-5; +5).

Hypothesis 4 is assessed over the following window periods:

- (-25; +25);
- (-10; +10);
- (-5; +5);
- (-25; -1)
- (1; 25)

Lastly, hypothesis 5 is assessed over the full event window of 51 days only:

- (-25; +25)

2.1. HYPOTHESIS 1

The null hypothesis suggests that announcements of M&A's does *not* impact the share price of the target and acquiring companies engaging in the M&A dealings. Thus, inferring that M&A announcements generate zero abnormal returns (where abnormal returns are the actual return less the standard return garnered from the market model.)

The alternate hypothesis suggests that announcements of M&A's *does* impact the share price of the target and acquiring companies engaging in the M&A dealings. Hypothesis 1 is evaluated using CAAR's (where abnormal returns are the actual return less the standard return garnered from the market model.)

2.2. HYPOTHESIS 2

Hypothesis tests are also employed to determine if there are any substantial variations in pre- and post-announcement CAAR's. ACAAR's are further employed for paired sample t-tests.

The null hypothesis states that for the pre-announcement period, the CAAR's for target and acquiring firms should be equal to the CAAR's for target and acquiring firm's post announcement.

The alternative hypothesis states that for the pre-announcement period, the CAAR's for target and acquiring firms are not equal to the CAAR's for target and acquiring firm's post announcement.

2.3. HYPOTHESIS 3

Hypothesis tests are also employed to determine if there are any substantial variations in the CAAR's experienced by the target and acquirer firms when different methods of funding are employed (such as cash or equity). This is assessed in terms of CAAR's and hence ACAAR's (employed for t-tests).

The null hypothesis states that the CAAR's for target and acquiring firms are equal when cash and stock payments are employed as funding methods.

The alternate hypothesis states that the CAAR's for target and acquiring firms are not equal when cash and stock payments are employed as funding methods.

2.4. HYPOTHESIS 4

Hypothesis tests are also employed to determine if there are any significant variations in the CAAR's experienced by the target and acquiring companies involved in M&A transactions. This is assessed in terms of CAAR's and hence ACAAR's (employed for t-tests).

The null hypothesis posits that the CAAR's obtained by the target firms *are* equal to the CAAR's obtained by the acquiring firms.

The alternative hypothesis posits that the CAAR's obtained by the target firms are *not* equal to the CAAR's obtained the acquiring firms.

2.5. HYPOTHESIS 5

Hypothesis are also tested determine if there are any substantial variations in the CAAR's experienced by different industry mergers. This hypothesis assesses both the target and acquirer firm's industry mergers, paired t-tests are employed to test whether the target or acquirer significantly outperformed over the full event window (-25; +25). Industry merger performance is further assessed as a group (including both target and acquirer firms), where a one-way ANOVA model is employed to test for significance between industry groups. This is assessed

in terms of CAAR's and hence ACAAR's (employed for t-tests) over the window period (-25; +25).

The null hypothesis states that the CAAR's obtained by different industry mergers are *equal* for the target and acquirer firms.

The alternate hypothesis states that the CAAR's obtained by different industry mergers are *not equal* for the target and acquirer firms.

3. LITERATURE REVIEW

3.1. INTRODUCTION

The objective of the literature review is to examine previous studies relating to mergers, paying special focus to whether M&A activity is viewed as value-destroying or value-creating. Section 3.1.1.1. until 3.1.1.10. deal with M&A motivations. Sections 3.2.1. and 3.2.2. presents M&A literature from both international and South African studies. Section 3.3 summarizes section 3.

3.1.1. M&A DETERMINENTS

The current body of literature has put forth many possible reasons that justify why firms engage in M&A activity. Thus, it is important to discuss some potential reasons for mergers and acquisitions. According to DePamphilis (2008), Moeller and Brady (2007), Bruner (2004) and Pautler (2001), some of the common reasons why M&A's take place are listed below and discussed further – namely:

1) The possible synergetic benefits;
2) The potential for the acquirer company to branch out into the sector of the target company;
3) Strategic re-alignment;
4) The potential to increase companies market power through the formation of monopolistic/oligopolistic companies;
5) Increasing managerial competency as a result of the elimination of ineffective managers;
6) Hubris and managerialism;
7) Purchasing assets below the fundamental value;
8) Mismanagement;

9) Tax effects; and
10) Differences in valuation; and

3.1.1.1. SYNERGY

Synergies may manifest in many forms and are experienced when joined firms lead to greater value for the stockholders – via improvements in functioning ability – than if the firms were functioning separately. Functionality synergetic benefits are made up of economies of scale and economies of scope. The former relates to distributing expenses over rising levels of manufacturing ability and the latter refers to the employment of a single asset to manufacture several products. There are other types of synergies, such as financial synergy. This synergy refers to the effect that M&A's will have on a firm's cost of capital. Hence, when a firm with surplus cash flow mergers with a firm with little cash flow but many investment opportunities this will reduce the combined firms cost of capital and hence ability to invest in future projects.

3.1.1.2. DIVERSIFICATION

Diversification is the tactic whereby firms engage in mergers with other firms, that operate in different markets or regions. Merging with firms in different geographical locations can present profitable opportunities, for the combined firm. Since, geographical diversification allows a firm access to new and possibly better political, workforce, regulatory and legal environments. Thus, diversification can be a very useful instrument which can help firms manage their exposure. Importantly, market contagions may prevent firms from diversifying to the appropriate level. Since, the way in which a market contagion affects the world economy is often unclear until it is too late (such as the global financial crash of 2008).

3.1.1.3. STRATEGIC REALLINGMENT

M&A's are also employed by firms to adapt to new or changing environments. Fluctuations in the business environment, can stem from many sources such as: industrial, governmental or judicial changes. With continuous technological innovation, M&A's provide a means by which firms may gain access to different industries – that come about owing to technological innovations. M&A's can thus be used as a quick method to acquire various technologies and thus consistently adapt to new business environments.

3.1.1.4. MARKET POWER

Market power comes about when the size and hence the market power of a firm increases.

This improves a firm's comparative ability influence prices by swaying demand/supply – or via collusion. This may create extreme obstacles for potential firms wanting to enter the market and could stop new entrances entirely. Hence, market power allows a firm to increase its chances of survival by limiting/removing possible competition.

Too much market power, however, can lead to monopolies/oligopolies; which is regulated by legislation. Market power can thus lead to a dead-weight loss since firms with significant market power will produce to maximize profit at the expense of the general well-being of society. Since, poor competition in the market place and hence too much market power can lead to a small selection of goods, lack of innovations and poor-quality products – thus hindering the living standards of society.

3.1.1.5. HUBRIS AND MANAGERIALISM

People can potentially be subject to emotions and hence biases. Thus, managers may believe that their a assessment of company's value is better than that of the market. This type of behaviour, can lead to paying too much for a target firm owing to biased and emotion-centric decision making – from the managers of the firm; for example, the yearning not to lose in a hostile merger can result in a bidding war that leads to an acquisition price in surplus of the fundamental value, owing to self-serving decisions made by managers. This is often termed "the winner's curse" (Henry 2002).

Furthermore, there are also cases where managers have faith in the fact that a merger is an event that should result in an elevation in power and hence wealth – this is often not the case. This concept is known as "empire building" and may occur when managers of a firm have too much free-cash-flow/power at their disposal and hence behave in their own self-interest, to the detriment of others. Hubris and managerialism can thus lead to value destruction. When managers are over confident, sub-optimal investments may be pursued and optimal investments may be ignored. These actions stem from emotional behaviour and lead to rash, irrational and reckless decision-making.

3.1.1.6. BUYING UNDERVALUED ASSETS

When a firm is looking to expand and hence grow, there are two option, it can either invest in new assets or it can search for undervalued firms and acquire these assets (and the firm) at a discount (i.e.: where the purchase cost is lower than the cost of replacement).

3.1.1.7. MISMANAGEMENT (AGENCY PROBLEMS)

Agency problems arise between the managers and the stockholders of a firm, when their respective welfare is not aligned. Management is often more inclined towards maintaining job security (entrenchment) than towards maximising stockholder value. Thus, this may result in management investing in sub-optimal investments that serve the interest of the managers and may even lead to a decline in stockholder value. In cases where the stock of a firm is widely distributed between many stockholders the cost of incompetent managers is borne proportionately across all stockholders. Hence these types of mangers may be tolerated, as the individual cost to each stockholder is minimal. M&A's may thus be a mechanism to amend the misalignment of goals, between stockholders and managers. When firms are valued below their fundamental value managers are put under stress and hence must either take the necessary action to raise the stock price or risk being targeted by potential acquiring companies.

3.1.1.8. TAX CONSIDERATIONS

When examining the part that taxes play as a motive for mergers and acquisitions; the following two concepts are important. Firstly, tax benefits may be employed to reduce the combined firms taxable cash flow. Furthermore, a tax shield is formed when a merger is reported under the purchase method of accounting. Secondly, the tax that pertains to a potential merger deal, plays an imperative part in deciding whether the acquisition happens. Thus, the presence or absence of tax may ultimately change the asking price of the deal and hence may decide the fate of the deal.

3.1.1.9. DIFFERENCES IN VALUATION

Acquirer firms may consistently generate income by purchasing target firms at a price below the fundamental value. Furthermore, overpriced firms can exploit mispricing to acquire assets or firms at a cheaper rate than if the firm was priced in accordance with the fundamental value. Thus, overvaluation and undervaluation can play an imperative role in the market for M&A's.

3.2. PREVIOUS STUDIES

3.2.1. INTERNATIONAL STUDIES

Andrade et al (2001) aimed to expand on the trends and characteristics of M&A's and suggests that acquisition activity in the 1990's (consistent with previous periods), tend to group together with regards to industry. A period of 26 years, starting from the year 1973 to 1999 (since this is the period where NASDAQ firms were fully combined in CRSP) is assessed by the authors.

The sample employed consists of 4300 completed M&A transactions where the target and the acquirer are both US based firms.

The results found by the authors suggest that M&A waves lead to the creation of value for the amalgamated firms, with majority of the value accumulating to the targets stockholders. The authors, concur that M&A's enhance efficiency and that the gains realized at the announcement of the M&A show the enhanced expectations of the firm's future cash flow.

Datta, Pinches and Narayanan (1992) assessed the consequence that acquisitions have on the stockholders of both the acquiring and the target firms. A meta-analytic method is employed owing to the difficulty that comes with accounting for all relevant factors in one study. Thus, stressing the need for several studies to draw meaningful conclusions (whilst regulating for inter-study variations). The sample employed is comprised of studies found through a wideranging search of the literature, focusing on the stockholders' wealth creation during M&A's. Importantly, the studies in the sample all employed an event study methodology.

The results of Datta *et al,* (1992) suggest that the stockholders of the target and acquirer firms generate the majority and minority of benefits, respectively. Thus, it is more profitable to be a target firm than an acquiring firm during a merger. The acquirer firms can maximize their wealth by assessing possible regulatory changes, the competitiveness of the market, the type of funding and the whether the merger is hostile or friendly. Furthermore, the target firms' can maximize their wealth gains by not engaging in equity financed M&A's or being targeted by a bidding firm in an unrelated line of business,

Stunda (2014) assesses the market reaction to M&A's from the acquirer firm's perspective, in the U.S. from 2009 to 2012 and related his results to the performance of companies (that are of a similar size) that did not participate in acquisitions, during the sample window. The sample consists of 1718 firms that were involved in mergers and 1500 firms who were not. Additionally, a base study period is also employed for the businesses that did not participate in mergers – this is then related to the acquiring companies time frame and compared. The author used an Ordinary Least Squares (OLS) regression to test the hypotheses. This is in line with prior studies thus allowing for comparability to previous literature.

Stunda (2014) found that the acquiring firms' stock price reaction was seen to be significantly negative and the acquired firms' stock price reaction was seen to be significantly positive. It was further shown that companies (in all industries) that participated in mergers underwent a

reduction in stock price whereas companies that did not participate in mergers underwent a rise in stock price. Importantly, firms in the oil, gas and finance industries were an exemption to the above findings – as they had significantly positive price effects.

Garfinkel and Hankins (2011), looked at the role that risk management plays within M&A waves. Fama and Frenchs' (1997) 48 industry scheme is used to categorize bidder and target industries and the M&A waves employed in the study are those suggested by Harford (2005). The data employed by Garfinkel and Hankins (2001) consists of all M&A's or tender offer proposals from 1981 to 2006, that met with the following conditions: the proposal must be worth $50 million or more in January 2002 dollars, only proposals with US targets are considered, the acquiring firm needs to attain all of the targets shares and must have owned less than half prior to the announcement and the SDC needs to classify the deal as either successful or unconditional.

Garfinkel and Hankins (2011) find that the amount of vertical integration within a sector has a positive association with the beginning of acquisition waves. It is also found that cash flow instability rises with the start of an acquisition wave. The authors suggest that if firms experience volatile cash flows then engaging in vertical integration may reduce this volatility. Since firms that engage in vertically integrated mergers, are found to have a reduction in costs, a reduced use of slack and a reduction in cash flow instability.

Thus, risk managing considerations (propelled by a surge in cash flow insecurity) appears to contribute to M&A activity. Moreover, there is considerable evidence that risk managing considerations play a main role in M&A's. This is in accordance with the notion that companies want to defend themselves against cash flow insecurity and that M&A's can be employed as a method to protect firms.

Heron and Lie (2002) reassess the relationship between the method of payment (stock, cash or mixed) in M&A's stock price responses and operating performance. The authors use a sample of 859 completed M&A's from the periods 1985 to 1987. The criteria to be included in the sample is as follows: the target and acquiring firm must be listed on a stock exchange, the target and acquiring firms must be covered on both CRSP and Compustat, financial firms are excluded and the target firms' must be of sufficient size thus enabling the authors to measure whether the merger indeed had a material impact

In the authors assessment of stock prices, the Jones (1991) model is used with long term and current accruals separately assessed. Furthermore, operating performance is measured as operating income over assets. The authors found no evidence of earnings management. Additionally, post-merger, acquirers show operating performance levels above their respective industries and outperform control firms. With regards to payment method, it was found that it does not provide info on the firms future operating performance. Further to this, it was found that operating performance improve when firms with a high book-to-market ratio acquire firms with a low book-to-market ratio and when the acquiring firm and the target firm are in the same line of business.

Fuller, Netter and Stegemoller (2002) looks at returns accruing to stockholders for companies that merged/acquired 5 or more targets firms. The authors gathered data from the period 1990 to 2000. Furthermore, to be counted in in the sample the following conditions must hold: the target firm must be a subsidiary of a listed firm or a private firm, more than 50% of the target firm is being acquired and the target has a known value, the value of the merger is at least $1 000 000, acquiring companies are listed U.S. firms on the CRSP, financial institutions are not included and firms must have completed deals with 5 or more targets in any 3-year period, over the entire time frame considered.

Fuller *et al* (2002) suggests bidder equity holders realize positive gains when a bidding firm acquires a non-listed firm or a subsidiary of a listed company and realize negative gains when the bidder acquires a listed firm. Furthermore, the absolute value of the positive or negative returns is greater when the bidder used equity. It is further suggested that when bidders buy private firms or subsidiaries the assets being purchased reflect a liquidity discount thus leading to higher returns for bidder equity holders. The greater returns received by bidders (when acquiring a private firm through equity) may be owing to tax and monitoring benefits.

Akgodu (2009) assesses the impact of every merger or acquisition in the telecom wave (prior to 2009), focusing on the acquirers and their industry competitors. The method employed to measure this is to test the effect of all firms who are in rivalry and operate under the same four digit SIC code, as the acquirer. Subsamples of acquisition and rival characteristics are assessed to allow the authors to differentiate among the several theories. Akgodu (2009) initially divides the sample into horizontal and non-horizontal acquisitions. Next, the rival characteristics are

employed to discriminate between theories that foresee non-positive rival gains and lastly competitive advantages and information theories are further broken down.

An event study procedure (in the form of the market model) is employed to assess the selected sample. The period assessed is from 1996 to 2005. The author imposed the following restriction that must hold for a company to be counted in the sample: only bidders from the telecommunications industry is considered, the bidders must have the SIC code of 4813, every transaction has a known dollar value and the acquirer is acquiring a controlling stake (i.e. above fifty percent).

The author finds that M&A activity impacts the acquirer as well as competing firms. It is further seen that the rival firms of the acquirer receive negative gains over the announcement of all acquisition types, except for horizontal acquisitions. The negative returns experienced are larger when the rival firms are similar in size and provide similar products. It is further found that the non-positive gains experienced by rival companies (to the acquirer) are owing to the acquirer itself experiencing negative returns.

3.2.2. SOUTH AFRICAN STUDIES

Smit and Ward (2007) aimed to verify whether big acquisitions by JSE-listed companies (from 2000 to 2002) resulted in any gains to JSE-listed acquiring firms. Smit and Ward (2007) examined the stock price of acquiring firms around the announcement date as well as the impact on the firms' financial performance, two years post-merger. The initial sample consisted of 802 M&A's however only 27 made it passed the selection criteria. The selection criteria consists of the following: the acquiring firm must have remained listed for at least one-year before and one-year after the merger, the merger value must have been bigger than twenty percent of the market cap of the acquirer firm, the balance sheet and cashflow data was accessible, the acquirer was not a cash shell before the merger and the acquiring firm had not engaged in any huge mergers that need the approval of equity holders for both 1-year pre-merger and post-merger.

The mergers which satisfy the conditions stated above are assessed. The findings suggested no noteworthy average cumulative abnormal returns, either pre- or post-merger. Additionally, no important IACRTA's were experienced thus suggesting that there is no substantial variation in the acquirer firm's performance in the years that followed the merger. Thus, Smit and Ward

(2007) suggest that mergers are zero net present value investments. Furthermore, any potential motivations for merger deals are not in accordance with the findings of this study.

Jacobson et al (1998) assess the effects that acquisition announcements have on the equity value for both the target firm and the acquiring firm listed on the JSE. When finalizing their sample, the authors imposed a few criteria such as, the acquiring firm had not engaged in more than one acquisition within a particular year, target and acquiring firms needed to be listed on the JSE for two-years or more, premerger. Lastly, the date of the acquisition needs to fall between the years 1977 and 1984.

The authors employed the following models to obtain their results:

- Market Model,
- The Halpern Model and
- The 0-1 Model

The study concluded that the equity holders of the target firms undergo positive gains pre-announcement. Whereas, the benefits for the acquirers are experienced around ten weeks preannouncement. Furthermore, the equity holders of the acquiring firm do not experience any gains in the short run. Lastly, it was found that the announcement of a merger has very little impact on the acquiring company and that the gains to the acquiring company are typically non-positive.

Negash and Wimberley (2004) conducted research where the foremost aim was investigative the long-term stock returns for acquirer companies – following acquisitions by JSE-listed firms. To be counted in in the sample, the target companies market cap during the announcement of the merger must be equal to at least 20% of the acquirer companies market cap and the acquirer company must have attained 20% or more of the equity capital of the target firm.

The authors examined post-merger stock gains, computed as the actual return less the benchmark, in monthly intervals for 3 years. The findings show a non-positive CAAR for 3 years post-merger, for acquirer firms.

3.3. SUMMARY

There are various motives with regards to why companies may choose to engage in merger arrangements. Several international studies have been assessed in the literature review. The

studies of Andrade *et al* (2001), Datta *et al* (1992), Stunda (2004) and Akgodu (2009) are all consistent, with regards to the acquiring firm receiving negative to zero gains when involved in M&A activity. The study performed by Heron and Lie (2002) stand in sharp contradiction to the above results. The authors find that acquirers (post-merger) realize positive returns and outperform their respected industries and control firms.

In terms of South African studies, Smit and Ward (2007) found no significant abnormal returns for acquiring firms and conclude that M&A's are zero NPV investments. This is in line with Jacobson *et al,* (1988) whose findings that acquired firms' usually experience non positive returns and with Negash and Wimberley (2004) who found negative CAAR's for acquiring firms. Thus, the current body of literature seems to support both sides with respect to mergers being value-destroying and value enhancing – emphasizing the need for further research.

4. DATA & METHODOLOGY

4.1. INTRODUCTION

This section forms the methodological process that is used to address the questions considered in this research. Section 4.2. describes the data and the selecting of the data. Section 4.3.1. considers the research design. Section 4.3.2. deals with the computational process. Section 4.3.3. deals with steps involved in the methodological process. Section 4.3.4. deals with the robustness tests. Section 4.3.5. deals with the significance testing. Section 4.4. summarises section 4.

4.2. DATA & SAMPLE SIZE

This research concentrates on any acquisition reported by JSE-listed firms. Several criteria must hold for the merger/acquisition deal to be included in the sample, namely:

1) All mergers must fall within the years 1990 to 2019;
2) The deal must be classified as complete;
3) Only South African deals are considered;
4) The target and acquirer firms were on the JSE for one-year or more pre- and post merger.
5) The acquirer must have owned fewer than 50% of the target firms' stock before the merger and obtained 50% - 100% of the target firms shares post-merger; 6) The target and acquirer, company and code were disclosed.

The limitations executed on picking an appropriate sample are moderately strict. This was mainly owing to the need to remove deals which may have been anticipated to have their data impacted by confounding events. The data that was chosen for this research is sourced from Bloomberg and includes: announcement dates, payment method, deal cost, transaction size, industry, dividends, corporate actions and transaction characteristics.

After the sample of merger deals has been gathered from Bloomberg, daily share prices for each firm is obtained from Bloomberg for the estimation and event period. Lastly, all stock prices are adjusted for corporate actions such as dividends, share splits, unbundling's and consolidations. In total there are 87 qualifying merger observations included in this study. Thus, there are 87 target firms and 87 acquirer firms (174 firms in total) which are assessed.

4.3. METHODOLOGY

4.3.1. RESEARCH DESIGN

In accordance with the study performed by Fama, Fisher, Jensen and Roll (1969), an event study methodology is utilized in this study. The event study methodology is an empirical investigation that measures the response of the stock price, to acquisition announcements. By means of the event study methodology, computations are executed to assess if there is an atypical stock price outcome around the announcement of a merger. If an atypical stock price is attained, then the size of the effect can infer the impact of the event. (McWilliams & Siegel, 1997).

One of the reasons as to why event studies are often employed by researchers, is that stock prices are much less susceptible to manipulation than other measures. Thus, event studies are observed to be (generally) more dependable. In contrast to this, event studies utilize several tenets with respect to the mechanism of the equity market.

1. Efficiency;
2. Rationality; and
3. The absence in restriction of arbitrage.

4.3.2. COMPUTATIONAL PROCESS

4.3.3. STEPS

To obtain the AR's for both target and acquirer firms, the normal returns need to be computed. The first calculation implemented is that of standard returns, that can be expected in the absence of mergers. The returns are computed using the daily share price data sourced from Bloomberg – mentioned in section 4.2.

4.3.3.1. STEP 1

Formula (1) below is utilized in calculating the standard returns – Importantly, the output for equation (1) is unit free:

$$R_{it} = Ln \frac{P_{i(t+1)}}{P_{it}}$$

Where:

- R_{it} is the return generated at period t for asset i;
- P_{it} and $P_{i(t+1)}$ represents the prices for asset i over periods t and $(t + 1)$ respectively;
- $Ln \frac{P_{i(t+1)}}{P_{it}}$ is the natural logarithm of $\frac{P_{i(t+1)}}{P_{it}}$

In line with Benninga and Voetmann (2014) three windows are employed in this event study. The windows to be employed are as follows:

1) The estimation window of 236 days (-261; -26); 2)
The event window of 51 days (-25; +25).

The estimation window, is to allow the computation of the typical performance of the target and acquirer firms stock value. The event window will be used to compute the expected returns $E(R_{it})$. According to Mackinlay (1997), the event window employed in an event study must be larger than the period of interest – the announcement date of the merger. Thus, the event window of 51 days (-25; +25) is to be employed – allowing a comprehensive evaluation of the stock price performance for target and acquirer firms.

Importantly, Benninga and Voetmann (2014) suggest an estimation window of (251) days or less depending on data availability. Thus, an estimation window of (236) days is employed – owing to limited data. Importantly, the event window and the estimation window do not overlap. Since, this stops the event from swaying the normal performance model – the parameters computed and hence the expected returns (MacKinlay, 1997).

Next, this research assesses whether stock prices display abnormal returns, for the event period.

For comparative purposes the following is assessed in terms of AAR's:

1) The full event window of 51 days (-25; +25);
2) The pre announcement window of 25 days (-25; 0); and 3) The post announcement window of 25 days (1; 25).

4.3.3.2. STEP 2

In accordance with Fama *et al* (1969), daily abnormal returns can be measured using several models, such as the market model, net-of-market returns, net-of-characteristic matched portfolio return; and an equilibrium asset pricing model, such as the CAPM.

Thus, in accordance with the above, anticipated returns are totalled with the use of the market model. The market model is a mathematical model that relates the study of any asset to that of the market and assumes that the only factor which influences the return on share *i*, at time *t*, is the return on the market at time *t*. Thus, to calculate the abnormal return it is essential to estimate the expected return. According to Brown and Warner (1985) when using large samples (this study assesses 87 merger observations), the results will not be particularly sensitive to the choice of estimation model. Thus, employment of the market model (in calculating expected returns) will allow inferences to be made from the results of this paper.

The window of approximation (of 236 days) employed is from days (-261) to (-26) – where day (0) is the announcement date of the merger. Within the estimation window, the typical performance of stocks is to be computed and hence the computation of AR's. In line with the market model, there is an assumption that yields corresponding to days greater than (-25) are standard yields and are not changed by acquisition events. Furthermore, an event window exhibits potential escapes of information, pre-merger report. It also represents all of the effects that the M&A's had on the equity prices.

The expected returns for each share will be determined, through the Market Model, using an estimation window of 236 days (-261; -26). Moreover, intercepts are assumed to be determined via Ordinary Least Squares ("OLS") regressions and therefore vary across subject firms.

4.3.3.3. STEP 3

To compute alpha (α_i) and beta (β_i), regressions are to be utilized for the returns of every relevant target and acquirer firms and the corresponding market returns (which is the difference

in the pricing of the JSE year on year.) Hence expected returns $E(R_{it})$ are calculated, over the event window of 51 days.

This relationship is defined in equation (2) beneath:

$$E(R_{it}) = \alpha_i + \beta_i(R_{mt}) + \varepsilon_{it}$$

Where:

- α_i and β_i represent the OLS parameters.
- R_{mt} represents the market return at time *t* and
- ε_{it} is the error term that is assumed to be normally distributed and homoscedastic.

4.3.3.4. STEP 4

The next step in the process, is to compute the AR's for every applicable target and acquirer firm. The abnormal return (AR_{it}) embodies the variation between the actual and expected returns on each day of the event window, as exhibited in equation (3) below;

$$AR_{it} = R_{it} - E(R_{it})$$

Where:

- R_{it} denotes the actual return; and
- $E(R_{it})$ is the standard return garnered from the market model.

4.3.3.5. STEP 5

Once the AR's are computed, the AAR's are calculated across all shares for each day in the event window. To compute the average abnormal returns (AARs), the abnormal returns for all 174 firms (87 target and acquirer firms respectively) are averaged at each period *t* as expressed in equation (4), below.

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

Where:

- AAR_{it} represents the average abnormal return over time *t* for asset *i*.

- N represents the number of observations.
- AR_{it} denotes the abnormal return over period t for asset i.
- $\sum_{i=1}^{N} AR_{it}$ denotes the summation of the abnormal returns over time period t for asset i.

The AR's and hence the AAR's are assessed for the following time periods:

- The full event window of 51 days (-25; +25);
- The pre-announcement event window of 25 days (-25; -1); and
- The post-announcement event window of 25 days (1; 25);

4.3.3.6. STEP 6

After the AAR's are computed, the AAR's are then cumulatively added to estimate the cumulative average abnormal returns (CAAR's). The calculation is described in equation (5), underneath.

$$CAAR_t = \sum_{i=1}^{N} CAAR_{t-1} + AAR_{it}$$

where:

- $CAAR_t$ is the cumulative average abnormal return at time t
- $CAAR_{t-1}$ is the cumulative average abnormal return at time (t - 1). • AAR_{it} is the average abnormal return for asset i over time t

CAAR's are assessed, within the event window, for the following time periods:

- (-25; +25); • (10; +10) and
- (-5; +5).

Lastly the ACAAR's are computed by equation (6) below where the CAAR's are divided by N.

$$ACAAR_t = \frac{1}{N} \sum_{i=1}^{N} CAAR_{it}$$

Where

- $ACAAR_t$ is the average cumulative average abnormal return at time t
- $CAAR_{it}$ is the cumulative average abnormal return for asset *i at* time *t*

This study measures the values for AAR's and CAAR's for all the M&A deals to be employed in the study. AAR's and CAAR's are fitting instruments for this study, as they provide clear and articulate results.

4.3.4. ROBUSTNESS TESTS

In accordance with Fama *et al* (1969), the AR's are recomputed (hence the AARs and CAARs) using the net-of-market-returns model. The robustness test is employed to ensure the results of this study are robust and hence insensitive to the methodology employed. Importantly, all graphs and tables relating to robustness can be found in the appendix.

The net-of-market-return equation (6) is given below:

$$ER_i = Rm_t$$

where:

- ER_i = expected return of investment;
- Rm_t = the return on the market at time t

4.3.5. SIGNIFICANCE TESTING

Once all the appropriate metrics have been computed and the abnormal returns have been observed, t-tests are to be used to assess whether the AR's are significant. Importantly, t-tests are only employed on AAR's as CAAR's are simply the sum of the AAR's (at a given time *t)*. In line with Benninga and Voetmann (2014), test statistics are performed for the event windows and all the corresponding scenarios that are assessed within the aforementioned windows.

