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An Event Study: The Market Reactions to Share Repurchase Announcements on the JSE

Submitted by:

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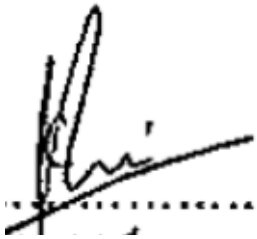
ABSTRACT

This study examines the market reactions to share repurchase announcements made by companies listed on the Johannesburg Stock Exchange from 2003 to 2012. We use an event study methodology and the Capital Asset Pricing Model to determine if there is an announcement effect when a share repurchase announcement is made. Our analysis show that consistent with signalling theory and the announcement effect, share repurchase announcements are associated with positive abnormal returns. The average abnormal return and cumulative average abnormal return noted was 0.46% and 3.81% respectively for the event period (t -20, t +20). There was an observable trend of declining share prices before the share repurchase announcement however the decline in the shares prices was not significant. We found some evidence of market timing ability in 2005 and 2010 however as a collective, we found no significant difference in timing a share repurchase announcement.

Keywords: Market reaction; Share repurchase announcement; average abnormal returns; cumulative average abnormal returns

DECLARATION

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



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LIST OF ABBREVIATIONS

ALSI	-	All Share Index
ALTX	-	Alternative Exchange
AAR	-	Average Abnormal Return
AR	-	Abnormal Return
CAR	-	Cumulative Abnormal Return
CAAR	-	Cumulative Average Abnormal Return
CAPM	-	Capital Asset Pricing Model
DCM	-	Development Capital Board
EMT	-	Efficient Markets Theory
JSE	-	Johannesburg Stock Exchange
SENS	-	Stock Exchange News Service
VCM	-	Venture Capital Board

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

Companies that accumulate cash fast may find it difficult to reinvest the cash at attractive rates of returns. Such companies may also be faced the difficult task of finding new investment opportunities which benefit its shareholders. Bhana (2007) states that when companies plan their allocation of any surplus capital resources, they are faced with two major alternatives. They may decide to invest the funds in order to advance their business goals, which include capital expenditure, retaining funds for working capital or engaging in acquisitions and mergers. The second option is that they may decide on returning cash to shareholders through dividends, debt repayment or share repurchases.

In this study, we focus on share repurchases. A share repurchase allows a company to reinvest in itself by increasing the proportion of shares that it owns thereby reducing the number of its shares in the market. A company may also repurchase its preference shares, warrants and debentures.

Share repurchases have become an important financial policy for listed companies for the past twenty years in the United States (Bhana, 2007). The reason for the increase in this form of activity is motivated by the use of open market repurchase programs, where no additional premium is paid to the current share price when repurchasing a company's shares. Both Skinner's (2008) research into the US markets and Von Eije and Megginson's (2008) research into the European markets indicate a trend that share repurchases is becoming a dominant method of replacing dividends and distributing corporate cash flows to shareholders.

In context of the economic climate, Grullon and Ikenberry (2000) found that share repurchases will likely remain the dominant transaction in the future as more

countries adopt enabling regulations such as relaxed tax legislations and corporate laws. Grullon and Ikenberry (2000) discuss two other factors affecting share repurchase program activity. These include the level of market prices and the underlying condition of the economy citing that when share prices fall announcements of repurchases rise.

Further to Grullon and Ikenberry's (2000) study, Sabri's (2003) study on using treasury repurchased shares to stablise stock markets found that there is an increasing movement in the world stock markets towards adopting or deregulating the share repurchase activity. More than half of his selected sample which included countries among others from developed economies such as the USA, UK and Hong Kong, and emerging economies such as Taiwan, Malaysia, India and South Africa have witnessed a change in the related laws such as corporate laws and company legislations relating of share repurchases during the period 1995 – 2000. In South Africa, the Johannesburg Stock Exchange (JSE) amended its listing requirements in October 2000 to allow companies to repurchase their shares. Sabri (2003) concluded that countries that already legitimised the share repurchasing activities are deregulating and relaxing conditions and rules to encourage corporations to use share repurchases as an alternative to dividends. One motivation for this practice is to improve a firm's share price this benefitting shareholders.

To determine other motivations for a share repurchase, a common thread in the literature by Vermaelen (1981), Stephens and Weisbach (1998), Ikenberry, Lakonishok, and Vermaelen (2000), Grullon and Ikenberry (2000), Bhana (2007), Lo, Wang, and Yeh (2008), Skinner (2008) and Von Eije and Megginson (2008) suggests that a well-known positive signal in a share repurchase is that managers seem to believe that the shares are undervalued. Ikenberry and Vermaelen's (1996) study on the option to repurchase shares point out that managers i.e. those managers within a firm who are tasked with repurchasing a firm's shares and who are concerned with maximising the wealth of long-term

shareholders will tend to repurchase shares when they view their shares as undervalued. Ikenberry and Vermaelen's (1996) findings show that this inherent flexibility offers value as an exchange option in which the market price of the share is exchanged for the true value of the share. Therefore the announcement of a repurchase expands the company's investment opportunity set as explained above by Bhana (2007).

The study of share repurchases is nothing new. De Ridder's (2009) study found that share repurchases have been extensively examined by the financial community since the late 1960's. Studies by Skinner (2008), Von Eije and Megginson (2008) and Lee, Ejara, and Gleason (2010) have been undertaken in the areas of the size and volume of repurchase activities, the information content of repurchase announcements and the characteristics of firms that repurchase their shares. However, De Ridder (2009) points out that the knowledge of how firms actually execute repurchases and impact of repurchases on the market have not yet been fully explored due to data constraints such as access to credible execution data and models for analysis purposes.

1.2 Motivation for the Research

Share repurchases has long been practised in the developed markets. For this reason, previous studies by Ikenberry and Vermaelen (1996) and Mishra, Racine, and Schmidt (2010) have been conducted in these markets. These developed markets include the USA, Canada, Europe, Japan and Australia. The abovementioned studies have examined an array of topics related to share repurchases. The most common of which have been the reasons for share repurchases, timing ability, signalling theory, and market reaction.

However, due to the operating nature of these developed markets, their size, the differences in the rules and regulations that govern such markets and the

maturity of the stock exchanges, their findings may not be applicable to the developing markets such as South Africa.

The South African economy is an active hub of activity where expansion and a faster more inclusive economic growth strategy are encouraged. The reward for such a strategy is that businesses are enhanced through better earnings prospects and improvements in financial ratios, performance is driven in terms of productivity gains and shareholder value is created. The JSE has become a financial link between issuers, analysts and investors in South Africa and internationally by providing the platform, the framework and regulating the environment for companies to conduct financial transactions.

