



GORDON INSTITUTE  
OF BUSINESS SCIENCE

University of Pretoria

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***The medium-long term impact of cross-border investments into Sub-Saharan Africa by listed South African companies***

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**A research report submitted**

**by**

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## **Abstract**

Research into whether the medium-long term impact on shareholders' value of acquiring companies engaged in cross-border merger and acquisition transactions (CBMA) into Sub-Saharan Africa.

By focussing on companies listed on the Johannesburg Securities Exchange ("JSE") and testing the general hypothesis whether the shareholders of acquiring companies earn statistically significant positive or negative returns within the medium-long term after the announcement date of a cross-border merger and acquisition transaction.

Out of a total of 10,167 merger and acquisition transactions over the eight-year period between 2000 and 2007, only 12 cross-border mergers and acquisitions into Sub-Saharan Africa satisfied all the selection criteria.

By exhaustive application of the single-factor market model to calculate the regression formula using 4 years of historical share price performance data, the results suggested that statistically significant negative weighted average abnormal returns for shareholders are consistently present over the event window. The study on the medium-long term event window starting 21 days prior to the first public announce of the transactions and continued up to 252 trading days after the announcement date. Thus it satisfied common critique by researchers about the true value of short term event studies for companies and their shareholders.

## **Declaration**

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

Pieter C. de Jager

13 November 2008

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<b>TABLE OF CONTENTS</b>	<b>PAGE</b>
<b>Abstract</b> .....	ii
<b>Declaration</b> .....	iii
<b>Acknowledgements</b> .....	iv
<b>Contents</b> .....	v
<b>1. Introduction to the research problem</b> .....	1
<b>2. Literature Review</b> .....	5
2.1 Data sources and the use of secondary data.....	5
2.2 Reasons for investments in foreign countries.....	5
2.3 Stimuli for cross-border investments into Sub-Saharan Africa.....	8
2.4 Entry strategies for foreign direct investments .....	11
2.5 Share price performance as a measure of mergers and acquisitions.....	13
2.6 Share price performance and cross-border mergers and acquisitions.....	13
2.7 Measuring abnormal share price returns and event studies.....	14
2.8 Post-acquisition impact on acquiring company share price.....	18
2.9 The longer term study of impact on share price performance.....	19
<b>3. Research hypothesis</b> .....	20
<b>4. Research methodology</b> .....	25
4.1 Unit of analysis.....	25
4.2 Population of relevance .....	25
4.3 Sampling method and size .....	30
4.4 Data gathering process.....	32
4.5 Data analysis approach .....	34
4.5.1 Population of relevance and the event window.....	34
4.5.2 Event studies and prediction model.....	34

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4.5.3 Measuring share price performance.....	38
4.6 Research limitations.....	44
4.7 Data integrity.....	46
<b>5. Results</b> .....	<b>48</b>
5.1 Description of sample .....	48
5.2 Descriptive statistics.....	50
5.3 Share price performance.....	55
<b>6. Discussion of results</b> .....	<b>57</b>
6.1 Analysis of descriptive statistics.....	57
6.2 Analysis of share price performance.....	60
6.3 Impact of weighting the abnormal returns on the research findings.....	63
6.4 Hypothesis testing of CWAARs of the full sample.....	66
6.5 Summarised conclusion of results.....	67
<b>7. Conclusion</b> .....	<b>69</b>
<b>References</b> .....	<b>72</b>
Appendix 1: Details of companies selected in the sample.....	79
Appendix 2: Scatter plots of correlations between the actual daily share price returns of all selected companies to the corresponding daily returns of the ALSI index for the 4 years prior to announcement – Used for each individual company’s regression formula.....	80
Appendix 3: Details of WAAR and CWAAR for the companies selected over the event window $t_{-21}$ to $t_{+252}$ .....	82
Appendix 4: Residuals plot of Average ALSI returns to WAARs.....	87
Appendix 7: CD containing database.....	87

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## **1. Introduction and definition of the research problem**

The mineral and gem-stone riches locked-up in Africa have been a draw-card for foreign companies for several decades. Over the past 40 years foreign companies have been investing and into Africa only to be discouraged in the long term by the rebellions, civil wars, crime, corruption and autocratic dictatorships. This situation had an exponential negative effect on economic development which resulted in increased poverty, diseases, famine and infrastructure-decay. At the beginning of the twenty first century we have witnessed democratically elected governments coming into power and peace treaties being established. New heads of state promised economic growth and infrastructural improvements. These events realised promising investment opportunities for more major industries like telecommunications, manufacturing, building and construction as well as energy generation and distribution.

In our current economic environment we are witnessing diminishing opportunities for organic growth within the established markets. As a result hereof companies are looking towards the emerging market economies for growth and expansion. This is achieved by organic growth via outward foreign investment (such as green field projects) or by conventional mergers and acquisitions of cross-border corporate targets. Internationally we have seen a significant increase in the number of cross-border mergers and acquisitions (CBMA) compared to mergers and acquisitions (M&A) within the same country or market. Hitt, Harrison and Ireland (2001) found that the percentage of CBMAs doubled from mid-year 1998 to 1999 accounting for more than forty

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percent of all corporate M&A worldwide. According to Hitt et al. (2001) literature and studies on M&A activities are dominated by acquisitions of the controlling interest or asset of the target firm. They further state that mergers are rare due to the latent complications of integrating two businesses or operations on a coequal basis. For purposes of this research significant relevance will be placed on CBMA as the most common form of cross-border outward foreign direct investments made by companies listed on the Johannesburg Securities Exchange (JSE).

Countries like Botswana, Zambia, Mozambique, Namibia, Angola, The Democratic Republic of the Congo, Tanzania and Sierra Leone to name a few have been targeted for foreign direct investment and more specifically CBMAs by South African and other multi-national companies in the past ten to twenty years. Given the persistent difficulties and challenges of doing business Africa the question is raised whether these investments have been successful. For listed companies, the success or failure of CBMA could be represented by movements in share price on the stock exchange. Movements in share prices directly reflect the sentiments and expectations of shareholders (and the investment market in general) in the performance of the company. An increase in share price increases the company's market capitalisation (or market value) for the issued shares traded on the securities exchange. This would represent an increase in shareholder value for the most important stakeholders in the company.

By focussing on South African companies listed on the JSE which have made significant investments into the Sub-Saharan Africa region, this research will

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aim to analyse the long term effect on shareholder value for the one to two years following such an investment. The Null Hypothesis, which will be statistically tested with empirical historical share price data is: “There is no significant difference in shareholder value before and in the medium-long term after cross-border merger or acquisition into other Sub-Saharan African countries are announced”. This will also give us some evidence towards measuring the impact on shareholders’ value of the comparative advantage and costs associated with doing business in Africa (Bourguignon & Pleskovic, 2006).

Debora Spar, professor of business administration at the Harvard Business School (HBS) was quoted in an Business Day newspaper article as highlighting companies such as MTN, Standard Bank and Shoprite/Checkers now having strong footholds in Africa realising their continental expansion to the fullest (Business Day, 2008 a).

The absence of published empirical proof or previous research on the research question as proposed and the statements and viewpoints published by acclaimed authors and academics in the field necessitates research into the longer term impact of cross-border investments into Sub-Saharan Africa by listed South African companies as proposed in this report.

Many researchers have addressed the question of wealth gains from acquisitions. Loughran and Vijh (1997) found that typically three general trends of result are witnessed: (i) target shareholders earn significantly positive abnormal returns from all acquisitions, (ii) acquiring shareholders earn little or no abnormal returns from tender offers, and (iii) acquiring shareholders earn

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negative abnormal returns from mergers. This is commonly based on returns studied over the short-term pre-acquisition period starting immediately before the announcement date and ending on or before the effective date. Such studies assume that market prices fully adjust to the likely efficiency gains from acquisitions in the short run. A few studies also examine the assumption of market efficiency by measuring abnormal returns after the acquisition effective date as per Loughran and Vijh (1997).

Acknowledging the inherent and latent difficulties involved in doing business in Africa as discussed before, the researcher is compelled to provide empirical proof of the successes or failures of companies listed on the JSE following their cross-border investments in to Sub-Saharan Africa.

This research report is set out as follows: Chapter 2 describes the relevant theory base by way of a literature review; Chapter 3 sets out the research hypothesis; Chapter 4 details the research methodology and approach that was applied; Chapter 5 presents the empirical results; Chapter 6 offers the discussion and analysis of the research results undertaken and Chapter 7 presents the conclusion.

## 2. Literature review

### 2.1 Data sources and the use of secondary data

Zikmund (2003) promoted the use of secondary data for business research purposes as being almost always less expensive and faster to obtain than compiling primary data. He warns against secondary data not being designed specifically for the researchers needs and that the researchers needs to ask the relevant questions to ensure the data is pertinent and consistent with the problem definition. He encouraged a thorough analysis of the secondary data to ensure it applies to the population of interest and that the time period covered is consistent with the researchers' needs.

### 2.2 Reasons for investments in foreign countries

Smit (2005), explored the most frequent reasons for merger and acquisition strategies of listed companies. Two of the most pertinent reasons for acquisition activities could be applicable to cross-border investments by companies listed on the JSE. These are: (1) Globalisation leading to scale of requirements and (2) the speed and considerations of growth.

Hill (2007) quotes a World Bank report estimating that by 2020, today's developing economies will account for more than 60 percent of the world economic activities and that today's rich nations may account for only 38

percent. He concedes that forecasts are not always correct but that there is a definite shift in the economic geography of the world under way. This definitely underlines the opportunities presented by the Sub-Saharan Africa region.

With specific focus on Sub-Saharan Africa, Hill (2007) dubs the countries situated south of the Sahara Desert as “the poorest region on the world’s poorest continent”. With more than half of the region’s 700 million people living in dismal poverty, governments of these countries are more and more welcoming foreign direct investments in an attempt to alleviate the situation. He further draws a comparison between the overwhelming economic success in Mozambique of attracting inward foreign investment through government policy in stark contrast to the total economic collapse of Zimbabwe where political and economic policy has short of stopped cross-border inward foreign investments (Hill, 2007 p.83-84).

Robbins (2005) proposed that in the new age of globalisation companies are primarily considering cultural and organisational fit before the pure historical considerations of financial benefits like growth and synergy when considering cross-border mergers and acquisitions (CBMA). Pointing to the apparent financial failures of the mergers and acquisitions undertaken between AT&T and NCR as well as Daimler-Benz and Chrysler Corporation in the 1990’s, Robbins (2005) sites cultural and organisational incompatibility as the primary reasons. We propose further research in to the reasons for failed CMBAs into Africa by South African companies considering the substantial cultural, political and regulatory diversities encountered.

There is strong evidence that companies with a track record of multiple mergers and acquisitions are more likely candidates for successful completion of mergers and acquisitions (Hitt, 2001). In applying the example of how General Electric (GE) successfully integrated their myriad of more than one hundred acquisitions using a model developed from their mergers and acquisitions experience, Ashkenas, Demonaco and Francis (1998) stated that the subsequent performance of companies who treated mergers and acquisitions as one-time events and succumbing to the efforts, anxieties and pitfalls involved, fell below the industry averages more often than not. From this evidence we can safely deduce that companies with successful mergers and acquisitions track records are most likely candidates to take on a cross-border acquisition when the relevant opportunity presents itself.

In a very competitive global economy the need to diversify risk and gain a sustainable competitive advantage can be achieved by mergers and acquisitions. CBMAs to attain complimentary products, services or assets leads to value-creative corporate growth that is difficult to imitate by competitors. Hitt (2001) highlights of the evolution of corporate mergers and acquisition which was once a phenomenon only seen in the USA and which are increasingly being pursued across national boundaries. He further proposes that acquisition strategies are amongst the most important corporate-level strategies of the new millennium.

### 2.3 Stimuli for cross-border investments into Sub-Saharan Africa

We have found numerous occurrences of ethnic, tribal and religious wars combined with rebellious military dictatorships causing serious harm to the well being of these countries in the decades preceding 1990. Circumstances like these have kept large multi-national corporations sceptic from investing in the region.

As mentioned before the peace treaties that were brokered, democratic elections that took place combined with the adoption of the Convention on Combating Bribery of Foreign Public Officials by 30 of the world's most powerful economies since 1997 (Hill, 2007), has lead to reconsideration of particularly the investment community.

Laura Alfaro, associate professor at Harvard Business School (HBS) was quoted saying that many South African companies' drive to become global players start with steps into Africa. She said that because of the proximity and knowledge of the region they have a comparative advantage (Business Day, 2008 a).

Professor Nick Binedell and Martyn Davies from the Gordon Institute of Business Science (GIBS) were also noted in the same article where they addressed the successes and failures of South African companies in the global arena. They laid claim that South African business leaders are more proficient at managing risk and makes speedier decisions than their global counterparts in their cross-border expansion activities. Davies noted that South African

companies are more competitive in the emerging market economies but less successful in the traditional developed countries. Binedell referred to the relaxation of foreign exchange control in South Africa as a “new freedom that hadn’t been there before allowing companies to diversify their business interests and spread their wings” (Business Day, 2008 a, p. 1-3).

Matthews (2008) cited the Ernst & Young (E&Y) annual report on South African mergers and acquisitions for 2007 placing emphasis on the activities in the mining sector. According to her the E&Y report said that with resource prices returning to sustainable levels after a long period of being depressed, economies of scale and the rising demand from emerging economies allowing more favourable access to its resources, has resulted in far more cross-border transactions since 2003.

Habib (2007) confirmed the international scramble underway for Africa’s resource riches. He compares the stark differences between the western (US lead) approach versus the Asian (Chinese lead) economic philosophy of partnering with some unsavoury leaders on the continent. In order to capitalise on these activities, he argues that South Africa should partner with US and western firms in order to have a more positive democratic and developmental effect.

Political correspondent for the Business Day, Linda Ensor (2007) reported on the ratification of the double tax avoidance treaty between South Africa and Mozambique which provided South African companies with more certainty over the tax treatment of their investments. The elimination of double taxation and

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reduction of withholding taxes coupled with the removal of barriers to cross-border trade and investment with Mozambique is expected to be a significant stimulus for outward cross-border transactions from South Africa. The South African Industrial Development Corporation had approved the funding ten major projects in Mozambique and was considering additional others in the areas of mining and mineral beneficiation, tourism, agriculture, chemicals, forestry, transport infrastructure and energy (Ensor, 2007)

Nyamakanga (2007) reported that First National Bank and Santam the short-term insurance group of South Africa were expanding their operations in Mozambique, Namibia, Zimbabwe, Malawi, Botswana and Zambia. He also commented that South African companies have been increasing their presence in Africa with Old Mutual announcing it planned to spend R2bn over the next five years growing its continental business.

But perhaps one of the most relevant stimuli for South African countries undertaking cross-border investments into Africa has been the South African finance ministry's relaxation of foreign exchange control as presented in the 2008 budget speech. This move brought South Africa's exchange control regime in line with that of other countries. Minister of Finance, Trevor Manuel, was quoted in saying that these changes were the biggest shift to date (Ensor and Bonorchis, 2008). The aim of this paper is to analyse the successes or failures of cross-border investment phenomenon by listed South African companies on the back of the evidence and stimuli discussed above.

To conclude and highlight the above, Seccombe (2008) in an article for MiningMx.com quoted the United Nations' 2007 World Investment Report which noted that FDI's into Africa grew 20% to US\$36bn between 2005 and 2006. South Africa did not feature in the top 10 African destinations that received \$32bn out of the US\$36bn FDI inflow, South African investors were however most aggressive during 2006, making up 80% of the record US\$8bn FDI outflow from Africa. The FDI from Africa have quadrupled compared to 2005 and are twice the peak reached a decade ago. The majority of the South African FDI outflow was into resources exploration and extraction, particularly in gold and oil in Africa and the rest of the world, the report said (Seccombe, 2008). This clearly highlights the urgent need for various empirical studies on the impact of outward cross-border investments from South Africa into the Sub-Saharan region to offer a better analysis and understanding to managers of such companies.

#### 2.4 Entry strategies for foreign direct investments

In his book on international business, Hill (2007) compares the advantages and disadvantages of the following different entry strategies (or modes of entry) into foreign direct investment (FDI) transactions:

- Exporting
- Turnkey projects
- Licensing
- Franchising
- Joint Venture

- Wholly owned subsidiaries
- Mergers & Acquisitions

These forms of FDI's was considered (where appropriate) when selecting companies to analyse towards solving the research hypothesis.

Smit (2005) made an in depth analysis of the share price performance and overall financial performance following large mergers and acquisitions of companies listed on the JSE. Mergers and acquisitions are considered the most popular forms of investment above a "green field" project where the operation or project has to be built from the ground up. With the current international trend of significant cross-border investments into Sub-Saharan Africa, there is a need to further Smit's research by focussing on such companies listed on the JSE.

Anand and Delios (2002) found empirical results to support their arguments about the important role that capabilities occupy as an influence on the choice between acquisition and greenfield entry. The role of downstream capabilities varied by whether a foreign firm was making a capability-seeking or a capability-exploiting investment, but when downstream capabilities were being sought the propensity was to use an acquisition. This American study seems to hold true in the South African context where financially resourced and skilled companies expand into Sub-Saharan Africa with capability (resources) exploiting strategic intent.

## 2.5 Share price performance as a measure of mergers and acquisitions

Mergers and acquisitions have been at the centre of local and international research studies for a number of decades. Even more so the impact on share price performance as a measure of success for mergers and acquisitions has been widely studied. Brown and Warner (1985) presented compelling evidence towards analysis of daily stock returns and how the particular characteristics of these data affect event study methodologies for assessing the share price impact of firm-specific events.

In an earlier study Brown and Warner (1980) already deployed the simple market model of measuring abnormal returns on share prices and found the even simpler models which do not adjust for risk or market wide factors do not perform noticeably worse the market model.

## 2.6 Share price performance and cross-border mergers and acquisitions

Harris and Ravenscraft (1991) found that targets of foreign buyers have significantly higher wealth gains than do targets of U.S. firms. In a discussion paper on measuring the effect of outward FDI announcements on the market price of the firms in Greece, Papanastassiou, Filippaios and Demos (1999) found that there was a definite impact of outward FDI announcements on the market value of firms participating in the Athens Stock Exchange. By applying the Capital Asset Pricing Model (CAPM) for risk-adjusted returns, a strong relationship between an FDI announcement and the variation in share prices

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were shown. This provides empirical proof that outward foreign investments have an impact on the share price performance in the companies involved elsewhere. This study has tested the above finding in a South African context.

## 2.7 Measuring abnormal share price returns and event studies

The theory of the efficient market hypothesis assumes that the share stocks reacts quickly to new information and already reflect all available information in its prices (Bodie, Kane and Marcus, 2005). The market's reaction to new information about a corporate action (i.e. cross-border investment, merger or acquisition) is measured by way of excess or abnormal returns. In studying the impact of new information (largely insider information) on the share price of bidding, acquiring or outward investing companies in the long term post the public announcement date for this research report, event study methodology was used.

This study aimed to further the research conducted by Smit (2005) on share price and operating performance post mergers and acquisitions by focussing on listed companies with significant cross-border investment activities into Sub-Saharan Africa. Van der Plas (2007) referred to a South African event study done by Mushidzi and Ward (2004) states that there are a number of approaches or methods to estimate a firm's expected return, the most prominent of which are based on:

- Average share price returns before the event, using the Mean Adjusted Model;

- Average share price returns of the market over the event window adjusted with the risk of the acquiring company relative to the market using the Market Adjusted Model;
- The share price returns of the market over the event window using the Market Model;
- Share price returns of a portfolio of control firms (for non-FDI companies) over the event window applying the Control Portfolio Model.

Based on exhaustive literature reviews, Smit (2005) came to the conclusion that the most appropriate model is the Control Portfolio Model. He also proposes that the cash flow return on assets is a more preferred measure of operational performance as opposed accounting measure because of the differences in accounting treatment of company results.

In a research report conducted by Van der Plas (2007) on the occurrence of insider trading in target shares of JSE listed companies prior to takeover announcements, he defended the use of the Control Portfolio Model by quoting a study by Wernerfelt and Montgomery (1988) who found that this model is more appropriate than the Mean Adjusted Model, the Market Model and the Market Adjusted Model. “The authors found that industry effects were the major determinants of firm performance, firm effects played a small role and market share played hardly any role” (Van der Plas, 2007, p.15).

The Control Portfolio Model promoted by the authors above is an example of a multi-factor model which attempts to compensate for the resources effect, price-to-book value ratio, and the company size effect. By accounting for these

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factors this model proposes to be more accurate in predicting an individual share's return characteristics through a process of pairing it with sub-sections of similar-characteristic shares in a control portfolio for regression analysis. Thus disregarding the total market effect on the individual share price behaviour to a large extent. MacKinley (1997) draws comparisons between all the major models used in event studies. He concludes that Generally, the benefits from using multifactor models for event studies (like the control portfolio model) are limited. He suggests that the reason for the limited benefit is the empirical fact that the marginal explanatory power of additional factors compared to the overall market factor is small, and hence, there is little reduction in the variance of the abnormal returns witnessed. He further acknowledges that the use of a multifactor model warrants consideration in the cases where the sample firms have a common characteristic, for example they are all members of one industry or they are all firms concentrated in one market capitalization group (MacKinley, 1997).

In this study the sample selection criteria did not focus on sector or size and hence there was not overwhelming support for the benefits applying a multifactor model for regression.

Biswas, Fraser and Hebb (2000) applied the single factor market model to an event study on large publicly listed commercial banks in the USA with great success following MacKinley (1997).

Coutts, Mills and Roberts (1997) performed a time series and cross-section stability of parameter estimates from the single-index market model, using a UK

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data set relating to the security prices of parent companies, divesting in the form of a management buyout. Their findings concluded the market model is sensitive to the number of observations (time-series) and changes in the cross-sectional sample of firms employed in the event study. They proposed that researchers be conscious of these factors and should add sensitivity analysis to the use of the market model. They however offered no evidence that other multi-factor models will overcome all or most of the impacting factors of the sensitivity instabilities witnessed in the use of the market model.

As recent as 2007, Chander, Sharma and Metha (2007) have applied an the Capital Asset Pricing Model (CAPM), Market Adjusted Model and Mean Adjusted Return Framework to event studies in an event study on large capitalized banks on the Bombay Stock Exchange in India. Although the preferred the pure CAPM model, good evidence was presented about the reliance that can be placed on the market adjusted model. It is interesting to note that in this study no mention was made to control portfolio models to compensate for the single sector of stocks that were studied.

In taking all the above evidence into account this study employed the market model for determination of the baseline regression formula to predict the normal share price performance selected sample securities listed on the JSE after the announcement date of a CMBA transaction. The model's linear specification follows from the assumed joint normality of asset returns.

For any security  $i$  the market model is:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (\text{Formula 1})$$

where:

$E(R_{it})$  = the expected return on security<sub>*i*</sub> on day<sub>*t*</sub>;

$\alpha_i$  and  $\beta_i$  = are the parameters of the market model;

$R_{mt}$  = the returns on the market portfolio on day<sub>*t*</sub>; and

$\varepsilon_{it}$  = the zero mean disturbance- or error term.

Mackinley (1997)

Smit (2005) made specific reference to studies by Kothari *et al* (1995) and Fama and French (1992) on the use of the various models where clear inconsistencies between the evaluation of the different models existed. They found no evidence to reject the market model in entirety. Accordingly the market model was used in this study.

## 2.8 Post-acquisition impact on acquiring company share price

Gaughan (1999) held that acquiring firms' shareholders tend to earn zero to negative returns from mergers and acquisitions, quoting several international studies. These findings are in line with more recent local studies including Smit (2005) who found no statistical significant positive or negative returns for shareholders of acquiring companies.

## 2.9 The longer term study of impact on share price performance

Gaughan (1999) found that several research studies concluded that the markets in general has a long-term experience of prior acquisition transactions and that it draws on this information when evaluating its response to new announcements. In addition Gaughan (1999) found that it is difficult to conduct long-term studies that filter out the effects one specific transaction from the many confounding events that may impact on the share price over a longer time period. This phenomenon was encountered in the current study which resulted in a fairly small judgemental sample eventually being selected without confounding events.

Agrawal Jaffee and Mandelker (1992) used a large sample of 765 mergers and studied their share price performance over a five-year period. They found that the shareholders of acquiring firms suffered an approximated 10% loss after the merger which is in line with this study's findings of a Cumulated Weighted Average Abnormal Return over a 1 year period of -10.82%.

Similarly, Loughran and Vjih (1997) used an even larger sample of 947 companies and found a negative excess return of -25% for share funded mergers and sharply contrasting positive 61.7% returns for cash funded tender offers over a five-year period.