The t-test employ 4 assumptions with respect to the population parameters Firstly, the examinations must be drawn from a normally distributed population. Secondly, the examinations must be independent. Thirdly homoscedasticity is present and lastly an anticipated value for AR's of 0.

Additionally, paired t-tests are conducted to observe whether the variations in the pre- and post-periods, cash versus share funded deals and targets versus acquirers are substantial – by considering the sample means. The formula for this test is as follows:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Where:

M_1= Average of pre-announcement observations

M_2= Average of post-announcement observations

S_1= Standard deviation of pre-announcement observations

S_2= Standard deviation of post-announcement observations
n_1= Sum of pre-announcements observations

n_2= Sum of post-announcements observations

A one-way ANOVA model is employed to analyse whether the differences in performance relating to industry mergers is significant. This analysis is employed as it allows for the assessment of several data sets simultaneously and hence determines the importance of the differences within and between data sets.

4.4. SUMMARY

This section, outlines the method employed in examining the five null and alternate hypotheses, put forth in section 2. This is achieved by explaining the methodology utilized to gather the data, the sources used, the restrictions employed that produce the final sample, as well as the manner in which the data is used to examine projected returns and thus the AARs, CAARs and ACAAR's. Furthermore, the research design is explained in detail, with AR's employed to measure the effect of the event. The computational process relating to AAR's CAAR's and hence ACAAR's are explained in great detail. Lastly, this section clarifies the approaches used to determine if the results to be presented are significant by way of t-tests, paired t-tests and a one-way ANOVA model.

5. RESULTS

5.1. INTRODUCTION

The population consists of all merger and acquisitions contained within the Bloomberg database, completed within the period 1990 – 2019. The final sample is chosen after applying the strict criteria mentioned in section 4.2. The final sample employed consists of 174 firms and 87 merger deals (87 acquirers and 87 targets.)

Section 5, presents the findings of the research. These are obtained through applying the methodological process detailed in section 4. Hence, the results with regards to the AAR's, CAAR's and average CAAR's (ACAAR) are presented. Additionally, separate daily AAR ttest results for each day of full event window of 51 days, as well paired sample t-test results indicating the samples average CAAR variations, are presented. Furthermore, in testing the last hypothesis a one-way ANOVA model is employed.

Section 5.2. presents the target and acquirer AAR's, AAR Significance, CAARs and descriptive statistics. The AARs are then graphically represented over different window periods, for further clarity. Section 5.3 reports the first hypothesis. Section 5.4. reports the second hypothesis where paired t-tests are utilized for windows ±25, ±10 and ±5. Section 5.5. reports the third hypothesis where paired t-tests are utilized for windows; ±25, ±10 and ±5. Section 5.6 reports the fourth hypothesis where paired t-tests are utilized for windows; (-25; +25), (-25; -1), (1; 25), (-10; +10) and (-5; +5). Section 5.7. reports the fifth hypothesis where paired t-tests are utilized, within each industry, for target and acquirer firms over the period (25; +25). Importantly, every section from 5.2. to 5.7. is divided into the target and acquirer firms.

5.2. AAR's

The sample for the study consists of 87 M&A's deals from JSE-listed targets and acquirers – over the period 1990 to 2019. The sample employed is attained after executing the selection conditions detailed in Section 4.2. The AAR's are broken down into target and acquirer firms.

5.2.1. TARGET

Table 1: Target Firms' AAR, AAR Significance and CAAR Over the Entire Event Window (-25; +25).

Day	AAR	CAAR Target

-25	0,488%	0,488%
-24	-0,336%	0,152%
-23	-0,010%	0,141%
-22	0,562%	0,704%

-21	0,505%	1,209%
-20	1,112%***	2,321%
-19	-0,115%	2,206%
-18	0,116%	2,322%
-17	-0,023%	2,299%
-16	0,263%	2,562%
-15	0,257%	2,819%
-14	0,250%	3,069%
-13	0,033%	3,102%
-12	0,371%	3,474%
-11	0,528%	4,002%
-10	0,000%	4,002%
-9	0,557%	4,559%
-8	-0,178%	4,380%
-7	0,291%	4,671%
-6	0,204%	4,875%
-5	0,597%	5,472%
-4	0,155%	5,628%
-3	0,614%***	6,242%
-2	0,739%	6,981%
-1	0,483%	7,464%
0	4,111%***	11,575%
1	0,398%	11,973%
2	0,394%	12,367%
3	0,745%***	13,112%
4	-0,188%	12,924%
5	0,029%	12,953%

6	-0,432%	12,521%
7	0,665%	13,186%
8	-0,170%	13,016%
9	0,263%	13,280%
10	0,300%	13,580%
11	0,079%	13,658%
12	-0,015%	13,643%
13	0,317%	13,960%
14	-0,289%	13,671%
15	0,385%	14,056%
16	0,079%	14,135%
17	-0,199%	13,936%
18	-0,029%	13,907%
19	0,162%	14,069%
20	-0,263%	13,806%
21	-0,198%	13,608%
22	0,190%	13,798%
23	-0,148%	13,650%
24	0,310%	13,960%
25	0,067%	14,027%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 1 exhibits the AAR's and table 1a presents summary statistics of the AAR data. Furthermore, in accordance with Selcuk (2015) day (0) has been included when computing the sample statistics.

Table 1a: Sample Statistics of the Target Firms AAR's Over the Entire Event Window (25; +25).

Mean	0,275%
Standard Error	0,089%
Median	0,204%

Standard Deviation	0,636%
Sample Variance	0,004%
Kurtosis	26,8
Skewness	4,502
Range	4,543%
Minimum	-0,432%
Maximum	4,111%
Sum	14,027%
Count	51

Table 1a: Descriptive Statistics for the Target Firms AAR's.

The sample daily mean in table 1a is 0,28% which implies target companies that engaged in merger transactions receive positive AAR's over the 51-day event window**.** The sample median is 0,20%, this suggests over half of the AAR's presented are positive in value**.** The standard deviation of 0,64% emphasizes that there is minimal variation in the target firms' sample AAR's. The skewness value of 4,50 suggests that the data is highly skewed to the right (positively skewed). Lastly, the kurtosis value of 26,8 suggests the data may be classified as leptokurtic. This implies that the distribution of this data, has long tails and outliers. A leptokurtic distribution is one which is subject to a skinny looking shape – owing to of the outliers which extends the x- axis making the majority of the data appear in a slim range.

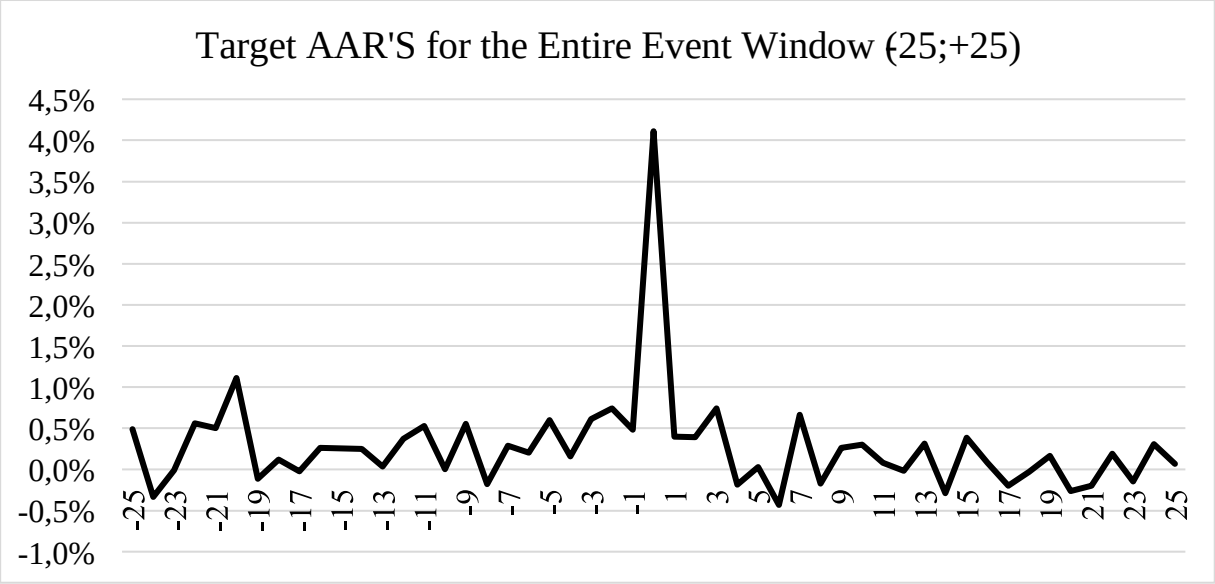

Figure 1: Target Firms AAR's Over the Entire Event Window (-25; +25).

Figure 1 shows the movement of the target firms AAR's, over the full event window. A return above and beneath the x-axis indicates positive and non-positive AAR's, respectively. Table 1 and Figure 1 show that all AAR's fall between the range (-0,43%; 4,11%). Where 4,11% is the AAR generated on day 0 and is significant at the 1% level and -0,43% is the AAR generated on day (6) – although insignificant. The following days AAR are found to be significant at the 1% level for the target firms: (-20), (-3), (0) and (3).

The event window and hence the AAR's are further broken down into pre- and post announcement, below. This allows a proper examination of these periods graphically, which may have not been visible in Figure 1.

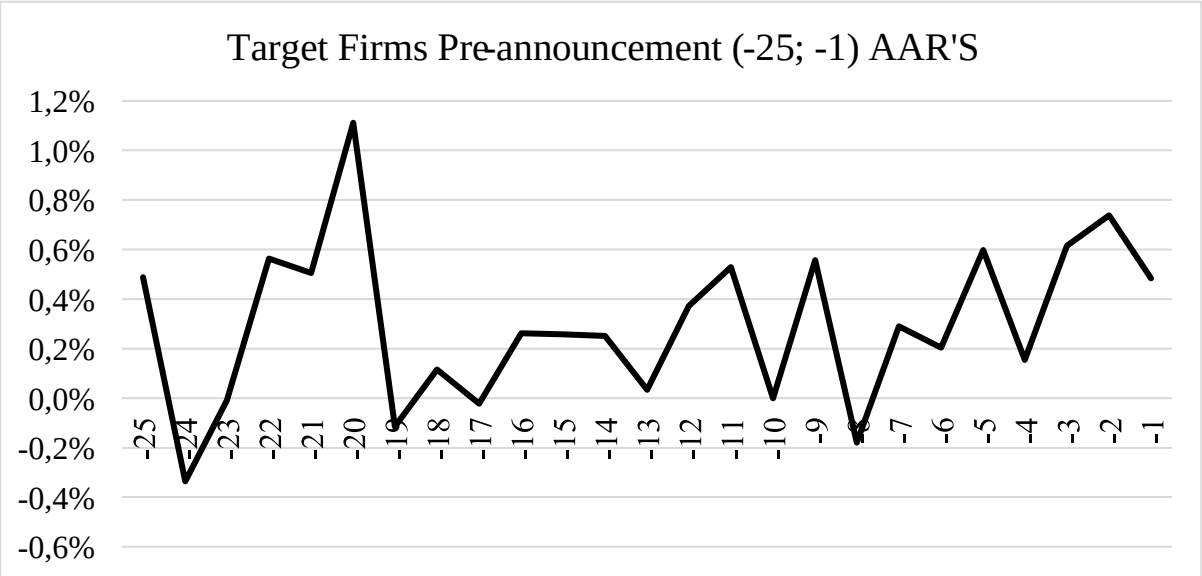

Figure 1a: Target Firms AAR's Over the Pre-announcement Period (-25; -1).

The pre-announcement, target firms AAR's fluctuate between positive and negative values – with several peaks and troughs. The majority of returns, in the pre-announcement period, are seen to be non-negative. Specifically, relatively, large returns are obtained at days: (-22; -20), (-11), (-9), (-5) and (-2). Unambiguous, relative, low returns are observed at days: (-24), (-19), (-17), (-10) and (-8).

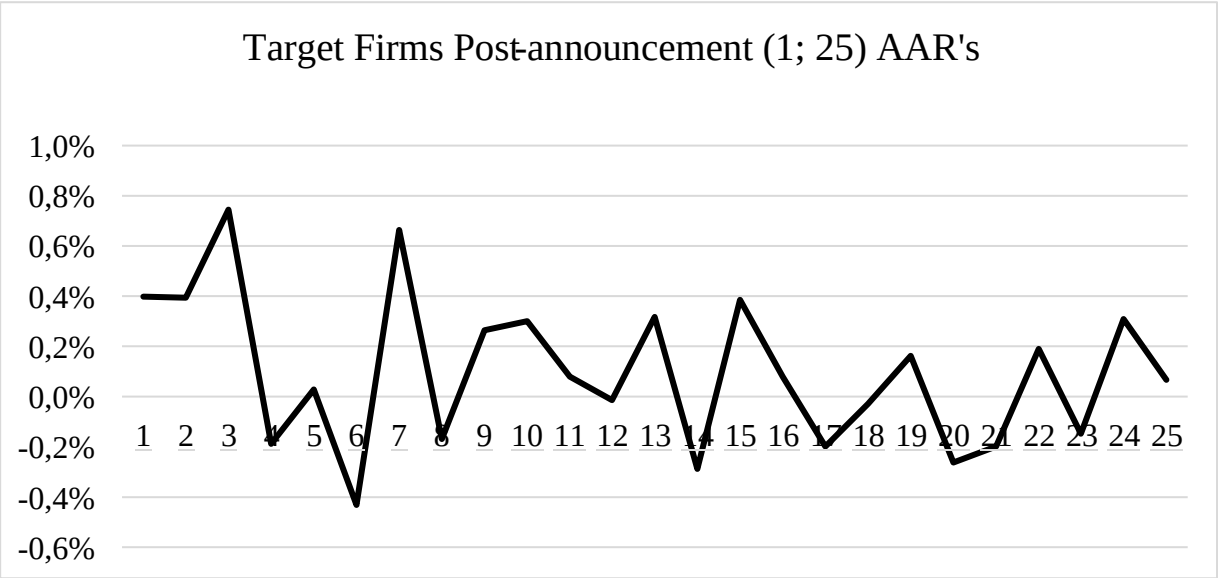

Figure 1b: Target Firms AAR's Over the Post-announcement Period (1; 25).

The post announcement period, similarly, oscillates between positive and negative returns. With positive returns being more prominent then their negative counterparts. Specifically, relatively, large returns are obtained on days: (3), (7), (9;10), (13), (15), (22) and (24) and relatively low returns on days: (4), (6), (8), (14), (17), (20), (21) and (28). Moreover, the large returns at time period (3) are specifically high in comparison to the rest of the post announcement returns. This may be owing to the that fact the effects of the merger deal may not yet have been fully incorporated by the South African market – this seems to be corrected in the following days.

5.2.2. ACQUIRER

Table 2: Acquirer Firms AARs, AAR Significance and CAARs for the Entire Event Window (-25; +25).

Day	AAR	CAAR
-25	-0,642%	-0,642%
-24	-0,171%	-0,814%
-23	0,192%	-0,621%
-22	0,162%	-0,459%
-21	0,135%	-0,324%
-20	0,042%	-0,282%
-19	-0,027%	-0,310%
-18	-0,385%	-0,695%

-17	-0,115%	-0,810%
-16	-0,183%	-0,993%
-15	0,191%	-0,802%
-14	0,411%***	-0,391%
-13	0,396%***	0,005%
-12	0,064%	0,069%
-11	0,235%	0,304%
-10	0,072%	0,376%
-9	-0,223%	0,153%
-8	-0,080%	0,072%
-7	-0,292%	-0,220%
-6	-0,036%	-0,256%
-5	0,348%	0,093%
-4	-0,108%	-0,015%
-3	0,139%	0,124%
-2	-0,031%	0,093%
-1	0,265%	0,358%
0	0,138%	0,496%
1	-0,200%	0,295%
2	-0,048%	0,248%
3	0,620%***	0,867%
4	0,513%***	1,380%
5	0,145%	1,525%
6	0,096%	1,621%
7	-0,174%	1,448%
8	0,014%	1,462%
9	0,339%***	1,802%
10	-0,237%	1,565%
11	0,552%***	2,117%
12	0,263%	2,380%
13	-0,192%	2,188%
14	0,070%	2,258%

15	-0,420%***	1,837%
16	-0,431%	1,406%
17	-0,253%	1,153%
18	-0,039%	1,114%
19	-0,035%	1,079%
20	-0,349%***	0,730%
21	-0,232%	0,498%
22	0,046%	0,544%
23	-0,168%	0,376%
24	-0,192%	0,184%
25	-0,261%	-0,076%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 2 exhibits the acquirer firms' AAR's and table 3 presents summary statistics of the AAR data. Furthermore, in accordance with Selcuk (2015) day (0) has been included when computing the sample statistics.

Table 2a: Sample Statistics for Acquirer Firms AAR's Over the Entire Event Window (25; +25).

Mean	-0,001%
Standard Error	0,038%
Median	-0,031%
Standard Deviation	0,269%
Sample Variance	0,001%
Kurtosis	-0,096
Skewness	0,203
Range	1,262%
Minimum	-0,642%
Maximum	0,620%

Sum	-0,001
Count	51

Table 2a: Descriptive Statistics, of the Acquirer Firms AAR's.

The daily sample mean in table 2a is - 0.001 which implies that acquirer businesses that underwent a merger deal receive slightly negative gains over the 51-day event window. The sample median is -0,03% this suggests that more than half of the average abnormal returns presented are non-positive in value. The standard deviation of 0,27% emphasizes that there is minimal variation in the sample AAR's. The skewness value of 0,20 suggests, that the data is almost symmetrical. Lastly, the kurtosis value of -0,1 suggests, the data may be classified as platykurtic This implies that the dispersal of the data employed is flatter with thinner tails in comparison to a normal distribution.

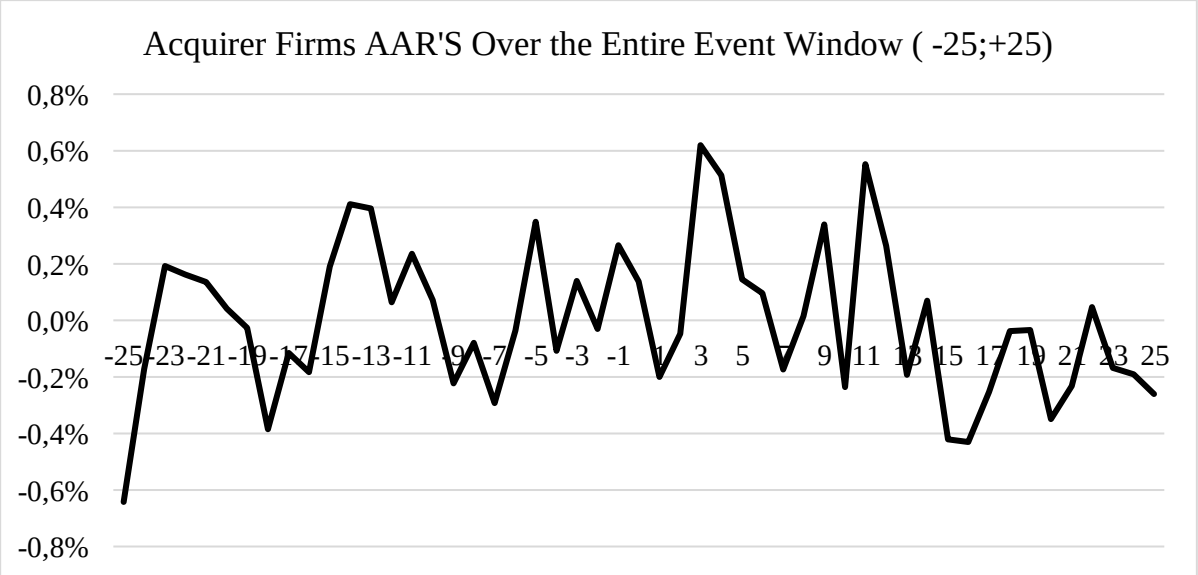

Figure 2: Acquirer Firms Entire Event Window (-25; 25) AAR's.

Figure 2 shows the movement of the acquirer firms AAR's – over the full event window. A return above and beneath the x-axis indicates positive and non-positive AAR's, respectively. Table 3 and Figure 4 show that all AAR's fall between the range (-0,64%; 0,62%). Where 0,62% is the AAR generated on day (3) and is significant at the 1% level and -0,64% is the AAR generated on day (-1) – although insignificant.

The event window and hence the AAR's are further broken down into pre- and post announcement, below. This allows for a thorough examination of these periods graphically, which may have not been visible in Figure 2.

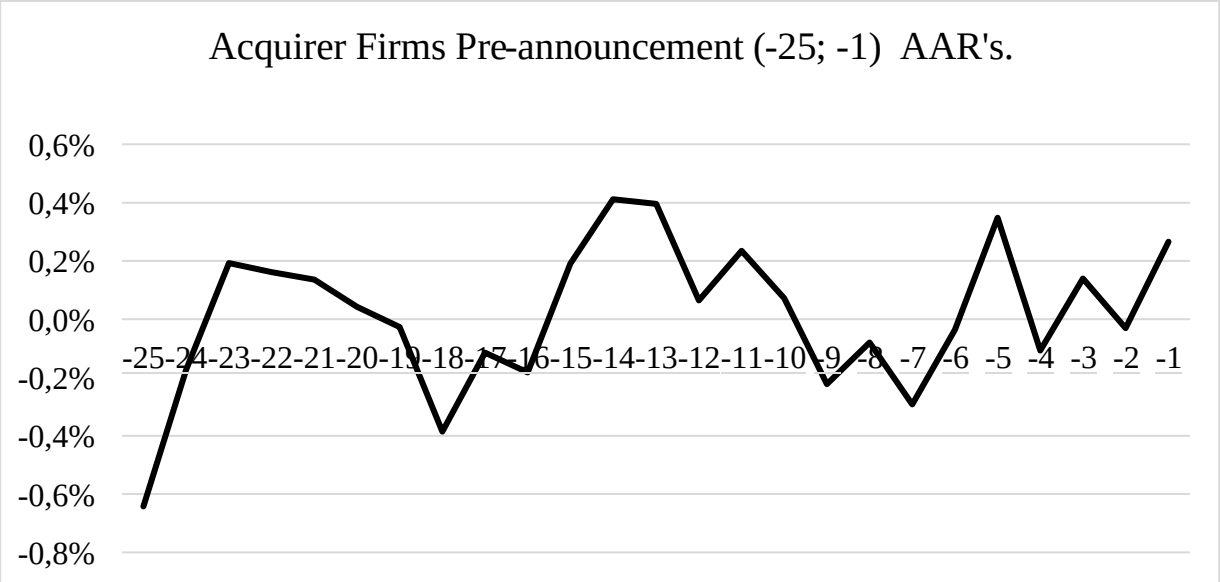

Figure 2a: Acquirer Firms Pre-announcement period (-25; -1) AAR's.

The, pre announcement, acquirer firms AAR data fluctuates between positive and negative values, with several peaks and troughs. The majority of returns in the pre announcement period is seen to be non-negative. Specifically, relatively large returns are obtained at days: (-23), (15; -13), (-11), (-5) and (-3). Unambiguous, relatively low returns are observed at days: (-25), (-24), (-18), (-9), (-8), (-7) and (-4).

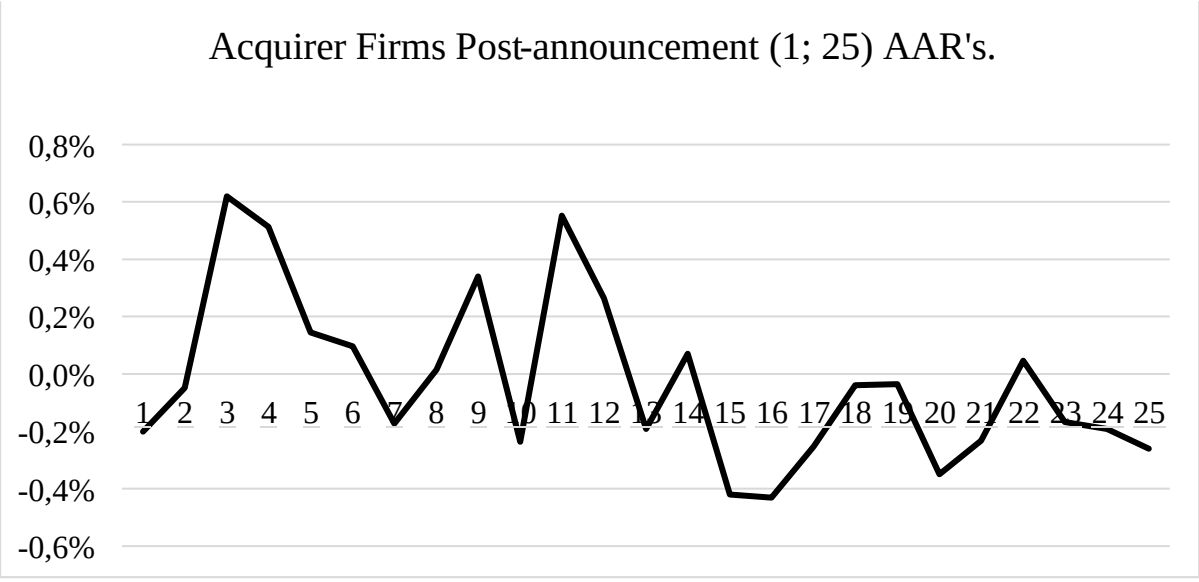

Figure 2b: Acquirer Firms Post-announcement period (1; 25) AAR's.

The post announcement period, similarly oscillates between positive and negative returns up until day (15) henceforth all returns are non-positive except for day (22). Further, negative

returns are more prominent then their positive counterparts. Specifically, relatively large returns are obtained from days: (3), (4), (9), (11), and (12) and relatively low returns from days: (1), (7), (10), (13), (15), (16), (20) and (25). Moreover, the large returns at time period (3) are specifically high in comparison to the rest of the post announcement returns. This may be owing to the effects of the merger deal not being fully incorporated by the South African market – this seems to be corrected in the following days.

5.3. CAAR's

Section 5.3. considers the CAARs and hence AAR significance over the entire event window. The target and acquirer firms and their respective CAAR's are assessed separately. These results are presented in Table 1 (Table 2) and graphically represented in Figure 1 (Figure 2) for the target (acquirer) firms.

This section considers the first null hypothesis which suggests: that the announcements of M&A's doesn't affect stockholder value of the target and acquirer firms that engaged in the M&A deals. Naturally this section is split into target and acquirer firms and is assessed over the following periods:

- (-25; +25); • (10; +10) and
- (-5; +5).

5.3.1. TARGET

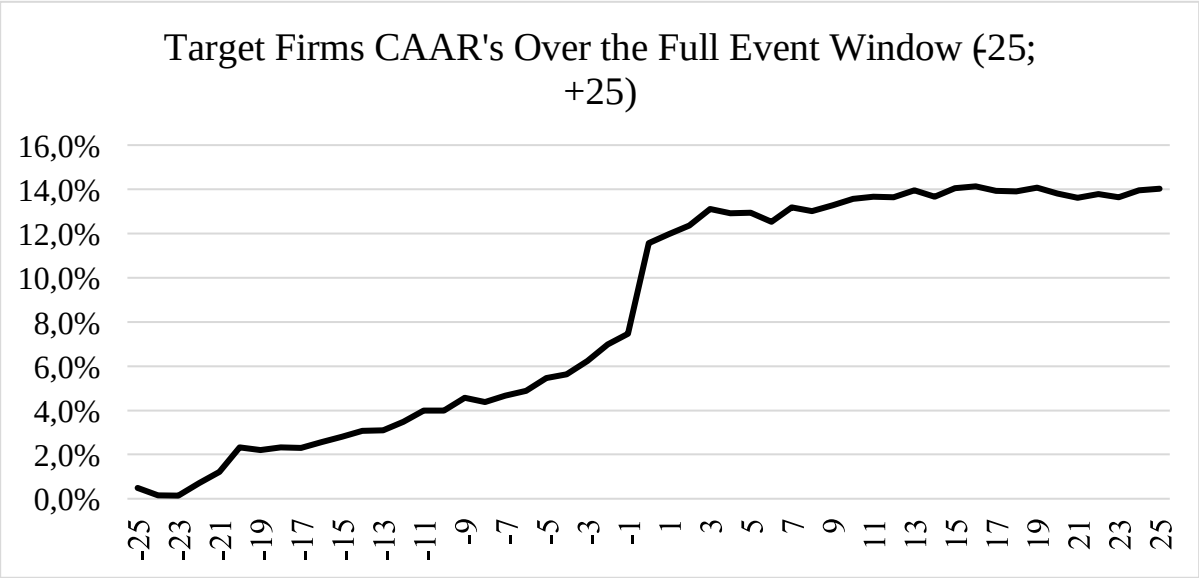

Figure 3: Target Firms CAAR's for the Entire Event Window (-25; +25).