Studies on share repurchases in developing markets are limited and in the South African context studies have either been conducted soon after the JSE officially allowed share repurchases in October 2000 or were not conducted over a long enough period to yield any reliable results. Due to the limited availability of studies in this area in South Africa, this study will add to the literature on share repurchases.

1.3 Aim and Objectives of the Study

Managers within a firm who are tasked with repurchasing a company's shares are typically from within a listed company's Treasury Department. The role of the Treasuy Department is to ensure that funds are available to support the business when required, to raise equity and to invest surplus funds. These managers are less likely to launch repurchases unless they believe that the expected performance of the firms stock is better than expected by the market, even after the repurchase program is announced (Yook, 2010). Since companies that announce share repurchase programs are under no obligation to carry them out, Ginglinger and Hamon (2007) state that the proportion of repurchases that are acutally undertaken is a prerequisite to gaining meaningful insight into

repurchase decisions. Market participants evaluate the credibility of a firm's open market share repurchase announcement based on actual completion rates of a firm's past repurchase program or a firm's ability to acquire the number of shares indicated in its announcement.

In light of the above, this study aims to examine the market reaction surrounding the announcements of share repurchases by listed companies on the JSE in order to establish whether there is an "announcement effect". The market can react in either one of three ways:

1. Positive reaction: this is characterised by an increase in the share price;
2. Negative reaction: this is characterised by a decrease in the share price; or
3. No reaction: this is characterised by not responding at all.

This study will utilise a recent data set and will cover a longer period, January 2003 to August 2012. Previous studies conducted around share repurchases on the JSE employed shorter periods (i.e. from 6 months to 5 years). This study uses a total of 9 years and 8 months of data under the assumption that a longer period will yield more reliable and conclusive results to the research questions.

1.4 Outline of Chapters

The following chapter presents the literature review, followed by the research questions in chapter three. The fourth chapter describes the data and methodology used in the analysis. The fifth chapter presents the results while the sixth chapter provides an analysis and discussion of the results. The last chapter concludes with a summary of the study and future research recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Firms buy back their own shares for various reasons. Some of the reasons found in the literature include managerial intentions to signal to the market that the shares are undervalued, to ward of potential takeover raiders, to distribute cash through repurchase instead of dividend payments, to use repurchased shares to settle outstanding options and convertible securities to avoid dilution, to distribute excess cash where is there is no investment opportunity, and to adjust financial leverage (Lee *et al.,* 2010). This study focuses on the market reaction to share repurchases. We will therefore focus on the following three common threads for repurchasing shares:

1. Signalling theory;
2. Long term stock performance; and
3. Market timing.

The signalling theory can be regarded as management's "signal" to the market that the current market price of the share is undervalued. This presupposes the existence of information asymmetry between management and investors. The greater the degree to assess the value of a firm, the more likely it is that information asymmetry may obscure the true value of a firm and hence it is unlikely that the firm may be undervalued.

The long term stock performance following a share repurchase announcement, will be studied to understand if firms experience positive abnormal returns afterwards and if firms repurchase their shares after a series of consecutive price declines. The third reason, market timing of share repurchases, will be studied to understand if firms can reacquire shares at a lower price.

2.2 Market Undervaluation as a Motive for Share Repurchases

Grullon and Ikenberry (2000) noted that researchers tend study the markets in search for the one explanation, or the single primary factor, that describes some trend or activity that can explain a phenomena. If the growing trend of share repurchases is regarded as a new phenomena, Grullon and Ikenberry (2000), Dittmar (2000), Dobbs and Rehm (2005) and Lee *et al.*, (2010) offer similar explanations to this phenomena which state that markets respond to announcements of share repurchases because they offer new information, sometimes called a "signal", about a company's future and hence its share price.

Grullon and Ikenberry (2000) offer two different versions to the "signalling" explanation. The first version states that repurchases are intended to convey a firm's expectation of future increases in earnings and cash flow. In other words, its management's optimistic view of the future value of the stock that is not shared by the market. This is also known as a positive signal, indicating that management has correctly forecasted future cash flow and does not need the excess cash to cover future commitments such as capital expenditures or interest payments.

The second version of "signalling" theory that Grullon and Ikenberry (2000) explain is that management is not attempting to convey new information to the market about a company's future and hence its share price, but are instead expressing their disagreement with how the market is pricing their current performance. This is management's view that the share is undervalued. It may also indicate that managers are not attempting to convey new information to the market, but are instead expressing their disagreement with how the market is pricing their current performance. Isa, Ghani, and Lee (2011) provide support to this argument by stating that information asymmetry (where managers within the firm have better information than outside investors), which in the context of share

repurchases, means that firms will buy back shares when they feel that the market is not providing the correct value to the firm.

Under most situations, Isa *et al.* (2011) assume that its is logical that the management of a firm have superior information about it current value and future prospects than outside investors. Therefore it is seen as a logical decision for management to buy back their own shares as a form of good investment, if they believe that it is infact being undervalued by the market. Because outside investors are not privy to same set of information that management has, the management's decision to repurchase their shares will act as a signal to the market and therefore we should be able to see a substantial and significant price increase on the repurchase day.

Jiang and Koller (2011) offer a different explanation to "signalling" theory stating that a negative signal, i.e. management's view that the share is undervalued, could indicate a failure of management to find enough value-creating investment opportunities. However studies on share repurchase motives by Asquith and Mullins (1986), Ikenberry and Vermaelen (1996), Dittmar (2000), Lee and Rui, (2007), Bhana (2007), De Ridder (2009) and Lee *et al*. (2010) indicate that may be ulterior motives behind the decisions to repurchase shares. The list includes tax benefits, distributing excess cash, and adjusting capital structure to avoid reduction in earnings caused by granting employees stock options. Companies may also repurchase their shares to reduce the supply, increase their leverage ratio or to eliminate any threats of unwanted takeover attempts by corporate raiders when the shares are traded at low value.

Lee *et al.* (2010) state that if the share is undervalued, potential raiders may also be attracted to take over the company. Management may then decide to repurchase shares so that the share price will adjust upwards to the correct level for the benefit of shareholders or to dismay the raider. Lee *et al.* (2010) further argue that signalling information to correct the share valuation and evade outside

takeover attempts of undervalued firms is more apparent under conditions of strong market monitoring circumstances. If there is no market monitoring, management may not be under pressure to release private information and share price may not respond to actions such as repurchase announcements. In this instance, the raider may also not benefit from taking over the undervalued firm since share price may not increase in the absence of market monitoring.

Jensen (1986) in (Dittmar, 2000) noted that firms repurchase stock to distribute excess cash flow. Stephens and Weisbach (1998) find a positive correlation between repurchases and levels of cash flow, which support the hypothesis of Jensen that positive abnormal returns exist upon the announcement of repurchases.