Tuch and O'Sullivan (2007) provided empirical evidence that suggests that, in the short run, acquisitions have at best an insignificant impact on shareholder

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wealth. They also presented that long-run performance analysis revealed overwhelmingly negative returns, while the evidence using accounting performance measures is mixed.

In the line with the above evidence there is a clear need to study CMBA transactions in the longer run. The title of a study by Loughran and Vijh (1997) very appropriately asks the question: “Do long-term shareholders benefit from corporate acquisitions?” in partial support of the research hypothesis addressed by this study.

This research proposed that short-term event studies on the share price impact of the acquiring firm before and after the announcement date of the transaction offer, at best, information to support speculative investment strategies. No substantial evidence of real economic benefit for long-term growth shareholders or for decision making corporate executives could be found in these short-term studies.

### 3. Research hypothesis

The focus of this study was to examine the impact on share price performance of the acquiring company over the long term after a Cross-Border Merger or Acquisition (CMBA) into Sub-Saharan Africa was announced. Taking into account the inherent risk factors of doing business in Sub-Saharan Africa and the corresponding rewards expected by companies and shareholders alike, any significant increase in the share price over the longer term post the CMBA announcement would provide evidence of such reward expected in shareholders' value. On the contrary, any significant decrease in share price of such companies over this period would hold evidence that CBMA's destroy shareholders' value to some degree.

In this research emphasis was placed on share price only and it did not consider (i) share volumes traded, (ii) operational profitability or (iii) operational cash flow returns of such companies. It is held that information of improvements in the above three factors will be disseminated into the market over the longer term and therefore reflected and accounted for in the share price performance. Analysts and stock traders will have digested the information and its potential value reflected in the market sentiment over the longer term.

Smit (2005) proposed that long-term share price performance could not be studied as a measure of value creation or destruction due to new market information, other than that of the merger or acquisition affects share price

performance. He quoted interim and annual financial results announcements as one such factor which could create market “noise” impacting the share price performance.

This study proposes that Smit’s approach (2005) disregarded the regular SENS announcements and compulsory financial performance announcements in accordance with the JSE listing requirements which is integral to doing business as a listed company. In addition to the above no mention is made of such other normal business events (which could be considered as confounding) during the historical period prior to the announcement used in deriving the regression formula. This study proposed that normal statutory announcements like interim and annual results and directors dealings in securities are also present in the historical regression period and therefore fully compensated for by the calculated market risk  $\beta$  (beta).

*Hypothesis 1:*

The null hypothesis states that the shareholders of acquiring companies do not earn significant positive or negative Cumulative Weighted Average Abnormal Returns (CWAARs) in the long term after the announcement date of Cross-Border Mergers and Acquisitions into Sub-Saharan Africa (CBMAs). The alternative hypothesis stated that the shareholders of acquiring companies earn significant positive or negative Cumulative Weighted Average Abnormal Returns (CWAARs) in the long term after the announcement date of Cross-Border Mergers and Acquisitions into Sub-Saharan Africa (CBMAs).

$H_0: CWAAR = 0$

$H_A: CWAAR \neq 0$

The term Cumulative Weighted Average Abnormal Return (CWAAR) used in this research hypothesis represents the cumulative weighted average abnormal returns of all 12 companies selected in the sample as described in more detail in Chapter 4.

The daily difference between projected share price returns and the actual share price performance were accumulated over the 274 day event window starting on day  $t_{-21}$  and ending on day  $t_{+252}$ , where the announcement day of the CBMAs were placed on day  $t_0$  in the data series. These accumulated results for each individual company were then average weighted by market capitalisation. The two central formulae to this study used in testing the hypothesis are presented as follows:

$$WAAR_t = \sum_{i=1}^n WAR_{i,t} \quad (\text{Formula 5})$$

where:

$WAAR_t$  = weighted average abnormal return of all sample securities for day<sub>t</sub>

$n$  = the number of stocks in the sample

$WAR_{i,t}$  = weighted abnormal return of stock<sub>i</sub> on day<sub>t</sub>

and

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$$CWAAR_T = \sum_{t=t_1}^{t_2} WAAR_t \quad (\text{Formula 6})$$

where:

$CWAAR_T$  = Cumulative weighted average abnormal return in period $_T$

$WAAR_t$  = weighted average abnormal return on day $_t$

$T$  =  $t_2 - t_1 + 1$

The hypothesis was tested at the 5% error level for significance by means of dividing the daily abnormal returns by the calculated standard error of each company's regression distribution for each trading day in the event window to obtain the t-test statistic as prescribed by Benninga (2008).

## 4. Research methodology

### 4.1 Unit of analysis

The unit of analysis was a single JSE listed bidding or acquiring company involved in an outward cross-border investment into a Sub-Saharan African country during the eight year period 2000 to 2007. Furthermore, at least four years of historical share price data will have to be available on such a company to be eligible.

### 4.2 Population of relevance

The methodology for determining the population of relevance that was used was similar to that used by Smit (2005) and Van der Plas (2007). The population of relevance consisted of all the JSE listed acquiring companies involved in outward cross-border investments into Sub-Saharan African countries. The population of relevance was extracted from the database of mergers and acquisitions compiled by Ernst & Young for their annual review of mergers and acquisitions (M&A) in South Africa. In order to be included in the population of relevance, selected companies had to adhere to all of the following criteria\*:

- The description of the transaction had to be either a share buy-back, conditional offer for shares, unconditional offer for shares, section 311 scheme of arrangement, acquisition of related business, offer to minorities, merger of related business, buyout of minorities, group

reconstruction, hostile takeover, acquisition of material asset or business expansion investment made;

- The transaction feature as detailed in the Ernst & Young database of M&As had to include “Outward Investment” in its description;
- The target company code as detailed in the Ernst & Young database of M&As had to include “Foreign” in its description;
- The transaction types listed above had to be made outward from South Africa into a cross-border entity located in Sub-Saharan Africa;
- The acquiring company had to be listed on the main board of the JSE at the time of the announcement;
- Confounding events must not have occurred in the period of 1 year prior to, and 1 year after the first public announcement; (confounding events for this study comprised of all information that could have a material effect on the share price of the acquiring company);
- Daily share price data of the acquiring companies had to be available for the entire event window as well as a period of four years leading up to the date of first announcement of the transaction;
- The acquiring companies’ total market capitalisation had to be available for each day in the event window; (the event window in this study ranged from 21 days prior to, and 252 days after the announcement date of the transaction).

[\* Adapted from Van der Plas (2007)].

Smit (2005) highlighted the need to focus on large acquisitions where he quoted Healy *et al* (1992) and various other authors. The most significant argument offered by Smit (2005) is that there is a statistically significant positive relationship between Average Cumulative Abnormal Returns (ACAR) of acquiring companies and the relative size of the targets. His approach was more suitable for a study that included analysis of financial (cash) operating performance to the net asset values after the acquisition announcements, as was the case in Smit (2005). On the other hand Van der Plas (2007) applied a minimum premium paid by the acquirer on the share price of the target to eliminate smaller relative transactions. This study did not disqualify any company from the sample based on the size of the transaction due to the inherent risk and expected returns from embarking on a CBMA transaction into Sub-Saharan Africa. This study went further to apply a market capitalisation-based average weighting to the results of individual companies to obtain a average sample population output which was more relevant to the comparative market index as discussed in section 4.5 below.

Due to the limitations of the data contained in the Ernst & Young database not containing all the information relevant to this study like the market capitalisation of the acquiring company or the exact details about the location of the target company, several steps were applied to isolate the acquiring companies that met the aforementioned criteria.

These steps included:

- Obtaining the Ernst & Young databases for the period 2000 to 2007 and exporting and merging and sorting them into one homogeneous data set on Microsoft Excel;

- Filtering on and extracting all the transactions from the data set with one of the following descriptions: share buy-back, conditional offer for shares, unconditional offer for shares, section 311 scheme of arrangement, acquisition of related business, offer to minorities, merger of related business, buyout of minorities, group reconstruction, hostile takeover, acquisition of material asset or business expansion investment made;
- From the above reduced data set further filtering on and extracting the transactions with feature description as “Outward Investment” and target company code description as “Foreign”;
- The above further reduced data set was studied in detail to manually isolate transactions where the target location was in Sub-Saharan Africa. Extensive research was done in various electronic media publications, company websites and the JSE SENS announcements via Fin24.com and the BFA McGregor Research Domain to identify the exact location of the target company or assets;
- Subsequent to the above, all acquiring that were not listed on the main board of the JSE at the time of first public announcement were eliminated;
- Next all companies in the reduced data set derived from the above were studied using the same methodology and consulting the same data sources as for the target location to ensure that no other merger or acquisition was announced in the period 1 year prior to, and 1 year after the first public announcement. Any such occurrences disqualified the company from the sample;

- Reviewing the raining (i.e. after the previous step) the McGregor's BFANet Word database (a database that contains all JSE-listed companies' SENS announcements; circulars; annual reports and news reports) as well as the electronic media publications and the company websites (where available) for each acquiring company, to determine whether any confounding events such as more M&As, disposals or other corporate restructurings occurred during the year preceding and the year following the first public announcement. All acquiring companies that had experienced confounding events during this period were eliminated from the population of relevance, because of the potential impact that such confounding events may have had on the share price of the acquiring company;
- Following this, companies that were not listed and/or for which no share price data was available for the 4 years preceding, and for at least 1 year after the CMBA announcement, were eliminated from the population of relevance;
- Then companies for which daily market capitalisation figures were not available from either McGregor's BFA research Domain or Bloomberg for the event window: 21 days before and 252 days after the announcement date were eliminated from the sample;
- Similarly companies for which daily share price data were not available from either McGregor's BFA research Domain or Bloomberg for the event window: 21 days before and 252 days after the announcement date were eliminated from the sample with the exception of Dunlop Africa (Share code: DNL) which was delisted within 8 months of the announcement date. The share price data was included in the sample

analysis up to the day of delisting and the company was omitted from the sample analysis after this date.

Mutooni and Muller (2007) argued that companies not listed on the main board of the relevant securities exchange tend to be very small and highly illiquid and therefore not significant inferences can be made by including them into event studies of this nature, and hence they may possess a large amount non-systemic risk.

#### 4.3 Sampling method and size

The sample was judgementally selected and not randomly, therefore it could place some limitation on the statistical inferences made although random sampling is a prerequisite of the Central Limit Theorem (Zikmund, 2003). This limitation is deemed to be an acceptable sampling risk based on other international and local research studies as mentioned above.

The population of relevance was obtained from the Ernst & Young annual databases of mergers and acquisitions that met the criteria detailed in 4.2 above and after strictly applying the selection steps mentioned in the same section.

Chipp (2007) highlighted the impact of extraneous variables or confounding events that could have possible impacts on the time-series data behaviour

before, during and after announcement of investment events. This study also investigated and considered these in the conclusion of the sample population.

Out of a total of 10,167 merger and acquisition transactions over the eight-year period between 2000 and 2007, only 12 Cross-Border Mergers and Acquisitions into Sub-Saharan Africa satisfied all the selection criteria. No further sub-sampling within the larger population was performed and each of the 12 companies selected was studied instead of treating the 12 CMBAs as a population in line with similar studies conducted by Mordant and Muller (2003), Smit (2005) and Van der Plas (2007).

It can be safely assumed that the longer the event window of study becomes, the greater the possibility of confounding events occurring becomes. This is evident in the relative small judgemental sample obtained in this study. It was also observed that the majority of the companies rejected by means of applying the criteria for confounding events, were larger market capitalisation companies who have embarked on strategic M&A expansion drives, thus being involved with multiple M&A transactions over the eight years reviewed. Many of these companies were involved in local as well as cross-border M&A transactions underlining their risk appetite for growth other than through traditional organic means.

#### 4.4 Data gathering process

As discussed in 4.2 above, historical share price data of companies listed on the main board of JSE was obtained from the McGregor BFANet database using their Research Domain access and deploying the Blink data extraction program to satisfy the research hypothesis. Where the daily share price data was not available from BFANet, Bloomberg was used. The daily market capitalisation data was also extracted as per the above.

Confounding events information was primarily obtained by inspecting the Securities Exchange News Service (SENS) announcements. The SENS announcements were accessed through McGregor's BFANet as well as through Fin24.com. It was noted the Fin24.com upgraded its website services during early October 2008 after which only a limited number of the latest SENS announcements per company was available. Prior to this, all SENS announcements per company ever listed on the JSE were easily accessible.

Electronic news publications like Business Day, News24.com, Mining Weekly, Mining MX as well as the individual company's websites were also studied for confounding events. These confounding events can be classified as follows:

- Any other merger or acquisition activity announcements in the period ranging from 1 year prior to, and 1 year post the CBMA announcement;
- Significant other corporate actions that could potentially influence the share price like unbundling, cautionary statement not related to the CBMA transaction, profit warnings etc.;

In contrast to other local and international event studies focussing on the short-term impact on share price performance, the following types of events were not considered as being confounding, but rather indicative of the normal business activities of a JSE listed company. This study argues that announcements and publications made in compliance of the JSE listing rules during the normal course of business will be present in the historical data used for regression analysis and thus the calculated market risk  $\beta$  (beta or slope) will account for its presence. These were:

- Audited annual financial statements and unaudited interim financial statements;
- Directors dealings in securities;
- Notifications of extraordinary shareholders meetings;
- Appointments and resignations of directors;
- Initial and further cautionary announcements directly related to the CBMA transactions of this study (since the medium and long term impact on shareholders' value is analysed for these specific events).

As was discussed in Chapter 2, the longer research window periods on share price performance are more indicative of proving shareholders value than the popular short term studies conducted. This study also proposes that comparative short term event window research is only valuable to speculative traders and not to long term investors seeking stable value growth.

## 4.5 Data analysis approach

### 4.5.1 Population of relevance and the event window

The population of relevance was judgementally selected following the criteria as detailed in 4.2 above resulting in a final sample of 12 securities listed on the JSE.

The event window for this study used the date of first public announcement of an intended CMBA transaction as benchmark by denoting it as “ $t_0$ ”. The impact on the acquiring company’s daily share price performance was measured over a period 274 days. The event window in this study started on the 21<sup>st</sup> trading before the announcement day ( $t_{-21}$ ) and worked forward for the 252 trading days after the announcement date ( $t_{+252}$ ).

In accordance with JSE listing requirements, any price sensitive information must be released on SENS before media or press releases are made. The announcement date ( $t_0$ ) of the CMBAs was accordingly correlated to the date of first announcement on SENS.

### 4.5.2 Event studies and prediction model

The research approach employed a causal design using statistical and financial analysis of historical (secondary) quantitative share data. In support of a causal

research hypothesis, the applicable dependent and independent variables were identified as follows:

- Dependent (Y) variable = actual share price returns of the individual companies judgementally selected for the sample;
- Independent (X) variable = JSE All-Share index (ALSI) returns compiled and published daily.

A simple regression model using a single independent explanatory variable namely the ALSI index was applied (Albright Winston & Zappa, 2006).

The research applied linear regression analysis tools on time-series data of historical share price performance to forecast the expected share price performance of the companies selected (Zikmund, 2003).

By performing the causal statistical analysis as described above on the share price performances of each company in the population of relevance, without any further sub-sampling, a very high confidence factor was achieved.

The event study approach of the share price data was used in line with the previous South African studies by Smit (2005), Van der Plas (2007), Mordant and Muller (2003) and Mutooni and Muller (2007). More specifically a market model of event study methodology was employed using daily stock returns.

The market model methodology applies the Capital Asset Pricing Model (CAPM) theory to the individual company's share price performance. The CAPM assumes that each company stock has a risk measure associated with it, called the beta or " $\beta$ ". The CAPM further asserts that the expected return on

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the company security is a linear function of its  $\beta$  (Albright Winston & Zappe, 2006). The CAPM market model uses the entire market index in which the particular security is listed as independent variable to calculate the specific security risk- $\beta$  (or slope) in relation to the market index's performance. Thus the market model assumes a stable linear relation between the market return and the security return.

The market model is one of the most widely used methodologies for event studies on share price performance over the past four decades. Examples of international studies using this prediction model include, amongst many others, McMillan (1996), Biswas Fraser & Hebb (2000), Coutts Mills & Roberts (1997) and MacKinley (1997).

MacKinley (1997) draws a very sober comparison between the most popular prediction models used in event studies. He argued that the market model posed a significant improvement over the constant mean return model by removing the portion of the return that is related to variation in the market's return, the variance of the abnormal return is reduced. This in turn can lead to increased ability to detect event effects. The market model is an example of a one factor model only taking the account of the broader market index in relation to the specific security's performance.

Fama and French (1996) developed a three-factor model to better explain the security price movements than the capital asset pricing model. Their design attempted to compensate for variables such as book-to-market equity ratio, company size, etc. They were of the opinion the  $\beta$  does not sufficiently explain

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expected returns. By their own admission the three-factor model is merely a model and could not be expected to fully explain the expected returns of all securities or portfolios.

Over time international and South African research studies have refined and re-focused the multi-factor models for event studies to the extent where Mordant & Muller (2003) developed an eight factor model using monthly rebalanced control portfolios of all the listed securities on the JSE (also used by Smit, 2005). Van der Plas (2007) went even further by developing a twelve factor control portfolio model to compensate for the resources effect, price-to-book value ratio, and the company size.

The statistical benefits from employing multifactor models for event studies can be considered as limited in general. This is due to the marginal explanatory power of additional factors to the market factor. MacKinley (1997) found that there is little reduction in the variances observed when applying multi factor models. The variance reduction of the abnormal returns measured will typically be greatest in cases where the securities in a sample have a common characteristic, for example they are all members of one industry or they are all companies concentrated in one similar size market capitalization group.

When the ratio of position size to capital is subject to realistic constraints like uncertainty about the models' pricing abilities, the differences in cross-sectional portfolios for different models become even less important to nonexistent as found by Pástor and Stambaugh (2000).

This study employed the market model for event studies as a prediction model of securities price performance for the above reasons and as discussed in more detail in Chapter 2.

#### 4.5.3 Measuring share price performance

The first step in event study methodology of this nature was to determine the expected share price returns for the reasons detailed in Paragraph 2.6 above. This study used the basic market model methodology of event studies as applied by McMillan (1996), Biswas Fraser & Hebb (2000), Coutts Mills & Roberts (1997), MacKinley (1997), Chander Shamra & Metha (2007) and many others, which uses the principles of the Capital Asset Pricing Model (CAPM) as basis discussed above.

As opposed to the portfolio theory of event study methodology, the market model applied to by this study used the daily returns of overall market index (ALSI) of the JSE as baseline explanatory variable against which the selected securities' daily share price returns were regressed to obtain the predictive formula. To achieve this, the daily share price data of each security in the sample was paired with the corresponding day's ALSI index value as extracted from McGregor's BFANet Blink data extraction program. The daily ALSI index return was calculated in terms of Formula 2.

$$R_{it} = \log [P_{it}/P_{it-1}] \quad (\text{Formula 2})$$

where:

$R_{it}$  = the share price return for security  $i$  for day $_t$ ; and

$P_{it}$  = the share price of security  $i$  at the end of day  $t$ .

The daily share price return of each company's historic data set was subsequently also calculated in terms of Formula 2 for consistency in comparison.

The use of the daily log-function calculation of returns on both the baseline control data set (in this case the ALSI index) and the individual security's daily share price data, followed that used by Mordant & Muller (2003), Smit (2005) and Van der Plas (2007). The two sets of log-function daily returns obtained above were matched and paired before they were regressed for the 4 year period preceding the CBMA announcement date to obtain the regression equation (Formula 3).

It has to be noted that the 4 year regression period applied in this study exceeded that used by the aforementioned authors: Mordant & Muller (2003) – 2 years; Smit (2005) – 18 months (1.5 years); Van der Plas (2007) – 3 years. This approach would theoretically improve the reliance that can be placed on the calculated  $\beta$ -risk coefficient given that more data points representing the individual security's performance in relation to the market index were used. The alpha ( $\alpha$ ) intercept coefficient, R-squared coefficient of determination and the Standard Error of the regression predicted dependent ( $Y$ ) values were also obtained from the regression equation. This was calculated for each individual security in isolation.

$$E(R_{it}) = \alpha_{i,t} + \beta_i R_{mt} + \varepsilon_{it} \quad (\text{Formula 3})$$

where:

$E(R_{it})$  = the expected return on security<sub>i</sub> on day<sub>t</sub>;

$\alpha_{i,t}$  = the alpha intercept term of security<sub>i</sub> on day<sub>t</sub>;

$\beta_i$  = the beta risk-coefficient;

$R_{mt}$  = the ALSI market return on day<sub>t</sub>; and

$\varepsilon_{it}$  = the error term.

Although the JSE has strict requirements around the announcements of price sensitive information as discussed earlier, the notable statistically significant Average Abnormal Returns realised on the ninth day preceding the announcement date ( $t_{-9}$ ) is evidence in support of price-sensitive information leakage into the market in support of Van der Plas's (2007) findings about the presence of insider trading in the South African market. This is also evidence in support of the reliance that can be placed on the use of the market model for regression. Smit (2005) noted similar abnormal returns prior to the announcement date with the use of the control portfolio model.

With the calculated  $\alpha$ - and  $\beta$  coefficients in hand, the log-function daily returns of the ALSI market index ( $R_{mt}$  in Formula 3) over the event window period was used and a new data set was constructed (being the event window projection data set). The  $\alpha$ - and  $\beta$  coefficients was applied to the  $R_{mt}$  to calculate the expected daily returns of each security over the corresponding event window period ( $E(R_{it})$  in Formula 3 above). The event window started from the 21 trading days preceding the announcement date of the CMBA transaction ( $t_{-21}$ ) and continued for 1 year (252 trading days) after the announcement date ( $t_{+252}$ ).

With the calculated expected daily returns in hand as calculated in terms of Formula 3, the abnormal return for security on each day in the event window was calculated by as follows: The log-function actual daily returns (Formula 2) of the selected securities was matched and paired with the calculated expected daily returns. The basic mathematical difference between the actual daily returns less the expected daily returns for that security on that day was calculated in terms of Formula 4.

$$AR_{it} = R_{it} - E(R_{it}) \quad (\text{Formula 4})$$

where:

$AR_{it}$  = the abnormal return of stock<sub>*i*</sub> in period<sub>*t*</sub>;

$E(R_{it})$  = the expected share price return of stock<sub>*i*</sub> in period<sub>*t*</sub> determined in terms of Formula 3;

$R_{it}$  = actual return of stock<sub>*i*</sub> in period<sub>*t*</sub> (Formula 2)

Following the principles of Mordant & Muller (2003) the abnormal share returns were weighted by their market capitalisation. This was done because an equal weighting would have resulted in an arbitrary bias in favour of returns from those smaller companies for which the transaction size could be deemed as being of lesser significance compared to those of the larger market capitalised companies in the sample. The bias stems from the research approach which did not take cognisance of the size of the transactions due to the inherently strict selection criteria applied in 4.2 above. This weighting by market capitalisation approach can further be argued to deliver an average abnormal return for the combined population which is more compatible with the way that the daily ALSI market index is compiled by the JSE. Hence this study proposes that the

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resulting Weighted Average Abnormal Returns (WAAR) for the population is more relevant to the market as a whole for purposes of analysis, comparison and decision making.

The weighting was calculated for each security during each day of the event window by dividing the individual security's market capitalisation (as obtained from McGregor's BFANet) by the total sum of the market capitalisation of all the securities in the sample on that day. Each abnormal return was then multiplied by this percentage weighting resulting in a Weighted Abnormal Return (WAR) for the population for each day in the event window. The combined Weighted Average Abnormal Returns (WAAR) for the population of relevance was calculated by summing the WARs for each security on each day during the event window in accordance with Formula 5.

$$WAAR_t = \sum_{i=1}^n WAR_{i,t} \quad (\text{Formula 5})$$

where:

$WAAR_t$  = weighted average abnormal return of all sample securities for day<sub>t</sub>

$n$  = the number of stocks in the sample

$WAR_{i,t}$  = weighted abnormal return of stock<sub>i</sub> on day<sub>t</sub>

Performance over the extended event window period was calculated through cumulative summing of the WAARs (Mordant & Muller, 2003) according to Formula 6.

$$CWAAR_T = \sum_{t=1}^{t2} WAAR_t \quad (\text{Formula 6})$$

where:

$CWAAR_T$  = Cumulative weighted average abnormal return in period $_T$

$WAAR_t$  = weighted average abnormal return on day $_t$

$T$  =  $t_2 - t_1 + 1$

Both the WAARs and CWAARs calculated by Formula 5 and 6 above respectively were subsequently subjected to two-tailed t-tests at the 5% error level to determine their statistical significance from zero (Research Hypothesis).