Figure 3 shows that The Target firms (over the full event window) displays gradually increasing CAAR's from day (-25) up until and including day (-1). The most noticeable spike in Figure 3 is from day (-1) to day (0) where the CAAR jumps from 7,46% to 11,58%.
Henceforth, the CAAR's oscillate around 14%. The CAAR over the full event is 14,03%. Furthermore, the target firms CAAR for event windows: (-10; +10) and (-5; +5) is 9,58% and 8,08% respectively. Hence, for the target firm we reject the null hypothesis which suggests that that the announcements of M&A's does *not* affect stockholder value of the target and acquirer companies that engaged in a merger transaction, for the following windows:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

. 5.3.2. ACQUIRER

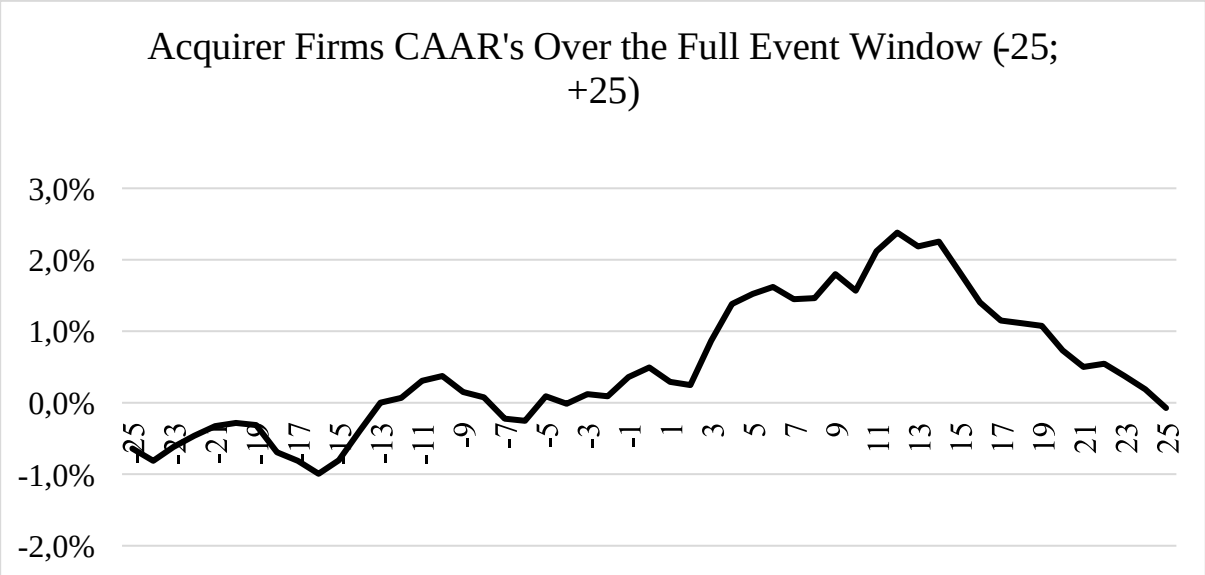

Figure 4: CAAR's for the entire event window (-25; +25) – for Acquirer Firms.

Figure 4 shows that the acquirer firms generate negative CAAR's from day (-25) up until day (-14). Furthermore, the CAAR's seem to be gradually increasing from day (-6) up until and including day (12). Henceforth, the CAAR's decrease until reaching -0,08% on day (25). The CAAR over the full event is -0,08%. Furthermore, The CAAR for the acquirer firms for event windows of: (-10; +10) and (-5; +5) is 1,26082% and 1,78101% respectively.

Table 2b: Target and Acquirer CAAR's Over Different Event Windows.

CAAR's	(-25; +25)	(-10; +10)	(-5; +5)

Target	14,027%	9,578%	8,078%
Acquirer	-0,076%	1,261%	1,781%

The CAAR, for windows (-25; +25), (-10; +10) and (-5; +5) – for the target and acquirer – are summarized in the table above. Thus, M&A announcements are well received by the South African market for target firms whereas the acquirer firms are not as well received (this is evident from the CAAR's generated over the different windows) Thus, we reject the null hypothesis which states that that the announcements of M&A's doesn't impact stockholder value of the acquirer companies that engaged in merger deals, for the following windows:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

Furthermore, it is seen that, the targets outperform the acquirers in every window period. Thus, the majority of gains amass to the target firm (CAAR = 14,03%) and negligible gains accrue to the acquirer firms (CAAR = 0,08%).

5.4. PRE-ANNOUNCEMENT CAAR's VERSUS POST-ANNOUNCEMENT CAAR's

The second null hypothesis to be explored is that the CAAR's (for both target and acquirer firms) pre- and post-announcement are equal. This section is broken down into target and acquirer pre-CAAR's and post-CAAR's and is tested over the following window periods:

- (-25; +25)
- (-10; +10)
- (-5; +5)

Additionally, rate of change with respect to CAAR's is assessed to provide a holistic view with regards to whether the majority of CAAR's were generated pre- or post-announcement. Hence emphasising the extent to which merger deal info may have been leaked as well as the time it takes for the South African market to fully incorporate the M&A announcements.

5.4.1. TARGET

The target firms pre and post CAAR's are graphically represented in Figure 5 and Figure 6 respectively, as can be seen below.

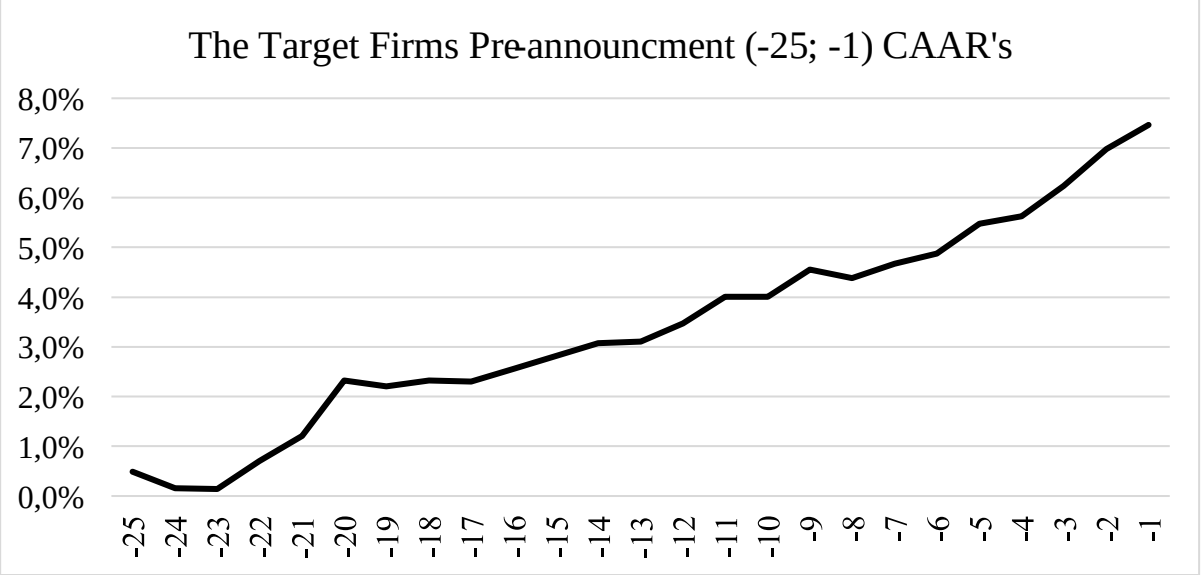

Figure 5: Target Firms Pre-announcement (-25; -1) CAAR's.

Figure 5 shows how the CAAR's generated by target company increases with time. The most noticeable increase occurs from days (-4; -1). The highest CAAR occurred at the end of the pre announcement period – on day (-1) – with a value of 7,46% and the lowest occurred on day (-23) with a value of 0,14%. Furthermore, the target firms mean CAAR and rate of change with respect to CAAR's for the pre announcement period is 3,41% and 7,32% respectively.

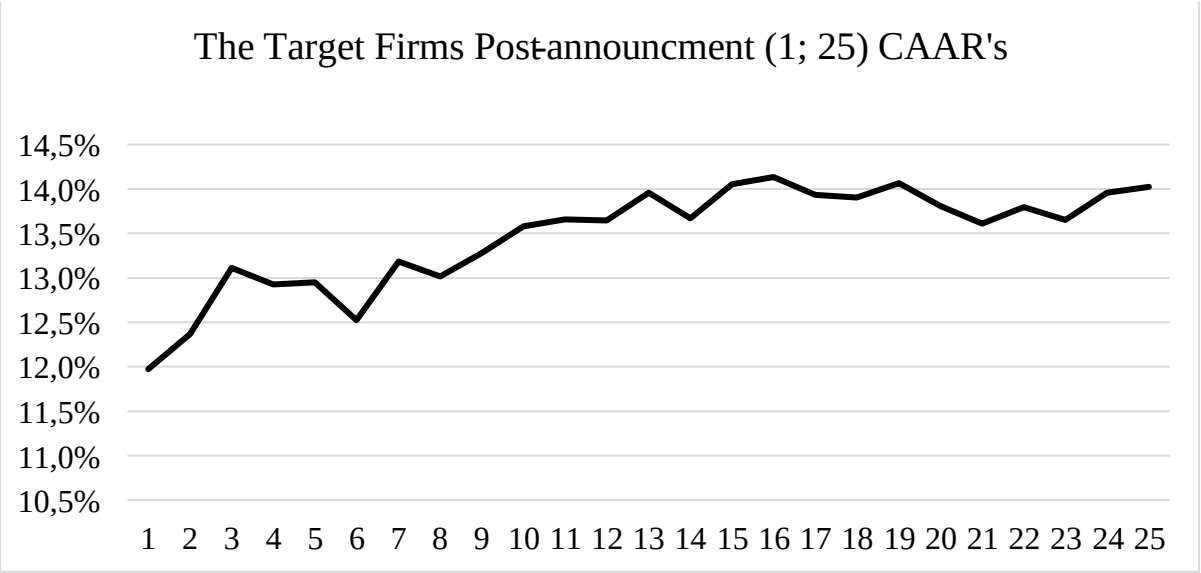

Figure 5a: The Target Firms Post-announcement (1; 25) CAAR's.

From Figure 6 is shown that the CAAR's are still increasing – although at a decreasing rate when compared to rate of growth in returns for the pre announcement period. From day (13) forth the CAAR's are seen to be oscillating around the 14% mark. The CAAR over the post

announcement period is 14,03%. Hence the average CAAR for the post announcement period is 13,47%. It is seen that the pre-announcement period has lower average CAAR's (3,41%.) relative to the post-announcement period (13,47%). Furthermore, the fact that returns are still increasing in the post-announcement period may suggest that the South African market is taking time to fully incorporate the announcement of a merger deal. Furthermore, the rate of change for target firm's post-announcement (1; 25) is 2,16%. Therefore, although the target firms CAAR is greater in the post-announcement period, the majority of the CAAR's (relating the target companies) were generated during pre-announcement period.

A t-test was conducted to examine if there are substantial variations in the CAAR's pre- and post-announcement for target firms, using a 95% confidence interval. Where the test statistic is -30,42; the P-value is 0; and T-critical is 2,06. The value of the test statistics 30,42 > Tcritical of 2,06. The P-value of 0 < 0.05 (the level of significance), therefore there is a substantial variation within the target firms pre- and post CAAR's at the 5% level.

Table 2c: Summary of the Targets Firms CAAR's Over Different Windows Periods.

CAAR	**(-10; +10)**	**(-5; +5)**
Pre-announcement	3,462%**	2,589%**
Post-announcement	9,577%**	8,078%**
Average CAAR	5,272%	4,824%

**Significant at the 5% level

Over periods (-10; +10) and (-5; +5), t-tests are conducted to examine if there are any substantial variations in the CAAR's pre- and post-announcement for target firms over the different time periods. The test was executed with a 95% confidence interval. The results found that at windows (-10; +10) and (-5; +5) the variations between pre and post CAAR's for target firms is significant. Thus, the null hypothesis that the average CAAR's (for the target firm) pre- and post-announcement are equal is rejected at the following periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

Additionally, the rate of change with regards to target firms CAAR's over windows (-10; 10) and (-5; +5) for the pre- and post-announcement periods is summarized below:

Table 2d: Target Firms Rate of Change in Pre- and Post-announcement CAAR's Over the Defined Event Window.

CAAR	(-10;10)	(-5;5)
Pre-announcement	3,462%	7,639%
Post-announcement	1,607%	1,139%

Thus, with relation to the above, the target firms CAAR's are larger post-announcement for the following windows (-25; 25), (-10; +10) and (-5; +5), however, the majority of CAAR's are generated in the pre-announcement period. This suggests there may have been an escape of info pre-merger announcement.

5.4.2. ACQUIRER

The acquirer firms pre- and post-announcement CAAR's are graphically represented in Figure 5a and Figure 6a respectively, as can be seen below.

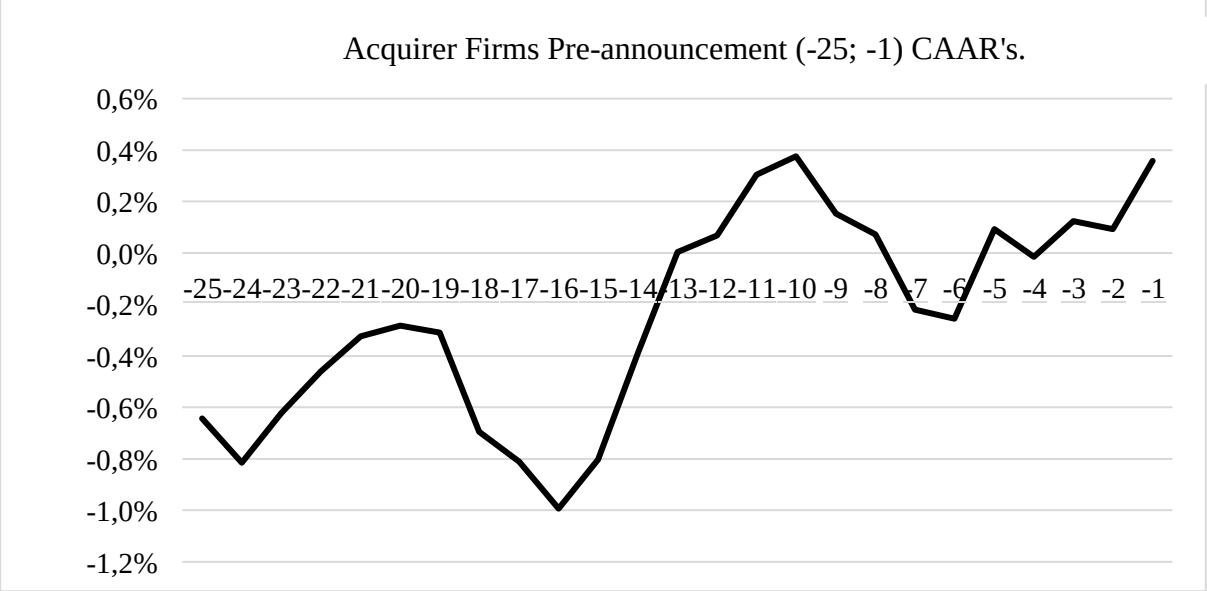

Figure 6: Acquirer Firms Pre-announcement (-25; -1) CAAR's.

Figure 6 shows how the CAAR's generated by acquirer firms are nonpositive from day (-25) up to and including day (-14). Where the most noticeable peak occurs from days (-11; -10). Further, the highest CAAR occurred on day (-10) with a value of 0,38% and the lowest occurred on day (-16) with a value of -0,99%. Furthermore, the mean CAAR for the pre-announcement period is -0,24%. The relatively large CAAR's at time (-1) may indicate the escape of info

premerger announcement. Additionally, the rate of change for the acquirer firm's preannouncement CAAR's is 1,37%.

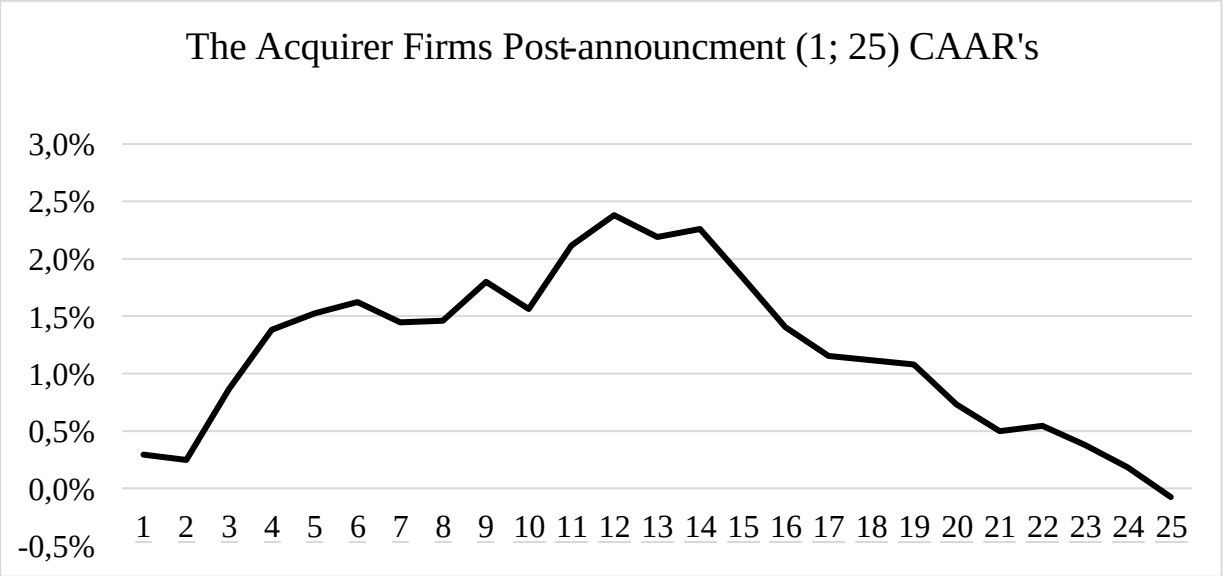

Figure 6a: Acquirer Firms Post-announcement (1; 25) CAAR's.

From Figure 6a it is shown that the CAAR's are still increasing post-announcement – at an increasing rate when compared to rate of growth in returns for the pre-announcement period. From day (14) forth, the CAAR's are observed to be gradually decreasing up until day (25). The maximum and minimum CAAR's are 2,38% on day (12) and -0,08% on day (25), respectively.

The CAAR for the post announcement period (1; 25) is -0,08% and hence the average CAAR is 1,20%. The fact that returns are still increasing in the post-announcement period may show that the South African market is taking time to fully incorporate/ adjust to the announcement of a merger deal. It is seen that the pre-announcement period (-25; -1) has lower average CAAR's (-0,24%) when compared to post announcement period (1; 25) CAAR (1,20%.). Furthermore, the rate of change for acquirer firm's post-announcement (1; 25) is 2,46%. Therefore, the majority of the CAAR's for the acquirer firms were generated in the post announcement period (1; 25).

A t-test was conducted to examine if there are substantial variations in the CAAR's pre and post announcement for acquirer firms, using a 95% confidence interval, where: The test statistic is -8,18, P-value is 0 and T-critical is 2,06. The value of the test statistic is 8,18 > T-critical of

2,06. The P – value of 0 < 0.05 (the level of significance), therefore there is a significant variation between the acquirer firms pre and post CAAR's over the full event window, at the 5% level of significance.

Table 2e: Summary of the Acquirer Firms CAAR's Over Different Windows

CAAR	(-10; +10)	(-5; +5)
Pre-announcement	0,053%**	0,614%**
Post-announcement	1,261%**	1,781%**
Average CAAR	0,338%	0,752%

**Significant at the 5% level

Moreover, for periods (-10; +10) and (-5; +5), t-tests are conducted to examine if there are substantial variations in the CAAR's pre and post announcement for acquirer over the different time periods. The test was executed with a 95% confidence interval. The results found that at windows (-10; +10) and (-5; +5) the variations in pre and post CAAR's for target firms is significant. Thus, the null hypothesis stating: the average CAAR's (for the acquirer firm) pre and post announcement are equal is rejected at the following periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

Additionally, the rate of change in target firms CAAR's over windows (-10; 10) and (-5; +5) pre- and post-announcement is summarized below:

Table 2f: Acquirer Firms Rate of Change in Pre- and Post-announcement CAAR's Over the Defined Event Windows.

CAAR	(-10;10)	(-5;5)
Pre-announcement	0,632%	0,373%
Post-announcement	1,554%	1,277%

Thus, with relation to the above, the acquirer firms CAAR's are larger pre-announcement for the following windows (-25; 25), (-10; +10) and (-5; +5), however, the majority of CAAR's are generated in the post-announcement period. This may suggest that the South African market is taking time to fully incorporate the announcement of the merger. Hence the target and acquirer firms generate the majority of gains in the pre-announcement and post-announcement

period respectively. Thus, the target firms receive the majority of their gains before the acquirer firms and further, significantly outperform the acquirer firms over all the windows assessed.

5.5. SHARE VERSUS CASH FUNDED M&A'S

This section assesses the third null hypothesis which posits: that the CAAR's for target and acquirer companies are equal when cash and stock payments are employed as funding methods. This section is broken down into the target and acquirer firms so as to gain a more comprehensive view, that the different effects of funding methods have on the target and acquirer firms. This is assessed over the following window periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

5.5.1. TARGET

Table 3: Target Firms' AAR's, T-test, Significance and CAAR's for Cash Versus Share Funded Deals.

Day	AAR	CAAR Cash	AAR	CAAR Stock
-25	0,570%	0,571%	0,104%	0,104%
-24	-0,090%	0,484%	-0,552%	-0,448%
-23	-0,300%	0,185%	0,243%	-0,205%
-22	1,330%	1,514%	-0,247%	-0,452%
-21	0,570%	2,088%	1,009%	0,557%
-20	1,010%***	3,096%	1,026%	1,583%
-19	1,410%***	4,509%	-2,445%***	-0,862%
-18	-0,460%	4,054%	0,559%	-0,303%
-17	0,100%	4,150%	-0,031%	-0,334%
-16	-0,010%	4,144%	0,608%	0,275%
-15	1,030%	5,172%	-0,483%	-0,208%
-14	-1,330%***	3,838%	0,785%	0,577%
-13	0,130%	3,972%	0,312%	0,889%
-12	0,900%	4,875%	-0,141%	0,748%
-11	-0,060%	4,813%	0,980%	1,728%
-10	-0,240%	4,573%	0,386%	2,114%

-9	0,930%	5,500%	0,312%	2,426%

-8	-0,640%	4,856%	-0,388%	2,038%
-7	-0,250%	4,604%	0,890%	2,928%
-6	0,840%	5,440%	-0,730%	2,199%
-5	1,310%	6,749%	0,253%	2,452%
-4	0,250%	7,004%	0,587%	3,039%
-3	0,430%	7,438%	0,638%***	3,677%
-2	1,150%	8,592%	0,229%	3,905%
-1	1,390%	9,983%	-0,358%	3,547%
0	6,740%***	16,725%	2,604%	6,151%
1	0,220%	16,947%	0,039%	6,190%
2	-0,070%	16,876%	0,515%	6,705%
3	0,590%	17,467%	0,981%***	7,686%
4	-0,340%	17,122%	-0,231%	7,455%
5	-0,010%	17,113%	0,394%	7,850%
6	-0,050%	17,061%	-1,091%	6,759%
7	-0,280%	16,777%	1,759%	8,518%
8	0,050%	16,831%	-0,278%	8,240%
9	0,430%	17,260%	0,280%	8,520%
10	0,420%	17,678%	0,094%	8,614%
11	-0,060%	17,619%	0,211%	8,825%
12	0,000%	17,614%	0,003%	8,828%
13	0,890%	18,508%	-0,192%	8,636%
14	-0,210%	18,299%	-0,534%	8,103%
15	-0,020%	18,283%	0,951%	9,054%
16	0,290%	18,570%	0,143%	9,196%
17	-0,080%	18,493%	-0,710%***	8,486%
18	-0,340%	18,152%	-0,046%	8,439%
19	0,340%	18,496%	0,054%	8,493%
20	0,250%	18,749%	-0,753%	7,740%
21	0,020%	18,770%	-0,572%	7,168%

22	-0,010%	18,761%	0,423%	7,591%
23	-0,020%	18,736%	-0,144%	7,447%
24	-0,010%	18,722%	0,897%***	8,344%
25	0,010%	18,731%	0,031%	8,375%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 3, above, shows the AAR's, and CAAR's for the target firms corresponding to both cash and share funded mergers. The AAR's significance is tested at the 1%,5% and 10% level, the results show that AAR's generated on the following days are statistically significant at the 1% level: (0), (-14), (-19), and (-20).

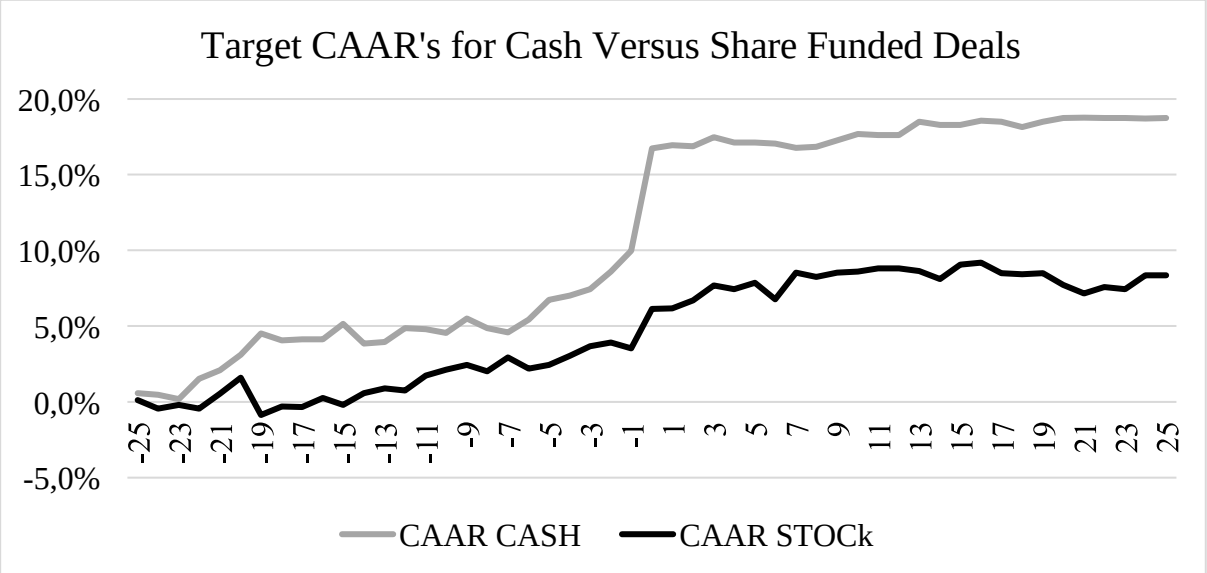

Figure 7: The Total CAAR's Obtained by Targets Firms for Cash and Share Funded Deals.

Additionally, Figure 7, graphically, represents the CAAR's generated by target firms when using cash funding and stock funding. From Figure 7 it is observed that when engaging in M&A deals, target firms generate much higher CAAR's when the deal is funded by cash as opposed to stock (over the full event window of 51 days). It is also seen that target firms accrue positive gains – irrespective of the funding method – henceforth day (13) onwards. The CAAR

for the target firms over the full event window for cash and stock funded deals is 18,73% and 8,38% respectively

The average CAARs and standard deviations observed over window (-25, 25), for both cash and share funded acquisitions, differ greatly. The volatility of CAAR (cash) is approximately seven time that of CAAR (stock). Furthermore, the means of the cash and stock CAAR's over the full event window are 11,31% and 4,7% respectively. Furthermore, the target CAAR's for cash and stock over windows (-10; +10) and (-5; +5) are shown beneath:

Table 3a: Target Firms Cash and Stock CAAR's Over the Defined Event Windows

CAAR	**(-10; +10)**	**(-5; +5)**
Cash	12,865%**	11,673%**
Stock	6,886%**	5,651%**

**Significant at the 5% level

A t-test was conducted to examine if there are substantial variations in the CAAR's for the target firms owing to the various funding methods, over window (-25; +25). Using 95% confidence interval significant variations are found – see table 3b below.

Table 3b: T-test and Statistics for Target Firms CAAR's and Their Corresponding Sources of Funding (Cash or Equity) Over the Full Event Window.

	CAAR cash	***CAAR stock***
Mean	11,306%	4,694%
Variance	0,486%	0,128%
Standard Deviation	6,973%	1,133%
%Observations	51	51
Pearson Correlation	0,971	
Hypothesized Mean Difference	0	
Df	50	
t Stat	13,129	
P(T<=t) one-tail	0	
t Critical one-tail	1,676	

P(T<=t) two-tail	0	
t Critical two-tail	2,008	

Moreover, for periods (-10; +10) and (-5; +5), t-test are conducted to examine if there are any substantial variations in the target firms CAAR's, owing to the two samples using different payment options. A 95% confidence interval is employed. The results found that at windows (-10; +10) and (-5; +5) the difference between pre- and post-CAAR's for target firms is significant, for both intervals at the 5% level. Thus, the null hypothesis that states the CAAR's for target firms are equal when cash and stock payments are employed as funding methods, is rejected at the following periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

5.5.2. ACQUIRER

Table 4: Acquirer Firms' AAR's, T-test, Significance and CAAR's for Cash Versus Share Funded Deals.