Stephens and Weisbach's (1998) finding also shows that repurchase activity is negatively correlated with prior stock returns, indicating that firms repurchase stock when their stock prices are perceived as undervalued. This view supports Vermaelen's (1981) initial study into share pruchases finding that firms repurchase stock to signal undervaluation. Bhana (2007) also concurs that the most commonly attributed motive to share repurchases is undervaluation.

When announcing a share repurchase program, Lee and Rui (2007) note that managers often make statements that their stock is "undervalued" or a "good buy" or "prices don't reflect the true value of the firm". To further examine whether these statements hold true on perceived undervalued of stocks, a four year study by Ikenberry *et al.* (2000) found excess returns of 12.14% over the four year period for their entire sample of firms. This finding is therefore consistent with the possibility that firms that do share repurchases are undervalued at the time they announce a repurchase. The authors do state that undervaluation is not the only motive managers have for repurchasing stock. Other considerations may also be at work. However, they do conclude that

better long-run performance is expected from repurchases that are driven more by undervaluation than by other motives.

In an attempt to focus on mispricing, Ikenberry *et al.* (2000) also considered the book-to-market ratio of companies when they announced their repurchase programs. Companies with high book-to-market ratios are often viewed as "value" stocks and in such cases, perceieved undervaluation is likely to be the primary factor in the decision to repurchase shares. For stocks with low book-to-market ratios, which are knows as "growth" stocks, undervaluation seems less likely to be the dominant motivating factor.

While the above arguments and studies support findings of share repurchases conducted in developed markets such as the USA, Canada and Europe, an emerging market study relating to the preannouncement undervaluation of share repurchases in Taiwan, an economy which is characterised by low to middle per capita income, was conducted by Lo, Wang, and Yeh in 2008. The final sample consisted of 268 repurchase announcements and their empirical evidence indicates that share repurchase in this emerging market is also associated with factors such as undervaluation, growth opportunity, the ratio of stock held by insiders and the debt ratio.

Lin, Lin, and Liu's (2011) event study which was also conducted on Taiwan's firms from 2000 to 2008 consisted of a much bigger sample (413 firms), where the authors found firms that experienced a larger decline in share price prior to the repurchase announcement were more willing to buy back their shares. Share reprucase announcements caused a significantly poistive response from the market while the effects of repurchase announcement varied across the industires.

Isa *et al.* (2011) conducted an event study on the Malaysian Stock Exchange of 149 firms over the period 2001 to 2005 showed a positive market reaction to the

actual repurchase of shares. The authors found that the pre-event abnormal returns and the event days abnormal returns clearly suggest the existence of a signalling effect of the repurchase. They also found that the signalling effect is larger for small firms compared to larger ones.

Based on the review of the literature above, undervaluation can be viewed as a dominant motive to executing a share repurchase corporate action in any given market and not just in developed markets. However, when firms make repurchase announcements, the market expects that they will follow the repurchase program and experience a better stock performance following the announcement date Chang *et al.* (2010). In the next part of the literature review, we look at long-term performance of share repurchase programs.

2.3 Long-term Performance of Open-market Repurchase Programs

The value of the exchange option embedded in an open-market share repurchase program depends on the ability of managers [who execute share repurchase programs] to detect and take advantage of valuation errors, especially over a long-term horizon (Zhang, 2005). Accessing long-term abnormal price performance can be very sensitive to performance benchmarks. A common method among the literature suggests a simple buy-and-hold return (BHR) should be used to measure long-run abnormal stock returns. Buy-and-hold abnormal returns (BHARs) are calculated relative to matched control firms based on both firm size and book-to-market value (BTMV).

Lee *et al.* (2010) conducted an event study of 512 share repurchases from four countries – France, Germany, Italy and the United Kingdom for the period 1990 to 2005, found that German and Italian share repurchases experience positive and significant share price response. However, British repurchase

announcements exhibit small positive abnormal returns, and abnormal returns of French share repurchases are insignificantly different from zero.

Vermaelen's (1981) initial study of 243 open market announcements finds that firms have been experiencing negative abnormal stock price performance prior to the open market repurchase. In the three months preceeding the repurchase, their stock prices have underperformed the market by about 7%. The repurchase produces a gain of little more than 3%, but prices retreat about 1% during the following three months. The result is an apparent gain of 2%. Asquith and Mullins (1986) argues that open market repurchases are less powerful than tender offers. For Vermaelen's (1981) sample, which has been underperforming the market, these repurchases are successful in halting the slide and producing a small gain. However, his interpretation of the results is consistent with his views on tender offers. Both types of repurchases benefit the shareholders (Asquith and Mullins, 1986).

Chang *et al.* (2010) conducted a study on the prior record of actual share repurchases and post-announcement share performance found that experience of prior share repurchases plays an important role in the value assessment of subsequent repurchase annoucements. During the period 1986 to 2005, a sample of 5,717 open market share repurchase announcements were made by 1,741 firms. The authors concluded that upon the announcement of share repurchases , stock markets respond more positively to those made by firms that have made better record on actual repurchases following previous such announcements. Their evidence also suggest that firms that deliver better stock performance after prior repurchase announcements experience a stronger positive market reaction.

Ikenberry *et al.* (2000) reexamined long term market performed with the three factor model and a sample of 1,060 Canadian firms, which demonstrated abnormal performance over the three year period after the announcement and

found excess returns to be 0.587% per month, which is roughly around 7% per year. Their sample at the time was divided into two parts according to whether the book-to-market ratio at the time of announcement was above or below average for Canadian firms overall. For growth firms, they found excess retruns of about 3.3% per year over the three-year period following the announcement while value firms earned excess annual returns of 9.1%.

In another study by Chan, Ikenberry, and Lee (2004), the authors examined long-horizon returns of over 4,000 open market programs announced by US firms from 1980 to 1996. Similar to the above findings, Chan, *et al.* (2004), reported evidence of abnormal returns. The study also found some evidence of excess performance by growth stocks. The author's did however, find evidence of higher long-run abnormal returns when companies actually repurchase stock in the first year of the repurchase program, particularly for value stocks.

Bradford (2008) conducted a study that reexamined buy-and-hold abnormal returns (BHAR) of Ikenberry, *et al.* (2000) and found support for the existence of long-term abnormal returns of 22.66% and 13.98% for year 1 and 2, but the findings were not supported by the three factor model after adjustement for multicollinearity. Bradford (2008) points out two important limitations that BHAR and the three factor model methods have in common. Both methods focus on the announcement date and do not employ matching control firms.

Zhang's (2005) study of firms on the Hong Kong Stock Exchange provides evidence that suggest managers do not exhibit superior performance when they make open-market share repurchases. The author's study concludes that at least for high book-to-market value firms, for which undervaluation is more likely to occur, managers can detect and size some of those opportunities when their shares are relatively undervalued and make repurchases to benefit long-term shareholders.