The t-statistic was calculated by dividing the daily WAARs by its cross-sectional standard error as suggested by Smit (2005) where he quoted several previous studies applying the same methodology. The t-statistic for the CWAARs was also calculated in the same fashion to determine its statistical significance for purposes of this research.

For purposes of comparative analysis and for the graphical representations found in Figures 5.4, 6.1, 6.2 and 6.3 the actual daily share price returns and the projected daily share price returns of the sample securities were average weighted and cumulatively added, daily over the event window, following the same steps as set out in Formulae 5 and 6 (above) respectively. The result was the Weighted Average Projected Daily Returns (WPDR) and the Weighted Average Actual Daily Returns (WADR) calculated with the methodology in Formula 5, and the Cumulative Weighted Average Projected Daily Returns (CWPDR) compared to the Cumulative Weighted Average Actual Daily Returns (CWADR) as calculated with the logic of Formula 6. By graphically mapping the evolution of the CWAARs over the event window in comparison the CWPDRs (predicted returns) and to the CWADR (actual returns) the  $\beta$  slope relation (as

calculated in the 4 year regression data set) becomes clearly apparent. Refer to Figure 5.4 and the discussions in Chapter 6 for the detailed findings.

Brown and Warner (1985, p. 25) appropriately explain that “standard parametric tests for significance on the mean excess return are well specified. IN samples of only 5 securities, and even when even days are clustered, the tests typically have the appropriate probability of Type I error”. This excerpt was also quoted by Smit (2005) in defence of using this significance testing methodology.

#### 4.6 Research limitations

The research that will be conducted in this project will have inter alia, the following limitations:

- The research investigated the occurrence of outward cross-border investments into Sub-Saharan Africa during the eight-year period from 2000 to 2007, therefore is not representative of all mergers and acquisitions during all time periods. This was mainly due to fact that the format of the Ernst & Young mergers and acquisitions database had changed in 1999 and outward cross-border investments prior to 1999 consequently could not be accessed for purposes of this study (in line with Smit (2005) and Van der Plas (2007));
- The study considered involved a relatively small sample;
- The population of relevance was a judgementally selected which placed some limitation on the statistical inferences made;

- The study focussed only on outward cross-border investments made by companies listed on the JSE and will, therefore not be representative of such transactions undertaken by unlisted companies, which could be significantly material transactions (e.g. De Beers is now an unlisted large capitalisation company involved several CBMA transactions annually); similarly it did not consider CBMAs by companies listed on other securities exchanges;
- The study did not focus on large (Category 1 or 2) outward foreign investments and hence it could be argued that the sample and findings are insignificant to the larger market index;
- It ignored the possible cross-sectional effects on share price behaviour like the resources effect, price-to-book value ratio and the company size which could lead to some doubt about the statistical inferences made using the CAPM market model for regression;
- It was noted that a significant number of the large capitalisation companies were involved in several forms of mergers and acquisitions or financially significant investment activities during the eight year period reviewed. This disqualified them from the sample selection based on confounding events but these transactions could possibly, if studied in isolation, have proved substantially different results to the findings of this study;
- The post announcement financial performance of companies were not studied and could have presented more evidence to the impact on shareholders' value in the long term after a CMBA announcement. Smit (2005) also studied the industry adjusted cash flow returns on assets

over the longer term after large acquisitions and found no significant improvement in results for shareholders.

#### 4.7 Data integrity

During the sample selection and construction of regression and estimation data sets in this study, the following data integrity issues were encountered:

- Companies with missing daily share price data or insufficient information on SENS to validate the CBMA announcement date were excluded from the sample;
- Companies for which no share price data was available in the 4 years leading up to CBMA or who was not listed for more than 4 years prior to the event were excluded from the sample;
- Merger and acquisitions prior to 1999 was excluded due to the lack sufficient information on the selection criteria;
- Companies which was delisted or suspended from trading for more than 6 months during the 1 year post the announcement date were excluded;
- It was found that Dunlop Africa Limited was delisted 9 months after the CBMA announcement and it was included in the population of relevance up to an including the last day of trading which represented 77% presence during the event window;
- Fin24.com provided a very efficient user interface with access to all SENS announcements of all companies ever listed on the JSE but changed their website during the latter part of the research period to a

subscription based access for all the information. Only limited and the latest SENS announcements were subsequently accessible which necessitated the fall-back to the McGregor's BFANet MSWORD database and the individual companies' website links to their own SENS announcements published. The alternatives was less user friendly and constrained the research process.

## 5. Results

### 5.1 Sample Description

The sample consisted of all the documented mergers and acquisitions of the Ernst & Young databases from 2000 to 2007 totalling 10,167 for the eight-year period. The population of relevance was extracted from the above database by subjecting the companies to a strict set of selection criteria as described in paragraph 4.2 above. The selection criteria can be summarised in three main categories, namely (1) the uniquely identifiable cross-border transactions for which (2) the required information was available and where the acquiring companies (3) had no confounding events for at least one year (or 252 trading days) prior to and for at least one year after the first public announcement of the merger or acquisition. Only 12 companies successfully met these criteria. Each of the 12 companies in this judgemental sample was analysed separately instead of treating the 12 selections as a population of relevance and selecting a random sample from such a small population of relevance. Appendix 1 provides a detailed representation of the companies selected. A summary of the sample is presented in Table 5.1.

**Table 5.1: Summary of the mergers and acquisitions between 2000 and 2007 that met the selection criteria**

<b>Population size</b>	<b>10,174</b>
<b>Sample size</b>	<b>12</b>
<b>Frequency of year of occurrence</b>	<b>12</b>
2000	0
2001	2
2002	2
2003	0
2004	3
2005	1
2006	1
2007	3
<b>JSE Sub-sectors</b>	<b>12</b>
Broadcasting & Entertainment	1
Broadline Retailers	1
Computer Hardware	1
Computer Services	2
Fixed Line Telecommunications	1
Investment Services	1
Nonferrous Metals	1
Real Estate Investment Trusts	1
Specialty Chemicals	2
Tyres	1
<b>Market Capitalisation Value at t-1</b>	<b>12</b>
< R1,000,000,000	4
R1,000,000,000 to R5,000,000,000	4
R5,000,000,000 to R10,000,000,000	1
R10,000,000,000 to R50,000,000,000	2
>R50,000,000,000	1

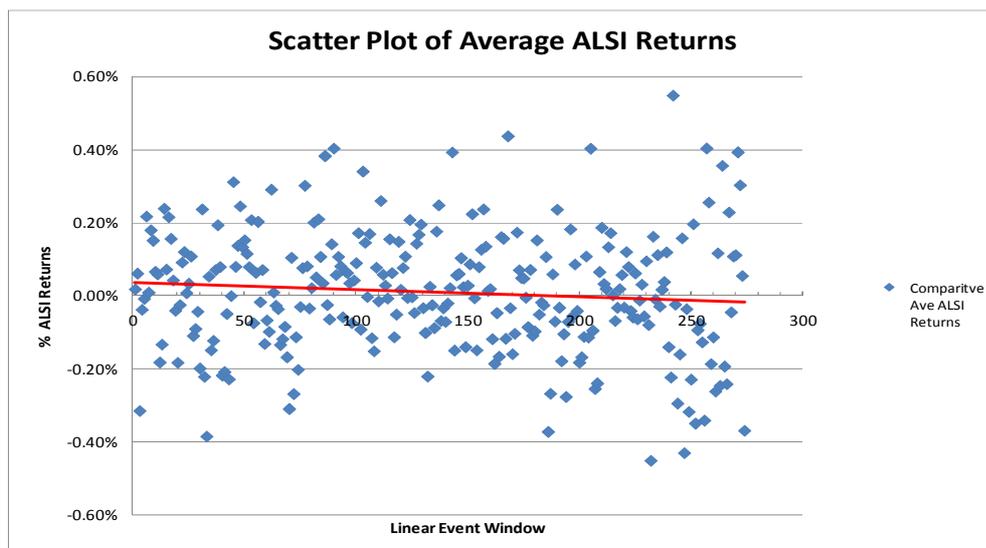
The JSE changed their sector grouping classifications in 2002. The above sub-sector summary are stated in line with the new JSE sector classifications

## 5.2 Descriptive statistics

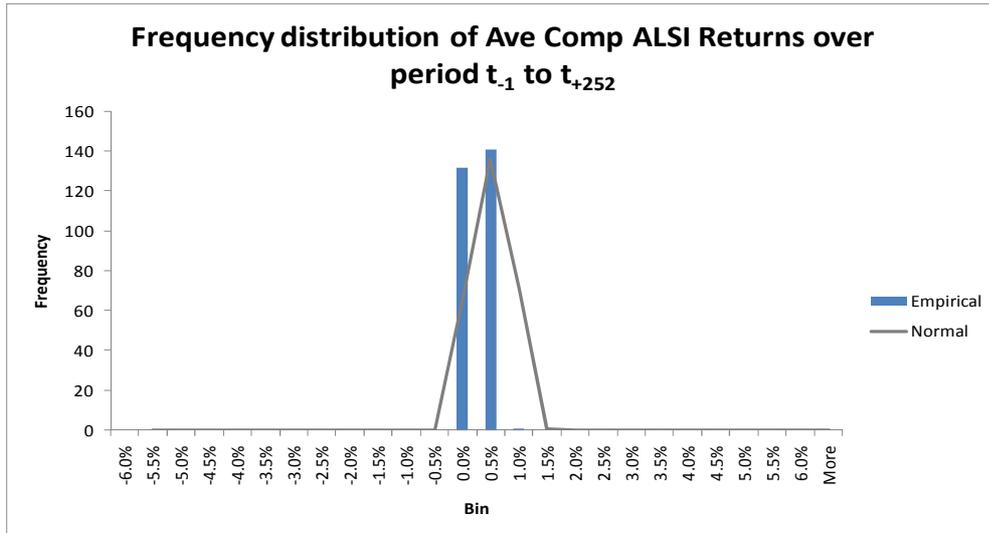
The XY correlation scatter plots for each individual company selected over the 4 year period preceding the announcement date of the CBMA event is depicted in Appendix 2. The actual daily share price returns (as the dependent variables) were plotted against the comparative day's All Share Index (ALSI) returns and this data was used to determine the slope, intercept and R-squared of the regression formulae.

Appendix 3 consists of the summarised results calculated for all 12 companies in the sample over the 274 day event window from day  $t_{-21}$  to  $t_{+252}$ . Here the ARs per company for each day in the event window were weighted against the daily market capitalisation of the total sample to obtain the WAARs for the population per day. All the key components as calculated and described in the data analysis approach (Chapter 4) are listed.

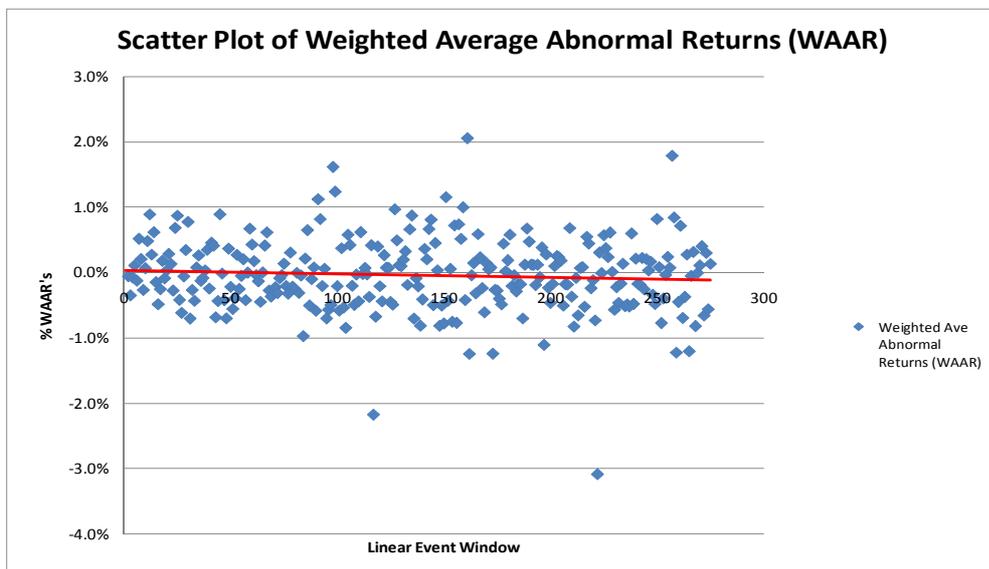
**Figure 5.1(a): Scatter plot of the daily ALSI returns over the event window**



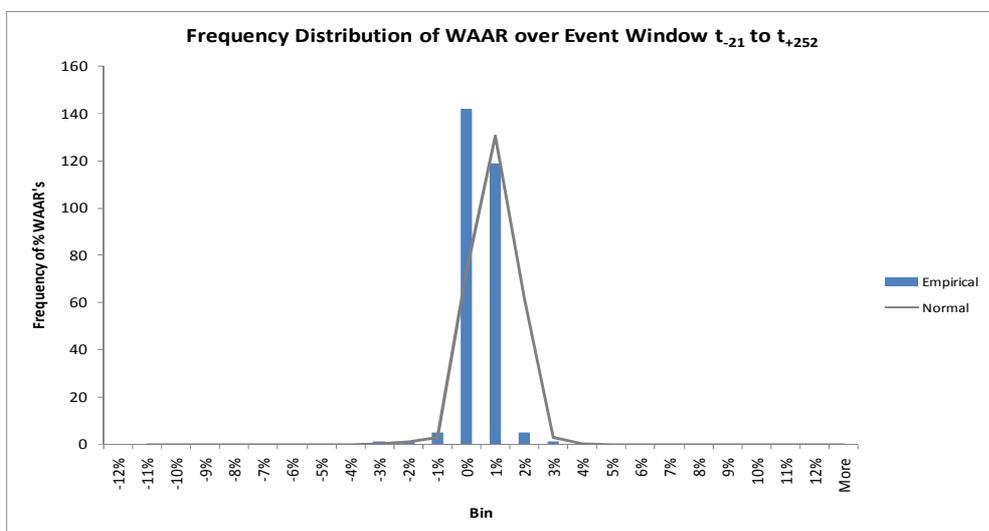
**Figure 5.1(b): Frequency distribution of the daily ALSI returns over the event window**



**Figure 5.2(a): Scatter plot of the WAARs over the event window**

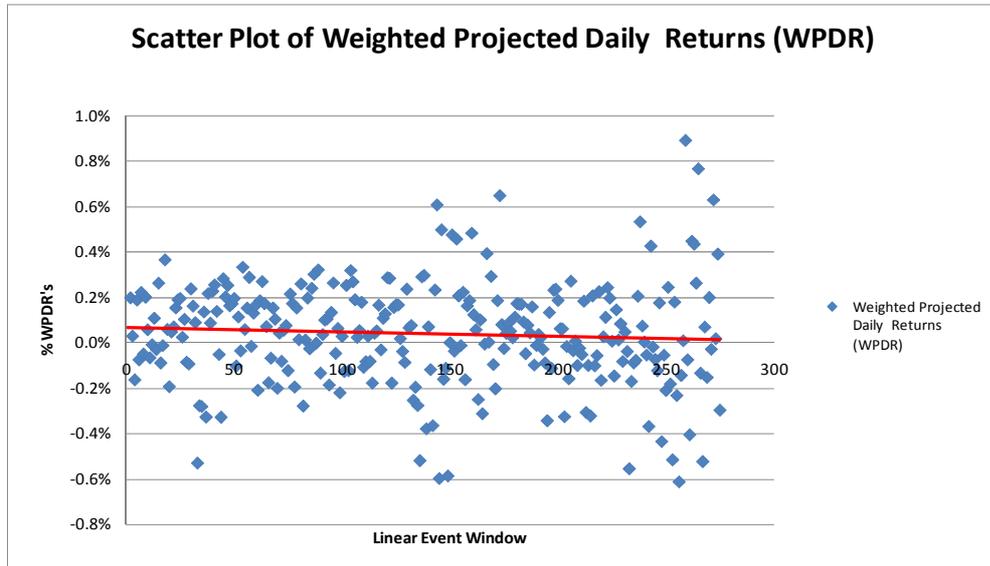


**Figure 5.2(b): Frequency distribution of the WAARs over the event window**

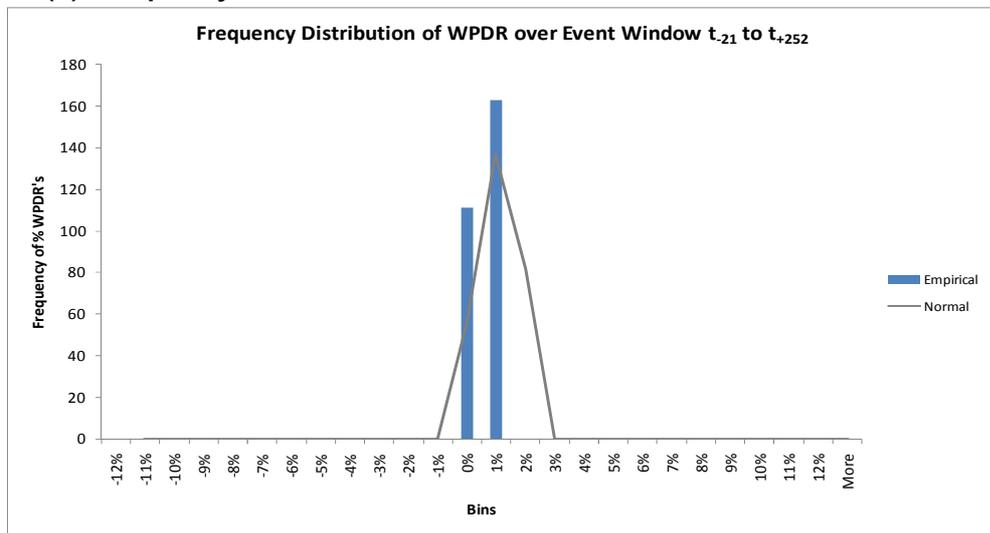


Similarly the market capitalisation weighted average daily projected returns (WPDRs) for the companies in the sample were analysed for comparison to the average ALSI returns and WAARs in Figures 5.1 and 5.2 respectively.

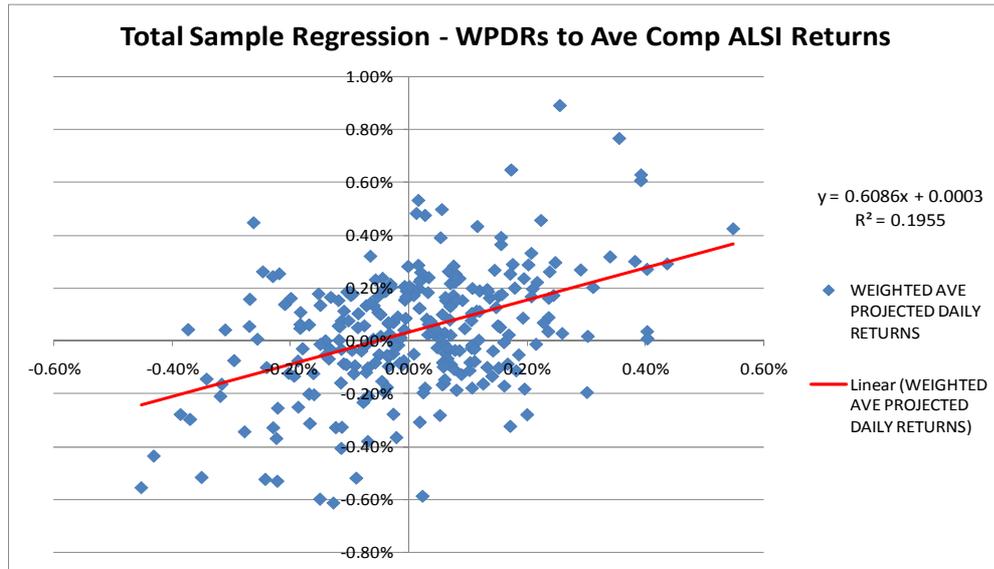
**Figure 5.3(a): Scatter plot of the WPDRs over the event window**



**Figure 5.3(b): Frequency distribution of the WPDRs over the event window**



**Figure 5.3(c): The Sample Regression Scatter Plot WPDRs to Average Daily ALSI Returns**



Figures 5.3(a) to 5.3(c) represents the graphical statistical output of the calculated Weighted Average Projected Daily Returns (WPDRs) for the sample population of companies derived by applying the individual historical regression formulae to the average comparative daily ALSI returns forward over the event window day  $t_{-21}$  to  $t_{+252}$ . The regression formula for the total combined sample was derived by comparing the average comparative ALSI daily returns as the independent (X) variable to the calculated WPDRs as the dependent (Y) variable.

To gain a better understanding of the sample data collected and calculated using the basic bootstrapping technique, the daily WAARs were analysed before being cumulated and compared against the average comparative daily ALSI returns. The average ALSI returns were regressed against the WAARs and plotted for residuals as demonstrated in Appendix 4.

**Table 5.2: Descriptive statistics of WAAR**

---

<i>Weighted Ave Abnormal Returns (WAAR)</i>	
Mean	-0.04%
Standard Error	0.03%
Median	-0.04%
Standard Deviation	0.55%
Sample Variance	0.00%
Kurtosis	4.24
Skewness	-0.35
Range	5.14%
Minimum	-3.09%
Maximum	2.05%
Sum	-11.09%
Count	274

---

**Table 5.3: Descriptive statistics of CWAAR**

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<i>Cumul Weighted Ave Abormal Returns (CWAAR)</i>	
Mean	-2.27%
Standard Error	0.22%
Median	-1.47%
Standard Deviation	3.70%
Sample Variance	0.14%
Kurtosis	-0.34
Skewness	-0.85
Range	14.10%
Minimum	-10.95%
Maximum	3.15%
Sum	-622.33%
Count	274

---

Table 5.2 represents a summary of the statistics of the output of frequency distribution over the entire period  $t_{-21}$  to  $t_{+252}$  for WAARs and was compared to the resulting statistics derived from the cumulative weighted average abnormal returns (CWAARs) shown in Table 5.3.

### 5.3 Share price performance

**Figure 5.4: Time series analysis of CWADR, CWAAR and CWPDR over the event window**

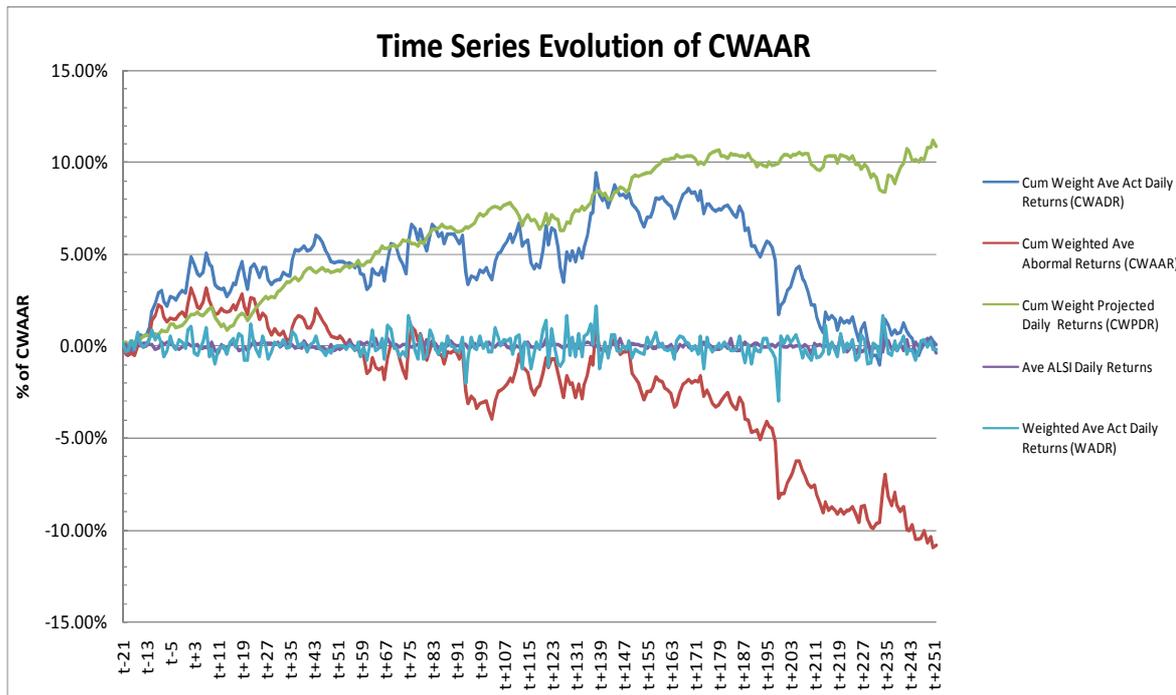
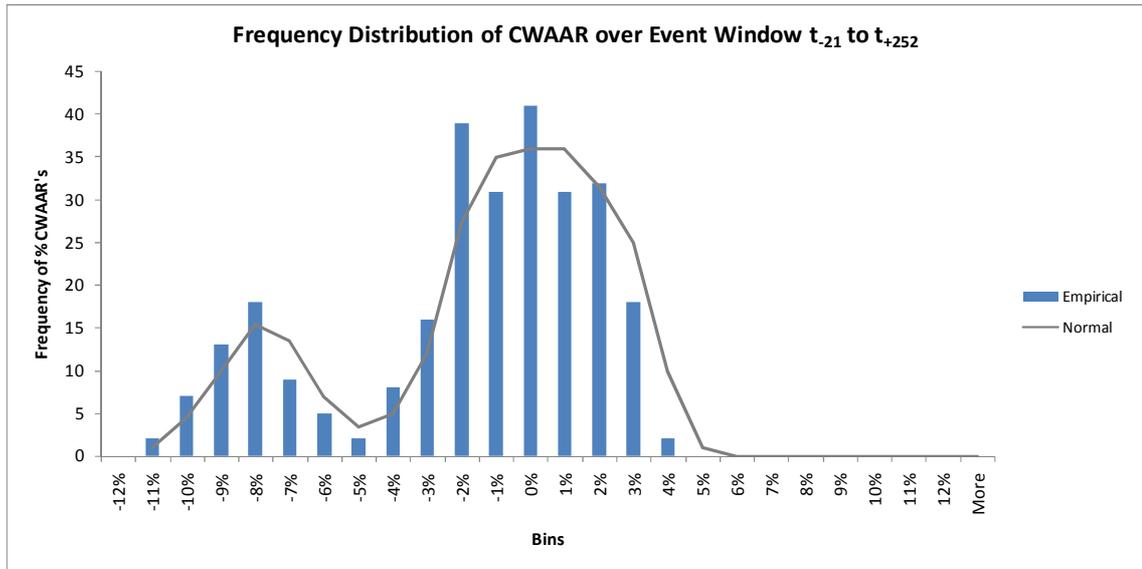


Figure 5.4 graphically represents the CWAARs of the sample over the entire event window from day  $t_{-21}$  to  $t_{+252}$  and compares it to the relevant time series data calculated for actual share data for the sample (CWADR), projected share price performance (CWPDR) as well as average ALSI daily returns.