Day	AAR	CAAR Cash	AAR	CAAR Stock
-25	-0,052%	-0,052%	-1,335%	-1,335%
-24	0,093%	0,041%	-0,388%	-1,723%
-23	0,392%	0,433%	-0,038%	-1,761%
-22	0,100%	0,534%	0,160%	-1,602%
-21	0,375%	0,908%	-0,140%	-1,742%
-20	-0,444%	0,464%	0,228%	-1,514%
-19	0,262%	0,726%	-0,391%	-1,905%
-18	-0,151%	0,574%	-0,924%***	-2,829%
-17	-0,078%	0,497%	-0,220%	-3,049%
-16	0,213%	0,710%	-0,638%***	-3,687%
-15	0,553%	1,263%	-0,336%	-4,023%
-14	-0,304%	0,959%	1,417%***	-2,606%
-13	0,667%***	1,626%	0,316%	-2,290%
-12	0,275%	1,901%	-0,085%	-2,374%

-11	0,284%	2,185%	0,338%	-2,036%
-10	0,205%	2,390%	-0,395%	-2,432%
-9	-0,201%	2,189%	-0,261%	-2,693%

-8	-0,228%	1,962%	0,186%	-2,506%
-7	-0,358%	1,604%	-0,038%	-2,545%
-6	0,141%	1,745%	-0,092%	-2,637%
-5	0,274%	2,019%	0,740%***	-1,897%
-4	-0,389%	1,630%	0,081%	-1,816%
-3	-0,215%	1,415%	0,363%	-1,453%
-2	0,319%	1,734%	-0,538%	-1,990%
-1	0,194%	1,928%	0,164%	-1,826%
0	0,077%	2,005%	0,373%	-1,453%
1	-0,200%	1,806%	-0,025%	-1,478%
2	0,210%	2,015%	-0,337%	-1,815%
3	0,520%	2,535%	0,605%	-1,210%
4	0,286%	2,821%	0,633%***	-0,576%
5	0,229%	3,050%	0,337%	-0,239%
6	-0,424%	2,626%	0,675%***	0,436%
7	-0,213%	2,413%	-0,254%	0,181%
8	0,121%	2,534%	0,189%	0,370%
9	0,371%***	2,905%	0,656%***	1,025%
10	-0,171%	2,735%	-0,352%	0,673%
11	0,640%	3,375%	0,393%	1,066%
12	0,895%	4,270%	-0,271%	0,796%
13	0,061%	4,331%	-0,295%	0,500%
14	0,164%	4,495%	-0,240%	0,261%
15	-0,554%***	3,940%	-0,375%	-0,114%
16	-0,663%	3,278%	-0,420%	-0,534%
17	-0,621%	2,657%	-0,226%	-0,759%
18	-0,239%	2,418%	0,176%	-0,584%
19	-0,041%	2,377%	-0,291%	-0,874%

20	-0,228%	2,149%	-0,822%***	-1,697%
21	-0,501%	1,648%	0,215%	-1,482%
22	-0,309%	1,338%	0,417%	-1,065%
23	0,564%	1,903%	-0,810%***	-1,875%
24	-0,450%	1,453%	0,268%	-1,608%
25	-0,411%	1,042%	-0,297%	-1,904%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 4, above, shows the AAR's, and CAAR's for the acquirer firms corresponding to both cash and share funded mergers. The AAR's significance is tested at the 1%,5% and 10% level. The results show that AAR's generated on the following days are statistically significant at the 1% level: (15), (9) and (-13). Furthermore, as seen in Table 5 the CAAR for acquirer over the full event window (-25; +25) for cash and stock is 1,04% and -1,90% respectively.

Furthermore, the CAAR's for the acquirer for cash and stock over: (-10; +10) and (-5; +5) is summarized below:

Table 4a: Acquirer Firms Cash and Stock CAAR's Over the Defined Event Windows

CAAR	**(-10; +10)**	**(-5; +5)**
Cash	0,550%**	1,306%**
Stock	2,709%**	2,398%**

**Significant at the 5% level

Table 5: The CAAR's for the Target and Acquirer Firms Over the Full Event Window (25; 25) for Cash Versus Equity.

CAAR	**Target**	**Acquirer**
Cash	18,731%	1,042%
Shares	8,375%	-1,904%

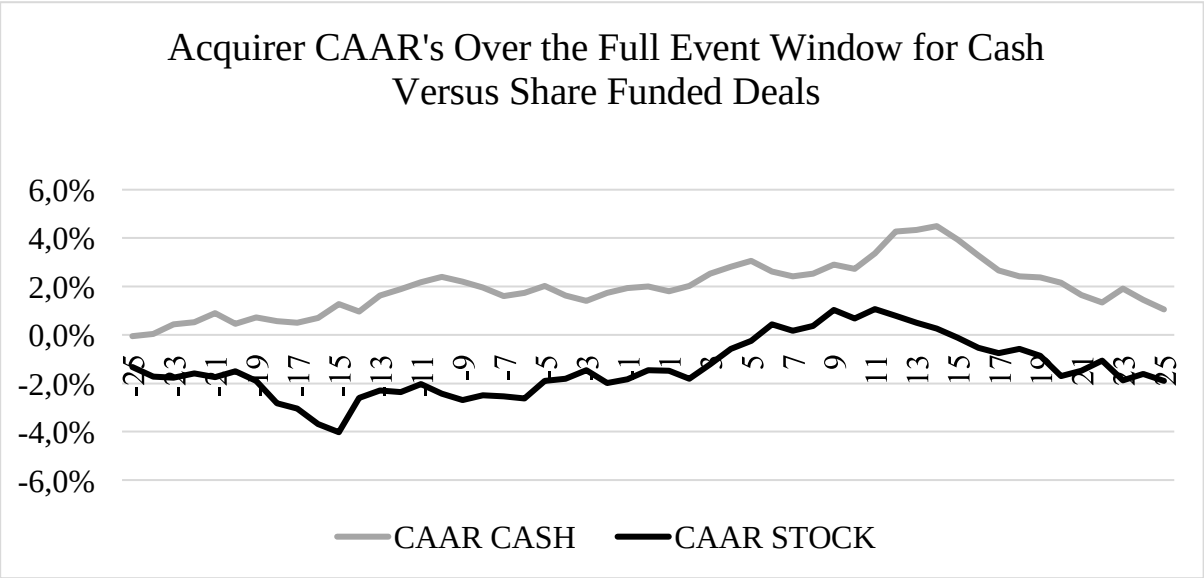

Figure 8: The total CAAR's Obtained by Acquirer Firms for Cash and Share Funded Deals.

Figure 8, graphically, represents the CAAR's generated by acquirer firms when using cash and stock funding. Unlike the target firms, the acquirer firms are seen to earn non-positive returns when using stock funding – this is observed from day (32) onwards – and positive returns when using cash funding – this observed from day (2) onwards. From Figure 8, below, it is observed, that when engaging in M&A deals acquirer firms generate much higher CAAR's when the deal is funded by cash as opposed to stock.

The mean CAAR's and standard deviations computed over window (-25; 25), for both equity and monetary funded acquisitions vary somewhat. The volatility of CAAR (cash) differs slightly to that of CAAR (stock). Furthermore, the means of CAAR (cash) and CAAR (stock) are 1,95% and -1,38% respectively. Hence it is seen target and acquiring firms generate higher average returns with cash then with stock over window (-25; +25).

A t-test was conducted to examine if there are substantial variations in the CAAR's for the acquirer firms owing to the various funding methods, over window (-25; +25). Using a 95% confidence interval, significant variations are found – the findings are shown in table 6.

Table 6: T-test and Statistics for Acquirer Firms CAAR's and Their Corresponding Sources of Funding (Cash or Equity).

	CAARc	***CAARs***
Mean	1,951%	-1,377%
Variance	0,011%	0,014%
Standard Deviation	1,071%	1,200%
Observations	51	51
Pearson Correlation	0,692	
Hypothesized Mean Difference	0	
df	50	
t Stat	26,419	
P(T<=t) one-tail	0	
t Critical one-tail	1,676	
P(T<=t) two-tail	0	
t Critical two-tail	2,01	

Moreover, for periods (-10; +10) and (-5; +5), t-test are conducted to examine if there are any substantial variations in the acquirer firms CAAR's, owing to the two samples employing dissimilar payment options. A 95% confidence interval is employed. The results found that at windows (-10; +10) and (-5; +5) the difference between pre and post CAAR's for acquirer firms is significant for both intervals at the 5% level. Thus, the null hypothesis that states the CAAR's for acquirer firms are equal when cash and stock payments are employed as funding methods is rejected at the following periods:

- (-25; +25); • (-10; +10); and
- (-5; +5).

Further, for the target firms cash merger significantly outperforms stock mergers over all windows. However, for the acquirer firms stock mergers significantly outperforms cash mergers over all windows except for the full event window (-25; +25). Also, when comparing the target and the acquirer firms CAAR's, it is clear that for both cash and equity most of the gains accrue to the target firms and negative to minimal gains accrue to the acquirer firms – this is observed from Table 5.

5.6. TARGET VERSUS ACQUIRER

This section assesses the fourth null hypothesis which posits: that the CAAR's obtained by the target firms are equal to the CAAR's obtained by the acquirer firms. This section is broken down into the target and acquirer firms and is tested over the subsequent periods:

- (-25; +25)
- (-10; +10)
- (-5; +5)

5.6.1. TARGET

Table 7: Target Firms AAR's, Test Statistics, Significance and the CAAR's Over the Full Event Window (-25; 25).

Day	AAR	CAAR Target
-25	0,488%	0,488%
-24	-0,336%	0,152%
-23	-0,010%	0,141%
-22	0,562%	0,704%
-21	0,505%	1,209%
-20	1,112%***	2,321%
-19	-0,115%	2,206%
-18	0,116%	2,322%
-17	-0,023%	2,299%
-16	0,263%	2,562%
-15	0,257%	2,819%
-14	0,250%	3,069%
-13	0,033%	3,102%
-12	0,371%	3,474%
-11	0,528%	4,002%
-10	0,000%	4,002%
-9	0,557%	4,559%
-8	-0,178%	4,380%
-7	0,291%	4,671%
-6	0,204%	4,875%
-5	0,597%	5,472%

-4	0,155%	5,628%
-3	0,614%***	6,242%
-2	0,739%	6,981%
-1	0,483%	7,464%
0	4,111%***	11,575%
1	0,398%	11,973%
2	0,394%	12,367%
3	0,745%***	13,112%
4	-0,188%	12,924%
5	0,029%	12,953%
6	-0,432%	12,521%
7	0,665%	13,186%
8	-0,170%	13,016%
9	0,263%	13,280%
10	0,300%	13,580%
11	0,079%	13,658%
12	-0,015%	13,643%
13	0,317%	13,960%
14	-0,289%	13,671%
15	0,385%	14,056%
16	0,079%	14,135%
17	-0,199%	13,936%
18	-0,029%	13,907%
19	0,162%	14,069%
20	-0,263%	13,806%
21	-0,198%	13,608%
22	0,190%	13,798%
23	-0,148%	13,650%
24	0,310%	13,960%
25	0,067%	14,027%

*Significant at the 10% level **Significant at the 5% level

***Significant at the 1% level

Table 7, above, shows the AAR's, and CAAR's for target companies over window (-25; 25). The AAR's significance is tested at the 1%,5% and 10% level, the results show that AAR's generated on the following days are statistically significant at the 1% level: (3), (0), (-3) and (20).

Figure 9: The Target firms CAAR's for the Full Event Window (-25; 25).

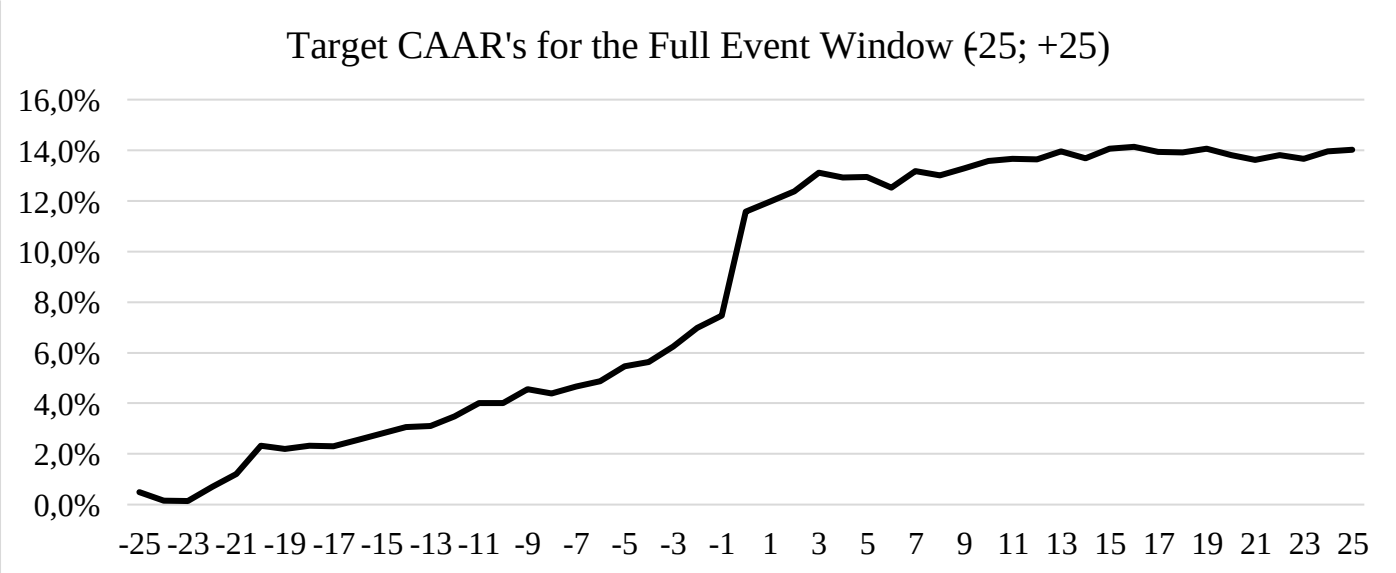

Figure 9 graphically represents the CAAR's generated by target companies, over window (25; +25). From Figure 9 it is observed that the target firms appear to have gradually increasing returns from day 23 henceforth, with a particularly large spike observed from days (-1; 1). Further, from day (13) to (25) the CAAR's oscillates around 14%.

The total CAAR for the full event window, pre-announcement CAAR and post-announcement CAAR for target firms is 14,03%, 7,46% and 2,45% respectively. Furthermore, the CAAR for the target firms over windows: (-10; +10) and (-5; +5) is: 9,58% and 8,08% respectively. This is summarized below:

Table 7a: Target Firms CAAR's Over the Defined Event Windows.

Window Periods	CAAR
(-25; +25)	14,027%
(-25; -1)	7,464%
(+1; +25)	2,451%
(-10; +10)	9,578%

(-5; +5)	8,078%

5.6.2. ACQUIRER

Table 8: Acquirer Firms AAR's, Test Statistic, Significance and the CAAR's Over the Full Event Window (-25; 25).

Day	AAR	CAAR
-25	-0,642%	-0,642%
-24	-0,171%	-0,814%
-23	0,192%	-0,621%
-22	0,162%	-0,459%
-21	0,135%	-0,324%
-20	0,042%	-0,282%
-19	-0,027%	-0,310%
-18	-0,385%	-0,695%
-17	-0,115%	-0,810%
-16	-0,183%	-0,993%
-15	0,191%	-0,802%
-14	0,411%***	-0,391%
-13	0,396%***	0,005%
-12	0,064%	0,069%
-11	0,235%	0,304%
-10	0,072%	0,376%
-9	-0,223%	0,153%
-8	-0,080%	0,072%
-7	-0,292%	-0,220%
-6	-0,036%	-0,256%
-5	0,348%	0,093%
-4	-0,108%	-0,015%
-3	0,139%	0,124%
-2	-0,031%	0,093%
-1	0,265%	0,358%
0	0,138%	0,496%

1	-0,200%	0,295%
2	-0,048%	0,248%
3	0,620%***	0,867%
4	0,513%***	1,380%
5	0,145%	1,525%
6	0,096%	1,621%
7	-0,174%	1,448%
8	0,014%	1,462%
9	0,339%***	1,802%
10	-0,237%	1,565%
11	0,552%***	2,117%
12	0,263%	2,380%
13	-0,192%	2,188%
14	0,070%	2,258%
15	-0,420%***	1,837%
16	-0,431%	1,406%
17	-0,253%	1,153%
18	-0,039%	1,114%
19	-0,035%	1,079%
20	-0,349%***	0,730%
21	-0,232%	0,498%
22	0,046%	0,544%
23	-0,168%	0,376%
24	-0,192%	0,184%
25	-0,261%	-0,076%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level Table 8, above shows the AAR's and CAAR's for the acquiring companies, over window (25; 25). The AAR's significance is tested at the 1%,5% and 10% level, the results show that AAR's generated are statistically significant at the 1% level for days: (20), (15), (11), (9), (4),

(3), (-13), (-14).

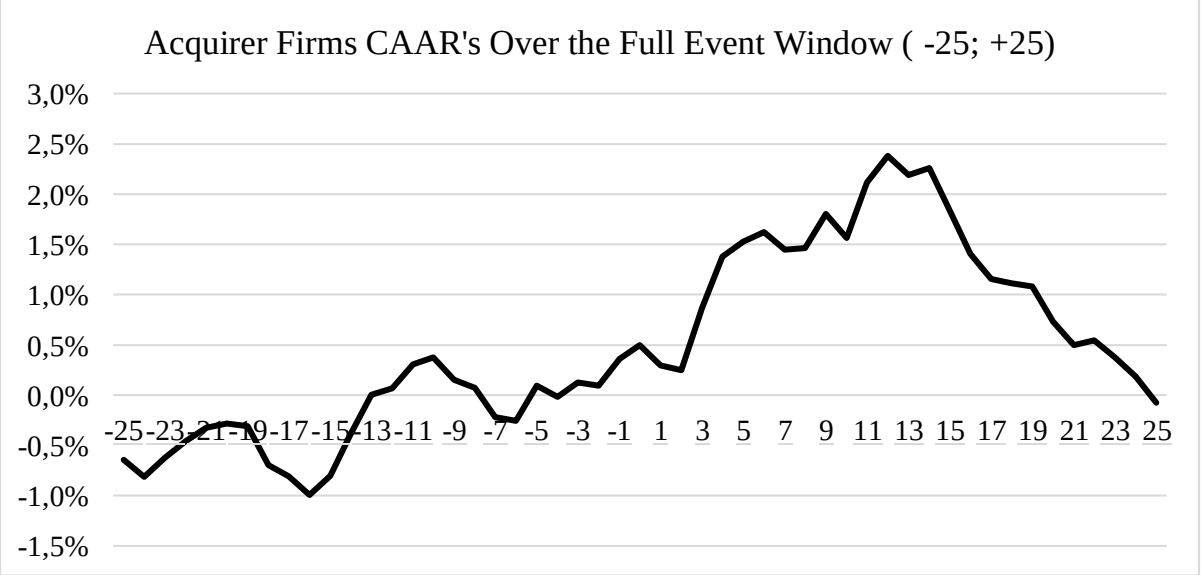

Figure 10: The Acquirer firms CAAR's for the Full Event Window (-25; 25).

Additionally, figure 10 graphically represents the CAAR's generated for the acquirer companies over (-25; 25). It is observed that the acquirer firms generate negative CAAR's form (-25) to (-14). Furthermore, the most extreme spike in CAAR's is observed to take place from day (2) to (3) – 0,25% to 0,87% respectively. From day (3) to day (15) the CAAR's are increasing relatively quickly, followed by a sharp decrease in CAAR's from day (13) until CAAR's reaches zero on day (25).

The total CAAR, pre-announcement CAAR and post-announcement CAAR for target firms (over the full event window of 51 days) is -0,08%, 0,36% and -0,57% respectively. Furthermore, the CAAR for the acquirer firms over windows: (-10; +10) and (-5; +5) is: 1,26% and 1,78% respectively. This is summarized below:

Table 8a: Acquirer Firms CAAR's Over the Defined Event Windows.

Window Periods	CAAR
(-25; +25)	-0,076%
(-25; -1)	0,358%
(+1; +25)	-0,572%
(-10; +10)	1,261%
(-5; +5)	1,781%

Table 8b: Target and Acquirer Firms T-test and Statistics.

	CAAR Target	*CAAR Acquirer*
Mean	8,500%	0,481%
Variance	0,277%	0,008%
Standard Deviation	5,265%	0,916%
Observations	51	51
Pearson Correlation	0,817	
Hypothesized Mean Difference	0	
Df	50	
t Stat	12,596	
P(T<=t) one-tail	0,00E+00	
t Critical one-tail	1,676	
P(T<=t) two-tail	0	
t Critical two-tail	2,01	

Table 9: A Comparison Between Target and Acquirer CAAR's Over Windows (-10; +10), (-5; +5) and (-2; +2)

CAAR	**(-25; +25)**	**(-10; +10)**	**(-5; +5)**	**(-25; -1)**	**(1; 25)**
Target	14,027%**	9,578%**	8,078%**	7,464%**	2,451%**
Acquirer	-0,076%**	1,261%**	1,781%**	0,358%**	-0,572%**

**Significant at the 5% level

From Table 8b it is observed that the average CAAR's and standard deviations calculated over (-25, 25), for the acquirer and target mergers differ immensely. Furthermore, the standard deviation of the target firm is 5,75 times larger than their acquirer counterparts. The means of the target and acquirer CAAR's are 8,50% and 0,48% respectively. The target firms average CAAR is approximately twice as large as their acquirer counterparts. Thus, it is observed that the average target firm returns are 17,69 times larger than their acquirer counterparts.

Additionally, a t-test is conducted to examine if there are any substantial variations in the targets and acquirer firms CAAR's for window (-25; +25). A 95% confidence interval is employed. The test-statistic is 12,6, P-value is 0 and T-critical is 2,01. The absolute value of the test-

statistic 12,6 > T-critical of 2,01 and the P-value of 0 < 0.05 (the level of significance); thus there is a substantial variation between the CAAR's generated by target firms and those generated by acquirer firms – at the 5% level of significance (see Table 8b).

Furthermore, the same paired two sample t-test is performed over periods: (-10; +10), (-5; +5) and (-25; -1) and (+1; +25). The results are presented in table 9 - above. Over all periods there is a significant difference found between the CAAR's generated by the target and those by the acquirer. Hence, the fourth hypothesis stating that the CAAR's generated by target and acquirer firms is equal is rejected at the following periods:

- (-25; +25);
- (-10; +10);
- (-5; +5);
- (-25; -1); and
- (+1; +25).

Furthermore, it is important to note that majority of the gains amass to the target firms, with minimal gains (oscillating around zero) amassing to the acquirer firms.

5.7. INDUSTRY ANALYSIS

This section considers the fifth hypothesis which states: the CAAR's obtained by firms engaging in merger activity in different industries is equal – for both target and acquirer firms. This section is split into target and acquirer industries and the following industries are assessed, over the full event window (-25; +25), namely: Financial, Consumer (Cyclical and Non-cyclical,) Basic Materials; and Industrial.

Importantly within each graph (in section 5.7.) the average target and acquirer CAAR is presented for comparative purposes.

5.7.1. FINANCIAL

Table 10: Target and Acquirer Firms AAR's, Test Statistic, Significance and the CAAR's Over the Full Event Window (-25; 25) – for the Finance Industry.

Days	AAR	CAAR Target	AAR	CAAR Acquirer
-25	0,488%	0,488%	-1,424%	-1,424%
-24	-1,175%	-0,687%	0,011%	-1,414%
-23	0,034%	-0,653%	0,448%	-0,966%
-22	1,434%	0,780%	0,192%	-0,774%
-21	-0,707%	0,074%	0,467%***	-0,307%

-20	0,729%***	0,803%	0,480%	0,173%
-19	0,893%***	1,696%	-0,078%	0,094%
-18	-0,112%	1,584%	-0,169%	-0,075%
-17	0,077%	1,661%	0,132%	0,058%
-16	0,264%	1,925%	-0,298%	-0,240%
-15	0,788%	2,713%	0,188%	-0,053%
-14	0,622%	3,335%	-0,029%	-0,082%
-13	-0,502%	2,832%	0,353%	0,271%
-12	0,622%	3,455%	-0,049%	0,222%
-11	-0,361%	3,094%	0,433%	0,655%
-10	-0,285%	2,809%	0,172%	0,827%
-9	-0,424%	2,385%	-0,648%***	0,179%
-8	-0,409%	1,976%	0,049%	0,228%
-7	0,360%	2,336%	0,232%	0,460%
-6	0,409%	2,745%	0,538%***	0,999%
-5	0,708%	3,453%	0,292%	1,291%
-4	-0,050%	3,404%	0,304%	1,594%
-3	0,495%***	3,898%	0,035%	1,630%
-2	-0,160%	3,739%	0,270%	1,899%
-1	0,726%	4,465%	-0,057%	1,842%
0	3,202%***	7,667%	0,395%	2,237%
1	0,053%	7,721%	-0,162%	2,075%
2	-0,069%	7,651%	0,107%	2,181%
3	1,000%	8,651%	0,462%***	2,643%
4	-0,411%	8,240%	0,031%	2,674%
5	-0,043%	8,197%	0,453%***	3,128%
6	-0,824%	7,373%	-0,076%	3,051%
7	0,581%	7,954%	-0,045%	3,007%
8	-0,204%	7,750%	-0,228%	2,779%
9	0,616%***	8,366%	0,324%	3,103%
10	0,143%	8,509%	-0,300%	2,803%
11	-0,136%	8,373%	0,814%***	3,617%

12	0,112%	8,485%	0,210%	3,827%
13	0,168%	8,653%	0,052%	3,879%
14	-0,790%	7,863%	0,266%	4,145%
15	0,740%	8,604%	-0,210%	3,934%
16	-0,013%	8,590%	-0,076%	3,858%
17	-0,367%	8,224%	-0,087%	3,771%
18	0,622%	8,846%	0,283%	4,054%
19	0,404%	9,250%	0,344%***	4,398%
20	-0,359%	8,891%	0,013%	4,411%
21	0,298%	9,189%	-0,374%	4,037%
22	-0,158%	9,031%	-0,009%	4,029%
23	-0,192%	8,839%	-0,311%	3,718%
24	0,351%	9,190%	-0,080%	3,638%
25	-0,209%	8,981%	-0,041%	3,596%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 10 above shows the AAR's and CAAR's for the target and acquirer firms for window (-25; 25). The AAR's significance is tested at the 1%,5% and 10% level. The results show that AAR's generated on the following days are statistically significant at the 1% level:

- For the target firms: (-20), (-19), (-3), (0) and (9).
- For the acquirer firms: (-21), (-9), (-6), (3), (5), (11) and (19)

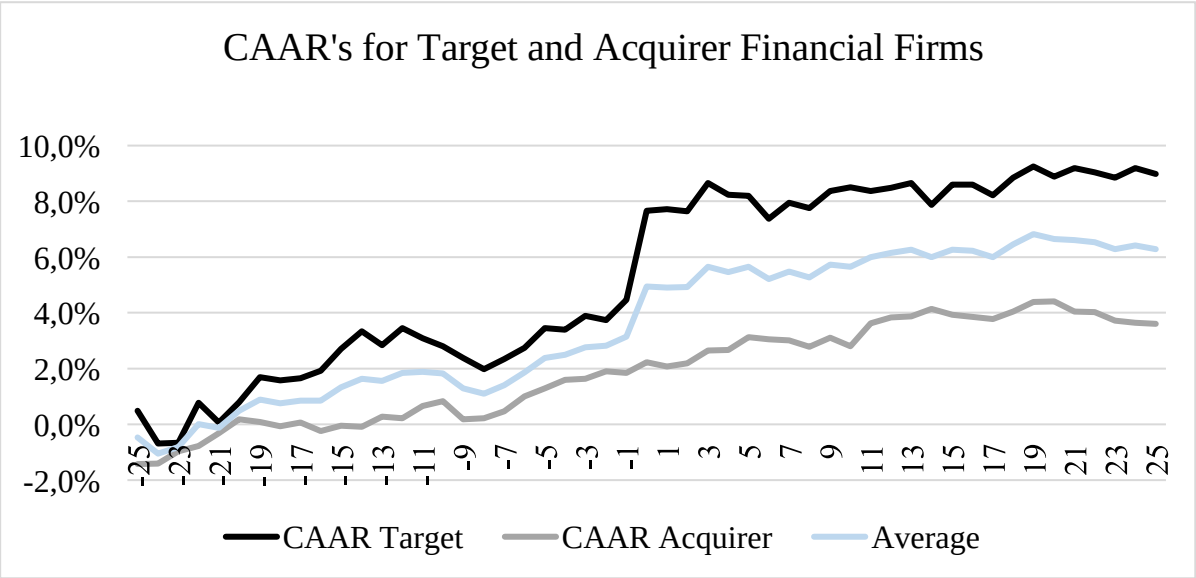

Figure 11: CAAR's for the Target and Acquirer Firms over the Full Event Window – Within the Financial Industry.

Additionally, figure 11 graphically represents the CAAR's generated by target and acquirer firms – for window (-25; +25) – that are within the financial industry. From Figure 11 it is shown that the target financial companies outperform the acquirer financial companies, for the entire event window. The total CAAR for target and acquirer firms for window (-25; +25) is 9% and 3,6%, respectively. Hence, the average CAAR for the target and acquirer firms is 5,4% and 1,9% respectively. This is summarized below.

Table 10a: Target and Acquirer Firms CAAR's and ACAAR's Over the Entire Event Window

	CAAR (-25; +25)	**ACAAR (-25; +25)**
Target	8,981%	5,361%
Acquirer	3,596%	1,876%

Additionally, a t-test is conducted to examine if there are any substantial variations in the target and acquiring firms average CAAR's for window (-25; +25). A 95% confidence interval is employed. The test-statistic is 17,27, P-value is 0 and T-critical is 2,01. The value of the test-statistic is 17,27 > T-critical of 2,01 and the P-value of 0 < 0.05 (the level of significance), therefore there is a substantial variation in the CAAR's generated by target firms and those generated by acquirer firms – at the 5% level of significance. Hence, within the financial

industry target firms outperform acquirer firms with respect to average CAAR's generated over the full period.