A study of repurchase programs by firms that are listed on the NYSE, AMEX or the NAS-DAQ was conducted by Yook (2010) whose sample consisted of 9,551 repurchase programs that were announced between 1994 and 2007 by 5,014 firms. The author found strong evidence of significant abnormal long-term performance of infrequent repurchasers who actually repurchase shares during the first four quarters following their announcements versus frequent repurchasers. This study provides strong evidence that firms that announce repurchase programs infrequently and also actually repurchase shares experience significant long-term returns.

This therefore indicates that the market does not react to announcements of repurchase programs because the market does not necessarily view the announcement as a firm commitment to actually repurchase the shares. Yook (2010) concludes that the extent to which the market does not fully incorporate the effect of the repurchase announcement in a short period, the residual value of the announcement would be revealed over a longer time period.

An analysis by Bhana (2007) of long-term performance of South African companies involved in open market share repurchases has shown that despite managers' frequent claims of undervaluation when announcing share repurchases, the return in the immediate days following the announcement is relatively small. This suggests that either the managers are being overly optimistic relative to the market about the firms firm's value or alternatively the market is wrong in responding and is thus underreacting to the repurchase signal. The possibility also exists that the market is slow in responding to the undervaluation signal contained in the repurchase announcements.

The short study conducted by Bhana (2007) consisted of 117 share repurchase announcements of firms list on the JSE during the period October 2000 to March 2003. The author found that using the buy-and-hold strategy, three-year abnormal returns following the announcement is 14.35%. Companies with high

book-to-market ratios that announce repurchase programs provided a three-year abnormal return of 32.78%.

Share repurchases have only been allowed by the JSE after October 2000 and the sample identified by Bhana (2007) comprised of 117 companies over a 30 month period. This indicates that further research in this field is therefore required.

2.4 Timing Ability when Executing Share Repurchase Programs

Brockman and Chung's (2001) study of the bid-ask spread analysed more than 5,000 share repurchases in 181 different firms on the Hong Kong Stock Exchange between 1992 to 1999, concluded that managers acquire shares at lower cost than a naive accumulation strategy, but their findings are also consistent with either opportune timing based on insider information or price support. Their findings indicate that repurchasing firms have market timing ability. Furthermore, they identified the important determinants of this market timing ability to be short interest rate, the firm's cash flow and frequency of repurchases.

Isa *et al.* (2011) conducted an event study on the Malaysian Stock Exchange of 149 firms over the period 2001 to 2005 indicates that management deliberatly timed their repurchase after a period of declining prices. The authors therefore conclude that if used correctly, share repurchases may become an effective tool for price stabilisation.

Zhang (2005) conducted a study on repurchasing firms on the Hong Kong Stock Exchange from September 1993 to August 1997, analysing 135 firms and 800 repurchase events. The author indicates that firms display market timing ability by repurchasing shares after a 20-day period of negative share price performance, that the short-term market response to actual share repurchases is significantly positive, and that subsequent 20-day period share price performance

is positive but only weakly significant. Zhang (2005) concludes that the performance of insider managers varies across firm size and book-to-market value ratios, and shows a clear and consistent pattern which indicates that the market reacts more favourably to small and value firms when they make actual share repurchases.

Actual share repurchases for 352 firms in France from 2000 to 2002 were examined by Ginglinger and Hamon (2007). These authors found that repurchasing firms have market timing ability; meaning that on average, these firms repurchased shares at a price lower than that paid by other investors since shares are repurchased after an observable decline in share price, even though they have no private information about future price developments. Their evidence suggest that firms act against market trends, executing their repurchases to take advantage of falling prices. This result is consistent with a price stabilisation motive for repurchases. This findings reaffirm the importance of timing skills as the repurchase would be expected to occur on trading days when prices are falling and/or immediately after a fall in the price. Managers who exercise timing skills, would expect to observe price trends in the trading days after the announcement day.

To examine how firms actually excute their share repurchases and to identify evidence of market timing ability, De Ridder (2009) conducted a study on repurchase activities of firms listed on the Stockholm Stock Exchange between 2000 to 2004, representing 174 share repurchase programs in 71 firms. Overall, there is strong empirical evidence of managerial timing capabilities for repurchasing firms in Sweden indicating that firms repurchased shares at a price lower than that paid by other investors. Furthermore, the author's analysis of repurchase patterns shows no particular pattern during the weekdays, but higher repurchase activity is recorded in February, March and August, which are months when most Swedish firms present their interim reports.

In summary, the evidence presented above suggests that firms not only time their repurchase program announcements but also actual share repurchases to buy back their shares at advantageous prices.

2.5 Conclusion on literature review

The literature review presented above has indicated three key themes that will be examined further. These are:

- The market reaction surrounding the announcement of share repurchases will be examined to establish whether there is an “announcement effect”.
- The short-term returns surrounding the share repurchase announcement will examined to determine whether there is a “price effect”
- Timing ability of managers will be examined to determine whether treasury managers have the ability to determine whether their company’s share is undervalued and are good investments.

In the next chapter, the research questions will be formulated to conduct the study.

CHAPTER THREE: RESEARCH QUESTIONS

3.1 Introduction

In line with the above literature review, this study aims to examine the market reaction surrounding the announcement of share repurchases made by listed companies on the JSE. By examining the market reaction we will be able to establish whether there is an "announcement effect". This question will be answered by examining the Average Abnormal Return (AAR) and the Cumulative Average Abnormal Return (CAAR) when a share repurchase announcement is made. The CAAR is defined by Miller and Ward (2011) as:

CAAR = Cumulative Average Gross Share Return – Cumulative Benchmark Gross Return

The following research questions have been proposed:

3.2 Research Question 1: What type of abnormal returns is associated with share repurchase announcements on the JSE?

The AAR will be examined along with the daily changes in the share price to determine the CAAR. A benchmark parameter will be set to measure the CAAR after a share repurchase announcement is made. The CAAR could be one of three types:

1) Positive return – where there is a return higher than the benchmark;
2) Negative return – where there is a return less than the benchmark; or
3) Neutral return – where the return is the same as the benchmark.

3.3 Research Question 2: Is there a significant price effect in the pre-announcement period?

The quantitative attributes of the share price change will be analysed to determine if repurchasing firms experience a relatively large price decline in the pre-announcement period. In the interest of gaining further insight to the share price behaviour, the AAR is examined. In order to answer this question, the following hypothesis is stated:

$$H_0 = AAR_{Post\text{-}announcement} - AAR_{Pre\text{-}announcement} = 0$$
$$H_1 = AAR_{Post\text{-}announcement} - AAR_{Pre\text{-}announcement} > 0$$

H_0: There is no significant difference between the means of the AAR in the post-announcement period and pre-announcement period.