The frequency distribution of the calculated CWAARs was inspected for distribution qualities as indicated in Figure 5.5 and compared to the descriptive statistics obtained of the sample as indicated in Table 5.3 above.

**Figure 5.5: Frequency distribution of CWAARS over the event window**



## 6. Discussion of results

### 6.1 Analysis of descriptive statistics

The XY correlation scatter plots for each individual company selected over the 4 year period preceding the announcement date of the CBMA event as depicted in Appendix 2 were used to gain a broad understanding of the relationship between the actual daily share price returns in relation to the comparative day's All Share Index (ALSI) returns. On average a positive sloped relationship between the individual companies and the ALSI was observed with the exception of Nictus Beperk (share code NCS) and Zambia Copper Investments (share code ZCI) which showed a very slight negative to almost zero point slope compared to the daily ALSI returns. None of the sample companies displayed a average historical share price performance in excess of the ALSI index performance.

The weighted average coefficient of determination (or R-squared) indicated a weak line-fit at 0.1955 which can be interpreted as 20% of the movement in the individual companies' daily share price performance (dependent Y variable) can be explained by the movement in the daily ALSI index returns (independent X variable). This finding can be due to market noise or industry specific variables which did not generally impact on the ALSI's performance over the periods compared. To compensate for the above and to obtain a stronger regression model for predicting the future share price performances, this research used 4 years (48 months) of historical share price performance data as described in

Chapter 4. This regression period used exceeds those used by Smith (2005) and Van der Plas (2007) who used 18 months and 36 months of historical data respectively to obtain their regression formulae.

It is also apparent that the more historical data is used for regression over longer and longer periods, the larger the possibility for confounding events and market noise become, which can be used to explain the relatively weak line-fit of the regression formula. This however is not sufficient evidence to reject the model, as the longer the period used for the historical regression, the better reliance can be placed on the calculated  $\beta$  risk factor used, which takes more of these market factors into account.

The average comparative ALSI index returns over the event window displays a very slight negative (almost flat) linear trend over the 274 day event window. These returns are normally distributed between 0.50% and -0.50% whilst the frequency distributions are skewed slightly to the left as indicated in Figures 5.1(a) and (b). Having used a 95% confidence level in the research one would expect the actual share price performances of the sample companies to follow a similar trend in the absence of large impacting events using the market risk  $\beta$ 's.

This is confirmed by the scatter plot of the Weighted Average Projected Daily Returns (WPDRs) calculated using the regression formula obtained as discussed above. The WPDRs display almost identical characteristics to the average ALSI returns over the event window, being normally distributed between 0.90% and -0.60% and the histogram of frequency distributions are slightly skewed to the left as indicated in Figures 5.3(a) and (b).

Prior to analysis of the Cumulative Weighted Average Abnormal Returns (CWAARs) a better understanding of the underlying Weighted Average Abnormal Returns (WAARs) were obtained. Having calculated the ARs from the difference between the actual daily returns and the calculated projected daily returns per company during each day in the event window, the ARs were weighted on the market capitalisation for each company to obtain the WAARs for the total sample population as explained in Chapter 4 in more detail.

The scatter plot and histogram of frequency distributions of the WAARs as depicted in Figures 5.2(a) and (b) proved to be in line with that of the ALSI returns and WPDRs yielding a slight negative linear slope normally distributed around zero percent returns over the event window.

The average ALSI returns were regressed against the WAARs and plotted for residuals as demonstrated in Appendix 4. This confirms the findings above that there is a clear correlation between the ALSI's performance and the WAARs.

Figure 5.3(c) graphically represents the regression formula for the total combined sample. It confirms the findings from analysing the individual regression scatter plots for each company. The combine sample regression shows a positive  $\beta$  slope of 0.6086 at intercept 0.0003 of the average ALSI returns during the event window. Thus it is expected that share price returns of the selected companies will move by only 61% of that of the ALSI per day over the event window in an upward (positive) direction. This formula also confirms the 20% line-fit ( $R^2$ ) argument discussed earlier in this section.

The summary of the statistics of the output of frequency distribution over the entire period  $t_{-21}$  to  $t_{+252}$  for WAARs in Table 5.2 are bound in the range (-3.09%, 2.05%) compared to the CWAARs the range (-10.95%, 14.10%). Both analysis displays negative skewness to the left (WAAR=-0.35; CWAAR=-0.85) which is also evident from the histograms of frequency distribution compared to the normal distribution overlaid on them in Figure 5.2(b) for the WAARs and in Figure 5.5 respectively. The WAARs differ from the CWAARs in terms of kurtosis whereas the WAARs have a more leptokurtic “peakedness” compared to the relative flatness of the CWAARs’ distribution peaks indicated by its negative kurtosis. The skewness is expected considering the bootstrapping technique using real data, and no assumptions around a normal distribution’s t- and z-tests were used as also noted by Van der Plas (2007).

## 6.2 Analysis of share price performance

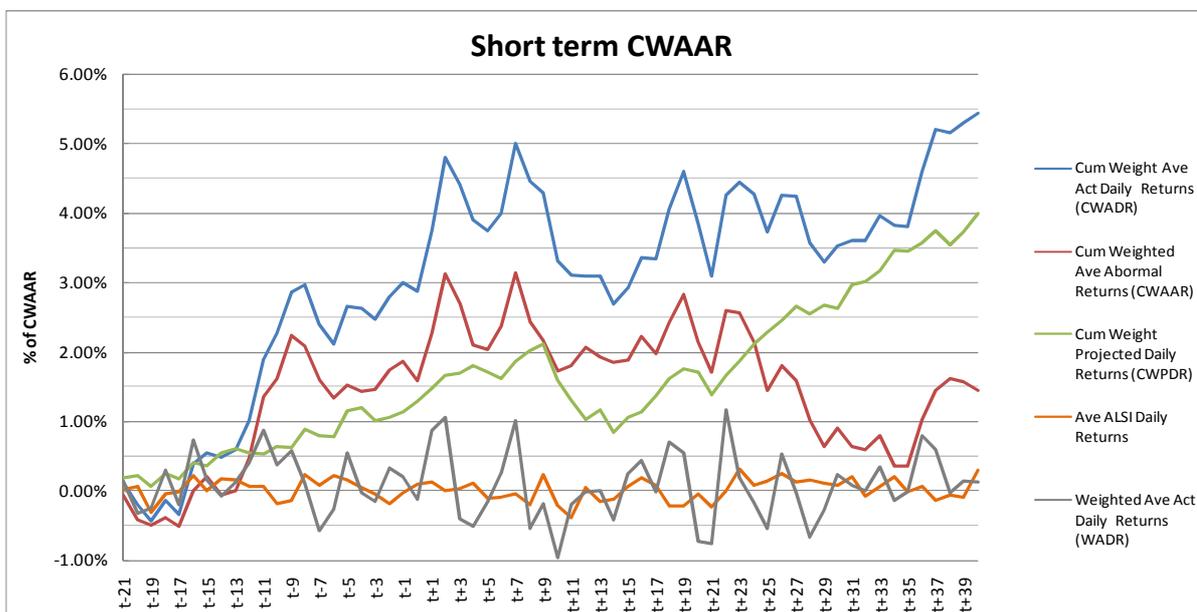
The central hypothesis of this study revolves around CWAARs earned over the total 274 day event window from day  $t_{-21}$  to  $t_{+252}$ . Figure 5.4 illustrates the evolution of CWAAR over this period by comparing it to actual CWADR and the projected CWPDRs.

In the short term the CWAARs outperformed the projected CWDRs from the 46 days  $t_{-21}$  to  $t_{+24}$ . This is in accord with various other local and international studies around the short term impact of share price performance around the announcement date of mergers and acquisitions. In the short term window the CWAARs peaks at a high of 2.24% on day  $t_9$  before the announcement date on  $t_0$  which is significant at the 95% confidence level as indicated on the data table

in Appendix 3. In the short term post announcement the CWAARs reaches a maximum of 3.15% on day  $t_{+7}$  and remains in the significant returns territory up to day  $t_{+24}$ . These findings agree with those of Van der Plas (2007) that significant earnings are realised prior to the first announcement date of large mergers and acquisitions in target companies due price sensitive information leakage into the market and sighting the presence of insider trading. Smit (2005) found no statistical significant returns earned by shareholders of the acquiring company around the announcement date of large mergers and acquisitions.

For the benefit of clarity, Figure 6.1 below provides a more focussed view of the short term event window as discussed above. The initial market excitement and appetite for shares in the acquiring company engaged in a CBMA transaction is evident in the short term after which the information becomes fully disseminated in the market and share prices start trading at earnings levels more in line with ALSI (market) index returns.

**Figure 6.1: Short term time series analysis of CWAAR**



After day  $t_{+24}$  the CWAARs become increasingly smaller and less significant although remaining positive up to day  $t_{+57}$  when negative cumulative returns are witnessed for the first time.

For the period  $t_{+58}$  to  $t_{+149}$  indifferent negative CWAARs are witnessed periodically returning to the 0.00% level of cumulative abnormal returns. From period  $t_{+150}$  to the end of the event window on day  $t_{+252}$  there is a noticeable and statistically significant decline of -9.37% in the CWAARs from -1.45% to -10.82% for the combined sample population. This resulted in a significant negative CWAAR over the entire event window of -10.82% for the sample as a whole. This is clearly identifiable from the graphical representation in Figure 5.4 by noting the evolution of the difference between the Cumulative Weighted Actual Daily Returns (CWADR) to the Cumulative Weighted Projected Daily Returns (CWPDR) over the course of the event window. This result is in line with findings by Agrawal, Jaffee and Mandelker (1992), who tested for excess returns of the acquiring company over a five-year period after the merger event.

In evidence of the descriptive statistical analysis in Table 5.3, the histogram of frequency distributions portrayed in Figure 5.5 for the CWAARs underlines the negative skewness (to the left) of the normal distribution significantly greater and more noticeable than that of the WAARs.

### 6.3 Impact of weighting the abnormal returns on the research findings

As discussed in Chapter 4, the abnormal daily returns were average weighted daily based on the individual company's market capitalisation divided by the total market capitalisation of all the companies in the sample. This was done because an equal weighting would have resulted in an arbitrary bias in favour of returns from those smaller companies for which the transaction size could be deemed as being of lesser significance compared to those of the larger market capitalised companies in the sample. This principle was also followed to determine the Weighted Actual Daily Returns (WADRs) and for the Weighted Projected Daily Returns (WPDRs) for consistency in comparison.

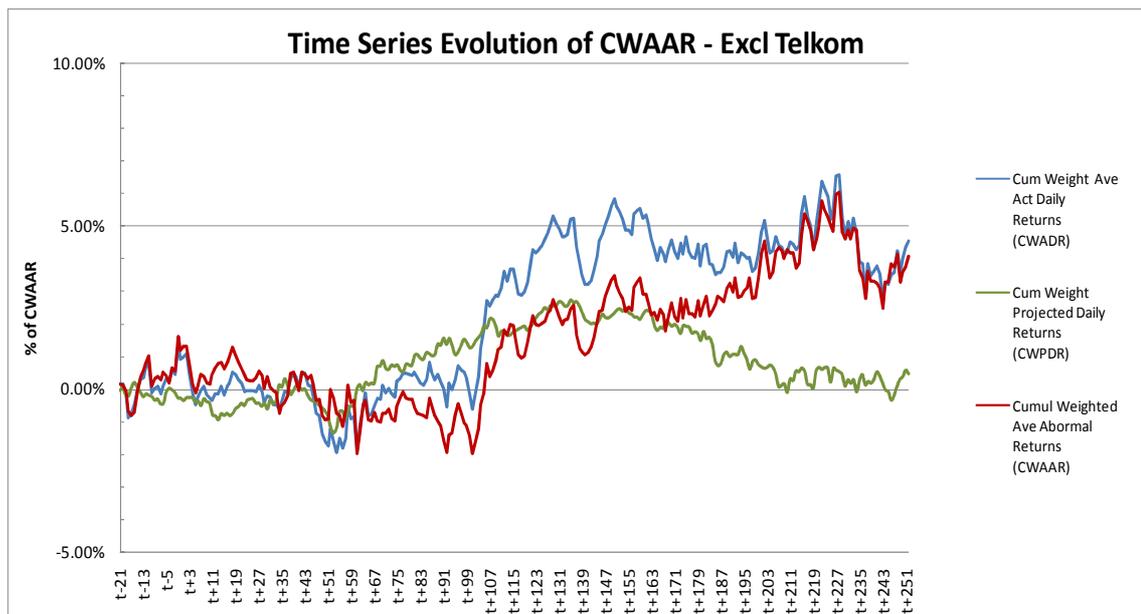
In analysing the percentage weighting of the individual companies contributing to these weighted averages, it is noted that one company (Telkom SA Ltd: TKG) has a significantly larger market capitalisation than those of the other companies in the sample. On average Telkom contributed 64% of all the variables mentioned above to the total sample population based on its market capitalisation weight. Thus it can be reasonably derived that 64% of the declining CWAARs observed specifically during the latter part of the event window ( $t_{+150}$  to  $t_{+252}$ ), but moreover for the entire event window, is attributable to Telkom's share price performance. The closing share price for Telkom deteriorated from 14600 cents on 15 January 2007 to 13270 cents on 15 February 2008 which fell inside the total event window. This represents a 9% drop in share price whilst its market capitalisation decreased by 11% over the

same period. It can subsequently be argued that Telkom contributed on average  $64\% \times 9\% = 5.76\%$  of the combined CWAAR of  $-10.85\%$  over the event window.

It is thus evident that the other companies in the sample still contributed (on average) a significant portion of the resulting CWAAR performance observed.

Further analysis of the sample database was done by excluding Telkom entirely. This resulted in the next largest company by market capitalisation (Naspers Ltd: NPN) taking a front seat. Naspers subsequently accounted for 41% of the combined sample results. This resulted in no significant positive returns in the short term before and after the announcement dates. It did however yield a statistically significant positive CWAAR from day  $t_{+105}$  to  $t_{+252}$ . Figure 6.2 below provides a reference of the CWAARs observed with the exclusion of Telkom from the sample.

**Figure 6.2: Time series analysis of CWAAR excluding Telkom SA Ltd**

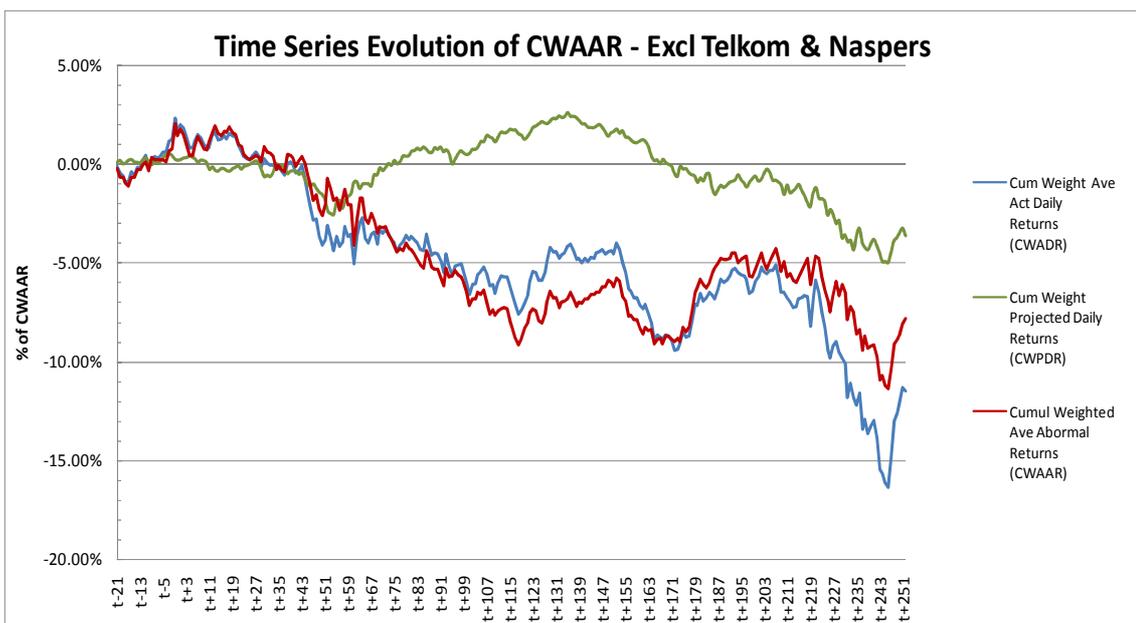


On day  $t_{+228}$  the CWAAR peaked at 6.04% and returned 4.09% on day  $t_{+252}$  cumulative over the event period, both of which is statistically significant at the 95% confidence level.

For the same argument as was posed with Telkom, a further analysis of the sample with the exclusion of Naspers was done.

The subsequent sample of 10 companies resulted in a similar situation where the next largest company by market capitalisation remaining (Dimension Data Holdings plc: DDT) yielded a 42% average contribution to the sample results. As opposed to the results found and discussed from Figure 6.2 above, the newly derived CWAARs yielded a total negative return of -7.83% over the event window, bottoming out at -11.34% on day  $t_{+246}$ . These results are also statistically significant at the 5% error level. Figure 6.3 below graphically depicts the reduced sample results.

**Figure 6.3: Time series analysis of CWAAR excluding Telkom SA & Naspers**



Taking the outcomes of the above simulations into account, it is clear that the results of large companies will inevitably be dominant in any weighted average analysis. The fact that the large market capitalised companies posted opposing results (positive and negative) in contribution to the total sample is unavoidable and a factor of the market risk  $\beta$  presented and accounted for by the capital asset pricing model (CAPM). It is therefore argued that no exclusions be made from the original 12 company sample and that the weighted average approach to analysis of share price performance be accepted as providing a more realistic output when considering the use of the market model of event study (ALSI index as the independent variable).

#### 6.4 Hypothesis testing of CWAARs of the full sample

The original research hypothesis tested was:

$$H_0: \text{CWAAR} = 0$$

$$H_A: \text{CWAAR} \neq 0$$

Based on the research results discussed in paragraph 6.2 and considering the arguments proposed in paragraph 6.3, the alternative hypothesis cannot be rejected for the full sample of companies over the entire event window in this study.

The negative -10.85% CWAAR realised by the companies in the sample over the entire event window is statistically significant within the 95% confidence interval applying a significance level of error of 5%.

#### 6.5 Summarised conclusion of results

The sample of relevance consisting of the securities of 12 companies engaged in CMBA transactions between 2000 and 2007 yielded varying weighted average abnormal returns (WAAR) in the medium-long term after the announcement dates. Statistically significant WAARs at the 5% error level were witnessed in the short term around the announcement date. In the medium-long term up to 252 trading days after the announcement date, a cumulative weighted average abnormal returns (CWAAR) over the entire event window yielded a statistically significant negative -10.82% was realised.

This is in line with other international studies like those presented by Agrawal Jaffee and Mandelker (1992) and Loughran and Vijh (1997).

Table 6.1 below offers a summarised comparison of the findings of this study regarding longer term share price performance in acquiring companies with those of the most prominent recent international and local studies found.

**Table 6.1: Comparison of summary results of post-acquisition, long-term Average Cumulative Abnormal Returns of Acquiring Companies**

Study	Sample Size	Period	Event Window (-before; +after date)	Abnormal Return
Rau and Vermaelen (1998)	2196 Mergers	1980 - 1991	[+1; +36] months	-4.0% **
Rau and Vermaelen (1998)	348 Tender Offers	1980 - 1991	[+1; +36] months	+8.9% **
Andrade <i>et al</i> (2001)	2068 securities	1961 - 1993	[+0; +3] years	-5.0% **
Loughran and Vijh (1997)	788 acquisitions	1970 - 1989	[+0; +5] years	-6.5%
Negash and Wimberley (2004)	299 securites	1989 - 1998	[+1; +12] months	+2.2%
Negash and Wimberley (2004)	299 securites	1989 - 1998	[+1; +36] months	-10.5% **
Smit (2005)	27 securities	2000 - 2002	[-10; +10] days	+4.35%
Smit (2005)	13 share funded acquisitions	2000 - 2002	[-10; +10] days	1.89%
Smit (2005)	10 cash funded acquisitions	2000 - 2002	[-10; +10] days	+11.50% **
This study	12 acquisitions	2000 - 2007	[-21; +252] days	-10.82% **
** - Statistically significant at the 5% level				

It is noticeable that many researchers including Smit (2005) found evidence of significant differences between the abnormal returns measured for share funded acquisitions versus cash funded acquisitions. Cash funded acquisitions yielding consistent statistical significant positive abnormal returns in the post-acquisition periods analysed.

## 7. Conclusion

This research found that shareholders of acquiring companies earn statistically significant negative Weighted Average Abnormal Returns within the medium-long term after the announcement date of a cross-border merger and acquisition transaction (CBMA) into Sub-Saharan Africa.

All local and international studies in this subject area found have a common theme in the results namely that shareholders of acquiring companies, on average, do not gain or lose much from mergers and acquisitions. Some studies even draw evidence that shareholders, in the longer term post the acquisition event, earn zero to negative average returns (Loughran and Vijh, 1997)

In addition Gaughan (1999) found that it is difficult to conduct long-term studies that filter out the effects of one specific transaction from the many confounding events that may impact on the share price over a longer time period. This phenomenon was encountered in the current study which resulted in a fairly small judgemental sample eventually being selected without confounding events.

The event window in this study started on the 21<sup>st</sup> trading day before the announcement day ( $t_{-21}$ ) and worked forward for the 252 trading days after the announcement date ( $t_{+252}$ ). It further employed the market model for event studies as a prediction model of securities price performance and the

subsequent calculation abnormal and weighted average abnormal returns earned by shareholders during the event window.

Employing a strict set of judgemental selection criteria of all mergers and acquisition during the eight year period from 2000 – 2007, the study returned a relatively small sample population of relevance of 12 companies. These companies were found to be involved in CBMAs into Sub-Saharan Africa without having confounding events in the two years pre-acquisition and up to one year post-acquisition.

The study found statistically significant negative average abnormal returns around -10% at the 5% error level of estimation over the event window. More reliance on the model was achieved by applying an average weighting of the individual securities daily abnormal returns based on their market capitalisation. Thus elimination a degree of company size bias towards the total ALSI market index as the independent variable used in the regression formula.