5.7.2. CONSUMER

Table 11: Target and Acquirer Firms AAR's, Test Statistic, Significance and CAAR's Over the Full Event Window (-25; 25) – for the Consumer (Cyclical and Non-cyclical) Industry.

Day	AAR	CAAR Target	AAR	CAAR Acquirer
-25	0,278%	0,278%	0,067%	0,067%
-24	0,295%	0,572%	-0,428%	-0,360%
-23	-0,716%	-0,144%	-0,100%	-0,460%
-22	0,786%	0,642%	0,444%	-0,016%
-21	1,518%	2,160%	0,055%	0,039%
-20	0,326%	2,486%	-0,621%	-0,582%
-19	-1,031%	1,455%	0,614%	0,031%
-18	0,235%	1,690%	-0,594%	-0,563%
-17	0,844%	2,535%	-0,082%	-0,644%
-16	-0,173%	2,362%	0,466%	-0,179%
-15	-0,291%	2,072%	0,894%	0,715%
-14	-0,022%	2,050%	-0,184%	0,531%
-13	0,465%	2,514%	-0,072%	0,458%
-12	0,517%	3,031%	0,576%	1,035%
-11	1,062%	4,093%	0,625%***	1,659%
-10	0,443%	4,536%	0,047%	1,707%
-9	1,966%	6,502%	-0,119%	1,588%
-8	0,117%	6,619%	-0,387%	1,201%
-7	0,532%	7,151%	-1,214%***	-0,013%
-6	0,713%	7,864%	0,239%	0,225%
-5	-0,020%	7,844%	0,160%	0,385%
-4	-0,337%	7,507%	-0,607%	-0,222%
-3	0,773%	8,280%	0,229%	0,007%
-2	2,138%	10,418%	-0,121%	-0,115%
-1	0,170%	10,588%	0,989%	0,874%

0	5,087%***	15,675%	0,029%	0,903%
1	0,675%	16,350%	0,154%	1,057%
2	0,113%	16,463%	0,092%	1,149%
3	0,680%	17,143%	0,612%	1,762%
4	-0,323%	16,820%	1,252%***	3,014%
5	0,186%	17,005%	0,076%	3,090%
6	0,065%	17,070%	-0,671%	2,419%
7	1,080%	18,150%	-0,184%	2,235%
8	-0,544%	17,606%	0,393%	2,628%
9	-0,983%	16,623%	0,099%	2,727%
10	-0,164%	16,460%	-0,209%	2,518%
11	-0,506%	15,953%	0,532%	3,050%
12	-0,196%	15,758%	1,283%	4,332%
13	1,247%	17,004%	-0,566%	3,766%
14	-0,443%***	16,561%	0,322%	4,088%
15	-0,006%	16,555%	-1,142%***	2,946%
16	0,574%	17,129%	-1,057%	1,889%
17	-0,509%	16,620%	-0,798%	1,091%
18	-0,330%	16,290%	-0,828%	0,262%
19	0,607%***	16,898%	-0,504%	-0,242%
20	-0,064%	16,834%	-0,752%***	-0,994%
21	-0,275%	16,558%	-0,246%	-1,239%
22	-0,501%***	16,057%	-0,023%	-1,262%
23	0,248%	16,305%	0,520%	-0,742%
24	0,330%	16,635%	-0,466%	-1,208%
25	0,036%	16,671%	-0,554%	-1,762%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level Table 11 above, shows the AAR's, and CAAR's for the target and acquirer firms for window

(-25; 25), that are in the consumer industry. The AAR's significance is tested at the 1%,5% and

10% level. The results show that AAR's generated on the following days are statistically significant at the 1% level:

- For the target firms: (0), (14), (19) and (22).
- For the acquirer firms: (-11), (-7), (4), (15) and (20).

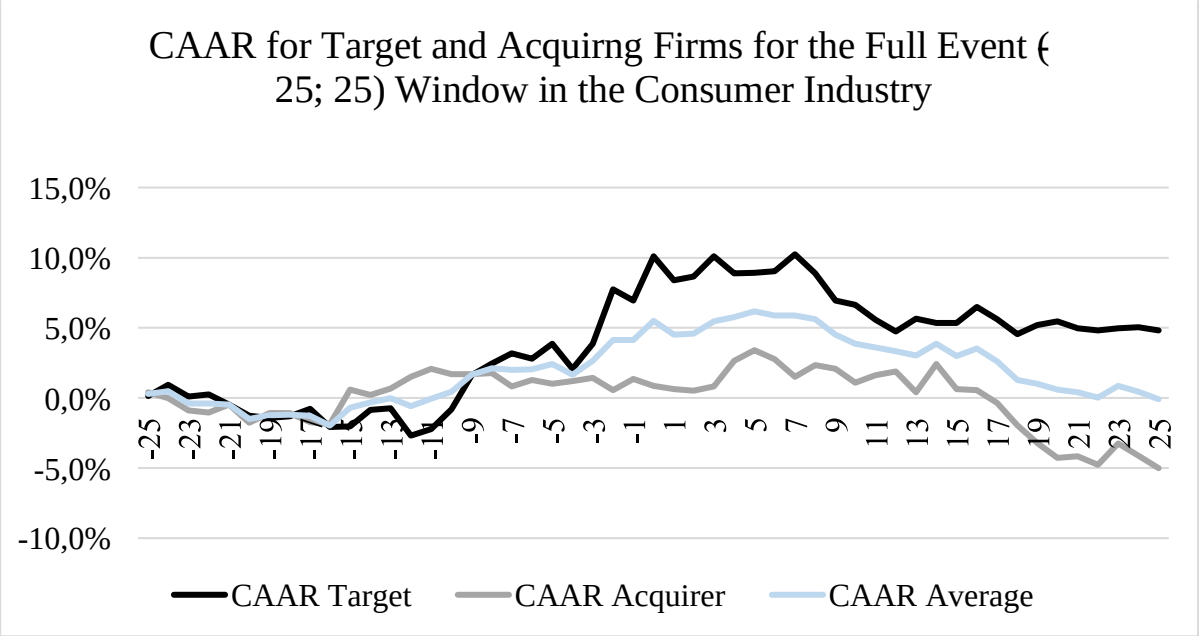

Figure 12: CAAR's for the Target and Acquirer Firms, Over the Full Event Window, Within the Consumer (Cyclical and Non-cyclical) Industry.

Additionally, figure 12 graphically represents the CAAR's generated by target and acquirer firms for window (-25; +25), that are within the consumer industry. From figure 11 and Table 11 it is seen that the target firms outperform the acquirer firms, for the entire event window. The total CAAR, for target and acquirer firms for window (-25; +25) is 16,67% and 1,76% respectively. Hence the average CAAR for target and acquirer firms is 10,55% and 0,88% respectively.

Additionally, a t-test is conducted to examine if there are any substantial variations in the targets and acquirer firms average CAAR's for window (-25; +25). A 95% confidence interval is employed. The test-statistic is 11,062, P-value is 0 and T-critical is 2,01. The value of the tstat 11,06 > t-critical of 2,01 and the P-value of 0 < 0.05 (the level of significance), thus there is a substantial variation between the CAAR's generated by target firms and those generated by acquirer firms – at the 5 % level of significance. Hence, within the consumer industry target firms outperform acquirer firms with respect to average CAAR's generated over the full period.

5.7.3. BASIC MATERIALS

Table 12: Target and Acquirer Firms AAR's, Test Statistic, Significance and CAAR's Over the Full Event Window (-25; 25) – for the Basic Materials Industry.

Day	AAR	CAAR Target	AAR	CAAR Acquirer
-25	0,771%	0,771%	0,004%	0,004%
-24	0,014%	0,785%	-0,040%	-0,036%
-23	-0,520%	0,265%	-0,272%	-0,308%
-22	0,047%	0,312%	-0,138%	-0,446%
-21	-1,308%	-0,996%	-0,368%	-0,814%
-20	0,775%	-0,221%	-0,446%	-1,259%
-19	-2,802%***	-3,023%	-2,044%***	-3,303%
-18	-0,455%	-3,479%	-1,484%***	-4,787%
-17	-0,790%	-4,269%	-0,887%	-5,674%
-16	0,195%	-4,074%	-0,692%	-6,367%
-15	-0,955%	-5,029%	-1,239%	-7,606%
-14	1,338%	-3,691%	2,253%***	-5,353%
-13	-1,171%	-4,862%	2,083%***	-3,270%
-12	-0,204%	-5,067%	-0,478%	-3,748%
-11	-0,749%	-5,816%	-0,572%	-4,320%
-10	1,401%	-4,415%	-0,504%	-4,824%
-9	0,223%	-4,192%	0,815%	-4,009%
-8	-0,750%***	-4,942%	-0,248%	-4,257%
-7	0,147%	-4,795%	-0,182%	-4,438%
-6	-0,847%	-5,642%	-1,992%	-6,430%
-5	0,186%	-5,456%	1,921%	-4,510%
-4	1,172%	-4,284%	0,785%	-3,725%
-3	0,588%	-3,696%	0,517%	-3,208%
-2	-1,567%***	-5,263%	-1,212%***	-4,420%
-1	1,770%***	-3,493%	0,644%	-3,776%
0	6,539%	3,046%	-0,772%	-4,548%
1	-0,235%	2,811%	0,203%	-4,344%
2	-0,379%	2,431%	-0,501%	-4,845%

3	0,911%	3,343%	1,196%	-3,649%
4	1,492%***	4,834%	1,281%	-2,367%
5	1,182%***	6,016%	-0,102%	-2,469%
6	-0,424%	5,592%	1,502%***	-0,967%
7	-0,493%	5,099%	-2,062%	-3,030%
8	-0,655%	4,444%	-0,793%	-3,823%
9	2,116%***	6,560%	2,294%***	-1,529%
10	-0,069%	6,491%	-1,879%	-3,408%
11	1,593%***	8,083%	1,034%	-2,374%
12	-1,250%	6,833%	-0,504%	-2,878%
13	0,456%	7,289%	-0,003%	-2,881%
14	-0,489%	6,800%	-0,686%	-3,567%
15	0,443%	7,244%	0,730%	-2,837%
16	-0,046%	7,197%	-0,795%	-3,632%
17	-1,218%	5,980%	-0,231%	-3,863%
18	-1,061%	4,918%	-0,244%	-4,107%
19	-0,219%	4,699%	-1,251%***	-5,358%
20	-1,102%	3,597%	-0,962%	-6,320%
21	-0,413%	3,184%	0,761%	-5,559%
22	1,542%	4,726%	1,386%	-4,174%
23	-1,663%	3,063%	-2,246%***	-6,419%
24	1,003%	4,066%	0,551%	-5,868%
25	1,440%	5,506%	0,811%	-5,057%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level Table 12 above shows the AAR's, and CAAR's for the target and acquirer firms – that fall under the basic materials industry – over the full event window of (-25; 25). The AAR's significance is tested at the 1%,5% and 10% level. The results show that AAR's generated on the following days are statistically significant at the 1% level:

- For the target firms: (-19), (-8), (-2), (-1), (4), (5), (9) and (11).
- For the acquirer firms: (-19), (-18), (-14), (-13), (-2), (6), (9), (19) and (23).

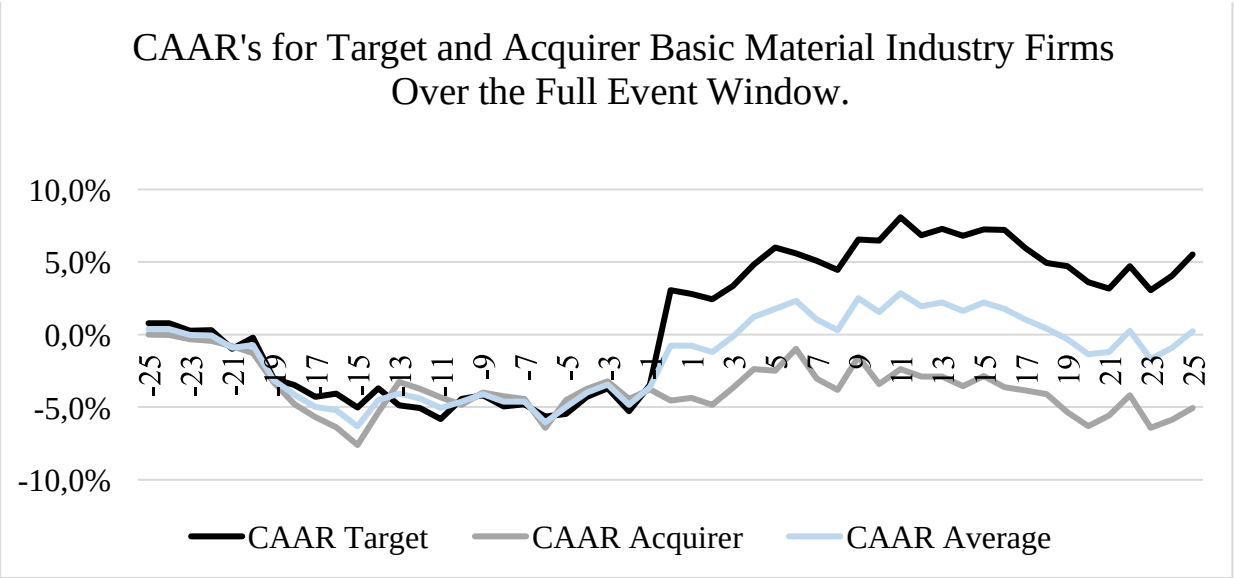

Figure 12: CAAR's for the Target and Acquirer Firms, Over the Full Event Window (25; +25), Within the Basic Material Industry.

The target firm mostly generates negative CAAR's from (-21; -1) and positive CAAR's henceforth. The acquirer firms generate negative CAAR's for the entire event window, except for day (-25). From day (0) onwards the target CAAR's outperform the acquirer CAAR's. The total CAAR for target and acquirer basic material industry firms, over the full event window (-25; +25) of 51 days is 5,51% and -5,06% respectively. Hence, the average CAAR's for target and acquirer firms is 0,97% and -3,74%. This is summarized below:

Table 12a: Target and Acquirer Firms CAAR's and ACAAR's Over the Entire Event Window.

	CAAR (-25; +25)	**ACAAR (-25; +25)**
Target	5,506%	0,966%
Acquirer	-5,057%	-3,740%

Additionally, a t-test is conducted to examine if there are any substantial variations in the targets and acquirer firms average CAAR's for window (-25; +25). A 95% confidence interval is employed. The test-statistic is 7,36, P-value is 0 and T-critical is 2,01. The value of the teststatistic 7,36 > t-critical of 2,01 and the P-value of 0 < 0.05 (the level of significance). Thus, there is substantial variation in the CAAR's generated by target firms and those generated by acquirer firms – at the 5% level of significance. Hence, within the basic materials industry,

target firms outperform acquirer firms with respect to average CAAR's generated over (-25; +25).

5.7.4. INDUSTRIAL

Table 13: Target and Acquirer Firms AAR's, Test Statistic, Significance and the CAAR's Over the Full Event Window (-25; 25) – for the Basic Materials Industry.

Days	AAR	CAAR Target	AAR	CAAR Acquirer
-25	3,408%	3,408%	0,183%	0,183%
-24	-2,569%	0,839%	0,255%	0,438%
-23	2,011%	2,851%	1,249%***	1,688%
-22	3,554%	6,405%	0,435%	2,122%
-21	5,552%	11,957%	-0,045%	2,077%
-20	8,958%	20,915%	2,908%	4,985%
-19	-8,102%	12,812%	1,410%	6,396%
-18	0,843%	13,655%	-0,536%	5,859%
-17	1,645%	15,300%	0,189%	6,049%
-16	4,193%	19,492%	-2,077%***	3,972%
-15	4,945%	24,437%	-0,090%	3,882%
-14	5,064%	29,501%	1,038%	4,919%
-13	-3,467%	26,034%	2,658%	7,578%
-12	-2,832%	23,202%	-1,157%	6,420%
-11	1,804%	25,006%	-0,237%	6,183%
-10	-5,899%	19,107%	-0,370%	5,813%
-9	0,406%	19,513%	0,286%	6,099%
-8	-1,633%	17,880%	2,262%	8,361%
-7	3,813%	21,693%	0,147%	8,508%
-6	-1,916%	19,776%	-0,483%	8,025%
-5	0,215%	19,991%	-1,817%	6,208%
-4	-1,648%	18,344%	0,275%	6,483%
-3	1,490%	19,834%	0,463%	6,946%
-2	2,578%	22,412%	0,048%	6,994%
-1	2,362%	24,774%	0,672%	7,666%
0	7,173%	31,947%	0,204%	7,870%

1	-2,645%	29,302%	-1,209%	6,661%
2	4,194%	33,497%	-0,593%	6,068%
3	0,564%***	34,061%	-0,534%	5,534%
4	-4,356%	29,705%	0,188%	5,722%
5	0,983%	30,688%	-0,181%	5,542%
6	0,982%	31,669%	1,543%	7,085%
7	-0,584%	31,085%	1,144%	8,229%
8	0,157%	31,242%	-0,547%	7,683%
9	-0,396%	30,846%	0,528%	8,211%
10	1,367%	32,213%	0,274%	8,484%
11	0,174%	32,387%	0,060%	8,544%
12	-0,094%	32,293%	-1,884%	6,660%
13	0,496%	32,789%	0,358%	7,018%
14	-0,438%	32,351%	-0,261%	6,757%
15	0,163%	32,514%	-0,218%	6,539%
16	-1,055%	31,459%	0,018%	6,557%
17	0,745%	32,204%	0,304%	6,861%
18	0,187%	32,391%	0,283%	7,145%
19	0,378%	32,769%	0,424%	7,569%
20	1,687%	34,456%	1,477%	9,046%
21	0,076%	34,531%	-0,973%	8,073%
22	-0,408%	34,123%	0,636%	8,709%
23	0,216%	34,340%	0,171%	8,879%
24	-0,253%	34,087%	-0,593%	8,286%
25	-1,387%	32,700%	0,334%	8,620%

*Significant at the 10% level **Significant at the 5% level

***Significant at the 1% level

Table 13 above, shows the AAR's, and CAAR's for the target and acquirer firms – that fall in the basic consumer industry – over the full event window of (-25; 25). The AAR's significance

is tested at the 1%,5% and 10% level. The results show that AAR's generated on the following days are statistically significant at the 1% level:

- The target companies: (-3); and
- The acquirer companies: (23), (16).

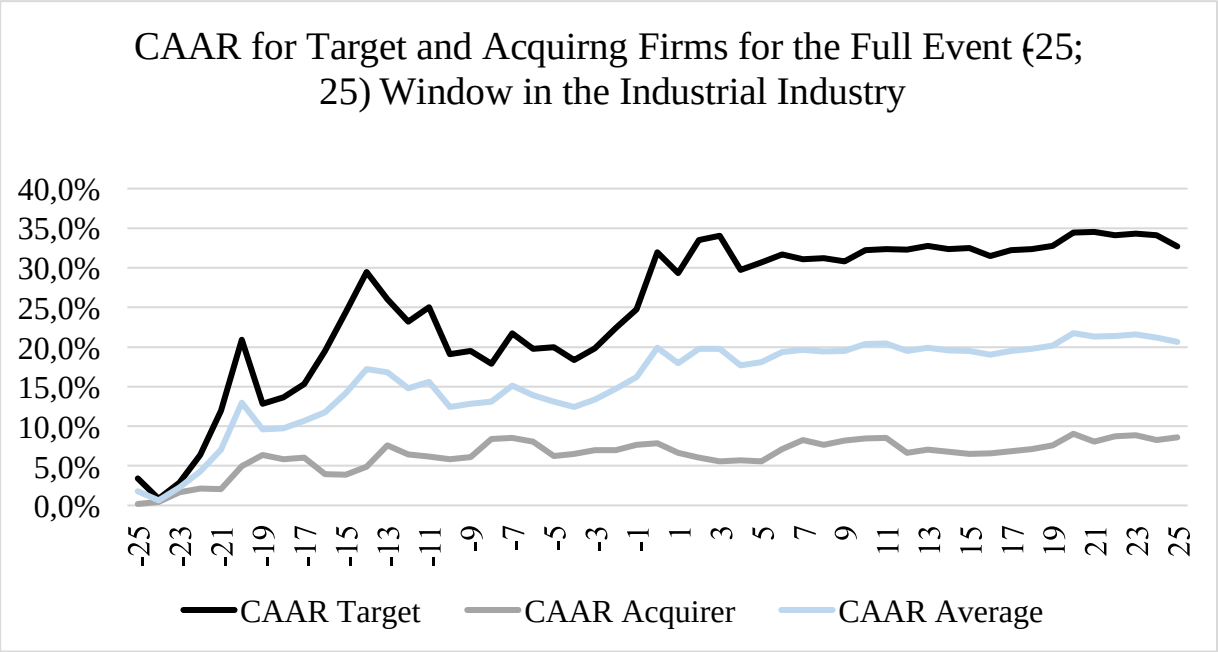

Figure 13: CAAR's for the Target and Acquirer Firms, Over the Full Event Window (25; +25) – Within the Industrial Industry.

From Table 13 and Figure 13 it is seen that the target firms generate positive CAAR's for the full window (-25; +25). The acquiring firms also generate positive CAAR's for the full window (-25; +25). Furthermore, the target and acquiring firms CAAR's hit a minimum and maximum of 0,84% and 34,53% and 0,18% and 9,05% respectively. The total CAAR, for target and acquirer industrial mergers (over the full event window (-25; +25) of 51 days) is 32,70% and 8,62% respectively. Hence, the average CAAR for target and acquirer firms is 25,11% and 6,4% respectively.

Additionally, a t-test is conducted to examine if there are any substantial variations in the targets and acquirer firms average CAAR's for window (-25; +25). A 95% confidence interval is employed. The test-statistic is 17,3, P-value is 0 and T-critical is 2,01. The value of the t-stat 17,3 > T-critical of 2,01 and the P-value of 0 < 0.05 (the level of significance), thus there is substantial variation in the CAAR's generated by target firms and those generated by acquirer

firms – at the 5% level of significance. Hence, within the industrial industry, target firms outperform acquirer firms with respect to CAAR's generated over the full period. Please see Table 14 for a summary of all industry CAAR's, Outperformance, T-Statistics, P-values, and T-critical values.

Table 14: Target and Acquirer Firms CAAR's Over the Full Event Window.

Industry	**CAAR Target (-25; +25)**	**CAAR Acquirer (-25; +25)**
Financial	8,981%**	3,596%**
Consumer, Non-cyclical and Cyclical	16,671%**	1,762%**
Basic Materials	5,506%**	-5,057%**
Industrial	32,700%**	8,620%**

**Significant at the 5% level

Table 15: A One-way ANOVA Model for the Four Industry Groups

Groups	***Count***	***Sum***	***Average***	***Variance***		
Financial	51	1,711	3,35%	0,001		
Consumer	51	2,473	4,85%	0,001		
Basic Material	51	-0,787	-1,54%	0,001		
Industrial	51	8,035	15,75%	0,003		
ANOVA						
Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F critical***
Between Groups	0,815	3	0,272	210,349	0	2,650
Within Groups	0,258	200	0,001			
Total	1,073	203				

From Table 15, a one-way ANOVA-model is conducted to analyse if there are any substantial variations between the four industries average CAAR's. A 95% confidence interval is used. The P-value is 0. Thus, the P-value of 0. < 0.05 (the level of significance), therefore there is substantial variation between the average CAAR's generated by the four different industries – at the 5% level of significance. The means for the financial, consumer, basic materials and industrial industry mergers are: 3,35%, 4,85%, -1,54% and 15,75% respectively. Thus, it is observed that industrial M&A's performed the best, followed by the consumer M&A's, then financial M&A's and lastly the basic materials M&A's. Hence, the fifth hypothesis that states the average CAAR's for target and acquirer industry mergers is the same is rejected for the window period assessed.

5.8. SUMMARY

Section 5 analyses the results of this study. The first hypothesis that posits that the announcement of M&A's doesn't impact equity holder value of the target and acquiring firms, is rejected for both target and acquirers who are both seen to generate positive CAAR's for the following windows periods – bar the acquirer CAAR's over (-25; +25):

- (-25; +25);
- (-10; +10); and
- (-5; +5)

Over all the window periods considered above; the target outperforms the acquiring companies with regards to CAAR's.

The second hypothesis which states that the CAAR's (for target and acquiring companies) pre- and post-announcement are equal is rejected. Furthermore, from the paired t-test it is observed that the variation in pre and post yields for the target and the acquirer firms, is significantly different and hence rejected for the following window periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

The target firms outperform the acquirer firms over all the windows considered above in terms of CAAR's and hence average CAAR's. Furthermore, the majority of gains accrued to the target firm in pre-announcement period and for the acquirer firms in the post-announcement period.

The third hypothesis suggests that the CAAR's for target and acquiring firms are equal, when cash and stock payments are employed as funding methods. From the paired t-test it is observed that the difference between cash and stock funding for the target and the acquirer firms is significantly different, and hence rejected for the following window periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

The target firms outperform their acquirer counterparts over all the windows considered for both cash and stock acquisitions.

The fourth hypothesis states that the CAAR's obtained by target companies are equal to the CAAR's obtained by acquirer companies. From a paired t-test it is seen that the difference between target and acquirer CAAR's is significantly different and hence rejected for the following window periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

The fifth states: the CAAR's obtained by firms engaging in merger activity (in different industries) is equal for both target and acquirer firms. It is observed that for all four industries considered, the target firms outperform acquirer firms. This is found to be significant at the 5% level.

Moreover, a one-way ANOVA test is conducted to assess whether any industry mergers significantly outperform. It is found that there is a significant difference between all the industries. Hence, industrial M&A's performed the best, followed by the consumer M&A's, then financial M&A's and lastly the basic material M&A's. Thus, the fifth hypothesis that states the average CAAR's for target and acquirer industry companies is the same is rejected pre- and post-merger.

5.9. ROBUSTNESS RESULTS

This section shows the robustness findings obtained when applying the net market returns model as opposed to the market model. Please note that all tables and graphs for this section can be found in the appendix.

In relation to hypothesis 1, the target firms CAAR's over the full event is 13,48%. The CAAR for the target firms for event windows: (-10; +10) and (-5; +5) is 9,58% and 8,08% respectively. Furthermore, the acquirer firms CAAR over the full event is 0,98%. The CAAR for the acquirer firms for event windows of: (-10; +10) and (-5; +5) is 1,97% and 1,94% respectively.

The results are identical to those found with the market model. Hence, for the target and acquirer firm we reject the null hypothesis which suggest that that the announcements of M&A's do not affect stockholder value of the target and acquiring companies that engaged in merger deals, for the following windows:

- (-25; +25); • (-10; +10); and
- (-5; +5).

Where the majority of the returns amass to the target companies and only slightly positive gains accumulate to acquirer companies.

Further, in relation to hypothesis 2, for the target firms, the mean CAAR for the pre announcement period is 3,16%. The average CAAR for the post announcement period is 13,48%. Hence, the pre-announcement period has much lower average CAAR's (3,16%.) when compared to post-announcement period (13,48%).

The acquirer firms mean target CAAR, for the pre-announcement period, is -0,41%. The average CAAR for the post announcement period is -1,65%. Hence, the pre-announcement period has much higher average CAAR's (-0,41%.) when compared to post-announcement period (-1,65%). A t-test was conducted to examine if there are substantial variations in the CAAR's pre- and post-announcement for the target firms. Using a 95% confidence interval, the following windows are tested:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

The results found that the difference between pre and post CAAR's for target and acquirer firms is significant over the windows (-25; +25) and (-10; +10) for both the target and acquiring firms. However over window (-5; +5) significance is only present for the target and not the acquirer. Thus, the null hypothesis that the average target and acquiring firms

CAAR's, pre and post announcement, are equal is rejected at the following periods for both the target and acquirer firms:

- (-25; +25); and
- (-10; +10);

And over window (-5; +5) for the target firm only. Additionally, the majority of the returns amass to the target companies and zero-negative gains accumulate to the acquirer firms

The third hypothesis looks at the different methods of payment (cash or stock) and the subsequent effects on merger deals for the target and acquirer firms. The CAAR for the target companies over the full event windows for cash and stock is 18,53% and 7,45% respectively. Hence, the means of the cash and stock CAAR's over the full event window (for the target firms) are 11,31% and 4,69% respectively. Additionally, the CAAR's for the targets cash and stock deals over: (-10; +10) and (-5; +5) is shown below:

Table 15.1: Target Firms Cash and Stock CAAR's Over the Defined Event Windows

CAAR	**(-10; +10)**	**(-5; +5)**
Cash	12,865%**	11,673%**
Stock	6,680%**	5,305%**

**Significant at the 5% level

Further, the CAAR for the target companies over the full event windows for cash and stock is 2,19% and 0,3% respectively. The means of the cash and stock CAAR's over the full event window (for the acquirer firms) are 2,78% and -1,32% respectively. The CAAR's for the target for cash and stock over: (-10; +10) and (-5; +5) is shown below:

Table 15.2: Acquirer Firms Cash and Stock CAAR's Over the Defined Event Windows

CAAR	**(-10; +10)**	**(-5; +5)**
Cash	0,937%**	1,757%**
Stock	4,346%**	2,885%**

**Significant at the 5% level

Moreover, for periods (-25; +25), (-10; +10) and (-5; +5), a t-test was conducted to examine if there are any substantial variations in the target and acquirer firms CAAR's, owing to the two samples using dissimilar funding methods. A 95% confidence interval is used. The results found that at windows (-25; +25), (-10; +10) and (-5; +5) the difference between CAAR's

within the target and acquirer firms when different funding methods are used is significant at the 5% level. Thus, the null hypothesis that states the CAAR's for target and acquirer firms are equal when cash and stock payments are employed as funding methods is rejected at the following periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

The fourth hypothesis assesses the target and acquiring companies in terms of CAAR's. Furthermore, the target firms total CAAR for the full event window, pre announcement CAAR and post-announcement CAAR for target firms is 13,48%, 7,13% and 2,23% respectively. Furthermore, the CAAR for the target firms over windows: (-10; +10) and (-5; +5) is 9,42% and 7,90% respectively.