H_1: There is a significant difference between the means of the AAR in the post-announcement period and pre-announcement period.

3.4 Research Question 3: What evidence exists of firms displaying market timing ability when repurchasing their shares?

The quantitative attributes of the share price change will be analysed per calendar year to determine if evidence exist of firms displaying market timing ability when making a share repurchase announcement. The AAR is examined through sub-windows which are defined as:

- Sub-window1: The number of days before the event.
- Sub-window2: The event day and the number of days after the event.

The following hypothesis is stated:

$$H_0 = AAR_{sub\text{-}window1} - AAR_{sub\text{-}window2} = 0$$
$$H_1 = AAR_{sub\text{-}window\ 1} - AAR_{sub\text{-}window2} > 0$$

H_0: There is no significant difference in timing share repurchase announcements.

H_1: There is a significant difference in timing a share repurchase announcement.

3.5 Conclusion

The research questions stated above are unpinned by the literature presented in chapter two and are formulated to meet the aims of this study. Question one will examine the CAAR and AAR to determine if an "announcement effect" exists and the type of returns (positive, negative or neutral) that are obtained. Question two will test the statistical significance of the share price in the pre-announcement period to determine if there has been a large decline in the share price before a share repurchase announcement is made. Question three will be tested to determine if evidence exist of firms displaying market timing ability when making a share repurchase announcement. The next chapter will present the research methodology that has been adopted to achieve the aims of the research questions stated above.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

In the previous chapter we presented the research questions. In this chapter we present the research approach. The unit of analysis and the population are described. This is followed by a discussion on the data collection process and data analysis methods. The chapter concludes with an indication of the limitations of this study.

The research method for this study was based on the event study methodology used by Zhang (2005), Chang *et al.* (2010), Lin *et al.* (2011) and Isa *et al.* (2011) in their research on the market reactions and open-market share repurchase announcements. Konchitchki and O'Leary (2011) describe an event study methodology as a theoretical framework based on the efficient markets theory (EMT) which states that the price of a share includes all relevant information that is available to the market. As a result, when share repurchase announcements are made by companies they provide the market with information that has already been factored into the share price.

Secondary data was sourced from existing financial databases and analysed. As a result, this study was quantitative in nature and time series based which covered nine years and eight months time period, from 2003 up to and including August 2012.

4.2 Unit of Analysis

The unit of analysis was the share price of JSE listed companies that made a share repurchase announcement within the test period.

4.3 Population of Relevance

As explained in chapter one, the JSE amended its listing requirements and allowed share repurchases from October 2000. The population of relevance therefore consisted of all listed companies on the JSE between 2003 and 2012. This period was chosen for three reasons namely:

1) This covers a period when firms were allowed to repurchase their shares. Blouin, Raedy, and Shackelford (2007) noted that firms needed time to adjust their payout policies of dividends to share repurchases following adjustments to tax reforms. Thus this study chose 2003 as the start to the test period to allow for adjustments in payout policies.
2) The period of the study starts from where Bhana's (2007) study ends hence the use of a recent data set and a longer period as indicated in chapter one.
3) This period was chosen for convenience as the data for companies in the sample that performed a share repurchase was readily available from 2003 onwards.

Companies which were initially listed, but later de-listed for whatever reason during this time period were exlcuded. This study therefore lends itself to survivorship bias (Ramloutan, 2008). The focus was on the main board of the JSE and excluded companies listed on the Alternative Exchange (ALTX). This exclusion may not have a significant impact on the findings since the combined market capitalisation of these companies is smaller relative to the rest of the sample (Lemmon and Zender, 2008). This study included the repurchase of a companies ordinary shares, preference shares or debentures. Firms with missing data were also excluded.

4.4 Sampling Method and Size

A non-probability sampling method was used since only companies on the JSE were investigated. Data for the test period 2003 to 2012 was readily available. This ensured that there were adequate data points so that the results from statistical analysis were reliable. This approach eliminated any random sampling errors (Ramloutan, 2008). The sample is free from selection biases associated with survey methods because it contains all open-market share repurchases in the sample period (Zhang, 2005).

4.5 Data Collection

Companies listed on the JSE are required to make announcements to their shareholders of any material issues that may have an impact on the company's share price. These announcements are made through the Stock Exchange News Service (SENS). SENS is an electronic notice board and information system designed to ensure that price-sensitive announcements can be received timeously by investors and analysts (Ward and Muller, 2010). Therefore as one of the mandatory requirements of the JSE, the information on corporate actions was available in the public domain.

All historical data on corporate actions was obtained from the McGregor BFA database. McGregor BFA is a provider of financial data and analysis tools in South Africa. Prior studies in the area of finance by Bhana (2007), Ramloutan (2008) and Halfar and Ward (2011) have used the database to obtain data extracts for their research. The daily closing share prices for each of the companies in the sample was downloaded from the McGregor BFA database for the period January 2003 up to and including 31 August 2012.

4.6 Data Analysis Approach

A content search was conducted for all corporate actions relating to share repurchases. Over the period 1 January 2003 and 31 August 2012, a total of 264 announcements were made by 99 listed companies on the JSE relating to share repurchases. There are two types of share repurchase announcements that are tracked on the McGregor BFA database. The first is "specific" share purchase and the second is "general" share repurchase.

4.6.1 Specific Share Repurchase

In a "specific" share repurchase, the company repurchases its shares from specific or defined shareholders. The JSE internal policy defines that this form of corporate action may be carried out either on a pro-rata basis, an election or it may be obligatory for all shareholders.

4.6.2 General Share Repurchase

In a "general" share repurchase, the company repurchases its shares from the general market where the number of listed shares are then withdrawn. The JSE internal policy defines this form of share repurchase which is commonly referred to as an "open-market" share repurchase, whereby no additional premium is paid to the current share price.

The data was analysed using hypothesis testing suggested by Zhang (2005), Isa (2011) and Lin (2011).

4.7 Data Preparation

This study only focused on open-market share repurchases, therefore each announcement in this test period was selected and reviewed for relevance. Each

announcement was examined for potentially unrelated events which can occur during the event window such as trading results or other corporate actions, and such announcements were omitted. Instances were observed where a company made a share repurchase announcement more than once within the event window. This was seen as a confounding event. However, in the interest of procuring a larger sample size for this study, this selection requirement was relaxed in order to include the recurring share repurchase announcements. Instances where there was insufficient data, those observations were removed.