The study also highlighted statistically significant positive average abnormal earnings in the short-term just before and just after the first announcement date of the CBMA transactions. The average abnormal positive earnings prior to the announcement date was in line with findings by Van der Plas (2007) and other international studies that information leakage and insider trading on the information is present prior to large merger and acquisition events.

Although this study employed the market model for regression it has to be noted that there are various other studies arguing the presence cross-sectional impact

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on share price performance which needs to be considered. Mordant and Muller (2003) employed a multi-factored control portfolio model to compensate for the resources effect, price-to-book value ratio, and the company size effect. This model was used in previously and subsequently in many international and local studies but none of the researchers found sufficient evidence to reject the market model in entirety.

This study poses a substantially focussed contribution insofar as it is the only South African study to date which offered evidence to the impact on shareholders' value of outward cross-border investments made into Sub-Saharan Africa. Future research may also consider to evaluate the difference in share funded cross-border mergers and acquisitions in comparison to those were cash funded. The operating financial performance of companies could also be analysed over the longer term after the cross-border investments made to present more evidence to the success or failure of these high-risk type transactions.

It is further proposed that the longer term (2 to 5 years) share price performance be considered by researchers to provide more empirical evidence for long term shareholders.

Finally the use of the market model should be subjected to a series of sensitivity analyses for application in cross-border mergers in acquisitions. There are economic variables unique to cross-border transactions like exchange rates, and taxation benefits which could impact the sensitivity of the market model.

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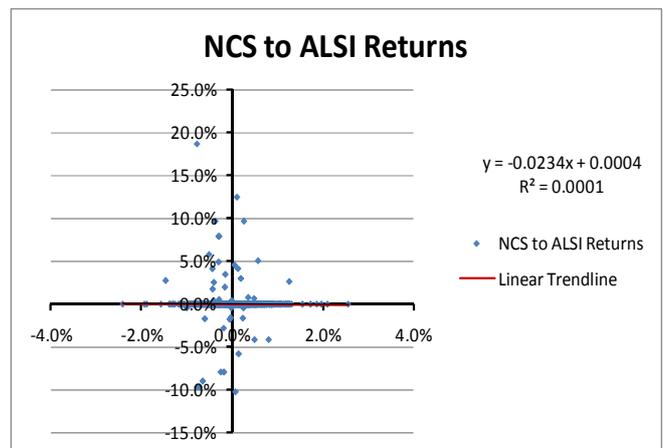
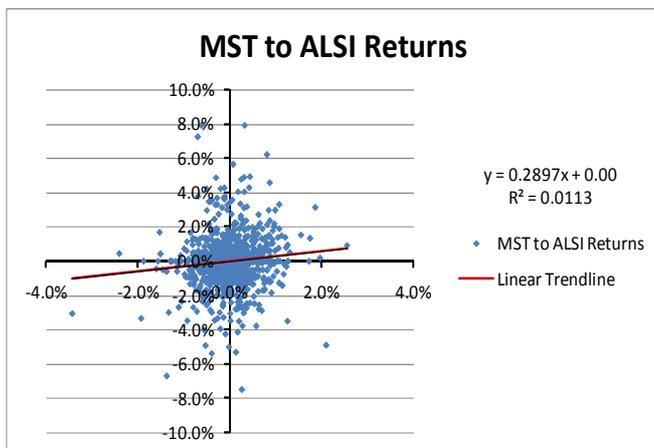
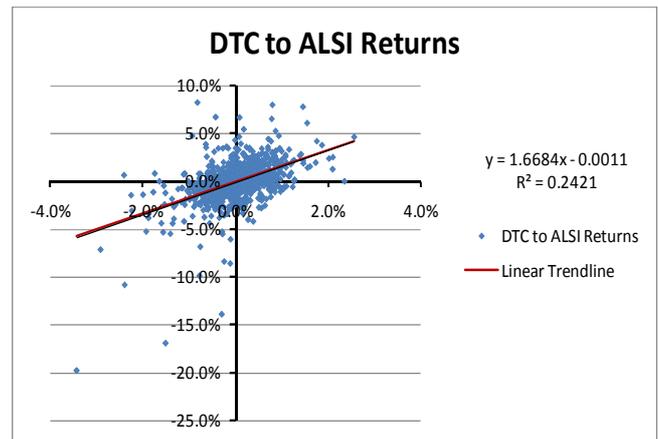
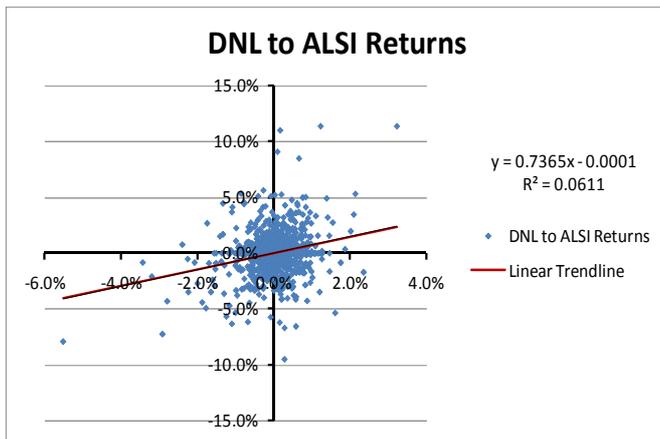
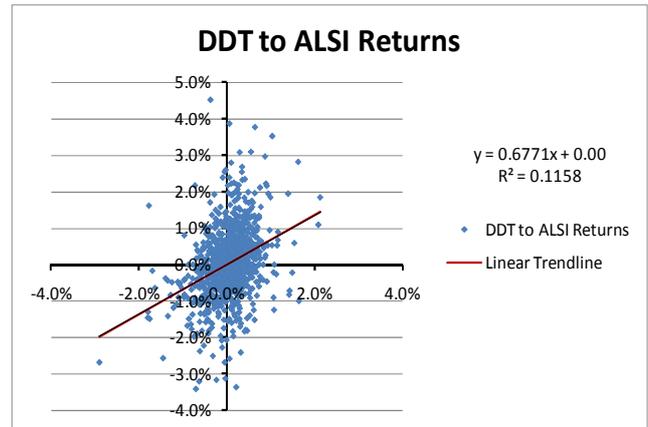
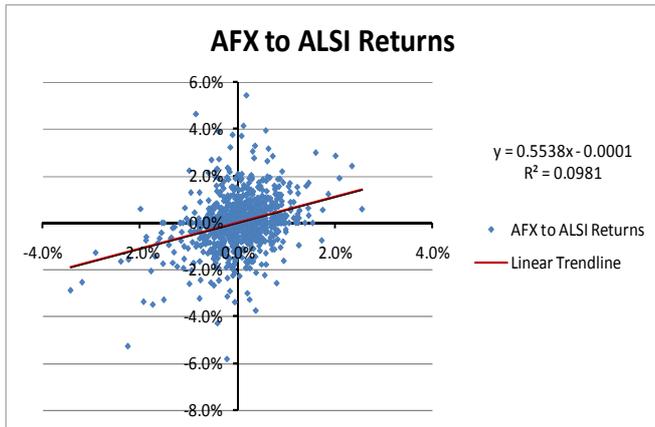
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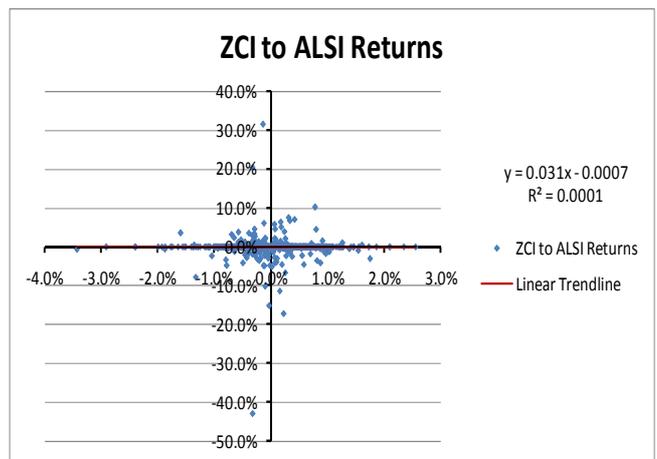
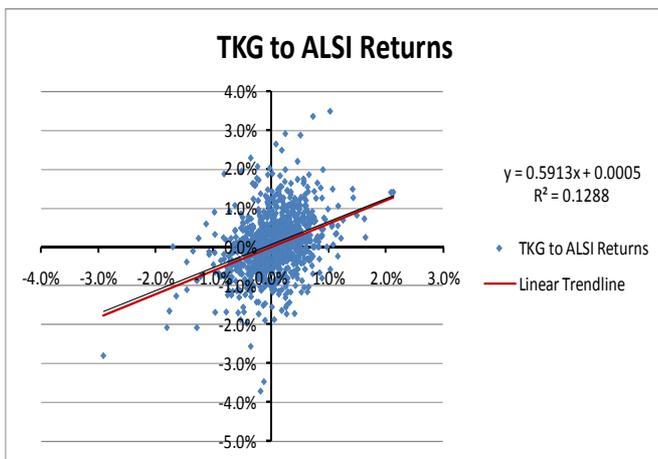
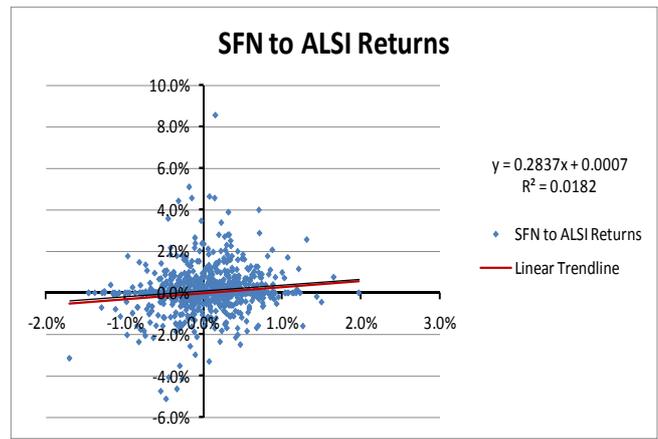
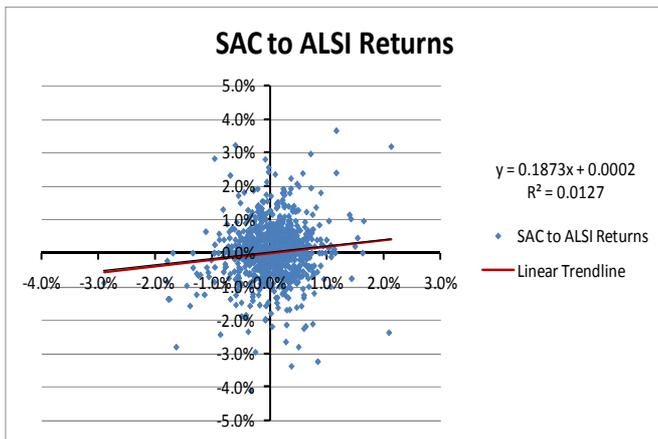
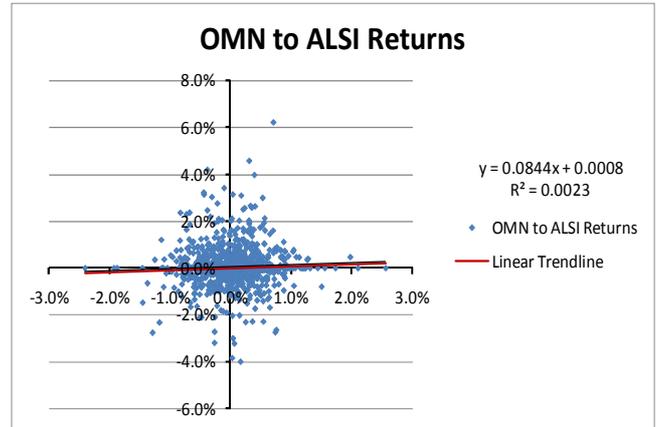
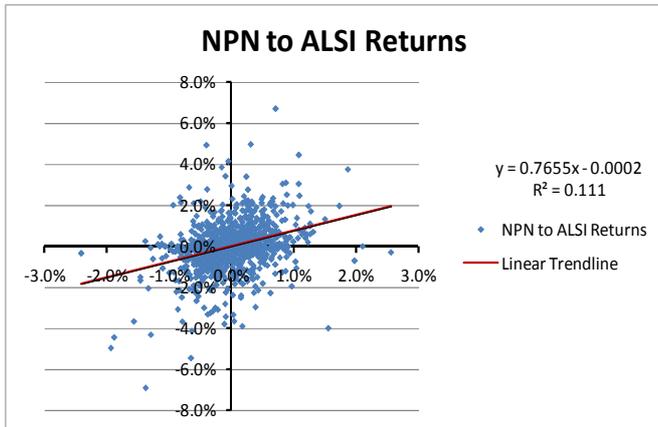
## Appendix 1: Details of companies selected in the sample

No.	Share Code	Acquirer Name	Target Name	Target Asset Location	Main Sector	Sub- Sector	Caution Date	Announce Date	Effect Date
1	<b>AFX</b>	AFRICAN OXYGEN LTD	Major liquefied petroleum gas distributor/ Assets of Messer(Fedgas)	Botswana/Namibia/ Mozambique/Madagascar	Chemicals	Specialty Chemicals	01/11/2001	01/11/2001	01/11/2001
2	<b>DDT</b>	DIMENSION DATA PLC	Accelon	Nigeria/Ghana	Software & Computer Services	Computer Services	01/11/2007	02/11/2007	02/11/2007
3	<b>DNL</b>	DUNLOP AFRICA LTD	Dunlop Nigeria & National Tyre Services Ltd (Zimbabwe)	Nigeria/Zimbabwe	Consumer Goods	Tyres	22/08/2001	22/08/2001	22/08/2001
4	<b>DTC</b>	DATATEC LTD	DataConnect	Botswana	Software & Computer Services	Computer Services	21/05/2002	21/05/2002	21/05/2002
5	<b>MST</b>	MUSTEK LTD	Mecer East Africa/Mecer EPZ (Pty) Ltd	Kenya	Technology Hardware & Equipment	Computer Hardware	25/02/2004	25/02/2004	25/02/2004
6	<b>NCS</b>	NICTUS BPK	Futeni Collections (Pty) Ltd	Namibia	General Retailers	Broadline Retailers	28/04/2004	28/04/2004	28/04/2004
7	<b>NPN</b>	NASPERS LTD	East Africa Magazines	Kenya	Media	Broadcasting & Entertainment	30/06/2004	30/06/2004	30/06/2004
8	<b>OMN</b>	OMNIA HOLDINGS LTD	African Polymers	East Africa	Chemicals	Specialty Chemicals	22/06/2005	22/06/2005	01/01/2005
9	<b>SAC</b>	SA CORP REAL ESTATE FUND LTD	Oryx Properties	Namibia	Real Estate	Real Estate Investment Trusts	22/10/2007	22/10/2007	22/10/2007
10	<b>SFN</b>	SASFIN HOLDINGS LTD	SMB Nedbank International Ltd	Mauritius	General Financial	Investment Services	28/04/2006	10/05/2006	30/04/2006
11	<b>TKG</b>	TELKOM SA LTD	Africa Online	Kenya/Zimbabwe/ Tanzania/Uganda	Fixed Line Telecommunications	Fixed Line Telecommunications	13/02/2007	13/02/2007	13/02/2007
12	<b>ZCI</b>	ZAMBIA COPPER INVESTMENTS LTD	Konkola Copper Mines plc	Zambia	Industrial Metals	Nonferrous Metals	26/01/2002	19/08/2002	16/09/2002



**Appendix 2: Scatter plots of correlations between the actual daily share price returns of all selected companies to the corresponding daily returns of the ALSI index for the 4 years prior to announcement – Used for each individual company’s regression formula**







### Appendix 3: Details of WAAR and CWAAR for the companies selected over the event window $t_{-21}$ to $t_{+252}$

	AFRICAN OXYGEN LIMITED (APX)	DIMENSION DATA HOLDINGS PLC (DDT)	DUNLOP AFRICA LTD (DNL)	DATATEC LIMITED (DTC)	MUSTEK LIMITED (MST)	NICTUS BEPERK (NCS)	NASPERS LIMITED (NPN)	OMNEA HOLDINGS LIMITED (OMN)	SA CORP REAL ESTATE FUND (SAC)	SASFIN HOLDINGS LIMITED (SFN)	TELKOM SA LIMITED (TKG)	ZAMBIA COPPER INVESTMENTS LIMITED (ZCI)	WEIGHTED AVE PROJECTED DAILY RETURNS
Intercept:	-0.0001	0.0000	-0.0001	-0.0011	0.0000	-0.0004	0.0004	-0.0002	0.0002	0.0007	0.0005	-0.0007	0.0003
Slope:	0.5538	0.6771	0.7365	1.6684	0.2897	-0.0234	0.7655	0.0844	0.1873	0.2837	0.5913	0.0310	0.6086
R-Squared:	0.0981	0.1158	0.0611	0.2421	0.0013	0.0001	0.1110	0.0023	0.0127	0.0188	0.1288	0.0001	0.1955
STD Error:	0.0101	0.0088	0.0181	0.0176	0.0145	0.0127	0.0111	0.0085	0.0078	0.0094	0.0072	0.0229	0.0020