The total CAAR, pre-announcement CAAR and post-announcement CAAR for acquirer firms is 0,98%, 0,38% and 0,64% respectively. Furthermore, the CAAR for the acquirer firms over windows: (-10; +10) and (-5; +5) is: 1,97% and 1,94% respectively. Hence, the target and acquirer firms CAAR's and the t-tests results over dissimilar windows is summarized below.

Table 15.3: Target and Acquirer CAAR's Over the Defined Event Windows.

CAAR's	**(-25; +25)**	**(-10; +10)**	**(-5; +5)**	**(-25; -1)**	**(1; 25)**
Target	13,481%**	9,425%**	7,905%**	7,132%**	2,228%**
Acquirer	0,981%**	1,966%**	1,940%**	0,384%**	0,638%**

**significant at the 5% level.

Additionally, a t-test was conducted to examine if there are any substantial variations in the target and acquirer firms CAAR's over the following windows:

- (-25; +25)
- (-10; +10)
- (-5; +5)
- (-25; -1)
- (1; 25)

The results show that for all periods there is a significant difference found between the CAAR's generated by the target and those by the acquirer. Hence, the fourth hypothesis stating that the CAAR's generated by target and acquirer firms is equal is rejected at the following periods:

- (-25; +25)
- (-10; +10)
- (-5; +5)
- (-25; -1)
- (1; 25)

Furthermore, it is important to note that majority of the gains amass to the target firms, with minimal gains (oscillating around zero) amassing to the acquirer firms. These results are consistent with the market model results. However, the acquirer and target firms seem to perform slightly better when using net market return model and the market model respectively.

The fifth and final hypothesis deals with the different industries involved in M&A's and hence their performance when engaging in M&A deals. First the industry performance is analysed (with regards to target and acquirer performance). Then, paired t-tests and a one-way ANOVA model is conducted to determine the significance between the target and acquirer firms' mergers within industries and industry mergers as a whole.

Furthermore, the financial sector total CAAR for target and acquirer firms for window (-25; +25) is 10,23% and 0,03% respectively. Hence, the average CAAR for the target and acquiring companies is 5,88% and 0,77% respectively.

Within the consumer industry the total CAAR for target and acquiring firms for window (25; +25) is 16,11% and -3,29%, respectively. Hence, the average CAAR for target and acquiring companies is 10,24% and 0,13% respectively. Within the basic materials industry the total CAAR for target and acquiring firms for window (-25; +25) is 4,59% and 0,97%, respectively. Hence, the average CAAR for target and acquiring companies is 0,05% and 1,52% respectively. Within the industrial industry the total CAAR for target and acquiring firms for window (-25; +25) is 32,16% and 12,24%, respectively. Hence, the average CAAR for target and acquiring companies is 24,57% and 8,24% respectively.

A t-test is conducted to examine if there are substantial variations in the targets and acquirer firms average CAAR's – within each industry – over the full event window of 51 days. The results show that there is a significant difference between the CAAR's generated by target firms and those generated by acquirer firms within each industry – over the full event window. Furthermore, within each industry, the target firms significantly outperform the acquirer firms with respect to average CAAR's generated over the full event window.

A one-way ANOVA-model is calculated to determine if there are any substantial variations between the four industries average CAAR's, around the merger event. A 95% confidence interval is used. The P-value is 0, thus, the P-value of $0 < 0.05$ (the level of significance), therefore there is a significant difference between the average CAAR's generated by the four different industries. The means for the financial, consumer, basic materials and industrial industries are: 3,45%, 4,28%, -1,64% and 16,40% respectively. Thus, it is observed that the industrial mergers performed the best, followed by consumer mergers, then financial mergers and lastly basic materials mergers. Hence, the fifth hypothesis that states the average CAAR's generated by the target and acquiring companies in dissimilar industries is the same, is rejected at the window considered.

5.9.1 SUMMARY

The net market return model is employed to determine if the results obtained from employing the market model are robust. Overall, all the results obtained from the net market returns model are in line with those obtained from the market model barring:

- For hypothesis 2 the variation between the acquirer's pre and post CAAR's over window (-5; +5) is not found to be significant at the 5% level.

6. CONCLUSION AND RECOMMENDATIONS

6.1. INTRODUCTION

This chapter completes this research, by describing the conclusions derived from the study. Furthermore, potential future research to be done in congruence with this study is suggested.

6.2. CONCLUSION AND RECOMMENDATION

This study sought to provide an empirical understanding of the South African market's reaction to merger announcements. A full event window of 51 days is employed (-25; +25) using 87 merger deals and hence 87 JSE-listed target and acquirer firms. The merger announcements were made from the period 1990 to 2019.

In total, there are five main hypotheses that this research considered. The first hypothesis considered looks at whether the announcement of M&A's affect stockholder value. The null hypothesis that M&A announcement do not affect stockholder value is rejected at the following window periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

The second hypothesis looks at the pre- and post-announcement CAAR's for target and acquiring companies where the null is that the pre and post CAAR's are equal – for the target and acquirer firms. However, it is observed that the variation between pre and post returns, for target and acquiring companies, is significantly dissimilar and hence the second hypothesis is rejected at the following window periods:

- (-25; +25);
- (-10; +10); and
- And at (-5; +5) for the target firms and not acquirer firms

This is where the market model does not seem to be robust. Since the market model finds pre and post CAAR's significantly different for the acquirer firms over window period (-5; +5). However, the net market return model found the acquirer firms pre and post CAAR's to be insignificant over window period (-5; +5). Furthermore, it is seen that the majority of CAAR's amass to the target and acquiring firms in the pre-announcement and post-announcement periods, respectively. This shows there may have been a leakage of info pre-merger announcement and that the South African market may take time to fully incorporate the effect of a merger announcement.

The third hypothesis posits that the CAAR's for target and acquiring companies are equal, when cash and stock payments are employed as funding methods. From the paired t-test it is observed that the difference between cash and stock funding for the target and the acquirer firms is significantly different and hence rejected for the following window periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

Furthermore, the target firms cash deals significantly outperform over all windows. Whereas the acquirer firm's deals significantly outperform with cash over the full window period and significantly outperform with stock over windows (-10; +10); and (-5; +5)

The fourth hypothesis states that the CAAR's obtained by the target companies are equal to the CAAR's obtained by the acquiring companies. From a t-test it is seen that the difference between target and acquiring CAAR's is significantly different and hence rejected for the following window periods:

- (-25; +25);
- (-10; +10); and
- (-5; +5)

Furthermore, it is important to note that majority of the gains accrue to the target firms, with minimal gains (oscillating around zero) accruing to the acquirer firms. Additionally, the acquirer and target firms seem to perform slightly better when using net market return model and the market model, respectively. However, the inferences made from the results remain the same.

The fifth hypothesis suggests: the CAAR's obtained by firms engaging in merger activity in different industries is equal – for both target and acquiring companies. It is observed that for all four industries considered, the target firms outperform the acquirer firms. This is found to be significant at the 5% level of significance.

Moreover, a one-way ANOVA test is conducted to assess whether any industry mergers significantly outperform. It is found that there is a significant difference between industry mergers. Hence, the industrial mergers performed the best, followed by consumer mergers, then financial mergers and lastly the basic material mergers. Thus, the fifth hypothesis that states the average CAAR's for target and acquiring industry mergers is the same is rejected at the following periods: (-25; +25).

Thus, with reference to the above, when engaging in a merger it is more profitable to be the target firm rather than the acquirer firm – the target firms significantly outperform their acquirer counterparts over all windows. It is also more profitable to be involved in cash deals for the

target companies and stock deals for acquiring companies. However, for the target firm the difference in returns when using cash or stock is much larger than their acquirer counterparts. Lastly, it is more profitable to be involved in industrial mergers, then the consumer mergers, following that is the financial mergers and lastly basic materials mergers.

In the field of M&A's there is a lot for a firm to consider, and hence prior to engaging in a merger a firm should thoroughly investigate and perform the necessary examinations to ensure that the firm gains the maximum benefit from the merger. Furthermore, from this research it is seen that, M&A can create economic value however there is a multitude of factors that must be considered.

Future researchers can expand on this study by:

- Increasing the sample period and hence sample size. This will increase the relative strength of the inferences that can be made.
- Including several different industries and using different industry classifications to gain a more comprehensive view of the way in which mergers are viewed within different industries and hence industry classifications.
- Looking at the target and acquiring firm's returns within the post event window, this provides a holistic view with regards to target and acquirer companies performance in the longer-run.
- Using different methods – bar the market model and net market returns model – to compute the expected returns for target and acquiring companies.
- Looking at the different types of mergers such as horizontal and vertical and observe whether either outperform and hence whether vertical mergers may be used as an operational hedge.
- Looking at regulatory/judicial changes and the subsequent effects on M&A performance
- Looking at the number of bidders and the subsequent effects on M&A performance.
- Looking at the approach that the bidders take (hostile or friendly) and the subsequent effects on M&A performance.
- Looking at the frequency with which firms acquire and the subsequent effects on M&A performance.

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7. APPENDIX

7.1. TARGET

Table 16 Target Firms AARs, AAR Significance and CAARs for the Entire Event Window.

Day	AAR	CAAR Target
-25	0,372%	0,372%
-24	-0,340%	0,032%
-23	-0,010%	0,022%
-22	0,541%	0,563%
-21	0,545%	1,108%
-20	1,069%***	2,177%
-19	-0,202%	1,975%
-18	0,040%	2,015%
-17	-0,041%	1,974%
-16	0,273%	2,246%
-15	0,240%	2,486%
-14	0,283%	2,769%
-13	0,048%	2,817%
-12	0,400%	3,217%
-11	0,511%	3,728%
-10	-0,010%	3,718%
-9	0,574%	4,292%
-8	-0,166%	4,125%
-7	0,274%	4,399%
-6	0,217%	4,616%
-5	0,569%	5,185%
-4	0,150%	5,335%
-3	0,599%***	5,934%
-2	0,715%	6,649%
-1	0,483%	7,132%
0	4,120%***	11,252%
1	0,385%	11,637%
2	0,384%	12,021%
3	0,700%***	12,721%
4	-0,208%	12,513%
5	0,008%	12,521%

6	-0,386%	12,135%
7	0,656%	12,791%
8	-0,135%	12,656%
9	0,211%	12,867%
10	0,286%	13,153%
11	0,089%	13,242%
12	-0,020%	13,222%
13	0,294%	13,517%
14	-0,268%	13,248%
15	0,368%	13,616%
16	0,049%	13,665%
17	-0,207%	13,458%
18	-0,094%	13,365%
19	0,254%	13,619%
20	-0,279%	13,340%
21	-0,275%	13,065%
22	0,181%	13,245%
23	-0,134%	13,111%
24	0,310%	13,421%
25	0,059%	13,481%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 17: Target Firms Sample Statistics for AAR's Over the Entire Event Window (25; +25).

Mean	0,003
Standard Error	0,001
Median	0,002
Standard Deviation	0,006
Sample Variance	4,06E-05
Kurtosis	27,288

Skewness	4,557
Range	0,0451
Minimum	-0,004
Maximum	0,041
Sum	0,135
Count	51

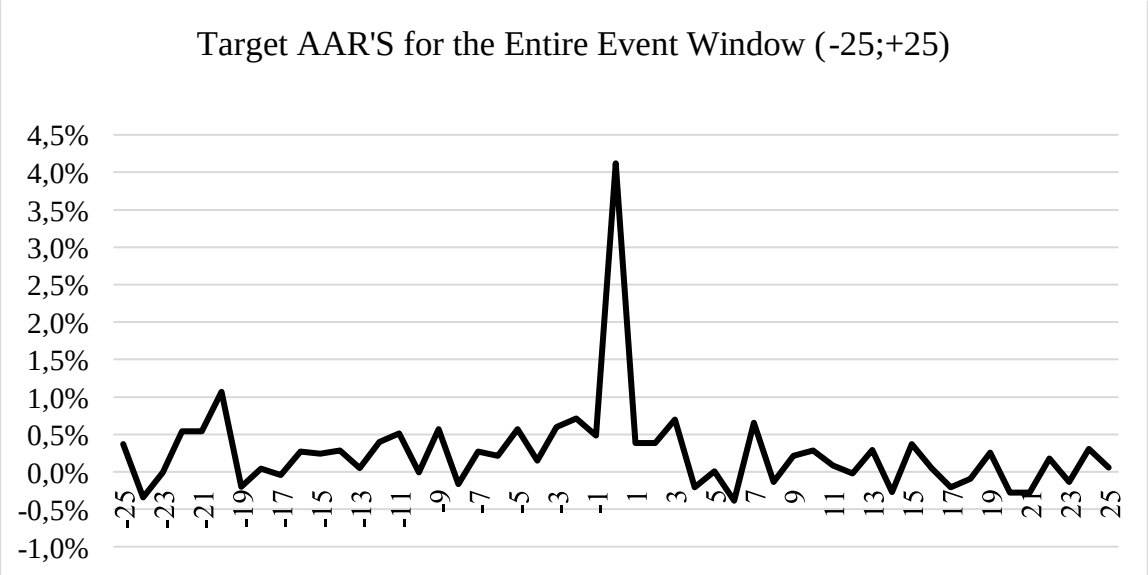

Figure 14: Target Firms AAR's for the Entire Event Window (-25; +25).

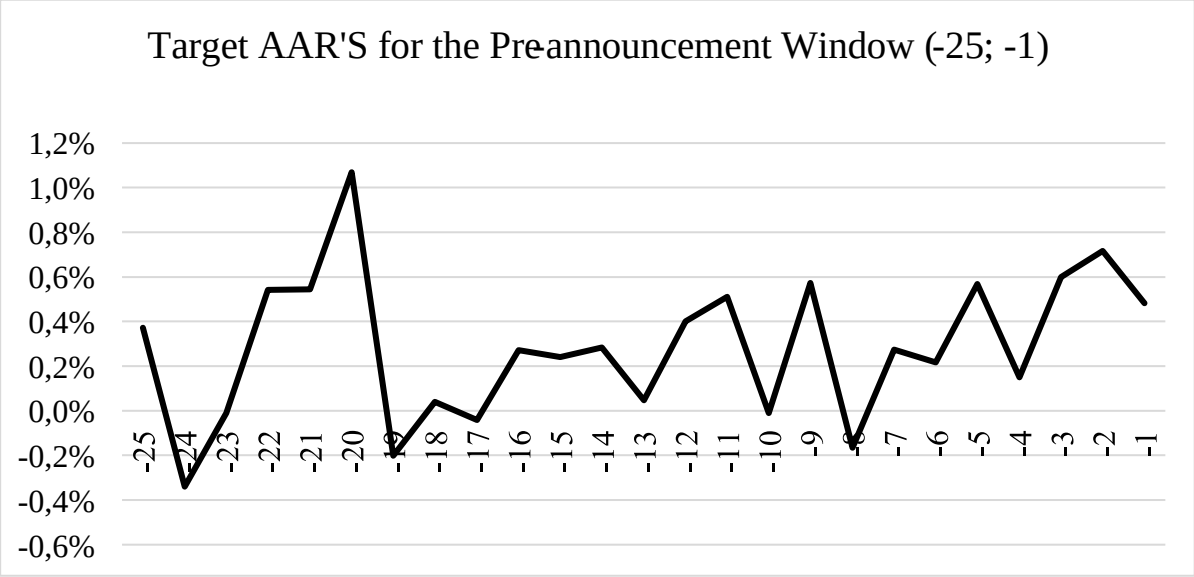

Figure 15: Target Firms AAR's for the Pre-announcement Period (-25; -1).

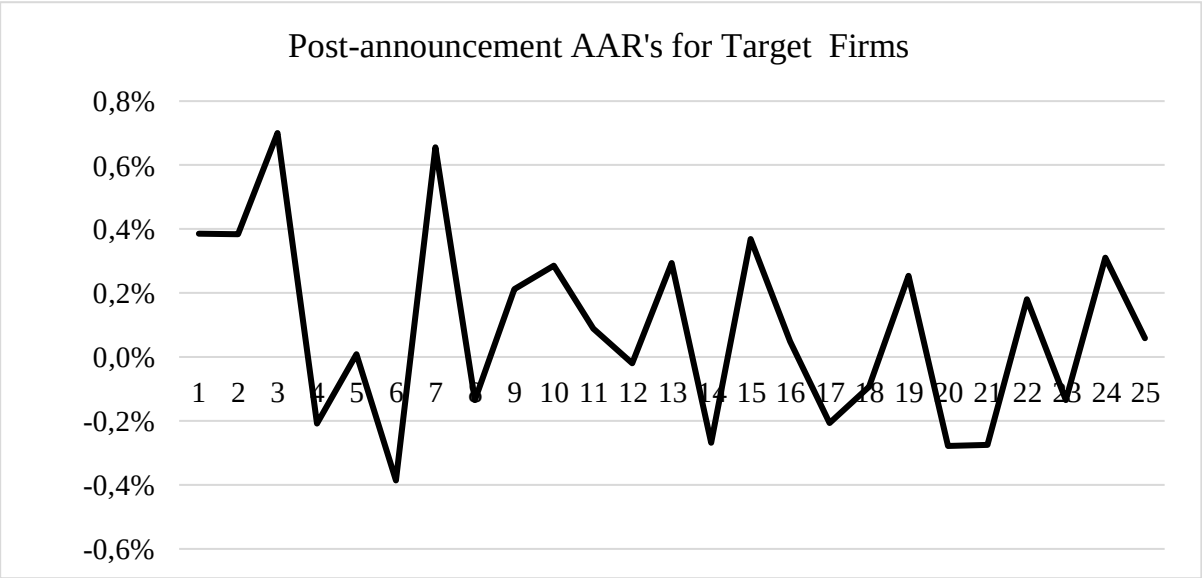

Figure 16: Target Firms AAR's for the Post-announcement Period (1; 25).

7.2. ACQUIRER

Table 18 Acquirer Firms AARs, AAR Significance and CAARs for the Entire Event Window

Day	AAR	CAAR Acquirer
-25	-0,954%***	-0,954%
-24	-0,200%	-1,154%
-23	0,284%	-0,870%
-22	0,093%	-0,777%
-21	0,141%	-0,635%
-20	-0,086%	-0,721%
-19	0,021%	-0,700%
-18	-0,308%	-1,009%
-17	-0,030%	-1,039%
-16	-0,223%	-1,262%
-15	0,239%	-1,023%
-14	0,365%	-0,657%
-13	0,361%***	-0,296%
-12	0,136%	-0,160%

-11	0,195%	0,036%
-10	0,138%	0,173%
-9	-0,138%	0,036%
-8	0,001%	0,037%
-7	-0,276%	-0,240%
-6	-0,039%	-0,279%
-5	0,444%***	0,166%
-4	-0,026%	0,139%
-3	0,218%	0,357%
-2	-0,119%	0,238%
-1	0,146%	0,384%
0	-0,041%	0,343%
1	-0,169%	0,173%
2	-0,001%	0,173%
3	0,634%***	0,806%
4	0,623%***	1,429%
5	0,232%	1,661%
6	0,114%	1,776%
7	-0,177%	1,599%
8	0,481%	2,079%
9	0,237%	2,316%
10	-0,315%	2,001%
11	0,334%	2,336%
12	0,216%	2,552%
13	-0,089%	2,463%
14	0,133%	2,596%
15	-0,257%	2,339%
16	-0,344%	1,994%
17	-0,193%	1,801%
18	0,081%	1,882%
19	-0,053%	1,830%
20	-0,388%***	1,442%

21	-0,208%	1,234%
22	0,085%	1,319%
23	-0,060%	1,259%
24	-0,137%	1,122%
25	-0,142%	0,981%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 19: Sample Statistics for AAR's over the entire event window (-25; +25) – for Acquirer Firms.

Mean	0,453
Standard Error	0,04
Median	0,438
Standard Deviation	0,285
Sample Variance	0,081
Kurtosis	-0,965
Skewness	0,254
Range	0,992
Minimum	0,004
Maximum	0,996
Sum	23,106
Count	51

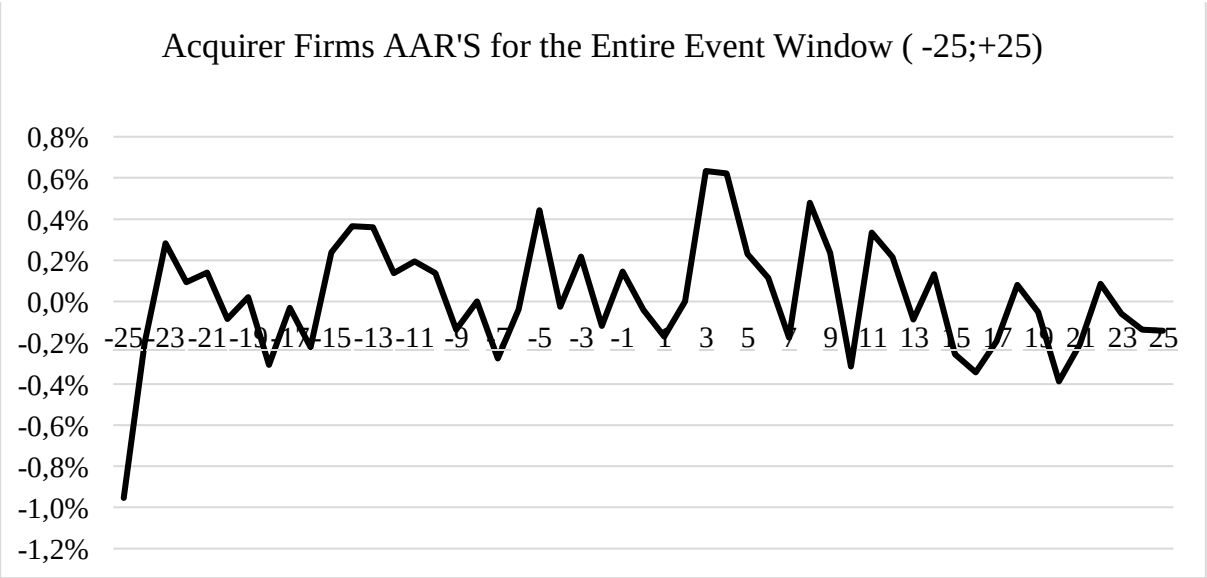

Figure 17: Acquirer Firms AAR's Over the Entire Event Window (-25; 25).

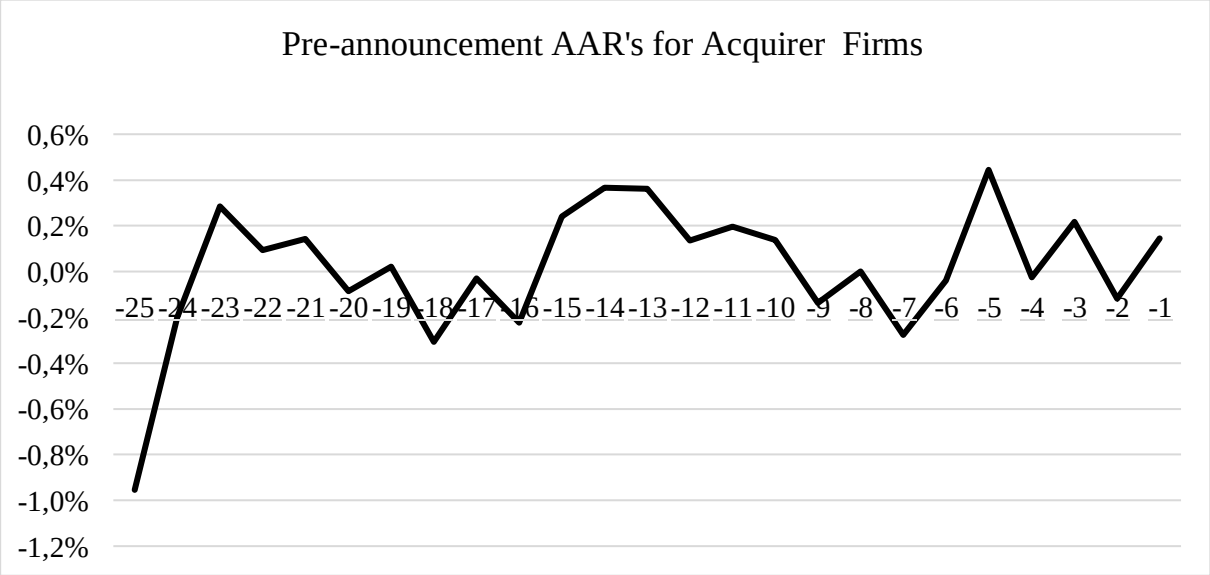

Figure 18: Acquirer Firms Pre-announcement period (-25; -1) AAR's.

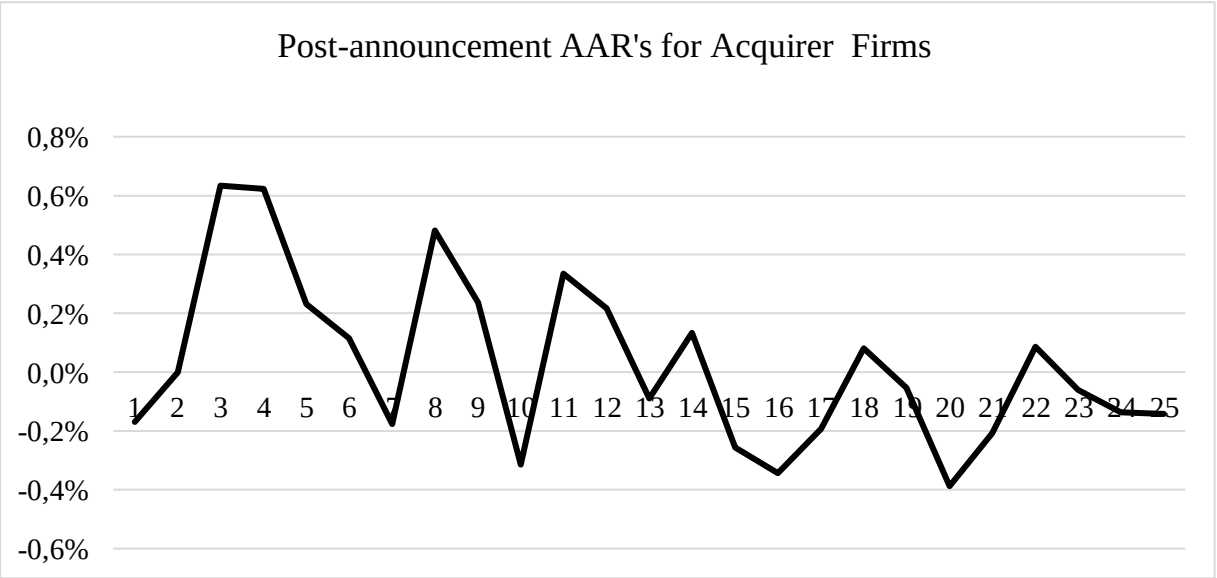

Figure 19: Acquirer Firms Post-announcement period (1; 25) AAR's

8.3. TARGET

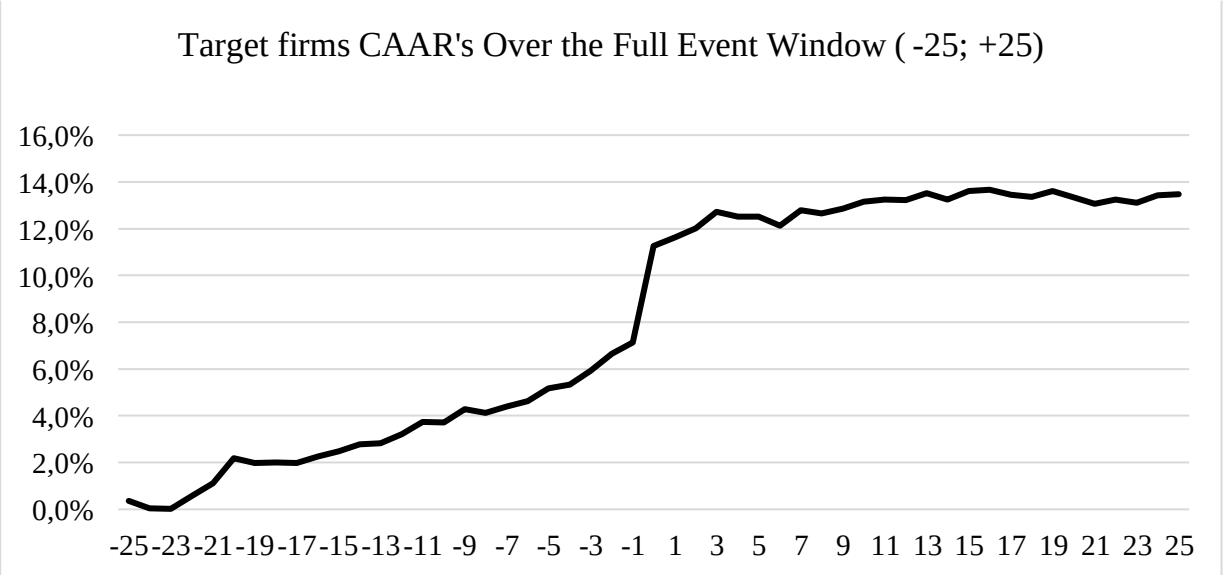

Figure 20: Target Firms CAAR's for the Entire Event Window (-25; +25).