The analysis considered companies that have been suspended during the test period. A suspension usually occurs when a company has failed to comply with a JSE listing requirement or when a significant event is about to occur which may have an adverse impact on the company's share price. Until this information is made public, the company's shares are suspended to prevent insiders from illegally buying or selling the shares. Such companies where either included or excluded from the sample depending on the time of their suspension in relation to the announcement of a share repurchase. This selection requirement is described by (Albright, Winston, and Zappe, 2009) as being judgemental where companies are chosen according to the researcher's judgement. Companies that have voluntarily been winded-up during the period have been excluded from the analysis. A reduced sample of 167 share repurchase announcements made by 62 companies, free from unrelated events, was used in the final analysis.

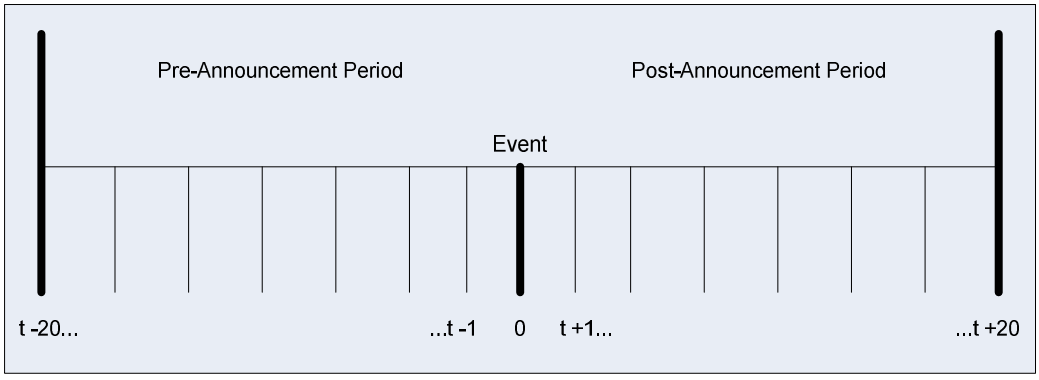
4.8 Event Window

The "event window" indicates the number of days before and after the announcement date over which the abnormal returns are accumulated (Konchitchki and O'Leary, 2011). To determine an appropriate event window for this study, the different models used in an event study was referenced to determine the most appropriate event window. Zhang (2005) used the market model and an event window of 41 trading days from 20 days before to 20 days

after with day 0 being the event day. The market model to obtain abnormal returns that has been used by Isa *et al.* (2011) uses an event window that starts from 20 days before the announcement and 20 days after the announcement (-20, +20) for 41 days. Examining the share price behaviour around share repurchase announcements, Lin *et al.* (2011) also used the market model to conduct an event study using the same event period (41 days) as mentoioned above.

The difference in the event windows will have an impact on the study as Lin *et al.* (2011) stated that an event window that is too short may undermine the predictive power of the forecasting model while an event window that is too long may produce an unstable model due to structural variations occurring within the period. In their methodology, Lin *et al.* (2011) stated that there were no objective criteria for the length of the window. The event window in this study starts from 20 days before the announcement to 20 days after the announcement (-20, +20). The repurchase announcement day was designated as “day 0” therefore the event period is for 41 days. The length of the event window is shown in Figure 1 below which has been adapted from Lin *et al.* (2011) and modified to show the post-announcment period.

Figure 1: Length of event window



4.9 Calculating the Abnormal Return

Although the literature review covered in chapter two above suggests that there is a positive impact of share repurchase announcements on market prices, it may not necessarily be obvious when applied to the South African context. The theory also argues that firms will buy back their shares when they feel that it is undervalued by the market. Event studies conducted by Zhang (2005), Chang *et al.* (2010), Isa *et al.* (2011) and Lin *et al.* (2011) have used the standard market model to calculate abnormal returns. The standard market model has been criticised by Petajisto (2011) stating that when there are changes to a share index it induces a selection bias to the alpha estimates of the market model. Therefore to calculate the abnormal return using the event study methodology, the Capital Asset Pricing Model (CAPM) is used. This model calculates the expected share price return by adjusting the market index by the company's beta value. Since the standard definition of beta as explained by Miller and Ward (2011) measures a company's systematic risk, the JSE All Share Index (ALSI) was used to calculate the market returns.

The daily return per share is calculated using the following equations listed below which has been adapted from Miller and Ward (2011):

$$R_{it} = \frac{(P_{it} - P_{it-1})}{P_{it-1}}$$

Equation 1

Where:

R_{it} = daily return of the share *i* on trading day *t*

P_{it} = closing price of the share *i* on trading day *t*

P_{it-1} = closing price of the share *i* on trading day *t -1*

The model's parameters such as beta (β) are estimated using the 60 monthly data returns against the ALSI, prior to the event day. The daily AR for each share on each event day is calculated as follows:

$$AR_{it} = R_{it} - \beta_i R_{mt}$$

Equation 2

Where:

AR_{it} = abnormal return of the share *i* on trading day *t*

R_{it} = return on the share on trading day *t*

$\beta_i R_{mt}$ = beta * the return on the market on trading day *t*

The abnormal returns are then averaged to obtain the daily AAR as follows:

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

Equation 3

Where *n* = number of firms on trading day *t*

While the announcement of a share repurchase is meant to be confidential until the announcement day, there are possibilities that such information may become public knowledge prior to the announcement day. Therefore to estimate the CAAR surrounding the event day, a benchmark of 100% was set for the day before the announcement (t -1). The CAAR was calculated using a multiplicative model which combines the effect of two factors and calculates the product of the isolated effects of each factor. The calculation is as follows:

$$CAAR_{t+1} = (1 + CAAR_{t0}) * (1 + AAR_{t1}) - 1$$

Equation 4

4.10 Assessing the Price Effect in the Pre-Announcement Period

To determine the statistical significance of the price effect in the pre-announcement period, t-statistics are used to examine the AAR. To test the

hypothesis, the means from each population were compared and tested for statistical significance. A paired sample t-test was used to compare the means of the AAR. The t-statistic for the AAR before the event (t -20) up to the day before the event (t -1) is calculated. The results were compared to the t-statistic for the AAR after the event (t +1) up to the end of the event window (t +20) to determine if there is a significant difference. Albright *et al.* (2009) state that this comparison is one of the most important problems analysed using statistical methods. Saunders and Lewis (2012) state that by using this method an assumption is made that both variables should be normally distributed. Albright *et al.* (2009) points out that the key to the analysis is the sampling distribution of the sample mean. Saunders and Lewis (2012) define a normal distribution as the sysmmetrical distribution of data values around the mean for a quantitative variable forming a bell-shaped curve. In a normal distribution, Saunders and Lewis (2012) state that the values of the mean, median and mode are the same.

A 95% confidence interval was used. Albright *et al.* (2009) defines the confidence interval as an interval around a point estimate, calculated from the sample data where the researcher strong believes the true value of the population parameter lies. The t-test was performed using the SPSS statistical package.