DAY	Abnormal Return AR	Total Market Cap of Population	Average Comparative All Share Returns	Average Abnormal Returns (AAR)	Weighted Projected Daily Returns (WPDR)	Cum Weight Projected Daily Returns (CWPDR)	Weighted Ave Act Daily Returns (WADR)	Cum Weight Ave Act Daily Returns (CWADR)	Weighted Ave Abnormal Returns (WAAR)	WAAR t-Test	WAAR Significant?	Cumul Weighted Ave Abnormal Returns (CWAAR)											
t-21	-0.2%	-0.7%	1.6%	-0.5%	-0.4%	0.0%	0.9%	1.1%	0.3%	-0.1%	-0.2%	0.1%	124777716750	0.02%	0.16%	0.20%	0.20%	0.14%	0.14%	-0.06%	-0.29	no	-0.06%
t-20	-1.7%	-0.1%	3.2%	0.1%	1.2%	0.0%	0.7%	-4.1%	0.2%	-1.9%	-0.5%	0.1%	123839247057	0.06%	-0.24%	0.03%	0.23%	-0.32%	-0.18%	-0.35%	-1.73	no	-0.41%
t-19	0.3%	-0.3%	-3.0%	0.9%	-0.3%	0.0%	-0.6%	1.0%	0.0%	-0.1%	0.0%	0.1%	123151877768	-0.32%	-0.17%	-0.16%	0.07%	-0.24%	-0.08%	-0.08%	-0.38	no	-0.49%
t-18	-0.1%	-0.2%	0.4%	0.9%	-0.3%	0.0%	-1.2%	-2.8%	-0.5%	-0.1%	0.5%	0.1%	123966819045	-0.04%	-0.28%	0.19%	0.25%	0.29%	-0.13%	0.11%	0.52	no	-0.39%
t-17	0.0%	-0.3%	-0.2%	-1.0%	-0.5%	0.0%	-1.0%	-0.9%	0.4%	0.0%	-0.4%	0.1%	123386934593	-0.01%	-0.21%	-0.07%	0.18%	-0.20%	-0.33%	-0.13%	-0.63	no	-0.51%
t-16	-0.1%	0.4%	1.6%	2.1%	0.4%	0.0%	-0.6%	0.4%	0.4%	0.0%	0.7%	0.0%	125486376447	0.22%	0.43%	0.22%	0.40%	0.74%	0.40%	0.51%	2.51	yes	0.00%
t-15	-0.4%	0.0%	0.0%	-0.2%	1.3%	0.0%	1.9%	-0.3%	0.1%	-0.2%	0.0%	0.1%	125921130151	0.01%	0.18%	-0.05%	0.35%	0.15%	0.56%	0.20%	0.99	no	0.20%
t-14	0.6%	0.6%	1.5%	1.4%	0.6%	0.0%	0.5%	-0.3%	-0.1%	-1.0%	-0.7%	0.1%	125714857045	0.18%	0.26%	0.20%	0.56%	-0.07%	0.49%	-0.27%	-1.33	no	-0.07%
t-13	0.9%	-0.2%	-3.4%	0.0%	-0.4%	0.0%	0.7%	-0.1%	0.3%	-0.7%	0.0%	0.0%	125981393343	0.15%	-0.26%	0.06%	0.61%	0.12%	0.61%	0.06%	0.30	no	-0.01%
t-12	-0.3%	-0.2%	0.2%	-0.8%	0.6%	0.0%	0.3%	-0.4%	1.5%	0.6%	0.6%	0.1%	127179685033	0.07%	0.18%	-0.07%	0.55%	0.41%	1.02%	0.48%	2.34	yes	0.47%
t-11	0.2%	0.5%	0.2%	-0.8%	0.7%	0.0%	0.2%	-0.1%	0.2%	-0.7%	1.3%	0.1%	129766547438	0.06%	0.14%	-0.01%	0.54%	0.88%	1.90%	0.89%	4.34	yes	1.36%
t-10	-0.1%	-0.3%	0.5%	-0.4%	0.8%	0.0%	-1.8%	0.0%	-1.2%	0.2%	0.9%	0.1%	130991052884	-0.08%	-0.12%	0.11%	0.65%	0.38%	2.28%	0.27%	1.33	no	1.63%
t-9	-0.3%	0.6%	0.4%	3.3%	-0.7%	0.0%	-0.6%	0.5%	0.5%	-0.3%	0.8%	0.1%	132925827371	-0.13%	0.36%	-0.03%	0.62%	0.58%	2.86%	0.61%	3.01	yes	2.24%
t-8	-0.4%	0.1%	0.0%	1.3%	0.5%	-0.1%	0.3%	1.5%	-1.1%	-0.2%	-0.3%	0.0%	132609383335	0.24%	0.15%	0.26%	0.88%	0.11%	2.97%	-0.15%	-0.74	no	2.09%
t-7	0.1%	0.0%	0.5%	0.5%	0.7%	0.0%	-0.2%	0.4%	-1.0%	3.6%	-0.7%	0.0%	130565526375	0.07%	0.34%	-0.09%	0.79%	-0.58%	2.39%	-0.49%	-2.39	yes	1.60%
t-6	0.0%	0.2%	1.2%	-0.7%	1.1%	0.0%	0.7%	-0.7%	-0.2%	0.4%	-0.5%	0.1%	129752173277	0.22%	0.13%	-0.01%	0.78%	-0.27%	2.13%	-0.26%	-1.26	no	1.34%
t-5	1.1%	-1.1%	-0.1%	2.1%	-0.9%	0.0%	-0.3%	-0.3%	0.5%	-0.1%	0.3%	0.0%	131246811518	0.16%	0.11%	0.37%	1.15%	0.54%	2.67%	0.18%	0.86	no	1.52%
t-4	-0.3%	-0.4%	1.3%	-0.1%	-0.3%	0.0%	-0.5%	0.2%	0.2%	-0.2%	0.0%	0.1%	131147008797	0.04%	0.00%	0.06%	1.21%	-0.03%	2.63%	-0.09%	-0.45	no	1.43%
t-3	-0.1%	1.1%	0.1%	-0.9%	-0.4%	0.0%	0.2%	-0.1%	0.8%	0.4%	-0.2%	0.1%	130650201346	-0.04%	0.08%	-0.19%	1.01%	-0.47%	2.47%	0.03%	0.15	no	1.46%
t-2	0.3%	0.3%	0.2%	0.1%	-1.2%	0.0%	-0.6%	1.5%	0.3%	0.5%	0.5%	0.0%	131637853312	-0.18%	0.10%	0.05%	1.06%	0.33%	2.80%	0.28%	1.38	no	1.74%
t-1	-0.7%	2.7%	-1.3%	0.1%	0.6%	0.0%	0.7%	0.1%	0.5%	2.6%	-0.4%	0.1%	13222438605	-0.03%	0.41%	0.07%	1.13%	0.20%	3.00%	0.13%	0.63	no	1.87%
t 0	-0.1%	-0.5%	-0.6%	-0.8%	0.5%	0.0%	-0.1%	-5.0%	0.0%	-2.4%	-0.2%	0.1%	131989090495	0.09%	-0.76%	0.15%	1.29%	-0.17%	2.88%	-0.28%	-1.37	no	1.59%
t+1	0.9%	0.9%	-0.3%	-0.9%	-0.9%	0.0%	-0.3%	-0.1%	-0.1%	1.0%	-0.2%	0.1%	134550703202	0.12%	0.87%	0.19%	1.48%	0.77%	3.75%	0.68%	3.33	yes	2.27%
t+2	0.8%	-0.8%	-1.7%	0.7%	0.8%	-0.1%	0.6%	-0.6%	-0.1%	-0.5%	1.3%	0.0%	137860002686	0.01%	0.05%	0.20%	1.67%	1.06%	4.81%	0.87%	4.24	yes	3.14%
t+3	0.1%	-0.8%	1.8%	-0.8%	0.1%	0.0%	-0.9%	-0.3%	-0.3%	-0.8%	-0.3%	0.0%	136605300642	0.03%	-0.19%	0.02%	1.70%	-0.40%	4.41%	-0.42%	-2.06	yes	2.72%
t+4	0.0%	-1.5%	-0.2%	0.2%	-0.4%	0.0%	-0.5%	-1.5%	0.4%	0.0%	-0.6%	0.1%	134989288032	0.11%	-0.34%	0.10%	1.80%	-0.52%	3.90%	-0.62%	-3.03	yes	2.10%
t+5	0.3%	-0.4%	0.8%	0.9%	0.9%	0.0%	-0.9%	-0.1%	0.1%	0.6%	0.0%	0.1%	134527329948	-0.11%	0.20%	-0.08%	1.72%	-0.15%	3.75%	-0.06%	-0.30	no	2.04%
t+6	0.6%	0.7%	0.7%	0.3%	0.3%	-0.1%	-0.4%	-0.1%	0.3%	-1.1%	-0.4%	0.0%	135293670191	-0.09%	0.13%	-0.09%	1.62%	0.25%	4.00%	0.34%	1.67	no	2.38%
t+7	1.4%	0.6%	-2.0%	-0.6%	0.3%	0.0%	0.1%	-0.1%	0.5%	0.2%	1.0%	0.1%	138498037239	-0.04%	0.12%	0.24%	1.86%	1.01%	5.01%	0.77%	3.78	yes	3.15%
t+8	0.6%	-0.6%	1.5%	-1.9%	0.4%	-0.1%	0.3%	-0.3%	0.1%	0.1%	-1.0%	0.1%	136757556099	-0.20%	-0.07%	0.16%	2.02%	-0.54%	4.46%	-0.71%	-3.46	yes	2.44%
t+9	-0.7%	-0.7%	0.3%	-0.8%	0.0%	0.0%	0.2%	0.2%	0.4%	-1.1%	-0.3%	0.1%	136185258864	0.24%	-0.20%	0.09%	2.11%	-0.18%	4.28%	-0.27%	-1.32	no	2.17%
t+10	-0.5%	-0.2%	-0.2%	0.5%	0.4%	0.0%	0.0%	-0.2%	0.2%	0.7%	-0.7%	0.1%	133179433292	-0.22%	0.01%	-0.53%	1.58%	-0.96%	3.32%	-0.44%	-2.14	yes	1.73%
t+11	0.0%	0.7%	-0.5%	1.2%	-0.6%	0.0%	0.1%	-0.1%	0.0%	-0.6%	0.0%	0.1%	132560161505	-0.39%	0.02%	-0.28%	1.31%	-0.20%	3.12%	0.07%	0.36	no	1.81%
t+12	1.2%	0.5%	2.6%	1.3%	-0.3%	0.0%	-0.4%	0.0%	-0.1%	-0.4%	0.3%	0.1%	132485526154	0.05%	0.39%	-0.28%	1.03%	-0.02%	3.10%	0.26%	1.27	no	2.07%
t+13	-0.3%	1.1%	1.0%	-0.1%	-0.2%	-0.1%	-0.5%	-0.1%	0.3%	-0.3%	0.3%	0.1%	132499169845	-0.15%	0.08%	0.14%	1.16%	0.01%	3.10%	-0.13%	-0.64	no	1.94%
t+14	-0.6%	-0.1%	2.1%	0.3%	-0.1%	0.0%	0.9%	-0.2%	-1.0%	0.0%	-0.1%	0.0%	132232087491	-0.12%	0.09%	-0.33%	0.84%	-0.41%	2.69%	-0.09%	-0.43	no	1.85%
t+15	0.5%	-0.1%	0.8%	1.6%	0.0%	0.0%	-0.4%	-0.1%	-1.0%	-0.6%	0.2%	0.0%	132342285440	0.07%	0.07%	0.22%	1.05%	0.25%	2.93%	0.03%	0.14	no	1.88%
t+16	0.2%	0.1%	-2.0%	-1.0%	-0.2%	0.0%	0.3%	2.2%	0.4%	-0.6%	0.4%	0.0%	133663466953	0.19%	-0.01%	0.09%	1.14%	0.43%	3.37%	0.35%	1.69	no	2.22%
t+17	-0.4%	-0.1%	0.6%	0.1%	-1.0%	0.0%	0.6%	-0.1%	0.3%	-0.4%	-0.5%	0.1%	133593627655	0.08%	-0.06%	0.23%	1.37%	-0.02%	3.34%	-0.25%	-1.22	no	1.98%
t+18	0.4%	-0.1%	-1.4%	1.2%	1.1%	-0.1%	0.4%	1.5%	0.2%	-0.7%	0.5%	0.1%	13803292085	-0.22%	0.71%	0.26%	1.62%	0.71%	4.05%	0.45%	2.22	yes	2.43%
t+19	0.2%	-0.5%	-0.2%	0.1%	0.1%	0.0%	-0.1%	-0.7%	-0.3%	0.4%	0.7%	0.1%	137513741477	-0.21%	-0.02%	0.14%	1.76%	0.55%	4.60%	0.41%	1.99	yes	2.84%
t+20	-0.2%	-0.2%	0.3%	0.1%	-0.3%	0.0%	-0.5%	-0.6%	-0.2%	-1.1%	-0.9%	0.1%	135196576089	-0.05%	-0.26%	-0.05%	1.71%	-0.74%	3.86%	-0.69%	-3.37	yes	2.15%
t+21	-1.5%	-0.3%	4.9%	-1.9%	0.4%	0.0%	0.5%	-0.6%	-0.2%	-1.6%	-0.6%	0.1%	132815629649	-0.23%	-0.07%	-0.33%	1.39%	-0.77%	3.09%	-0.44%	-2.15	yes	1.71%
t+22	-0.7%	0.1%	2.3%	-0.9%	0.1%	0.0%	-0.3%	-0.7%	0.0%	-0.5%	1.4%	0.1%	136416030750	0.00%	0.08%	0.17%	1.67%	1.17%	4.26%	0.89%	4.35	yes	2.60%
t+23	-0.9%	-0.7%	-2.1%	0.7%	0.8%	0.0%	0.4%	1.0%	0.2%	0.0%	0.0%	-20.3%	136968312652	0.31%	-1.74%	0.20%	1.87%	0.18%	4.45%	-0.02%	-0.09	no	2.58%
t+24	-1.1%	-0.3%	-1.7%	0.7%	0.7%	0.0%	0.2%	-0.1%	-0.1%	-0.6%	-0.6%	20.5%	136394085383	0.08%	1.30%	0.25%	2.12%	-0.17%	4.27%	-0.43%	-2.09	yes	2.15%
t+25	-0.4%	0.3%	-2.8%	-2.2%	0.4%	0.0%	0.2%	-0.2%	-0.2%	1.6%	-1.1%	0.1%	134688472262	0.14%	-0.35%	0.16%	2.29%	-0.54%	3.73%	-0.70%	-3.45	yes	1.45%
t+26	-0.6%	-0.1%	2.0%	0.4%	0.4%	0.0%	0.1%	0.0%	0.5%	1.4%	0.5%	0.1%	136386354104	0.25%	0.38%	0.17%	2.46%	0.53%	4.27%	0.36%	1.77	no	1.81%
t+27	-0.6%	0.3%	0.0%	0.8%	0.0%	0.0%	0.4%	1.0%	0.3%	-0.2%	0.8%	0.0%	136296577041	0.13%	0.09%	0.20%	2.65%	-0.03%	4.24%	-0.22%	-1.09	no	1.58%
t+28	-0.2%	0.5%	-0.3%	1.4%	-1.6%	0.0%	-0.1%	-1.1%	-1.2%	-0.3%	-0.8%	0.1%	134227018919	0.15%	-0.23%	-0.10%	2.55%	-0.66%	3.58%	-0.56%	-2.74	yes	1.02%
t+29	-0.2%	0.3%	-0.2%	-2.4%	-0.5%	0.0%	-0.8%	-0.4%	-0.4%	-0.4%	-0.4%	0.1%	133363571187	0.12%	-0.39%	0.11%	2.67%	-0.39%	3.30%	-0.39%	-1.92	no	0.63%
t+30	0.0%	1.7%	-1.9%	0.5%	-0.6%	0.0%	-0.6%	0.0%	0.3%	-1.1%													



	AFRICAN OXYGEN LIMITED (AFK)	DIMENSION DATA HOLDINGS PLC (DDT)	DUNLOP AFRICA LTD (DNL)	DATATEC LIMITED (DTC)	HUSTEK LIMITED (MST)	NICTUS BEPERK (NCS)	NASPERS LIMITED (NPN)	OMNIA HOLDINGS LIMITED (OMN)	SA CORP REAL ESTATE FUND (SAC)	SASFIN HOLDINGS LIMITED (SFK)	TELKOM SA LIMITED (TKG)	ZAMBIA COPPER INVESTMENTS LIMITED (ZCI)	WEIGHTED AVE PROJECTED DAILY RETURNS
Intercept:	-0.0001	0.0000	-0.0001	-0.0011	0.0000	0.0004	-0.0002	0.0008	0.0002	0.0007	0.0005	-0.0007	0.0003
Slope:	0.5538	0.6771	0.7365	1.6684	0.2897	-0.0234	0.7655	0.0844	0.1873	0.2837	0.5913	0.0310	0.6086
R-Squared:	0.0981	0.1158	0.0611	0.2421	0.0113	0.0001	0.1110	0.0023	0.0127	0.0182	0.1288	0.0001	0.1955
STD Error:	0.0101	0.0088	0.0181	0.0176	0.0145	0.0127	0.0111	0.0085	0.0078	0.0094	0.0072	0.0229	0.0020

DAY	Abnormal Return AR	Total Market Cap of Population	Average Comparative All Share Returns	Average Abnormal Returns (AAR)	Weighted Projected Daily Returns (WPDR)	Cum Weight Projected Daily Returns (CWPDR)	Weighted Ave Act Daily Returns (WADR)	Cum Weight Ave Act Daily Returns (CWADR)	Weighted Ave Abnormal Returns (WAAR)	WAAR t-Test	WAAR Significant?	Cumul Weighted Ave Abnormal Returns (CWAAR)											
t+36	0.2%	-0.4%	0.0%	-2.2%	0.9%	0.0%	0.7%	0.3%	0.0%	1.0%	1.0%	0.1%	137514162198	0.07%	0.13%	0.13%	3.58%	0.80%	4.61%	0.67%	3.27	yes	1.03%
t+37	0.9%	-0.4%	0.4%	2.0%	0.0%	0.0%	0.8%	-0.4%	-0.3%	-1.5%	0.5%	0.1%	139387394378	-0.13%	0.16%	0.17%	3.75%	0.59%	5.20%	0.42%	2.08	yes	1.45%
t+38	-0.1%	1.8%	1.0%	0.1%	-0.2%	0.0%	0.3%	0.2%	0.3%	-0.1%	-0.1%	0.0%	139265420259	-0.07%	0.28%	-0.21%	3.54%	-0.04%	5.16%	0.17%	0.84	no	1.62%
t+39	1.0%	0.0%	0.7%	-1.9%	0.2%	0.0%	0.2%	-1.6%	0.0%	0.9%	-0.1%	0.1%	139770901173	-0.10%	-0.04%	0.19%	3.73%	0.14%	5.31%	-0.04%	-0.21	no	1.58%
t+40	-0.3%	-0.4%	-0.7%	0.5%	0.3%	0.0%	-0.5%	-0.6%	0.5%	-0.3%	-0.1%	0.0%	140195850401	0.29%	-0.14%	0.27%	4.00%	0.13%	5.44%	-0.14%	-0.67	no	1.44%
t+41	-0.1%	-0.6%	0.1%	-1.7%	0.6%	0.0%	0.0%	-0.1%	-0.7%	1.9%	-0.5%	0.1%	139294503910	0.01%	-0.09%	0.17%	4.17%	-0.28%	5.16%	-0.45%	-2.21	yes	0.99%
t+42	1.2%	1.0%	-1.6%	-1.7%	-0.4%	0.0%	1.1%	-0.1%	-0.6%	-0.1%	-0.3%	0.1%	139507899333	-0.03%	-0.11%	0.07%	4.24%	0.07%	5.23%	0.00%	-0.01	no	0.99%
t+43	0.1%	-0.2%	2.4%	1.5%	-0.6%	0.0%	1.5%	0.7%	0.0%	0.6%	0.0%	0.1%	140258790125	-0.04%	0.33%	-0.17%	4.06%	0.24%	5.47%	0.41%	2.01	yes	1.40%
t+44	-0.8%	-0.3%	-1.1%	-2.0%	-0.2%	0.0%	0.3%	0.1%	0.0%	-0.3%	1.0%	0.1%	142003907886	-0.13%	-0.27%	-0.07%	4.00%	0.54%	6.01%	0.61%	2.99	yes	2.01%
t+45	0.2%	-1.3%	0.2%	-1.0%	0.5%	0.0%	1.5%	0.0%	0.4%	0.3%	-0.5%	0.0%	141571109366	-0.12%	-0.04%	0.15%	4.15%	-0.12%	5.89%	-0.28%	-1.36	no	1.73%
t+46	-0.5%	-1.1%	2.3%	-1.7%	-0.3%	0.0%	0.0%	0.2%	0.6%	0.1%	-0.4%	0.1%	140701027998	-0.08%	-0.07%	0.10%	4.26%	-0.27%	5.62%	-0.37%	-1.81	no	1.37%
t+47	0.0%	-2.2%	-0.2%	-0.9%	0.5%	0.0%	0.1%	-0.1%	0.2%	-0.5%	-0.2%	0.1%	139171965257	-0.17%	-0.26%	-0.20%	4.06%	-0.47%	5.15%	-0.27%	-1.33	no	1.09%
t+48	-1.4%	1.5%	0.4%	3.9%	0.2%	0.0%	0.0%	-0.4%	-1.1%	-0.9%	-0.9%	0.1%	138560440936	-0.31%	0.15%	0.04%	4.10%	-0.19%	4.96%	-0.23%	-1.13	no	0.86%
t+49	-0.3%	-2.5%	-0.2%	0.2%	-0.1%	0.0%	-0.1%	-0.1%	1.0%	-0.4%	-0.2%	0.1%	137267435893	0.10%	-0.22%	-0.08%	4.02%	-0.40%	4.56%	-0.32%	-1.55	no	0.55%
t+50	0.7%	-1.3%	-0.4%	1.1%	0.1%	0.0%	0.2%	-0.1%	0.0%	0.1%	-0.1%	0.1%	137155967946	-0.27%	0.04%	0.06%	4.07%	-0.03%	4.57%	-0.09%	-0.44	no	0.46%
t+51	1.3%	1.8%	0.2%	-3.0%	0.0%	0.0%	-0.9%	-0.4%	-0.7%	0.1%	-0.1%	0.1%	137250312512	-0.11%	-0.14%	0.08%	4.15%	0.03%	4.57%	-0.04%	-0.21	no	0.41%
t+52	0.3%	2.8%	0.6%	1.4%	-1.4%	0.0%	0.1%	0.2%	0.6%	-0.2%	0.2%	0.1%	137273963996	-0.20%	0.34%	-0.02%	4.03%	0.34%	4.58%	0.13%	0.65	no	0.55%
t+53	-1.0%	-0.4%	-0.2%	1.8%	-0.8%	0.0%	0.1%	0.5%	-1.0%	-0.1%	-0.2%	0.0%	137284066888	-0.03%	-0.10%	0.22%	4.24%	0.01%	4.58%	-0.21%	-1.03	no	0.34%
t+54	-1.0%	-0.9%	-0.2%	-0.7%	-0.5%	0.0%	-0.2%	2.5%	-0.8%	-1.1%	-0.3%	0.1%	136843857292	0.08%	-0.26%	0.17%	4.42%	-0.15%	4.43%	-0.33%	-1.59	no	0.01%
t+55	0.4%	0.2%	0.0%	0.5%	-0.4%	0.0%	-0.4%	-0.1%	0.0%	0.0%	0.5%	-3.3%	137170352440	0.30%	-0.22%	-0.19%	4.22%	0.11%	4.54%	0.30%	1.47	no	0.31%
t+56	0.2%	-0.6%	2.2%	-1.4%	0.0%	0.0%	0.2%	-0.3%	-1.3%	0.1%	-0.2%	0.1%	136949242684	0.08%	-0.09%	0.15%	4.38%	-0.07%	4.47%	-0.22%	-1.09	no	0.09%
t+57	-0.3%	1.6%	-0.6%	-0.2%	0.1%	0.0%	0.3%	0.6%	0.1%	0.6%	-0.6%	0.1%	136199445928	-0.03%	0.13%	0.01%	4.39%	-0.24%	4.23%	-0.25%	-1.23	no	-0.16%
t+58	0.8%	1.1%	-2.5%	-0.5%	-0.1%	0.0%	1.3%	-0.5%	0.0%	0.0%	-0.4%	0.1%	136971282341	0.02%	-0.08%	0.26%	4.63%	0.25%	4.48%	-0.01%	-0.04	no	-0.17%
t+59	-0.1%	-1.5%	-1.5%	0.7%	0.5%	0.0%	0.0%	0.4%	0.0%	-0.2%	-0.2%	0.1%	135110650522	0.20%	-0.28%	-0.28%	4.37%	-0.59%	3.89%	-0.32%	-1.55	no	-0.48%
t+60	-0.9%	0.0%	-0.2%	0.2%	-0.8%	-0.1%	0.1%	0.6%	0.5%	0.1%	-0.1%	0.1%	13499999436	0.05%	-0.04%	0.01%	4.39%	-0.03%	3.85%	-0.05%	-0.23	no	-0.53%
t+61	-0.3%	-1.5%	1.1%	-0.3%	0.3%	0.0%	-0.8%	-0.3%	6.0%	1.1%	-0.7%	0.1%	132536562890	0.21%	-0.65%	0.02%	4.58%	-0.68%	3.08%	-0.98%	-4.78	yes	-1.51%
t+62	-0.7%	1.3%	-0.6%	-0.6%	-0.5%	0.0%	-0.4%	-0.1%	4.2%	-1.9%	-0.9%	0.1%	133060698064	0.11%	0.05%	-0.03%	4.56%	0.18%	3.26%	0.21%	1.03	no	-1.30%
t+63	0.8%	1.3%	0.0%	-1.1%	-0.1%	0.0%	0.3%	-0.8%	1.9%	-0.1%	0.6%	0.1%	135797893825	0.03%	0.23%	0.24%	4.80%	0.89%	4.15%	0.65%	3.16	yes	-0.65%
t+64	-1.8%	1.1%	-0.1%	-4.2%	-0.5%	0.0%	0.4%	-0.6%	-0.1%	0.8%	-0.8%	0.0%	135135666512	0.38%	-0.48%	0.30%	5.10%	-0.21%	3.94%	-0.51%	-2.49	yes	-1.16%
t+65	0.5%	-2.3%	-0.4%	-1.8%	0.6%	0.0%	0.2%	0.0%	-1.8%	0.2%	-0.2%	0.1%	134788527301	-0.03%	-0.13%	0.00%	5.10%	-0.10%	3.83%	-0.10%	-0.51	no	-1.26%
t+66	0.4%	0.1%	0.1%	-0.6%	0.1%	0.0%	0.3%	-0.9%	-0.7%	-0.1%	0.1%	0.1%	136017200768	-0.06%	-0.11%	0.32%	5.42%	0.40%	4.23%	0.07%	0.36	no	-1.19%
t+67	-0.6%	1.0%	0.2%	0.1%	0.0%	0.0%	-0.2%	-0.1%	0.7%	-0.3%	-1.0%	0.1%	133753868979	0.14%	-0.01%	-0.13%	5.29%	-0.72%	3.51%	-0.59%	-2.89	yes	-1.78%
t+68	0.4%	-0.7%	0.1%	-1.1%	-0.8%	0.0%	0.0%	-0.1%	-0.4%	-0.3%	1.8%	0.1%	137342493491	0.40%	-0.09%	0.04%	5.32%	1.16%	4.66%	1.12%	5.48	yes	-0.66%
t+69	-0.2%	0.2%	0.3%	-2.5%	0.4%	0.0%	1.0%	0.1%	-2.5%	-0.2%	1.2%	0.1%	140230983860	0.06%	-0.17%	0.10%	5.42%	0.91%	5.58%	0.81%	3.99	yes	0.15%
t+70	-0.2%	0.8%	-0.5%	-2.4%	1.4%	0.0%	0.1%	-0.1%	0.3%	0.3%	0.3%	0.1%	139883855369	0.11%	-0.06%	0.10%	5.53%	-0.10%	5.47%	-0.21%	-1.02	no	-0.06%
t+71	-0.9%	-0.3%	0.9%	-1.8%	0.0%	-0.1%	0.1%	0.5%	0.9%	-0.2%	0.1%	0.0%	139464770977	0.08%	-0.07%	-0.18%	5.34%	-0.13%	5.35%	0.06%	0.27	no	0.00%
t+72	-1.0%	0.4%	-0.5%	-0.4%	-0.4%	0.0%	0.4%	0.0%	0.0%	1.0%	-1.1%	0.1%	137628030682	-0.06%	-0.14%	0.13%	5.48%	-0.57%	4.77%	-0.71%	-3.45	yes	-0.70%
t+73	2.6%	-1.4%	-1.3%	1.2%	-0.5%	0.0%	-0.1%	-0.7%	-0.7%	0.1%	-0.7%	0.1%	136646271722	0.07%	-0.12%	0.26%	5.74%	-0.31%	4.47%	-0.57%	-2.80	yes	-1.28%
t+74	0.0%	-0.2%	-1.2%	-0.4%	0.0%	0.0%	0.3%	-0.8%	-0.4%	-0.1%	-0.7%	0.0%	134930996306	0.06%	-0.29%	-0.05%	5.70%	-0.55%	3.92%	-0.50%	-2.45	yes	-1.78%
t+75	0.4%	-0.9%	-0.4%	-2.6%	-0.6%	0.0%	1.7%	-0.5%	0.3%	2.4%	2.2%	3.5%	140205034639	0.03%	0.45%	0.06%	5.76%	1.68%	5.60%	1.61%	7.90	yes	-0.16%
t+76	-0.4%	-0.3%	0.1%	-2.3%	0.3%	0.0%	1.1%	-1.0%	0.1%	-0.2%	0.1%	-2.2%	143494516315	-0.07%	-0.26%	-0.22%	5.54%	1.01%	6.61%	1.23%	6.04	yes	1.07%
t+77	-0.9%	0.9%	0.3%	-0.1%	0.4%	0.0%	0.3%	-0.6%	-0.3%	0.1%	-0.4%	0.1%	142885720613	0.04%	-0.03%	0.03%	5.57%	-0.18%	6.43%	-0.21%	-1.04	no	0.86%
t+78	-0.3%	-1.0%	0.7%	-2.8%	-0.8%	0.0%	-0.4%	-0.7%	1.9%	-0.3%	-0.8%	0.1%	140547500319	0.09%	-0.13%	0.04%	5.44%	-0.57%	5.72%	-0.59%	-2.87	yes	0.27%
t+79	-0.6%	0.7%	-0.3%	-0.4%	-0.8%	0.0%	-0.7%	-0.6%	0.9%	-0.2%	0.6%	0.1%	14255990133	0.17%	-0.12%	0.25%	5.70%	0.62%	6.34%	0.37%	1.80	no	0.64%
t+80	-0.6%	-0.2%	2.6%	0.1%	-0.3%	-6.7%	0.4%	-0.6%	-0.2%	-0.2%	-0.8%	0.1%	140380764013	-0.09%	-0.54%	-0.12%	5.57%	-0.66%	5.68%	-0.54%	-2.64	yes	0.10%
t+81	0.7%	-0.7%	-1.5%	0.9%	2.9%	0.0%	-0.5%	0.0%	0.3%	-1.2%	0.9%	-0.4%	138668414835	0.34%	-0.07%	0.32%	5.89%	-0.53%	5.15%	-0.85%	-4.16	yes	-0.75%
t+82	0.2%	-0.7%	-0.7%	-0.9%	-0.5%	0.0%	-0.1%	-0.1%	0.4%	0.0%	0.9%	0.1%	14136887153	0.15%	-0.13%	0.27%	6.16%	0.84%	5.99%	0.57%	2.82	yes	-0.17%
t+83	-0.5%	-0.5%	-0.2%	0.3%	0.0%	0.0%	0.3%	-0.1%	0.0%	0.0%	0.6%	0.1%	143351786310	0.00%	0.00%	0.00%	6.35%	0.61%	6.60%	0.42%	2.05	yes	0.25%
t+84	-0.5%	0.0%	-1.1%	-2.2%	-0.6%	0.0%	0.3%	-0.6%	-0.1%	0.2%	-0.3%	0.0%	142747774285	0.17%	-0.41%	0.02%	6.38%	-0.18%	6.42%	-0.21%	-1.01	no	0.04%
t+85	0.3%	-0.5%	1.9%	-1.0%	0.0%	-77.8%	0.2%	0.0%	0.2%	0.0%	-0.7%	0.1%	141272254050	-0.12%	-6.48%	0.05%	6.43%	-0.44%	5.97%	-0.50%	-2.44	yes	-0.46%
t+86	-0.2%	2.1%	0.3%	6.4%	0.1%	0.0%	0.1%	-0.3%	-0.7%	0.9%	-0.3%	0.1%	141726715118	-0.15%	0.70%	0.18%	6.61%	0.15%	6.12%	-0.03%	-0.16	no	-0.49%
t+87	0.0%	-0.5%	0.2%	-0.1%	-0.1%	0.0%	-0.2%	-0.1%	-0.1%	-1.1%	-0.5%	0.0%	139936352255	0.08%	-0.20%	0.11%	6.5						