8.4. ACQUIRER

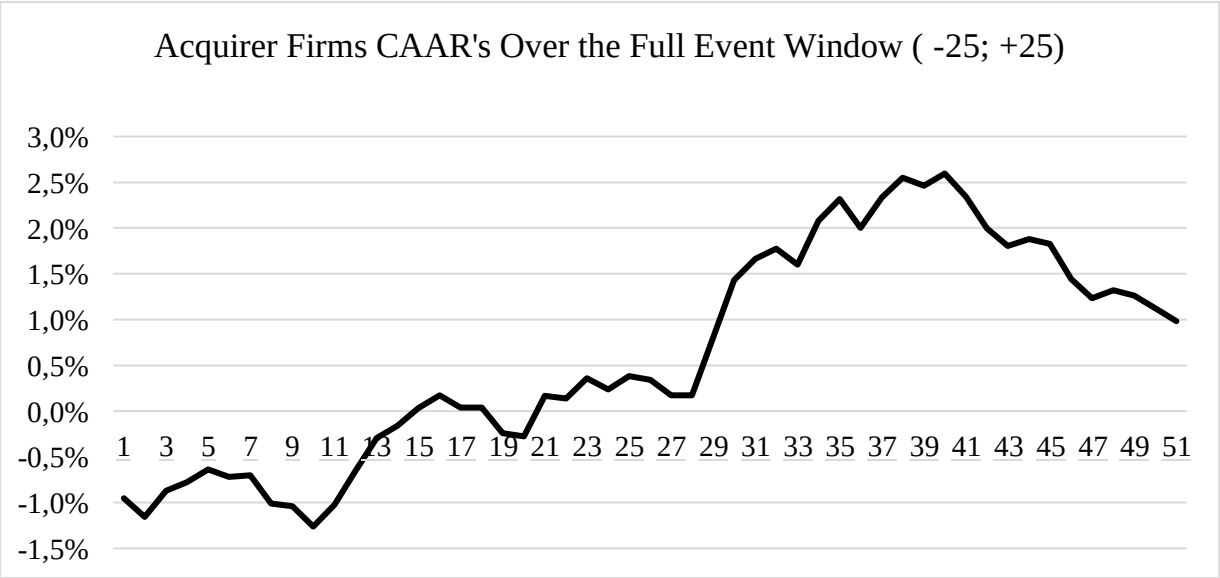

Figure 21: Acquirer Firms CAAR's for the Entire Event Window (-25; +25).

Table 20: Target and Acquirer CAAR's Over Different Event Windows:

CAAR's	**(-25; +25)**	**(-10; +10)**	**(-5; +5)**
Target	13,481%	9,425%	7,900%
Acquirer	0,980%	1,966%	1,940%

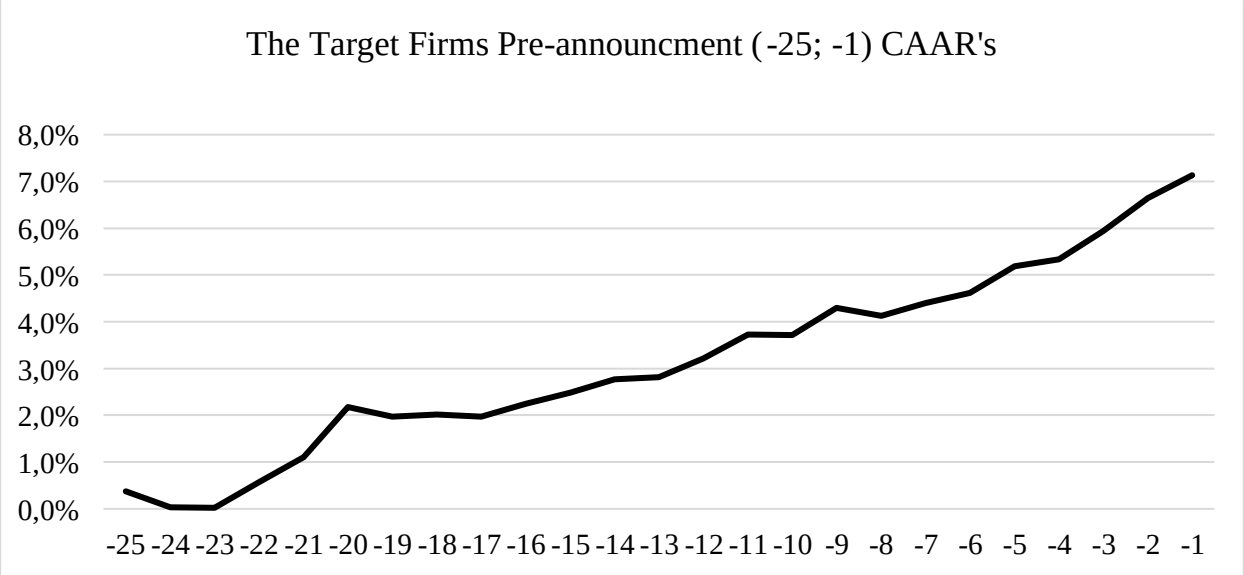

Figure 22: Target Firms Pre-announcement (-25; -1) CAAR's.

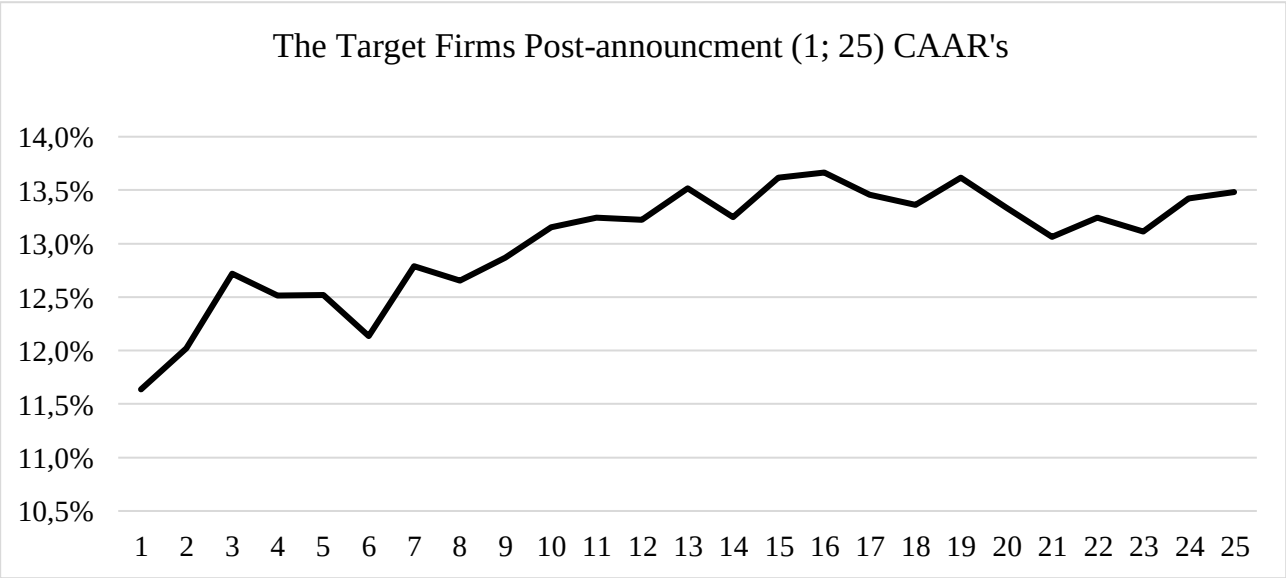

Figure 23: The Target Firms Post-announcement (1; 25) CAAR's.

Table 21: A Summary of the Targets Firms CAAR's Over Different Windows

CAAR	**(-10; +10)**	**(-5; +5)**
Pre-announcement	3,404%**	2,516%**
Postannouncement	9,425%**	7,905%**
Average CAAR	5,208%	4,740%

** Significant at the 5% level.

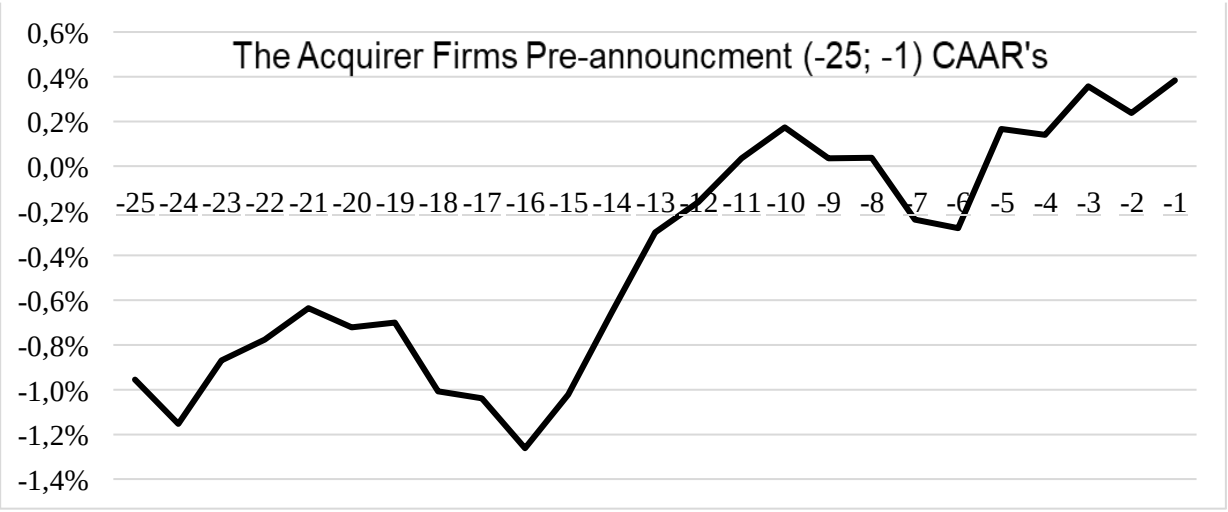

Figure 24: The Acquirer Firms Pre-announcement CAAR's for JSE listed firms from 1990 to 2019.

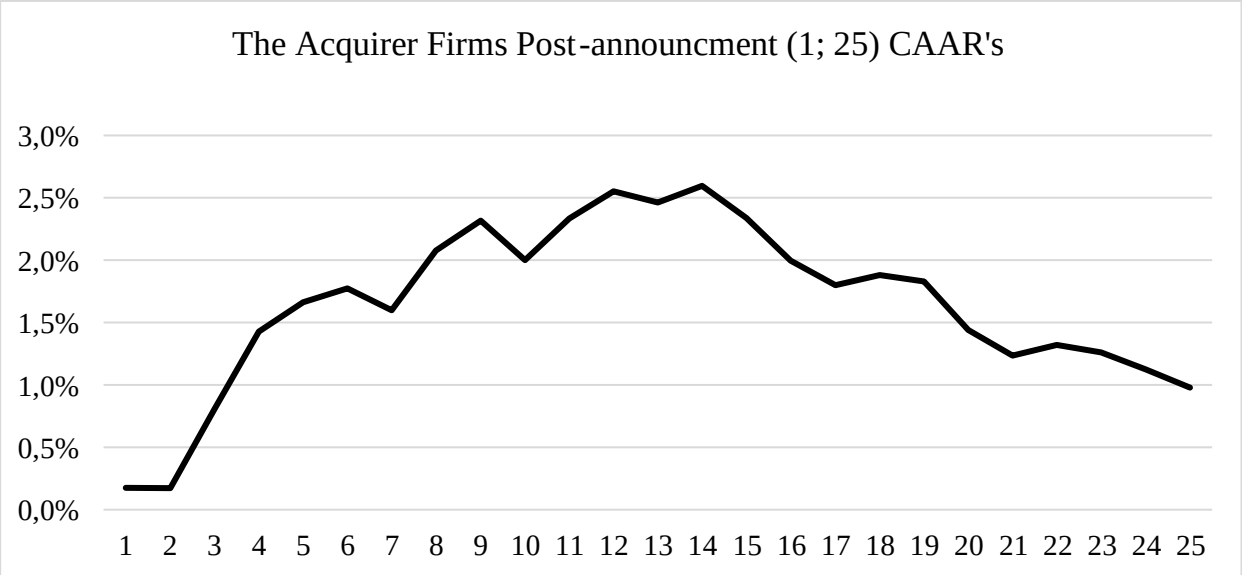

Figure 25: The Acquirer Firms Post-announcement CAAR's.

Table 22: Summary of the Acquirer Firms CAAR's Over Different Windows

CAAR	**(-10; +10)**	**(-5; +5)**
Pre-announcement	0,054%**	0,614%
Post-announcement	1,261%**	1,781%
Average CAAR	0,338%	0,752%

** Significant at the 5% level.

8.5. TARGET

Table 23: Target Firms' AAR's, T-test, Significance and CAAR's for Cash Versus Share Funded Deals.

Day	**AAR**	**CAAR Cash**	**AAR**	**CAAR Stock**
-25	0,374%	0,374%	0,019%	0,019%
-24	-0,087%	0,287%	-0,538%	-0,519%
-23	-0,300%	-0,012%	0,237%	-0,282%
-22	1,330%	1,318%	-0,261%	-0,543%
-21	0,573%	1,891%	1,101%	0,558%
-20	1,008%***	2,900%	0,945%	1,503%
-19	1,413%***	4,312%	-2,663%***	-1,160%
-18	-0,455%	3,857%	0,337%	-0,823%

-17	0,096%	3,954%	-0,053%	-0,876%
-16	-0,006%	3,947%	0,598%	-0,278%
-15	1,028%	4,975%	-0,556%	-0,834%
-14	-1,334%***	3,641%	0,838%	0,004%
-13	0,134%	3,775%	0,382%	0,386%
-12	0,903%	4,678%	-0,049%	0,337%
-11	-0,061%	4,617%	0,905%	1,242%
-10	-0,241%	4,376%	0,348%	1,590%
-9	0,928%	5,303%	0,354%	1,945%
-8	-0,644%	4,660%	-0,314%	1,631%
-7	-0,252%	4,407%	0,891%	2,521%
-6	0,836%	5,244%	-0,674%	1,847%
-5	1,309%	6,553%	0,159%	2,006%
-4	0,255%	6,808%	0,620%	2,627%
-3	0,434%	7,241%	0,588%***	3,215%
-2	1,154%	8,395%	0,198%	3,413%
-1	1,391%	9,786%	-0,334%	3,079%
0	6,743%	16,529%	2,613%	5,691%
1	0,222%	16,751%	0,017%	5,708%
2	-0,071%	16,679%	0,458%	6,166%
3	0,591%	17,270%	0,888%***	7,054%
4	-0,344%	16,926%	-0,263%	6,791%
5	-0,009%	16,917%	0,361%	7,152%
6	-0,052%	16,864%	-1,017%	6,135%
7	-0,284%	16,580%	1,753%	7,888%
8	0,055%	16,634%	-0,227%	7,661%
9	0,428%	17,063%	0,179%	7,840%
10	0,418%	17,481%	0,082%	7,923%
11	-0,059%	17,422%	0,237%	8,160%
12	-0,004%	17,418%	-0,008%	8,152%
13	0,894%	18,311%	-0,224%	7,928%
14	-0,209%	18,103%	-0,482%	7,446%

15	-0,017%	18,086%	0,933%	8,379%
16	0,288%	18,374%	0,065%	8,444%
17	-0,078%	18,296%	-0,730%***	7,714%
18	-0,341%	17,955%	-0,205%	7,509%
19	0,344%	18,299%	0,278%	7,787%
20	0,253%	18,552%	-0,793%	6,994%
21	0,021%	18,573%	-0,745%	6,249%
22	-0,009%	18,564%	0,382%	6,631%
23	-0,025%	18,539%	-0,103%	6,528%
24	-0,014%	18,526%	0,898%***	7,425%
25	0,009%	18,534%	0,020%	7,446%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

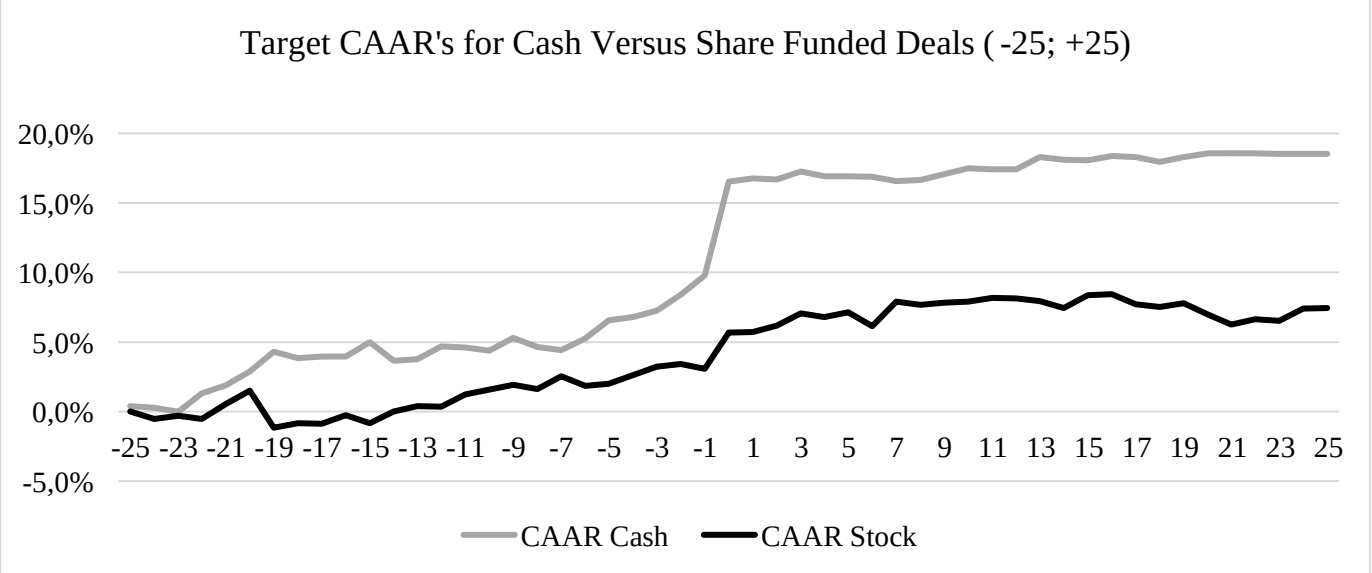

Figure 26: Total CAAR's Obtained by Targets Firms for Cash and Share Funded Deals

Table 24: Target Firms CAAR's for Cash and Share Funded Mergers.

CAAR	**(-10; +10)**	**(-5; +5)**
Cash	7,215%**	7,470%**

Stock	3,514%**	2,962%**

** significant at the 5% level.

Table 25: t test and Statistics for Target Firms CAAR's and their Corresponding Sources of Funding (Cash or Equity).

	CAAR Cash	*CAAR Stock*
Mean	11,108%	4,145%
Variance	0,486%	0,116%
Observations	51	51
Pearson Correlation	0,964	
Hypothesized Mean Difference	0	
Df	50	
t Stat	13,10	
P(T<=t) one-tail	0	
t Critical one-tail	1,676	
P(T<=t) two-tail	0	
t Critical two-tail	2,009	

8.6. ACQUIRER

Table 26: Acquirer Firms' AAR's, T-test, Significance and CAAR's for Cash Versus Share Funded Deals.

Day	AAR	CAAR Cash	AAR	CAAR Stock
-25	-0,174%	-0,174%	-1,938%***	-1,938%
-24	0,015%	-0,159%	-0,382%	-2,321%
-23	0,479%	0,320%	0,040%	-2,281%
-22	0,180%	0,500%	0,088%	-2,193%
-21	0,412%	0,912%	0,081%	-2,112%
-20	-0,163%	0,749%	0,042%	-2,070%
-19	0,340%	1,088%	-0,384%	-2,454%
-18	-0,039%	1,050%	-0,892%***	-3,346%

-17	-0,029%	1,020%	-0,109%	-3,455%
-16	0,084%	1,105%	-0,654%***	-4,109%
-15	0,483%	1,587%	-0,138%	-4,247%
-14	-0,251%	1,336%	0,869%***	-3,378%
-13	0,775%***	2,111%	0,016%	-3,363%
-12	0,343%	2,454%	0,086%	-3,277%
-11	0,261%	2,715%	0,235%	-3,041%
-10	0,308%	3,024%	-0,151%	-3,192%
-9	-0,128%	2,895%	-0,281%	-3,473%
-8	-0,089%	2,806%	0,224%	-3,249%
-7	-0,335%	2,471%	0,075%	-3,174%
-6	0,192%	2,663%	-0,174%	-3,347%
-5	0,402%	3,065%	0,865%***	-2,482%
-4	-0,299%	2,766%	0,264%	-2,218%
-3	-0,202%	2,564%	0,398%	-1,819%
-2	0,328%	2,892%	-0,468%	-2,287%
-1	0,130%	3,022%	-0,009%	-2,296%
0	0,139%	3,161%	0,176%	-2,120%
1	-0,214%	2,947%	0,108%	-2,012%
2	0,280%	3,226%	-0,132%	-2,143%
3	0,475%	3,702%	0,569%	-1,574%
4	0,363%	4,064%	0,768%***	-0,806%
5	0,356%	4,420%	0,343%	-0,463%
6	-0,479%	3,940%	0,728%***	0,266%
7	-0,226%	3,714%	-0,207%	0,059%
8	0,180%	3,894%	1,145%	1,204%
9	0,234%	4,128%	0,444%	1,648%
10	-0,476%	3,652%	-0,344%	1,304%
11	0,514%	4,166%	0,105%	1,410%
12	0,838%	5,005%	-0,265%	1,144%
13	0,213%	5,218%	-0,249%	0,895%
14	0,131%	5,349%	-0,081%	0,814%

15	-0,417%	4,932%	-0,061%	0,753%
16	-0,564%	4,367%	-0,250%	0,503%
17	-0,617%	3,750%	-0,054%	0,450%
18	-0,054%	3,697%	0,305%	0,754%
19	-0,165%	3,532%	-0,184%	0,570%
20	-0,323%	3,208%	-0,774%***	-0,204%
21	-0,564%	2,644%	0,272%	0,068%
22	-0,264%	2,381%	0,613%	0,682%
23	0,629%***	3,010%	-0,682%***	0,000%
24	-0,473%***	2,537%	0,408%	0,408%
25	-0,343%	2,194%	-0,111%	0,297%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 27: Acquirer Firms CAAR's for Cash and Share Funded Mergers.

CAAR	**(-10; +10)**	**(-5; +5)**
Cash	0,937%**	1,757%**
Stock	4,346%**	2,885%**

** Significant at the 5% level.

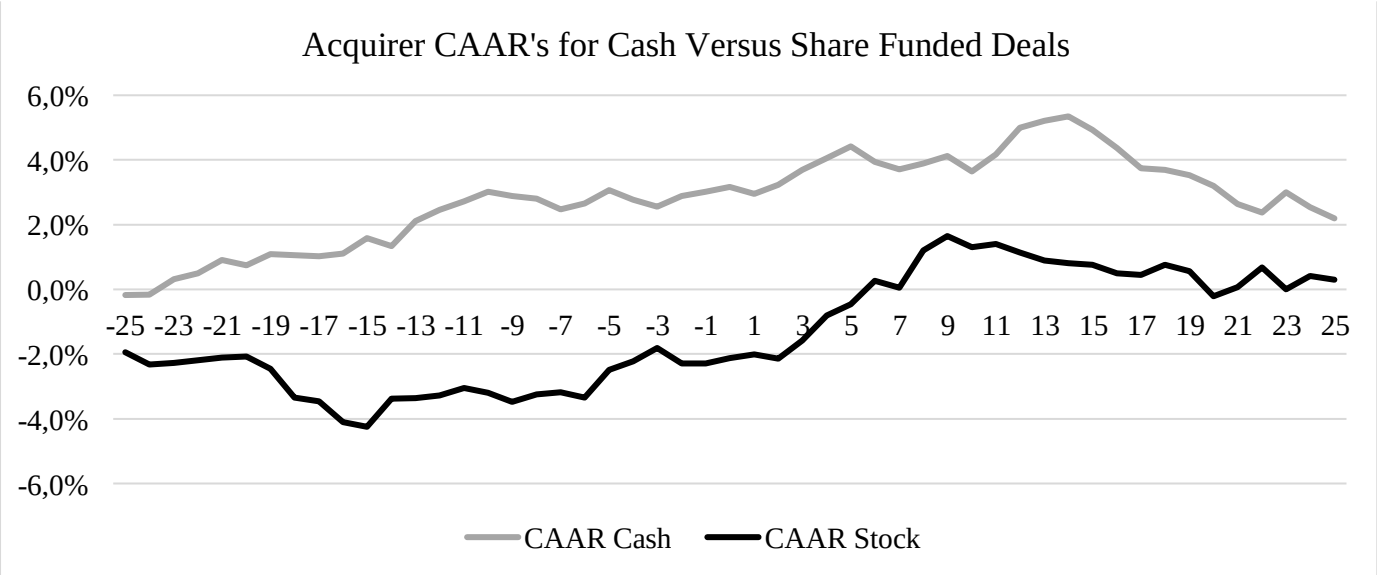

Figure 27: The Total CAAR's Obtained by Acquirer Firms for Cash and Share Funded Mergers.

Table 28: The CAAR's for the Target and Acquirer Firms Over the Full Event Window (-25; 25) for Cash VS Equity

CAAR	Target	Acquirer
Cash	18,534%	2,194%
Shares	7,446%	0,297%

Table 29: t test and Statistics for Acquirer Firms CAAR's and their Corresponding Sources of Funding (Cash or Equity).

	CAAR Cash	*CAAR Stock*
Mean	2,777%	-1,318%
Variance	0,019%	0,031%
Observations	51	51
Pearson Correlation	0,650	
Hypothesized Mean Difference	0	
Df	50	
t Stat	21,546	
P(T<=t) one-tail	0	
t Critical one-tail	1,676	
P(T<=t) two-tail	0	
t Critical two-tail	2,009	

8.7. TARGET

Table 30: Showing the AAR's, Test Stat, Significance and the CAAR's Over the Full Event Window (-25; 25) for the Target Firms.

Day	AAR'S	CAAR Target
-25	0,372%	0,372%
-24	-0,340%	0,032%
-23	-0,010%	0,022%
-22	0,541%	0,563%
-21	0,545%	1,108%
-20	1,069%***	2,177%

-19	-0,202%	1,975%
-18	0,040%	2,015%
-17	-0,041%	1,974%
-16	0,273%	2,246%
-15	0,240%	2,486%
-14	0,283%	2,769%
-13	0,048%	2,817%
-12	0,400%	3,217%
-11	0,511%	3,728%
-10	-0,010%	3,718%
-9	0,574%	4,292%
-8	-0,166%	4,125%
-7	0,274%	4,399%
-6	0,217%	4,616%
-5	0,569%	5,185%
-4	0,150%	5,335%
-3	0,599%***	5,934%
-2	0,715%	6,649%
-1	0,483%	7,132%
0	4,120%***	11,252%
1	0,385%	11,637%
2	0,384%	12,021%
3	0,700%***	12,721%
4	-0,208%	12,513%
5	0,008%	12,521%
6	-0,386%	12,135%
7	0,656%	12,791%
8	-0,135%	12,656%
9	0,211%	12,867%
10	0,286%	13,153%
11	0,089%	13,242%
12	-0,020%	13,222%
13	0,294%	13,517%
14	-0,268%	13,248%
15	0,368%	13,616%
16	0,049%	13,665%
17	-0,207%	13,458%
18	-0,094%	13,365%
19	0,254%	13,619%
20	-0,279%	13,340%
21	-0,275%	13,065%
22	0,181%	13,245%

23	-0,134%	13,111%
24	0,310%	13,421%
25	0,059%	13,481%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

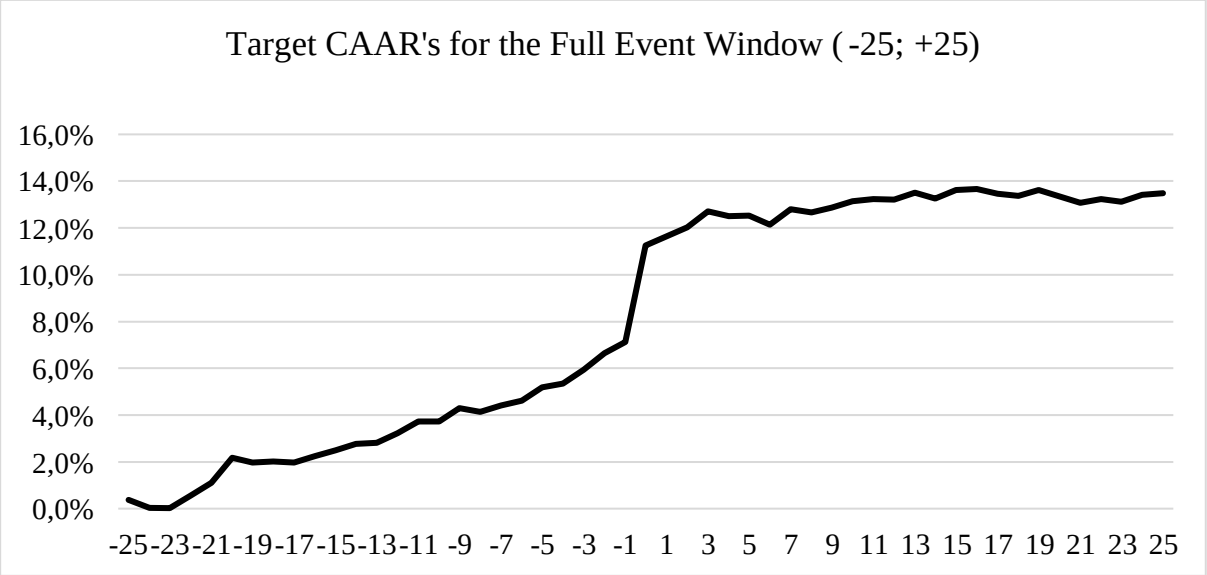

Figure 28: The Target firms CAAR's for the Full Event Window (-25; 25).