4.11 Assessing Market Timing Ability

The quantitative attributes of the share price changes have been analysed per year to determine if evidence exists of firms displaying market timing ability when making a share repurchase announcement. The distribution of share repurchase announcements during the test period is analysed to determine the frequency of announcements per calendar year.

As mentioned in section 4.8 above, the event window for the study is 41 trading days. The pre-announcement period occurs from 20 days before the event to 20

days after the event. The event day is set as day 0. This event window period was used to measure the short-term price performance. Zhang (2005) and Isa *et al.* (2011) used the same event period in their methodologies. Zhang (2005) points out that this period is approximately equivalent to one calendar month before to one calander month after the event day. As part of conducting an event study, the length of the estimation period must be specified (Konchitchki and O'Leary, 2011). The estimation period in this study was split into sub-windows which were defined to examine the AAR. Researchers using event studies in share repurchases have used a range for the sub-windows. Table 1 below shows related studies on share repurchases and some characteristics.

Table 1: Share repurchase related studies and some characteristics

Author	Topic	Number of firms	Sample period	Number of sub-windows	List of sub-windows
Zhang, (2005)	Share price performance following actual share repurchases	135	1993 – 1997	3	(-20,-1) (0,2) (0,20)
Chang *et al.* (2010)	Does prior record matter in the wealth effect of open-market share repurchase announcements?	1,741	1986 - 2005	4	(0,1) (0,3) (-1,2) (-2,2)
Lee *et al.* (2010)	An empirical analysis of European stock repurchases	512	1990 - 2005	3	(-1,0) (0,0) (-1,+1)
Isa *et al.* (2011)	Market reaction to actual share repurchases in Malaysia	149	2001 – 2005	4	(-20,-1) (0,2) (3,20) (-20,20)
Lin *et al.* (2011)	Stock repurchase announcements and stock prices evidence from Taiwan	413	2000 – 2008	1	(100,300)

The table above shows that different researchers used different sub-windows in their analysis although there are some similarities and overlaps noted. In cases where loadings (i.e. betas) are used to predict normal (i.e. expected) returns, the

estimation period required for predicting the normal returns needs to be established relative to the event window (Konchitchki and O'Leary, 2011). The beta coefficient in the CAPM model explained in section 4.9 above is estimated by using 60 monthly data returns prior to the event day. This study therefore used the following three sub-windows:

- (t -20, t -1) – 20 days before the event to 1 day before the event;
- (t 0, t +2) – The event day plus 2 days after the event; and
- (t 0, t +20) – The event day plus 20 days after the event.

A one-sample t-test was used to compare the mean of the AAR in each sub-window to the known value which was the population mean. This test was chosen as it allows for the use of the sample data to calculate a t-statistic that has a known sampling distribution. Albright *et al.* (2009) state that the result can then be used to calculate a corresponding *p*-value which is used to measure support for the alternative hypothesis. A 95% confidence level as explained in section 4.10 above was used in the calculation for the final sample and in the per calendar year analysis.

4.12 Research Limitations

The research focused only on companies listed on the main board of the JSE. The main board of the JSE is composed by the majority of companies with the highest market capitalisation and includes the JSE's Top 40 shares. The JSE is the only stock exchange in South Arica and is therefore the only stock exchange used in this study. The findings may only apply to these companies listed on the main board of the JSE to the exclusion of private companies.

Only the time period from 2003 to 2012 was included in this research. The initial years when share repurchases were allowed on the JSE have been excluded. Therefore the results of this study are representative of historical periods. The

test period of this research only provided limited data points for inclusion in the statistical analysis.

Due to availability of the data, the research focused on companies that were listed and remained listed by the end of the test period of 31 August 2012. Companies that have been delisted over the test period for whatever reason were excluded. This exposes the study to survivorship bias (Ramloutan, 2008). A disadvantage of studying companies that survived the test period is that there is a reduction of the sample size.

The effect of the number of shares repurchased in relation to the announcement effect has not been tested. This study will only focus on the "announcement effect".

4.13 Conclusion

An event study methodology has been adopted to test the AAR and CAAR for share repurchase announcements. The unit of analysis for this study is the share price of the JSE listed companies. The population for this study was JSE listed companies that made a share repurchase announcement from 01 January 2003 to 31 August 2012. The sampling method chosen is a non-probability sample. The data for this study has been sourced from the McGregor BFA database. The data has been analysed per research question stated in chapter three. Some limitations exist and have been listed in section 4.12 above. Chapter five presents the results of the research questions using the event study methodology stated above.

CHAPTER FIVE: RESEARCH RESULTS

5.1 Introduction

In the previous chapter we presented the research methodology. Chapter five of the study presents the findings of the research as outlined in chapter four. The first part of this chapter (section 5.2), describes the initial sample to gain an understanding of the two different types of share repurchase announcements (specific and general). The second part (section 5.3) provides some descriptive statistics of the final sample. The results presented in sections 5.4, 5.5 and 5.6 are structured around the three research questions listed in chapter three with limited commentary. Where applicable, inferences from the data have been drawn in relation to the three research questions. Section 5.7 provides a summary of the key findings and section 5.8 concludes this chapter.

5.2 Population Description

As discussed in section 4.5, the data for the study was obtained from the McGregor BFA database. The data obtained consisted of companies that made a specific or general share repurchase announcement. Each announcement contained the following description:

- JSE identification code which is a unique identifier assigned to the share;
- Date stamp which represents the date of the announcement;
- Share name;
- JSE board that the share is listed on such as the Main Board, ALTX, Venture Capital Board (VCM) or Development Capital Board (DCM);
- Event type such as “share repurchase – ordinary” or “share repurchase – specific”;
- Share type such as ordinary share, preference share or debenture;
- Industry sector and sub sector of the share; and

- Instrument added/withdrawn which represents the number of shares repurchased.

The raw sample consisted of 264 share repurchase announcements made by 99 companies during the test period 01 January 2003 to 31 August 2012. Table 2 below shows the proportion of announcements per sector per calendar year. The size of the repurchase is split between specific and general share repurchase.