	AFRICAN OXYGEN LIMITED (AFX)	DIMENSION DATA HOLDINGS PLC (DDT)	DUNLOP AFRICA LTD (DNL)	DATATEC LIMITED (DTC)	MUSTEK LIMITED (MST)	NECTUS BEPERK (NCS)	NASPERS LIMITED (NPN)	OMNIA HOLDINGS LIMITED (OMN)	SA CORP REAL ESTATE FUND (SAC)	SASFIN HOLDINGS LIMITED (SFN)	TELKOM SA LIMITED (TKG)	ZAMBIA COPPER INVESTMENTS LIMITED (ZCI)	WEIGHTED AVE PROJECTED DAILY RETURNS
Intercept:	-0.0001	0.0000	-0.0001	-0.0011	0.0000	0.0004	-0.0002	0.0008	0.0002	0.0007	0.0005	-0.0007	0.0003
Slope:	0.5538	0.6771	0.7365	1.6684	0.2897	-0.0234	0.7655	0.0844	0.1873	0.2837	0.5913	0.0310	0.6086
R-Squared:	0.0981	0.1158	0.0611	0.2421	0.0113	0.0001	0.1110	0.0023	0.0127	0.0182	0.1288	0.0001	0.1955
STD Error:	0.0101	0.0088	0.0181	0.0176	0.0145	0.0127	0.0111	0.0085	0.0078	0.0094	0.0072	0.0229	0.0020

DAY	Abnormal Return AR	Total Market Cap of Population	Average Comparative All Share Returns	Average Abnormal Returns (AAR)	Weighted Projected Daily Returns (WPDR)	Cum Weight Projected Daily Returns (CWPDR)	Weighted Ave Act Daily Returns (WADR)	Cum Weight Ave Act Daily Returns (CWADR)	Weighted Ave Abnormal Returns (WAAR)	WAAR t-Test	WAAR Significant?	Cumul Weighted Ave Abnormal Returns (CWAAR)											
t+96	0.3%	0.7%	-0.4%	-0.3%	0.1%	0.0%	0.5%	-0.6%	-0.1%	0.1%	0.4%	0.1%	134192287967	-0.05%	0.06%	0.11%	6.53%	0.50%	3.80%	0.39%	1.93	no	-2.73%
t+97	0.2%	-0.5%	0.2%	0.3%	0.0%	0.0%	-0.4%	0.5%	-0.2%	-0.1%	-0.2%	0.1%	133927313436	0.13%	-0.03%	0.13%	6.66%	-0.09%	3.71%	-0.21%	-1.04	no	-2.94%
t+98	0.7%	-0.6%	0.6%	1.7%	-0.3%	0.0%	-0.5%	-0.6%	0.1%	-0.3%	-0.5%	0.1%	133445683493	0.02%	0.03%	0.29%	6.94%	-0.16%	3.56%	-0.44%	-2.17	yes	-3.39%
t+99	0.0%	-0.5%	-0.2%	0.7%	2.5%	0.0%	0.1%	-1.8%	0.1%	0.4%	0.4%	0.1%	135124239566	0.08%	0.14%	0.28%	7.23%	0.55%	4.10%	0.26%	1.29	no	-3.12%
t+100	-0.1%	0.4%	0.4%	-0.8%	0.1%	0.0%	0.0%	-1.5%	-2.4%	-0.5%	0.3%	0.0%	134790538868	0.11%	-0.34%	-0.18%	7.05%	-0.10%	4.00%	0.07%	0.35	no	-3.05%
t+101	-1.8%	0.0%	0.6%	1.8%	-0.4%	0.0%	-0.3%	0.7%	-2.2%	-0.2%	0.4%	-3.1%	13546640143	-0.01%	-0.39%	0.16%	7.21%	0.22%	4.22%	0.07%	0.33	no	-2.98%
t+102	1.0%	-0.3%	0.3%	-2.2%	0.2%	0.0%	0.4%	0.2%	1.7%	-1.6%	-0.9%	0.1%	134561839751	0.21%	-0.09%	0.17%	7.37%	-0.29%	3.94%	-0.45%	-2.22	yes	-3.44%
t+103	0.2%	-0.1%	0.3%	-0.5%	0.3%	0.0%	0.9%	0.1%	0.1%	-0.1%	-1.0%	0.1%	133531270781	0.00%	0.01%	0.17%	7.54%	-0.33%	3.61%	-0.50%	-2.43	yes	-3.93%
t+104	-1.1%	0.4%	0.4%	0.3%	-1.3%	0.0%	1.4%	1.8%	0.7%	-0.1%	1.1%	0.1%	136579938052	-0.05%	0.36%	0.02%	7.56%	0.98%	4.59%	0.96%	4.72	yes	-2.97%
t+105	0.8%	-0.6%	0.5%	2.1%	0.3%	0.0%	1.0%	-1.1%	0.2%	-0.9%	0.6%	0.1%	138001428804	0.14%	0.24%	-0.04%	7.52%	0.45%	5.04%	0.49%	2.39	yes	-2.48%
t+106	0.1%	0.0%	-0.3%	3.3%	1.1%	0.0%	1.9%	1.1%	0.0%	-0.3%	-0.3%	0.1%	138047201290	0.17%	0.62%	-0.09%	7.44%	0.02%	5.07%	0.11%	0.53	no	-2.37%
t+107	0.6%	-1.1%	0.5%	-2.5%	-0.7%	0.0%	-0.1%	-0.2%	-0.4%	-0.6%	0.4%	0.1%	139099231480	0.20%	-0.35%	0.24%	7.67%	0.33%	5.40%	0.10%	0.47	no	-2.28%
t+108	-0.6%	-0.9%	-0.1%	-2.1%	0.5%	0.0%	1.2%	-0.2%	-0.1%	-0.1%	0.2%	0.1%	139921746575	-0.03%	-0.18%	0.07%	7.74%	0.26%	5.66%	0.19%	0.95	no	-2.08%
t+109	0.4%	0.0%	0.0%	-0.9%	-0.3%	0.0%	0.5%	0.0%	0.7%	0.5%	0.3%	0.1%	141206063407	-0.10%	0.11%	0.08%	7.82%	0.40%	6.06%	0.32%	1.57	no	-1.76%
t+110	-0.2%	-0.4%	0.2%	1.0%	0.0%	0.0%	1.0%	-0.2%	-0.3%	-1.5%	-0.5%	0.1%	139755843775	-0.22%	-0.05%	-0.25%	7.56%	-0.45%	5.61%	-0.19%	-0.95	no	-1.96%
t+111	0.1%	0.1%	-0.4%	0.7%	-0.4%	0.0%	-0.2%	0.0%	0.6%	0.9%	1.0%	0.1%	141251853924	0.02%	0.21%	-0.19%	7.37%	0.46%	6.07%	0.66%	3.22	yes	-1.30%
t+112	0.3%	-0.5%	-0.8%	2.6%	-1.2%	0.0%	1.1%	-0.2%	0.9%	0.1%	1.0%	0.1%	143190548921	-0.03%	0.30%	-0.28%	7.09%	0.59%	6.67%	0.87%	4.25	yes	-0.43%
t+113	-0.3%	0.0%	-0.1%	0.1%	0.0%	0.0%	-0.4%	-1.1%	0.6%	-0.1%	-1.0%	0.1%	139183960807	-0.09%	-0.20%	-0.52%	6.58%	-1.23%	5.44%	-0.71%	-3.47	yes	-1.14%
t+114	0.1%	-0.1%	0.0%	0.4%	-0.1%	0.0%	0.8%	0.5%	-0.2%	-0.1%	-0.3%	0.1%	139826833292	0.18%	0.08%	0.29%	6.87%	0.20%	5.64%	-0.09%	-0.44	no	-1.23%
t+115	-0.3%	-0.9%	-0.3%	-3.1%	1.1%	0.0%	0.7%	-0.7%	-0.4%	-0.3%	0.1%	0.1%	140084890457	0.5%	-0.36%	0.30%	7.16%	0.08%	5.72%	-0.22%	-1.05	no	-1.44%
t+116	0.5%	-1.0%	0.3%	2.2%	0.6%	0.0%	-0.4%	-1.0%	-0.2%	-0.1%	-1.1%	0.1%	136264070111	-0.07%	-0.01%	-0.38%	6.79%	-1.19%	4.53%	-0.82%	-4.00	yes	-2.26%
t+117	0.2%	-1.5%	0.1%	0.8%	0.7%	0.0%	-0.5%	0.2%	0.0%	0.0%	-0.4%	0.1%	1351862999094	-0.03%	-0.05%	0.07%	6.86%	-0.34%	4.18%	-0.41%	-2.03	yes	-2.67%
t+118	1.0%	-0.6%	-0.2%	1.4%	-1.1%	0.0%	0.2%	0.7%	-1.2%	0.0%	0.6%	0.1%	135926265297	-0.07%	0.07%	-0.12%	6.74%	0.24%	4.42%	0.36%	1.76	no	-2.31%
t+119	1.0%	0.8%	-0.1%	-1.0%	-0.2%	0.0%	-0.2%	-0.4%	-0.4%	0.0%	0.3%	0.1%	13540678058	-0.02%	-0.01%	-0.26%	6.37%	-0.17%	4.26%	0.20%	0.97	no	-2.12%
t+120	1.2%	0.6%	-0.3%	1.7%	0.5%	0.0%	0.3%	-0.1%	-0.2%	0.0%	0.8%	0.1%	138216149704	0.02%	0.40%	0.33%	6.61%	0.89%	5.15%	0.66%	3.24	yes	-1.45%
t+121	0.9%	0.5%	-0.7%	-0.8%	0.6%	0.0%	0.7%	-0.1%	-0.2%	-0.1%	1.0%	0.1%	142768986408	0.39%	0.16%	0.61%	7.21%	1.41%	6.57%	0.81%	3.95	yes	-0.65%
t+122	2.0%	0.4%	0.5%	0.1%	-0.1%	0.0%	0.1%	-0.5%	0.0%	0.1%	-1.0%	0.1%	139147120607	-0.15%	0.15%	-0.60%	6.62%	-1.10%	6.62%	-0.50%	-2.46	yes	-1.15%
t+123	2.4%	-0.1%	0.6%	-1.2%	0.4%	0.0%	-0.9%	-0.1%	-0.4%	0.0%	0.8%	0.1%	142176336607	0.06%	0.13%	0.50%	7.12%	0.95%	6.41%	0.45%	2.20	yes	-0.70%
t+124	-0.1%	0.0%	-0.1%	0.3%	-0.9%	0.0%	0.1%	-0.1%	-0.5%	0.6%	0.1%	0.1%	141756536645	0.06%	-0.06%	-0.16%	6.96%	-0.13%	6.29%	0.03%	0.16	no	-0.67%
t+125	-1.5%	-0.5%	0.6%	3.4%	-0.1%	0.0%	0.7%	0.2%	-1.0%	1.0%	0.1%	0.1%	138719071930	0.10%	0.13%	-0.11%	6.85%	-0.93%	5.36%	-0.82%	-4.01	yes	-1.49%
t+126	-1.3%	0.1%	0.5%	0.6%	-0.1%	0.0%	0.3%	-0.1%	0.3%	-0.1%	-0.9%	0.1%	135227053016	0.02%	-0.05%	-0.59%	6.26%	-1.09%	4.26%	-0.51%	-2.50	yes	-2.00%
t+127	1.0%	0.5%	-0.2%	0.5%	0.9%	0.0%	0.0%	-0.2%	0.0%	-1.4%	0.1%	0.1%	132790255025	-0.14%	0.12%	0.00%	6.26%	-0.78%	3.48%	-0.78%	-3.84	yes	-2.78%
t+128	0.7%	1.2%	-0.6%	-0.4%	0.9%	-0.1%	-0.6%	-0.4%	0.3%	-1.1%	1.8%	0.1%	137803391794	0.03%	0.16%	0.48%	6.74%	1.63%	5.10%	1.15%	5.63	yes	-1.63%
t+129	-1.1%	1.8%	-0.3%	-3.6%	1.9%	0.0%	0.1%	0.2%	0.0%	-0.1%	-0.9%	0.1%	136288782198	0.09%	-0.17%	-0.04%	6.70%	-0.47%	4.63%	-0.43%	-2.12	yes	-2.07%
t+130	0.1%	-0.4%	-0.3%	2.2%	1.5%	0.0%	-0.1%	0.0%	-1.4%	0.1%	0.2%	0.1%	137881634232	0.22%	0.15%	0.46%	7.16%	0.51%	5.14%	0.05%	0.25	no	-2.01%
t+131	-0.1%	-0.4%	0.4%	1.9%	-1.3%	0.0%	-0.6%	-0.1%	0.9%	-0.1%	-1.0%	-6.6%	136143579891	-0.01%	-0.60%	0.21%	7.36%	-0.55%	4.60%	-0.76%	-3.70	yes	-2.77%
t+132	-0.3%	-0.8%	0.4%	2.0%	-0.1%	0.0%	0.1%	0.7%	-0.8%	-0.9%	1.3%	0.1%	138351954246	-0.15%	0.14%	-0.01%	7.35%	0.71%	5.30%	0.72%	3.51	yes	-2.05%
t+133	0.2%	0.1%	-0.1%	0.1%	-0.3%	0.0%	-0.1%	0.4%	0.9%	0.0%	-1.3%	0.1%	136602790592	0.08%	0.00%	0.22%	7.58%	-0.55%	4.75%	-0.77%	-3.79	yes	-2.82%
t+134	0.5%	-0.1%	-0.2%	-0.2%	1.4%	0.0%	0.1%	-0.3%	-0.2%	1.1%	0.1%	0.1%	138411075817	0.13%	0.18%	-0.16%	7.41%	0.57%	5.32%	0.73%	3.60	yes	-2.09%
t+135	-0.1%	0.6%	0.1%	-1.1%	0.6%	0.0%	0.5%	-0.1%	-0.2%	-1.0%	0.6%	0.1%	140572098591	0.24%	0.00%	0.16%	7.58%	0.67%	6.00%	0.51%	2.50	yes	-1.58%
t+136	-0.4%	1.0%	-0.6%	-0.1%	-1.6%	0.0%	-0.1%	1.0%	-0.3%	0.5%	1.5%	0.1%	144419100734	0.13%	0.07%	0.19%	7.76%	1.18%	7.10%	1.00%	4.87	yes	-0.58%
t+137	0.5%	-1.0%	-0.4%	-0.1%	0.3%	0.0%	-1.7%	0.5%	0.0%	-0.1%	-0.2%	0.1%	144588290183	0.01%	-0.18%	0.48%	8.25%	0.06%	7.24%	-0.42%	-2.08	yes	-1.01%
t+138	-0.3%	-0.9%	0.3%	0.5%	0.0%	0.0%	-0.4%	0.4%	-0.1%	0.3%	3.3%	0.1%	151871280985	0.02%	0.24%	0.12%	8.37%	2.18%	9.41%	2.05%	10.05	yes	1.05%
t+139	-0.7%	1.0%	0.2%	-0.4%	-0.2%	0.0%	-0.6%	-0.1%	-0.4%	0.5%	-1.8%	0.1%	147741664831	-0.12%	0.20%	0.06%	8.43%	-1.19%	8.22%	-1.25%	-6.12	yes	-0.20%
t+140	-0.2%	0.5%	-0.2%	-0.3%	0.1%	0.0%	-0.1%	-0.9%	-0.9%	0.7%	0.0%	0.1%	146743737908	-0.19%	-0.10%	-0.25%	8.18%	-0.25%	7.93%	-0.04%	-0.22	no	-0.25%
t+141	0.5%	0.7%	0.0%	0.1%	-0.5%	0.0%	-0.1%	0.2%	-0.8%	-0.6%	0.2%	0.1%	147561761706	-0.05%	-0.03%	0.04%	8.28%	0.24%	8.17%	0.14%	0.69	no	-0.11%
t+142	0.4%	0.2%	-0.2%	0.6%	-0.1%	0.0%	0.4%	0.0%	-0.7%	0.5%	-0.6%	0.1%	14541368558	-0.17%	0.04%	-0.31%	7.97%	-0.63%	7.54%	-0.32%	-1.57	no	-0.43%
t+143	-0.1%	0.2%	0.0%	1.1%	1.5%	0.0%	0.4%	0.4%	0.2%	-0.2%	1.7%	0.0%	146824120922	0.16%	0.38%	-0.01%	7.96%	0.38%	8.12%	0.58%	2.86	yes	0.16%
t+144	-0.7%	0.0%	0.0%	0.0%	-0.3%	0.0%	1.1%	1.3%	0.4%	-1.4%	0.1%	0.0%	148936502658	0.16%	0.04%	0.39%	8.36%	0.62%	8.74%	0.23%	1.12	no	0.39%
t+145	0.3%	0.0%	0.0%	-2.6%	-1.7%	0.0%	0.5%	0.1%	0.9%	0.6%	-0.5%	0.1%	148111717238	-0.12%	-0.21%	0.00%	8.36%	-0.24%	8.50%	-0.24%	-1.18	no	0.14%
t+146	-0.1%	0.1%	0.0%	-5.7%	0.4%	0.0%	0.1%	-0.5%	0.7%	0.2%	-1.0%	0.0%	147018764690	0.44%	-0.52%	0.29%	8.65%	-0.32%	8.18%	-0.61%	-3.00	yes	-0.47%
t+147	0.6%	-0.2%	0.0%	2.1%	0.9%	0.0%	0.6%	-0.2%	0.5%	0.4%	0.0%	0.1%	1										



	AFRICAN OXYGEN LIMITED (AFK)	DIMENSION DATA HOLDINGS PLC (DDT)	DUNLOP AFRICA LTD (DNL)	DATATEC LIMITED (DTC)	MUSTEK LIMITED (MST)	NICTUS BEPERK (NCS)	NASPERS LIMITED (NPN)	OMNIA HOLDINGS LIMITED (OMN)	SA CORP REAL ESTATE FUND (SAC)	SASFIN HOLDINGS LIMITED (SFN)	TELKOM SA LIMITED (TKG)	ZAMBIA COPPER INVESTMENTS LIMITED (ZCI)	WEIGHTED AVE PROJECTED DAILY RETURNS
Intercept:	-0.001	0.0000	-0.0001	-0.0011	0.0000	0.0004	-0.0002	0.0008	0.0002	0.0007	0.0005	-0.0007	0.0003
Slope:	0.5538	0.6771	0.7365	1.6684	0.2897	-0.0234	0.7655	0.0844	0.1873	0.2837	0.5913	0.0310	0.6086
R-Squared:	0.0981	0.1158	0.0611	0.2421	0.0113	0.0001	0.1110	0.0023	0.0127	0.0182	0.1288	0.0001	0.1955
STD Error:	0.0101	0.0088	0.0181	0.0176	0.0145	0.0127	0.0111	0.0085	0.0078	0.0094	0.0072	0.0229	0.0020