8.8. ACQUIRER

Table 31: Acquirer Firms AAR's, Test Statistic, Significance and the CAAR's Over the Full Event Window (-25; 25).

Day	AAR'S	CAAR Acquirer
-25	-0,954%***	-0,954%
-24	-0,200%	-1,154%
-23	0,284%	-0,870%
-22	0,093%	-0,777%
-21	0,141%	-0,635%
-20	-0,086%	-0,721%
-19	0,021%	-0,700%
-18	-0,308%	-1,009%
-17	-0,030%	-1,039%
-16	-0,223%	-1,262%

-15	0,239%	-1,023%
-14	0,365%	-0,657%
-13	0,361%***	-0,296%
-12	0,136%	-0,160%
-11	0,195%	0,036%
-10	0,138%	0,173%
-9	-0,138%	0,036%
-8	0,001%	0,037%
-7	-0,276%	-0,240%
-6	-0,039%	-0,279%
-5	0,444%***	0,166%
-4	-0,026%	0,139%
-3	0,218%	0,357%
-2	-0,119%	0,238%
-1	0,146%	0,384%
0	-0,041%	0,343%
1	-0,169%	0,173%
2	-0,001%	0,173%
3	0,634%***	0,806%
4	0,623%***	1,429%
5	0,232%	1,661%
6	0,114%	1,776%
7	-0,177%	1,599%
8	0,481%	2,079%
9	0,237%	2,316%
10	-0,315%	2,001%
11	0,334%	2,336%
12	0,216%	2,552%
13	-0,089%	2,463%
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17	-0,193%	1,801%
18	0,081%	1,882%
19	-0,053%	1,830%
20	-0,388%***	1,442%
21	-0,208%	1,234%
22	0,085%	1,319%
23	-0,060%	1,259%
24	-0,137%	1,122%
25	-0,142%	0,981%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

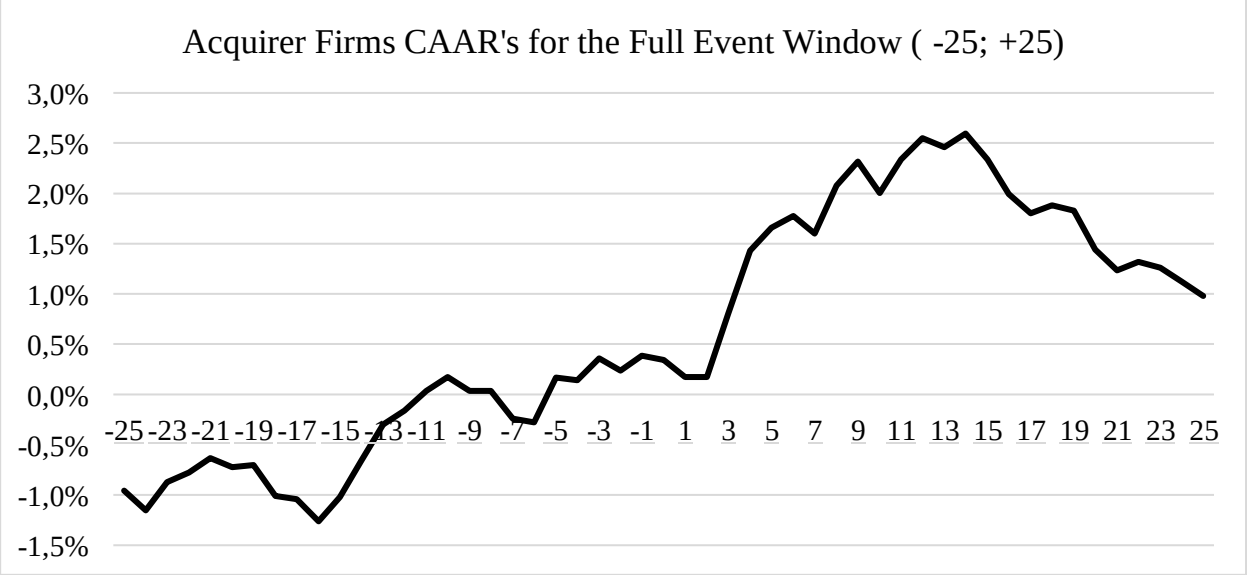

Figure 29: Acquirer firms CAAR's for the Full Event Window (-25; 25).

Table 32: T-test and Statistics for Acquirer and Target Firms CAAR's.

	CAAR TARGET	**CAAR ACQUIRER**
Mean	8,152%	0,614%
Variance	0,266%	0,014%
Observations	51	51
Pearson Correlation	0,9139	
Hypothesized Mean Difference	0	
Df	50	

t Stat	13,119	
P(T<=t) one-tail	4,10E-18	
t Critical one-tail	1,676	
P(T<=t) two-tail	8,19E-18	
t Critical two-tail	2,009	

Table 9: A Comparison Between Target and Acquirer CAAR's Over Different Windows Periods.

CAAR's	(-25; +25)	(-10; +10)	(-5; +5)	(-25; -1)	(1; 25)
Target	13,481%**	9,425%**	7,905%**	7,132%**	2,228%**
Acquirer	0,981%**	1,966%**	1,940%**	0,384%**	0,638%**

** Significant at the 5% level.

8.9. FINANCIAL

Table 33: AAR's, Test Statistic, Significance and the CAAR's Over the Full Event Window (-25; 25) for Target and Acquirer Firms in the Finance Industry.

Day	AAR'S	CAAR Target	AAR'S	CAAR Acquirer
-25	0,492%	0,492%	-1,632%	-1,632%
-24	-0,746%	-0,253%	-0,082%	-1,714%
-23	0,034%	-0,220%	0,376%	-1,338%
-22	1,013%	0,793%	-0,003%	-1,341%
-21	-0,599%	0,194%	0,455%***	-0,886%
-20	0,733%	0,927%	-0,079%	-0,965%
-19	0,650%	1,577%	-0,109%	-1,074%
-18	-0,353%	1,224%	-0,102%	-1,176%
-17	-0,197%	1,027%	0,092%	-1,083%
-16	0,337%	1,364%	-0,209%	-1,293%
-15	0,812%	2,176%	0,183%	-1,109%
-14	0,781%	2,957%	-0,123%	-1,233%
-13	-0,403%	2,554%	0,159%	-1,074%
-12	0,618%	3,172%	0,103%	-0,971%
-11	-0,197%	2,975%	0,463%	-0,508%

-10	-0,344%	2,631%	0,106%	-0,402%
-9	0,004%	2,635%	-0,423%	-0,825%
-8	0,034%	2,669%	-0,063%	-0,888%
-7	0,284%	2,953%	0,196%	-0,692%
-6	0,050%	3,003%	0,300%	-0,392%
-5	0,594%	3,596%	0,457%	0,065%
-4	0,210%	3,806%	0,173%	0,237%
-3	0,389%***	4,195%	0,131%	0,368%
-2	-0,182%	4,013%	0,157%	0,525%
-1	0,580%	4,592%	-0,123%	0,403%
0	3,333%***	7,926%	0,066%	0,469%
1	0,578%	8,503%	-0,209%	0,260%
2	-0,065%	8,438%	0,048%	0,308%
3	0,894%	9,333%	0,507%***	0,815%
4	-0,382%	8,951%	0,106%	0,921%
5	-0,061%	8,890%	0,406%***	1,327%
6	-0,494%	8,396%	0,103%	1,430%
7	0,489%	8,885%	0,084%	1,514%
8	-0,137%	8,748%	0,796%	2,310%
9	0,502%	9,250%	0,068%	2,377%
10	0,196%	9,446%	-0,156%	2,222%
11	-0,041%	9,405%	0,278%	2,500%
12	0,144%	9,549%	0,092%	2,591%
13	0,142%	9,691%	-0,003%	2,588%
14	-0,543%	9,147%	0,358%	2,946%
15	0,677%	9,824%	0,010%	2,956%
16	-0,025%	9,799%	-0,200%	2,756%
17	-0,157%	9,643%	-0,041%	2,716%
18	0,148%	9,791%	0,248%	2,964%
19	0,538%	10,329%	0,514%***	3,477%
20	-0,302%	10,027%	0,026%	3,503%
21	-0,011%	10,015%	-0,278%	3,224%

22	0,045%	10,061%	0,017%	3,242%
23	-0,104%	9,957%	-0,171%	3,071%
24	0,431%	10,388%	-0,088%	2,983%
25	-0,162%	10,226%	-0,238%	2,745%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

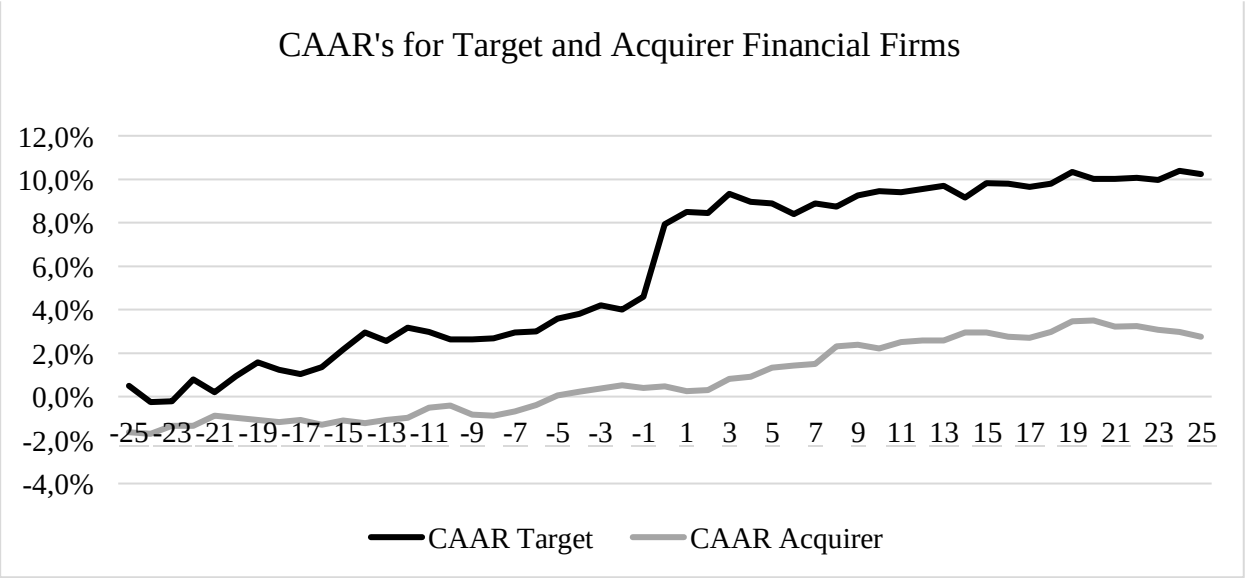

Figure 30: CAAR's for the Target and Acquirer Firms, Over the Full Event Window, Within the Financial Industry.

8.10 CONSUMER

Table 34: Showing the AAR's, Test Statistic, Significance and the CAAR's Over the Full Event Window (-25; 25) for Target and Acquirer Firms in the Consumer (Cyclical and Non-cyclical) Industry.

Day	AAR	CAAR Target	AAR	CAAR Acquirer
-25	0,212%	0,212%	-0,160%	-0,160%
-24	0,243%	0,455%	-0,492%	-0,652%
-23	-0,703%	-0,247%	0,066%	-0,586%
-22	0,701%	0,453%	0,396%	-0,190%
-21	1,533%	1,986%	0,106%	-0,084%
-20	0,270%	2,257%	-0,505%	-0,589%
-19	-1,025%	1,231%	0,743%***	0,155%

-18	0,307%	1,539%	-0,534%	-0,380%
-17	0,791%	2,330%	-0,086%	-0,465%
-16	-0,096%	2,234%	0,276%	-0,190%
-15	-0,225%	2,009%	0,853%	0,664%
-14	0,041%	2,050%	-0,063%	0,601%
-13	0,389%	2,440%	-0,217%	0,384%
-12	0,472%	2,911%	0,471%	0,855%
-11	1,133%***	4,045%	0,454%	1,309%
-10	0,472%	4,517%	0,049%	1,358%
-9	1,965%	6,482%	0,040%	1,398%
-8	0,021%	6,503%	-0,352%	1,046%
-7	0,437%	6,940%	-1,209%***	-0,163%
-6	0,665%	7,605%	0,225%	0,062%
-5	0,028%	7,633%	0,289%	0,351%
-4	-0,437%	7,196%	-0,552%	-0,201%
-3	0,797%	7,993%	0,100%	-0,101%
-2	2,078%	10,071%	-0,420%	-0,521%
-1	0,116%	10,187%	0,769%	0,248%
0	5,118%***	15,304%	0,064%	0,312%
1	0,653%	15,958%	0,044%	0,356%
2	0,182%	16,140%	0,134%	0,490%
3	0,641%	16,781%	0,546%	1,035%
4	-0,363%	16,417%	1,312%***	2,347%
5	0,143%	16,560%	0,201%	2,548%
6	0,151%	16,711%	-0,854%	1,694%
7	1,047%	17,758%	-0,423%	1,270%
8	-0,469%	17,289%	0,417%	1,687%
9	-1,046%	16,243%	-0,016%	1,671%
10	-0,213%	16,029%	-0,669%	1,002%
11	-0,507%	15,523%	0,262%	1,264%
12	-0,196%	15,326%	1,024%	2,288%
13	1,196%	16,522%	-0,497%	1,791%

14	-0,445%***	16,078%	0,372%	2,163%
15	-0,058%	16,020%	-0,938%***	1,225%
16	0,577%	16,597%	-0,945%	0,281%
17	-0,509%	16,088%	-0,869%	-0,588%
18	-0,335%	15,753%	-0,582%	-1,170%
19	0,618%***	16,372%	-0,699%***	-1,869%
20	-0,065%	16,307%	-0,935%***	-2,804%
21	-0,315%	15,992%	-0,418%	-3,222%
22	-0,465%***	15,527%	0,126%	-3,096%
23	0,236%	15,763%	0,680%	-2,415%
24	0,329%	16,093%	-0,324%	-2,739%
25	0,021%	16,114%	-0,552%***	-3,291%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

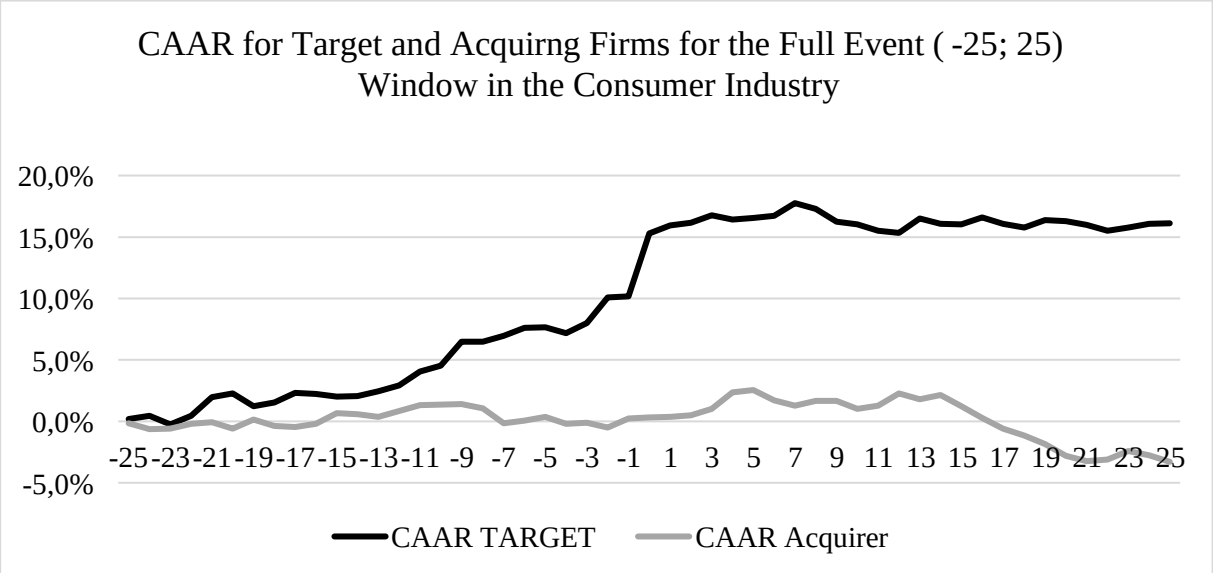

Figure 31: CAAR's for the Target and Acquirer Firms, Over the Full Event Window, Within the Consumer (Cyclical and Non-cyclical) Industry.

8.11 BASIC MATERIALS

Table 35: AAR's, Test Statistic, Significance and the CAAR's Over the Full Event Window (-25; 25) for Target and Acquirer Firms in the Basic Materials Industry.

Day	AAR	CAAR Target	AAR	CAAR Acquirer
-25	-0,145%	-0,145%	-0,807%***	-0,807%
-24	0,014%	-0,130%	-0,194%	-1,001%
-23	-0,520%	-0,650%	0,180%	-0,821%
-22	0,047%	-0,604%	-0,900%	-1,720%
-21	-1,308%	-1,912%	-0,026%	-1,746%
-20	0,775%	-1,137%	0,313%	-1,433%
-19	-2,802%***	-3,939%	-2,423%***	-3,856%
-18	-0,455%	-4,394%	-1,765%	-5,622%
-17	-0,790%	-5,184%	-0,605%	-6,226%
-16	0,195%	-4,989%	-0,524%	-6,751%
-15	-0,955%	-5,944%	-1,332%	-8,083%
-14	1,338%	-4,607%	1,935%***	-6,148%
-13	-1,171%	-5,778%	2,345%***	-3,803%
-12	-0,204%	-5,982%	-0,921%	-4,723%
-11	-0,749%	-6,731%	-0,056%	-4,780%
-10	1,401%	-5,330%	0,253%	-4,527%
-9	0,223%	-5,107%	1,553%	-2,974%
-8	-0,750%***	-5,857%	-0,520%	-3,494%
-7	0,147%	-5,710%	-0,343%	-3,837%
-6	-0,847%	-6,557%	-2,678%	-6,515%
-5	0,186%	-6,371%	2,958%	-3,557%
-4	1,172%	-5,199%	0,479%	-3,078%
-3	0,588%	-4,611%	-0,203%	-3,282%
-2	-1,567%	-6,178%	-0,754%***	-4,035%
-1	1,770%	-4,409%	1,970%	-2,065%
0	6,539%	2,130%	0,512%	-1,553%
1	-0,235%	1,895%	1,194%	-0,360%
2	-0,379%	1,516%	-0,346%	-0,706%
3	0,911%	2,427%	1,846%	1,141%
4	1,492%***	3,919%	2,203%	3,344%
5	1,182%***	5,101%	0,364%	3,708%

6	-0,424%	4,677%	1,808%***	5,516%
7	-0,493%	4,183%	-2,945%	2,572%
8	-0,655%	3,528%	-1,743%	0,828%
9	2,116%***	5,644%	1,738%***	2,567%
10	-0,069%	5,575%	-1,654%	0,913%
11	1,593%***	7,168%	0,460%	1,372%
12	-1,250%	5,918%	-0,924%	0,448%
13	0,456%	6,374%	-0,062%	0,386%
14	-0,489%	5,885%	-0,593%***	-0,207%
15	0,443%	6,328%	0,274%	0,067%
16	-0,046%	6,282%	-0,445%	-0,378%
17	-1,218%	5,064%	0,201%	-0,177%
18	-1,061%	4,003%	-0,130%	-0,307%
19	-0,219%	3,783%	-1,033%***	-1,340%
20	-1,102%	2,682%	-0,349%	-1,688%
21	-0,413%	2,268%	1,299%	-0,390%
22	1,542%	3,810%	2,221%	1,832%
23	-1,663%	2,147%	-2,598%***	-0,767%
24	1,003%	3,150%	0,429%	-0,337%
25	1,440%	4,590%	1,308%	0,970%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

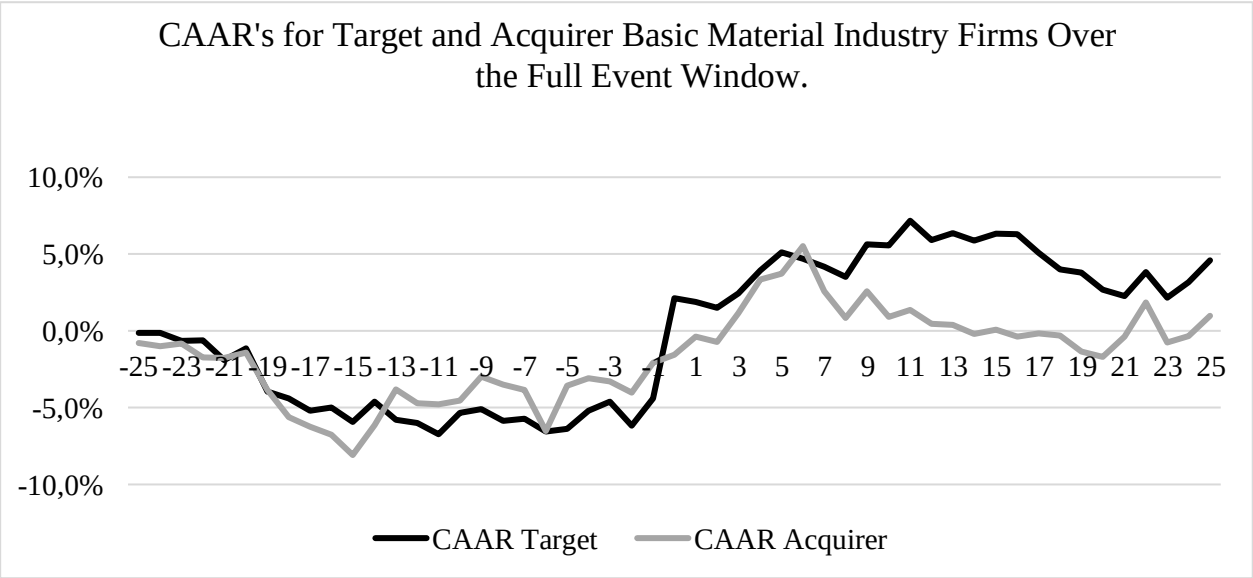

Figure 32: CAAR's for the Target and Acquirer Firms, Over the Full Event Window (25; +25), Within the Basic Material Industry

8.12. INDUSTRIAL

Table 36: AAR's, Test Statistic, Significance and the CAAR's Over the Full Event Window (-25; 25) for Target and Acquirer Firms in the Industrial Industry.

Time	AAR	CAAR Target	AAR	CAAR Acquirer
-25	2,867%	2,867%	-0,04%	-0,036%
-24	-2,569%	0,298%	0,16%	0,120%
-23	2,011%	2,310%	1,22%***	1,336%
-22	3,554%	5,864%	0,29%	1,625%
-21	5,552%	11,416%	0,31%	1,936%
-20	8,958%	20,373%	3,14%	5,081%
-19	-8,102%	12,271%	0,94%	6,022%
-18	0,843%	13,114%	-0,09%	5,935%
-17	1,645%	14,759%	0,07%	6,001%
-16	4,193%	18,951%	-1,97%***	4,033%
-15	4,945%	23,896%	-0,03%	4,002%
-14	5,064%	28,960%	0,70%	4,699%
-13	-3,467%	25,493%	2,55%	7,251%
-12	-2,832%	22,661%	-0,76%	6,491%
-11	1,804%	24,465%	-0,38%	6,112%

-10	-5,899%	18,566%	0,01%	6,127%
-9	0,406%	18,972%	0,44%	6,563%
-8	-1,633%	17,339%	2,64%	9,199%
-7	3,813%	21,152%	0,32%	9,522%
-6	-1,916%	19,235%	-0,35%	9,167%
-5	0,215%	19,450%	-1,27%	7,899%
-4	-1,648%	17,803%	0,16%	8,058%
-3	1,490%	19,293%	1,06%	9,116%
-2	2,578%	21,871%	-0,10%	9,017%
-1	2,362%	24,233%	-0,15%	8,865%
0	7,173%	31,406%	0,12%	8,987%
1	-2,645%	28,761%	-0,52%	8,471%
2	4,194%	32,956%	-0,22%	8,249%
3	0,564%***	33,520%	-0,55%	7,696%
4	-4,356%	29,164%	0,62%	8,321%
5	0,983%	30,147%	0,49%	8,812%
6	0,982%	31,128%	0,99%	9,806%
7	-0,584%	30,544%	1,11%	10,917%
8	0,157%	30,701%	-0,02%	10,892%
9	-0,396%	30,305%	0,36%	11,252%
10	1,367%	31,672%	0,01%	11,258%
11	0,174%	31,846%	-0,04%	11,218%
12	-0,094%	31,752%	-1,40%	9,814%
13	0,496%	32,248%	0,68%	10,492%
14	-0,438%	31,810%	-0,20%	10,295%
15	0,163%	31,973%	-0,05%	10,248%
16	-1,055%	30,918%	0,23%	10,477%
17	0,745%	31,663%	0,57%	11,045%
18	0,187%	31,850%	0,71%	11,755%
19	0,378%	32,228%	0,19%	11,941%
20	1,687%	33,914%	1,25%	13,192%
21	0,076%	33,990%	-1,03%	12,163%

22	-0,408%	33,582%	0,08%	12,246%
23	0,216%	33,799%	0,46%	12,711%
24	-0,253%	33,546%	-1,28%	11,432%
25	-1,387%	32,159%	0,81%	12,243%

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

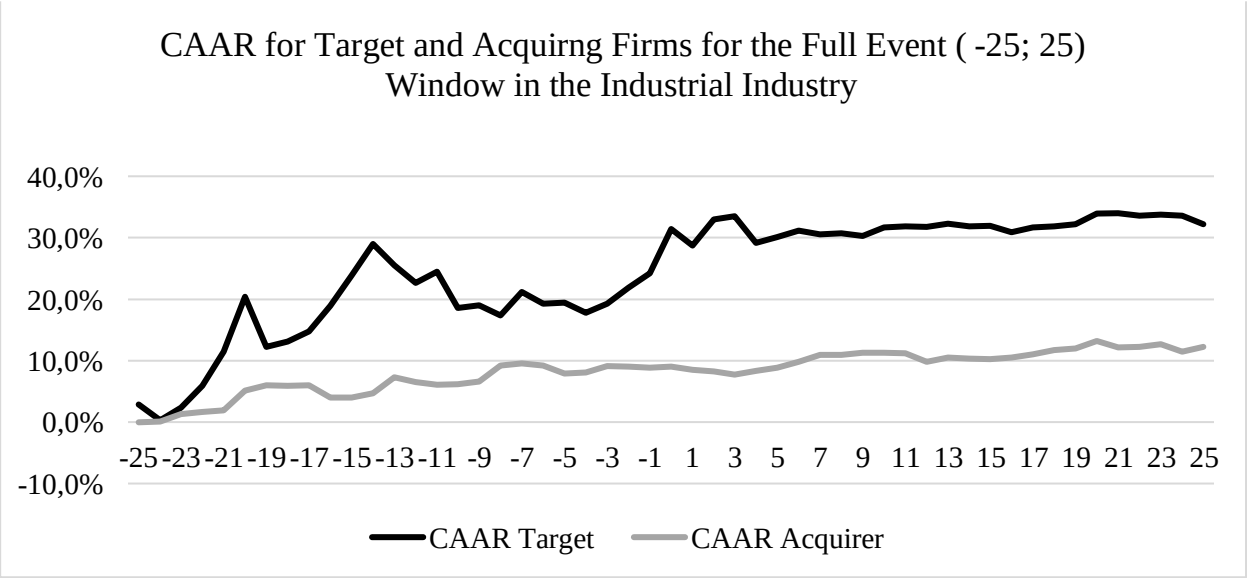

Figure 33: CAAR's for the Target and Acquirer Firms, Over the Full Event Window (25; +25), Within the Industrial Industry

Table 37: Target and Acquirer CAAR's, Who Outperformed, T-Statistics, P-values, and T-critical values.

Industry	CAAR Target (-25; +25)	CAAR Acquirer (-25; +25)
Financial	8,981%**	3,596%**
Consumer, Non-cyclical and Cyclical	16,671%**	1,762%**
Basic Materials	5,506%**	-5,057%**
Industrial	32,700%**	8,620%**

** Significant at the 5% level.

Note: the CAAR (target) and CAAR (acquirer) shows the full event window (-25; 25) CAAR for the corresponding industry.

Table 38: A One-way ANOVA Model for the Four Industry Groups

Groups	***Count***	***Sum***	***Average***	***Variance***		
Financial	51	1,711	3,354%	0,052%		
Consumer	51	2,473	4,849%	0,103%		
Basic Material	51	-0,787	-1,544%	0,068%		
Industrial	51	8,035	15,755%	0,294%		
ANOVA						
Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F critical***
Between Groups	0,815	3	0,272	210,349	0,000	2,650
Within Groups	0,258	200	0,001			
Total	1,073	203				