DAY	Abnormal Return AR	Total Market Cap of Population	Average Comparative All Share Returns	Average Abnormal Returns (AAR)	Weighted Projected Daily Returns (WPDR)	Cum Weight Projected Daily Returns (CWPDR)	Weighted Ave Act Daily Returns (WADR)	Cum Weight Ave Act Daily Returns (CWADR)	Weighted Ave Abnormal Returns (WAAR)	WAAR t-Test	WAAR Significant?	Cumul Weighted Ave Abnormal Returns (CWAAR)											
t+156	-0.3%	-1.6%	0.0%	-0.3%	0.1%	0.0%	0.7%	-0.7%	0.0%	0.2%	0.1%	0.0%	142932510890	0.07%	-0.17%	0.02%	9.45%	0.04%	7.00%	0.01%	0.07	no	-2.45%
t+157	1.2%	-0.7%	0.0%	-0.6%	0.6%	0.0%	1.4%	0.2%	0.7%	-0.2%	-0.1%	0.0%	143903168421	-0.11%	0.23%	0.11%	9.56%	0.30%	7.30%	0.18%	0.90	no	-2.26%
t+158	-0.8%	-0.1%	0.0%	-2.4%	-0.1%	0.0%	0.5%	-0.5%	0.1%	0.1%	0.8%	0.1%	146393571306	-0.10%	-0.21%	0.17%	9.73%	0.75%	8.04%	0.58%	2.82	yes	-1.69%
t+159	-0.9%	0.7%	0.0%	0.0%	-0.1%	0.0%	0.2%	0.1%	-0.6%	0.3%	-0.4%	0.0%	146252903935	0.15%	-0.07%	0.17%	9.90%	-0.04%	8.00%	-0.21%	-1.03	no	-1.90%
t+160	-0.7%	-0.4%	0.0%	0.5%	-0.3%	0.0%	-0.5%	0.5%	-0.8%	-0.5%	0.2%	0.1%	146666470429	-0.05%	-0.19%	0.17%	10.07%	0.12%	8.13%	-0.05%	-0.22	no	-1.94%
t+161	0.5%	-0.6%	0.0%	1.0%	-0.4%	0.0%	0.2%	-0.3%	-0.4%	0.3%	-0.4%	0.1%	145988625280	-0.02%	-0.02%	0.09%	10.16%	-0.20%	7.93%	-0.29%	-1.43	no	-2.24%
t+162	-0.4%	1.0%	0.0%	0.1%	-0.4%	0.0%	-0.8%	1.1%	-0.6%	0.2%	-0.2%	0.1%	145221520667	-0.03%	0.01%	-0.05%	10.12%	-0.23%	7.70%	-0.18%	-0.88	no	-2.42%
t+163	0.1%	0.0%	0.0%	0.2%	-1.1%	0.0%	-0.6%	0.4%	-0.9%	-0.1%	-0.1%	0.1%	144867334104	0.11%	-0.20%	0.08%	10.20%	-0.10%	7.60%	-0.18%	-0.89	no	-2.60%
t+164	-0.9%	0.1%	0.0%	3.0%	0.8%	0.0%	0.1%	-0.3%	0.2%	0.2%	-1.1%	0.1%	142669496524	-0.37%	0.19%	0.04%	10.24%	-0.71%	6.93%	-0.71%	-3.46	yes	-3.30%
t+165	0.3%	-0.3%	0.0%	0.0%	0.8%	0.0%	0.2%	-1.2%	-2.6%	0.1%	0.3%	0.1%	143558680629	0.07%	-0.22%	0.16%	10.40%	0.28%	7.21%	0.12%	0.57	no	-3.19%
t+166	0.8%	0.0%	0.0%	-0.1%	-0.4%	0.0%	0.4%	0.2%	0.2%	0.2%	0.9%	0.1%	145462310816	-0.06%	0.18%	-0.10%	10.30%	0.57%	7.78%	0.67%	3.28	yes	-2.52%
t+167	1.5%	-0.4%	0.0%	1.1%	0.2%	0.0%	-0.4%	-0.1%	-0.1%	-0.4%	0.8%	0.1%	146991419781	-0.07%	0.19%	-0.01%	10.29%	0.46%	8.24%	0.47%	2.30	yes	-2.05%
t+168	0.5%	-0.7%	0.0%	-1.0%	0.2%	0.0%	-0.6%	0.0%	-0.4%	1.0%	0.4%	0.1%	147517561010	0.24%	-0.06%	0.04%	10.33%	0.16%	8.40%	0.12%	0.59	no	-1.93%
t+169	-0.4%	0.0%	0.0%	0.6%	0.2%	0.0%	0.5%	0.8%	1.1%	2.8%	-0.1%	0.1%	147976025406	-0.03%	0.52%	0.02%	10.35%	0.14%	8.53%	0.11%	0.56	no	-1.81%
t+170	0.2%	-0.4%	0.0%	1.2%	-0.4%	0.0%	0.7%	0.5%	0.3%	0.4%	-0.5%	0.1%	147218562337	-0.18%	0.20%	-0.03%	10.32%	-0.22%	8.31%	-0.19%	-0.95	no	-2.01%
t+171	-0.7%	-0.4%	0.0%	-0.4%	0.0%	0.0%	-0.7%	-0.9%	1.0%	0.1%	0.4%	0.1%	147304231543	-0.11%	-0.14%	-0.09%	10.23%	0.03%	8.34%	0.03%	0.57	no	-1.89%
t+172	1.0%	0.4%	0.0%	-1.6%	-1.0%	0.0%	-0.1%	0.2%	-1.9%	0.1%	0.0%	0.1%	145888218468	-0.28%	-0.28%	-0.34%	9.89%	-0.42%	7.92%	-0.07%	-0.36	no	-1.97%
t+173	-1.0%	0.9%	0.0%	-0.7%	0.4%	0.0%	-4.5%	1.2%	0.5%	-0.1%	0.5%	0.0%	147617746510	-0.07%	-0.24%	0.13%	10.02%	0.51%	8.44%	0.38%	1.86	no	-1.59%
t+174	-0.1%	-0.6%	0.0%	0.3%	0.3%	0.0%	-1.0%	-0.1%	0.4%	-0.9%	-1.4%	0.0%	143505369458	0.18%	-0.28%	-0.11%	9.91%	-1.22%	7.21%	-1.11%	-5.44	yes	-2.70%
t+175	0.8%	1.4%	0.0%	-0.2%	0.4%	0.0%	0.4%	0.0%	0.4%	-0.3%	0.2%	0.1%	145183340093	-0.06%	0.24%	0.23%	10.14%	0.51%	7.72%	0.27%	1.34	no	-2.42%
t+176	-0.5%	-0.5%	0.0%	0.4%	-0.1%	0.0%	-0.7%	0.1%	0.1%	0.1%	-0.1%	0.1%	145176430297	0.09%	-0.10%	0.24%	10.38%	0.00%	7.72%	-0.24%	-1.16	no	-2.66%
t+177	0.5%	-0.1%	0.0%	-0.7%	0.5%	0.0%	-0.2%	-0.1%	0.8%	1.4%	-0.7%	0.1%	144236701896	-0.04%	0.13%	0.19%	10.57%	-0.28%	7.44%	-0.47%	-2.29	yes	-3.13%
t+178	0.2%	1.5%	0.0%	0.4%	0.6%	0.0%	-1.0%	0.0%	0.4%	-1.4%	-0.2%	0.1%	143990629806	-0.18%	0.17%	0.06%	10.63%	-0.11%	7.32%	-0.18%	-0.87	no	-3.31%
t+179	0.7%	2.4%	0.0%	-1.3%	0.6%	0.0%	0.0%	-0.7%	-0.4%	-0.3%	-0.1%	0.1%	144432263184	-0.17%	0.06%	0.06%	10.69%	0.16%	7.48%	0.09%	0.46	no	-3.21%
t+180	-0.4%	0.5%	0.0%	-0.2%	-0.1%	0.0%	-1.3%	-0.3%	0.9%	-1.5%	0.0%	0.0%	145158266423	-0.11%	-0.16%	-0.32%	10.37%	-0.08%	7.40%	-0.09%	1.21	no	-2.96%
t+181	-0.6%	0.4%	0.0%	-0.9%	0.5%	0.0%	0.2%	-0.6%	1.4%	2.1%	0.2%	0.1%	145861265035	0.11%	0.25%	-0.02%	10.35%	0.21%	7.61%	0.23%	1.11	no	-2.74%
t+182	-0.4%	-0.7%	0.0%	-4.1%	-0.6%	0.0%	0.9%	0.4%	1.4%	-1.1%	0.1%	0.0%	145915297024	-0.11%	-0.38%	0.19%	10.19%	0.02%	7.63%	0.18%	0.87	no	-2.56%
t+183	1.4%	-1.1%	0.0%	-0.3%	-1.2%	0.0%	-1.1%	-0.1%	0.5%	0.9%	-0.4%	0.0%	14510586876	0.40%	0.14%	0.27%	10.47%	-0.24%	7.40%	-0.51%	-2.49	yes	-3.07%
t+184	-1.0%	0.1%	0.0%	-1.5%	0.0%	0.0%	-0.6%	0.1%	1.7%	1.5%	-0.4%	0.1%	144378008125	-0.10%	-0.03%	-0.03%	10.43%	-0.22%	7.18%	-0.18%	-0.89	no	-3.25%
t+185	1.7%	0.0%	0.0%	4.0%	-0.3%	0.0%	-0.1%	-0.2%	0.7%	0.3%	-0.4%	0.1%	143748733706	-0.26%	0.51%	0.01%	10.44%	-0.18%	7.00%	-0.19%	-0.92	no	-3.44%
t+186	-0.9%	1.1%	0.0%	-0.4%	0.0%	0.0%	0.2%	-0.5%	-0.7%	1.0%	0.9%	0.1%	145661622723	-0.24%	0.08%	-0.10%	10.34%	0.58%	7.58%	0.68%	3.31	yes	-2.76%
t+187	0.9%	0.6%	0.0%	-2.2%	0.9%	0.0%	-0.4%	-0.2%	-0.8%	0.4%	-0.5%	0.1%	144324710484	0.07%	-0.12%	-0.02%	10.32%	-0.40%	7.18%	-0.37%	-1.83	no	-3.14%
t+188	-0.6%	1.0%	0.0%	-0.6%	-0.8%	0.0%	-0.5%	-0.1%	-0.2%	-0.2%	-1.2%	0.1%	141395712442	0.19%	-0.30%	-0.05%	10.26%	-0.88%	6.30%	-0.83%	-4.06	yes	-3.96%
t+189	-0.6%	0.3%	0.0%	1.6%	0.2%	0.0%	0.9%	-0.5%	-0.5%	0.2%	-0.4%	0.1%	141704187674	0.03%	0.11%	0.18%	10.45%	0.10%	6.40%	-0.09%	-0.42	no	-4.05%
t+190	-0.2%	0.1%	0.0%	0.9%	-0.1%	0.0%	0.4%	-0.2%	-0.1%	-0.2%	-1.1%	0.1%	138568473813	0.02%	-0.05%	-0.31%	10.14%	-0.97%	5.43%	-0.66%	-3.23	yes	-4.71%
t+191	0.5%	0.1%	0.0%	0.0%	-2.5%	0.0%	-0.6%	-0.1%	0.0%	-0.1%	0.3%	0.1%	138457393877	0.13%	-0.22%	-0.10%	10.04%	-0.07%	5.40%	0.07%	0.32	no	-4.64%
t+192	-0.1%	-0.1%	0.0%	-0.6%	0.9%	0.0%	0.7%	1.4%	0.9%	0.6%	-0.1%	0.0%	137669934713	0.17%	0.33%	-0.32%	9.72%	-0.24%	5.16%	0.08%	0.38	no	-4.57%
t+193	-0.2%	-0.9%	0.0%	1.6%	1.0%	0.0%	-1.4%	-0.5%	1.8%	-0.1%	-0.5%	0.1%	136644993750	0.00%	0.07%	0.21%	9.93%	-0.32%	4.84%	-0.53%	-2.58	yes	-5.09%
t+194	0.2%	-1.1%	0.0%	0.7%	-0.1%	0.0%	0.7%	0.9%	-0.4%	0.1%	0.8%	0.1%	138035702400	-0.07%	0.17%	-0.10%	9.83%	0.44%	5.28%	0.54%	2.66	yes	-4.55%
t+195	-0.4%	0.7%	0.0%	0.3%	0.2%	0.0%	0.2%	-0.1%	-0.4%	-0.7%	0.6%	0.1%	139256943511	-0.03%	0.03%	-0.06%	9.77%	0.38%	5.66%	0.44%	2.16	yes	-4.11%
t+196	0.1%	-0.1%	0.0%	1.0%	0.0%	0.0%	0.1%	0.1%	0.6%	-0.1%	-0.4%	0.1%	139198002964	0.02%	0.11%	0.23%	10.00%	-0.24%	5.64%	-0.24%	-1.19	no	-4.35%
t+197	1.3%	0.2%	0.0%	-3.7%	0.1%	0.0%	0.7%	-0.2%	-0.8%	-0.1%	-0.4%	0.0%	138281261709	0.06%	-0.27%	-0.16%	9.83%	-0.28%	5.36%	-0.12%	-0.59	no	-4.47%
t+198	-1.6%	-1.5%	0.0%	4.6%	0.1%	0.0%	-0.3%	0.1%	-0.1%	-1.5%	-0.8%	-13.0%	136029695224	-0.03%	-1.27%	0.03%	9.86%	-0.71%	4.65%	-0.74%	-3.60	yes	-5.21%
t+199	-0.6%	-0.4%	0.0%	-2.9%	0.3%	0.0%	0.2%	0.7%	0.7%	0.0%	-5.1%	0.0%	126813924538	0.12%	-0.64%	0.11%	9.97%	-2.98%	1.68%	-3.09%	-15.13	yes	-8.30%
t+200	0.0%	-0.3%	0.0%	-2.3%	1.9%	0.0%	0.8%	0.9%	1.9%	0.2%	0.1%	0.1%	128409741000	0.08%	0.31%	0.24%	10.21%	0.55%	2.22%	0.30%	1.48	no	-7.99%
t+201	0.0%	1.1%	0.0%	3.0%	-0.3%	0.0%	1.1%	0.5%	1.3%	-0.2%	-0.5%	0.1%	128947005774	-0.04%	0.35%	0.20%	10.41%	0.18%	2.41%	-0.01%	-0.06	no	-8.00%
t+202	0.5%	0.8%	0.0%	1.2%	0.0%	0.0%	0.3%	0.4%	-0.2%	-0.8%	0.7%	0.1%	130661662127	-0.06%	0.27%	0.01%	10.42%	0.58%	2.98%	0.57%	2.78	yes	-7.44%
t+203	-0.6%	-0.7%	0.0%	-0.1%	-0.8%	0.0%	-0.4%	-0.2%	0.2%	0.9%	0.2%	0.1%	131329514309	0.06%	-0.17%	-0.15%	10.27%	0.22%	3.21%	0.37%	1.81	no	-7.07%
t+204	0.4%	-1.1%	0.0%	-2.0%	-0.1%	0.0%	-1.0%	1.2%	0.2%	-0.3%	0.8%	0.1%	132453880397	-0.06%	-0.18%	0.13%	10.42%	0.38%	3.59%	0.23%	1.14	no	-6.83%
t+205	0.1%	1.1%	0.0%	-0.8%	0.7%	0.0%	-0.1%	-0.7%	-0.2%	-1.8%	0.9%	0.0%	134353872139	-0.01%	-0.06%	0.01%	10.43%	0.62%	4.21%	0.61%	2.98	yes	-6.22%
t+206	0.0%	0.6%	0.0%	0.4%	-0.5%	0.0%	1.0%	0.5%	0.6%	-1.0%	-0.4%	0.1%	134628431333	0.03%	0.10%	0.08%	10.52%	0.09%	4.30%	0.01%	0.03	no	-6.22%
t+207	0.0%	0.6%	0.0%	-0.3%	1.6%	0.0%	-0.1%																



	AFRICAN OXYGEN LIMITED (AFX)	DIMENSION DATA HOLDINGS PLC (DDT)	DUNLOP AFRICA LTD (DNL)	DATATEC LIMITED (DTC)	MUSTEK LIMITED (MST)	NICTUS BEPERK (NCS)	NASPERS LIMITED (NPN)	OMNIA HOLDINGS LIMITED (OMN)	SA CORP REAL ESTATE FUND (SAC)	SASFIN HOLDINGS LIMITED (SFN)	TELKOM SA LIMITED (TKG)	ZAMBIA COPPER INVESTMENTS LIMITED (ZCI)	WEIGHTED AVE PROJECTED DAILY RETURNS
Intercept:	-0.0001	0.0000	-0.0001	-0.0011	0.0000	0.0004	-0.0002	0.0008	0.0002	0.0007	0.0005	-0.0007	0.0003
Slope:	0.5538	0.6771	0.7365	1.6684	0.2897	-0.0234	0.7655	0.0844	0.1873	0.2837	0.5913	0.0310	0.6086
R-Squared:	0.0981	0.1158	0.0611	0.2421	0.0113	0.0001	0.1110	0.0023	0.0127	0.0182	0.1288	0.0001	0.1955
STD Error:	0.0101	0.0088	0.0181	0.0176	0.0145	0.0127	0.0111	0.0085	0.0078	0.0094	0.0072	0.0229	0.0020

DAY	Abnormal Return	Total Market Cap of Population	Average Comparative All Share Returns	Average Abnormal Returns (AAR)	Weighted Projected Daily Returns (WPDR)	Cum Weight Projected Daily Returns (CWPDR)	Weighted Ave Act Daily Returns (WAAR)	Cum Weight Ave Act Daily Returns (CWADR)	Weighted Ave Abnormal Returns (WAAR)	WAAR t-Test	WAAR Significant?	Cumul Weighted Ave Abnormal Returns (CWAAR)											
t+216	-1.0%	0.9%	0.0%	0.6%	-0.1%	0.0%	0.9%	0.4%	0.3%	-0.2%	-1.3%	0.1%	125882775552	0.04%	0.06%	0.07%	10.37%	-0.41%	1.42%	-0.48%	-2.36	yes	-8.95%
t+217	-0.2%	0.2%	0.0%	-0.3%	0.1%	0.0%	-0.8%	0.3%	1.3%	-0.2%	0.5%	0.1%	126474392262	0.12%	0.08%	0.00%	10.37%	0.21%	1.63%	0.21%	1.02	no	-8.74%
t+218	0.4%	0.5%	0.0%	0.0%	-0.6%	0.0%	-0.9%	0.4%	-0.1%	-0.2%	-0.1%	0.1%	125805088082	-0.14%	-0.04%	-0.05%	10.32%	-0.23%	1.40%	-0.18%	-0.86	no	-8.92%
t+219	0.1%	-2.8%	0.0%	0.0%	0.4%	0.0%	0.1%	0.3%	-0.7%	-0.2%	0.1%	0.1%	124181929032	-0.22%	-0.24%	-0.37%	9.95%	-0.56%	0.85%	-0.19%	-0.92	no	-9.10%
t+220	0.3%	1.7%	0.0%	-0.6%	0.2%	0.0%	-0.2%	-0.1%	0.5%	-0.2%	0.1%	0.0%	126026511391	0.55%	0.15%	0.43%	10.38%	0.65%	1.49%	0.22%	1.08	no	-8.88%
t+221	0.3%	1.1%	0.0%	0.0%	-0.3%	0.0%	0.1%	0.0%	0.1%	0.0%	-0.7%	0.1%	125202089089	-0.02%	0.06%	-0.02%	10.36%	-0.28%	1.22%	-0.26%	-1.28	no	-9.14%
t+222	-0.3%	0.1%	0.0%	-1.7%	0.0%	0.0%	1.7%	0.3%	-0.2%	-0.6%	-0.2%	0.1%	125539431443	-0.29%	-0.08%	-0.07%	10.29%	0.13%	1.35%	0.20%	0.99	no	-8.94%
t+223	0.2%	-2.1%	0.0%	2.1%	0.1%	0.0%	0.4%	-1.5%	-0.3%	0.4%	0.3%	0.1%	125253376609	-0.16%	-0.04%	-0.12%	10.16%	-0.09%	1.25%	0.03%	0.14	no	-8.91%
t+224	-0.1%	-0.8%	0.0%	1.2%	-0.1%	0.0%	0.3%	-0.3%	-1.5%	0.3%	0.4%	0.0%	126219881085	0.16%	-0.06%	0.18%	10.34%	0.34%	1.59%	0.16%	0.80	no	-8.75%
t+225	0.4%	-0.8%	0.0%	-1.5%	-0.8%	0.0%	-0.1%	0.1%	-0.5%	-0.1%	-0.4%	0.1%	123967870780	-0.43%	-0.34%	-0.43%	9.91%	-0.78%	0.81%	-0.34%	-1.68	no	-9.09%
t+226	-0.4%	-1.4%	0.0%	-0.5%	-0.2%	0.0%	0.3%	0.8%	-0.3%	0.4%	-0.7%	0.1%	122415341336	-0.04%	-0.18%	-0.05%	9.85%	-0.54%	0.27%	-0.49%	-2.38	yes	-9.58%
t+227	-0.5%	2.2%	0.0%	2.1%	-1.0%	0.0%	1.4%	-1.0%	0.4%	-0.1%	0.6%	0.1%	124123040750	-0.32%	0.38%	-0.21%	9.64%	0.61%	0.88%	0.82%	3.99	yes	-8.76%
t+228	0.0%	1.9%	0.0%	1.4%	0.0%	0.0%	-0.5%	-1.4%	-0.1%	0.1%	0.1%	0.1%	125044180704	-0.23%	0.12%	0.24%	9.89%	0.32%	1.20%	0.08%	0.38	no	-8.68%
t+229	0.3%	-0.3%	0.0%	0.7%	0.5%	-0.1%	-1.8%	-0.2%	-3.2%	0.0%	-0.4%	0.1%	122301667033	0.20%	-0.40%	-0.18%	9.71%	-0.96%	0.25%	-0.78%	-3.80	yes	-9.46%
t+230	-0.2%	0.4%	0.0%	1.3%	-0.1%	0.0%	-0.9%	0.0%	2.1%	0.5%	-0.6%	-0.1%	119730217626	-0.35%	-0.41%	-0.51%	9.19%	-0.91%	-0.67%	-0.40%	-1.96	yes	-9.86%
t+231	0.6%	-0.7%	0.0%	0.6%	1.0%	0.0%	0.9%	-0.1%	-1.4%	0.0%	-0.3%	0.1%	120108672718	-0.09%	0.07%	0.18%	9.37%	0.14%	-0.52%	-0.04%	-0.18	no	-9.90%
t+232	-0.2%	-3.6%	0.0%	3.1%	0.7%	0.0%	0.7%	-1.2%	0.3%	-0.2%	0.6%	0.0%	120063837005	-0.08%	0.03%	-0.23%	9.14%	0.00%	-0.52%	0.24%	1.16	no	-9.66%
t+233	0.5%	1.2%	0.0%	2.4%	-0.1%	0.0%	0.1%	0.4%	0.1%	-0.2%	-0.1%	0.1%	118550295048	-0.13%	0.39%	-0.61%	8.53%	-0.54%	-1.06%	0.07%	0.35	no	-9.59%
t+234	-0.1%	-0.1%	0.0%	-0.1%	-0.2%	0.0%	0.1%	0.0%	-0.8%	-0.2%	3.1%	0.1%	123010928658	-0.34%	0.16%	-0.14%	8.39%	1.64%	0.58%	1.78%	8.73	yes	-7.81%
t+235	-0.7%	-1.4%	0.0%	0.4%	0.0%	0.0%	-1.3%	-1.1%	-1.6%	-0.1%	2.2%	0.1%	125367325093	0.40%	-0.32%	0.01%	8.40%	0.85%	1.43%	0.84%	4.11	yes	-6.97%
t+236	0.2%	0.5%	0.0%	0.6%	0.4%	0.0%	-0.6%	0.0%	-0.2%	-0.9%	-1.9%	0.1%	124385560563	0.26%	-0.17%	0.89%	9.29%	-0.34%	1.09%	-1.23%	-6.02	yes	-8.20%
t+237	-0.3%	-3.8%	0.0%	2.1%	0.0%	0.0%	-0.2%	0.3%	1.5%	0.0%	-0.3%	0.1%	122801505943	-0.19%	-0.07%	-0.07%	9.21%	-0.53%	0.56%	-0.45%	-2.22	yes	-8.65%
t+238	0.6%	1.1%	0.0%	-2.5%	0.0%	0.0%	0.9%	0.0%	1.4%	-0.2%	0.6%	0.1%	123659408420	-0.11%	0.17%	-0.40%	8.81%	0.31%	0.87%	0.71%	3.48	yes	-7.94%
t+239	-0.2%	-1.4%	0.0%	1.8%	-0.1%	0.0%	0.0%	-0.5%	-0.3%	-0.1%	-1.0%	0.1%	122945422210	-0.26%	-0.16%	0.45%	9.26%	-0.25%	0.62%	-0.70%	-3.42	yes	-8.64%
t+240	-0.5%	-0.7%	0.0%	0.8%	0.1%	0.0%	-0.1%	1.2%	1.0%	1.5%	-0.6%	0.1%	123107178142	0.12%	0.25%	0.43%	9.69%	0.06%	0.68%	-0.38%	-1.84	no	-9.01%
t+241	1.1%	-0.9%	0.0%	0.0%	0.5%	0.0%	-0.2%	-2.4%	1.4%	-0.1%	0.5%	0.1%	124618168040	-0.25%	0.00%	0.26%	9.95%	0.53%	1.21%	0.27%	1.32	no	-8.74%
t+242	0.1%	-0.8%	0.0%	0.4%	-1.3%	0.0%	0.2%	0.0%	-1.0%	-0.5%	-1.9%	0.1%	123342740117	0.36%	-0.43%	0.77%	10.72%	-0.44%	0.77%	-1.21%	-5.92	yes	-9.95%
t+243	0.8%	-2.3%	0.0%	-2.2%	0.8%	0.0%	-0.1%	-0.5%	-2.2%	-0.1%	0.3%	0.1%	122779331774	-0.19%	-0.50%	-0.13%	10.59%	-0.19%	0.58%	-0.05%	-0.27	no	-10.00%
t+244	-0.3%	1.5%	0.0%	0.1%	0.3%	0.0%	1.2%	-1.3%	-0.3%	-0.1%	0.0%	0.1%	122164365250	-0.24%	0.10%	-0.52%	10.06%	-0.21%	0.37%	0.31%	1.52	no	-9.69%
t+245	0.1%	-1.4%	0.0%	-1.8%	0.1%	-0.1%	0.4%	0.2%	-0.1%	-0.1%	-1.4%	0.1%	120051990045	0.23%	-0.36%	0.07%	10.13%	-0.75%	-0.38%	-0.82%	-4.02	yes	-10.51%
t+246	0.4%	-1.1%	0.0%	1.3%	-0.1%	0.0%	1.2%	-0.1%	0.0%	0.9%	-0.4%	0.1%	119596563035	-0.04%	0.19%	-0.15%	9.98%	-0.16%	-0.54%	-0.01%	-0.05	no	-10.52%
t+247	0.7%	3.0%	0.0%	0.8%	0.0%	0.0%	-1.0%	1.4%	-2.1%	1.5%	0.8%	0.1%	120373075000	0.11%	0.43%	0.20%	10.18%	-0.24%	0.11%	0.11%	0.52	no	-10.42%
t+248	-0.1%	3.5%	0.0%	-0.6%	-0.5%	0.0%	-0.4%	1.1%	-1.0%	1.5%	0.4%	0.1%	121346584794	0.11%	0.37%	-0.03%	10.15%	0.37%	0.14%	0.40%	1.95	no	-10.02%
t+249	1.0%	-0.2%	0.0%	3.1%	-0.6%	0.0%	-1.8%	0.8%	-0.2%	-0.2%	-0.5%	0.1%	121235726735	0.39%	0.13%	0.63%	10.78%	-0.03%	0.10%	-0.66%	-3.23	yes	-10.68%
t+250	-0.2%	0.1%	0.0%	3.5%	-0.2%	0.0%	0.3%	1.8%	-0.6%	0.3%	0.3%	7.1%	122107493652	0.30%	1.13%	0.02%	10.80%	0.31%	0.42%	0.30%	1.45	no	-10.38%
t+251	1.6%	1.4%	0.0%	-0.7%	-0.3%	-8.0%	-0.2%	0.0%	-0.4%	-3.8%	-1.1%	9.8%	121592692881	0.05%	-0.16%	0.39%	11.19%	-0.17%	0.24%	-0.56%	-2.77	yes	-10.95%
t+252	-0.5%	1.6%	0.0%	-0.7%	-0.7%	-0.1%	0.4%	0.1%	-1.8%	1.1%	0.0%	0.0%	121115458221	-0.37%	-0.05%	-0.30%	10.90%	-0.17%	0.08%	0.13%	0.63	no	-10.82%

**Appendix 4: Residuals plot of Average ALSI returns to WAARs**