Table 2: Total share repurchase announcements per sector per calendar year for the population

Sector	Year	Number of announcements	General	Specific
Chemicals	2003	1	2,269,984	0
Construction & Materials	2003	1	9,751,254	0
Financial Services	2003	3	3,957,525	4,036,431
Industrial Goods & Services	2003	13	8,708,092	12,818,331
Investment Instruments	2003	5	0	346,995,327
Media	2003	2	2,870,008	0
Real Estate	2003	1	271,450	0
Retail	2003	1	19,337	0
Technology	2003	5	5,807,049	7,599,638
Travel & Leisure	2003	2	11,670	0
Construction & Materials	2004	1	10,219,548	0
Debt	2004	1	2,500	0
Financial Services	2004	6	31,893,704	0
Industrial Goods & Services	2004	5	35,245,554	8,958,956
Insurance	2004	3	7,446,627	35,376,184
Personal & Household Goods	2004	1	0	9,374,251
Real Estate	2004	1	95,000	0
Banks	2005	4	10,164,515	0
Basic Resources	2005	2	1,850,000	0
Chemicals	2005	1	174	0
Financial Services	2005	3	5,123,166	0
Industrial Goods & Services	2005	7	42,753,897	12,564,726
Insurance	2005	8	422,077,803	0
Investment Instruments	2005	1	4,512,667	0

Sector	Year	Number of announcements	General	Specific
Media	2005	1	7,119,825	0
Personal & Household Goods	2005	7	3,626,973	10,066,376
Retail	2005	2	91,388,559	0
Telecommunications	2005	2	12,086,920	0
Banks	2006	1	1,305,000	0
Basic Resources	2006	4	33,487,214	38,331,012
Financial Services	2006	5	37,628,271	21,540,000
Food & Beverage	2006	3	1,971,298	0
Healthcare	2006	3	130,312,734	0
Industrial Goods & Services	2006	5	37,385,407	37,691,443
Insurance	2006	3	85,884,600	0
Investment Instruments	2006	3	8,064,000	300,000
Oil & Gas	2006	1	0	60,111,477
Personal & Household Goods	2006	9	46,956,394	0
Retail	2006	3	38,654,400	0
Telecommunications	2006	1	3,506,619	0
Travel & Leisure	2006	1	427,855	0
Banks	2007	1	6,370,888	0
Basic Resources	2007	3	72,870,529	0
Financial Services	2007	1	13,876,793	0
Food & Beverage	2007	2	5,575,513	0
Industrial Goods & Services	2007	4	7,195,974	68,771
Insurance	2007	1	44,023,149	0
Retail	2007	3	21,630,199	0
Telecommunications	2007	2	83,128	0
Travel & Leisure	2007	1	8,994	0
Banks	2008	4	1,258,735	0
Basic Resources	2008	3	237,025,800	428,347
Chemicals	2008	1	1,895,592	0
Construction & Materials	2008	4	55,360,362	3,769,252
Financial Services	2008	1	8,211,988	0
Industrial Goods & Services	2008	1	0	6,922,314
Insurance	2008	1	26,362,870	0
Oil & Gas	2008	1	0	31,500,000
Real Estate	2008	1	1,740,178	0
Retail	2008	2	15,020,000	0

Sector	Year	Number of announcements	General	Specific
Technology	2008	3	876,670	0
Telecommunications	2008	1	7,627,206	0
Travel & Leisure	2008	1	0	1
Basic Resources	2009	2	0	70,519,719
Construction & Materials	2009	1	14,046,443	0
Consumer Services	2009	1	1,826,705	0
Debt	2009	1	100,000	0
Financial Services	2009	1	1,343,305	0
Healthcare	2009	3	0	475,265,611
Industrial Goods & Services	2009	3	30,215,750	45,607,175
Insurance	2009	2	45,734,584	0
Real Estate	2009	1	4,991,335	0
Retail	2009	2	21,500,000	5,674
Telecommunications	2009	1	0	243,500,011
Basic Resources	2010	2	2,049,573	0
Construction & Materials	2010	5	1,740,018	51,600,000
Financial Services	2010	2	3,287,171	0
Food & Beverage	2010	1	0	968,105
Healthcare	2010	2	0	34,681,301
Industrial Goods & Services	2010	3	2,123,775	33,967,693
Retail	2010	2	46,079,832	0
Technology	2010	2	14,004,426	0
Banks	2011	1	0	9,949,367
Basic Resources	2011	5	4,393,864	5,458,930
Construction & Materials	2011	2	550,000	948,900
Food & Beverage	2011	1	8,984,469	0
Industrial Goods & Services	2011	9	6,195,218	99,036,210
Media	2011	1	4,991,374	0
Retail	2011	5	16,354,311	843
Technology	2011	2	682,000	5,815,363
Telecommunications	2011	2	0	91,871,052
Construction & Materials	2012	2	22,085,788	0
Consumer Services	2012	1	340,000	0
Financial Services	2012	3	7,705,774	169,287
Industrial Goods & Services	2012	12	14,324,984	1,424,780
Investment Instruments	2012	2	9,000,000	35,765,285

Sector	Year	Number of announcements	General	Specific
Real Estate	2012	3	32,623,899	0
Technology	2012	2	188,000	11,482,801
Total		**264**	**1,989,334,759**	**1,866,490,944**

To compare the difference in the total number of shares repurchased during the test period between a general and specific repurchase, we note that the difference amounts to 122,843,815 shares. Table 3 below shows the JSE sectors that have been the most active in repurchasing their shares during the test period based on the number of announcements. This table is shown to provide context in relation to the sector and total number of shares repurchased over the test period.

Table 3: Distribution of JSE sectors that repurchased shares

Sector	Total number of shares repurchased	Number of announcements
Industrial Goods & Services	443,209,049	62
Financial Services	138,773,415	25
Basic Resources	466,414,988	21
Retail	250,653,155	20
Insurance	666,905,817	18
Personal & Household Goods	70,023,994	17
Construction & Materials	170,071,565	16
Technology	46,455,947	14
Investment Instruments	404,637,279	11
Banks	29,048,505	11
Telecommunications	358,674,936	9
Healthcare	640,259,646	8
Real Estate	39,721,862	7
Food & Beverage	17,499,385	7
Travel & Leisure	448,520	5
Media	14,981,207	4
Chemicals	4,165,750	3
Oil & Gas	91,611,477	2
Consumer Services	2,166,705	2
Debt	102,500	2
Total	**3,855,825,702**	**264**

Further examination of the data was conducted on the top three JSE sectors and their respective sub-sectors of the above table. We noted that the industrial goods & services sector ranks highest with the most number of announcements. This sector is made up of a range of companies operating in the industries such as marine transport, transportation services, diversified industrials, containers and packaging, industrial machinery, electronic equipment, business support services, employment agencies and electrical components. The financial services sector made the second highest number of share repurchase announcements and consisted of asset managers, investment services firms, speciality finance and consumer finance firms. The basic resources sector made the third highest number of share repurchase announcements and consisted of general mining, gold mining, coal, iron & steel, forestry and nonferrous metals companies. Table 3 also shows the size of the shares repurchased in that sector. The industrial goods & services sector has made the highest number of share repurchase announcements but the insurance sector repurchased the largest number of shares in the test period followed by healthcare and basic resources sectors.

5.3 Descriptive Statistics of the Final Sample

As discussed in section 4.7, the study only focused on general share repurchase announcements, therefore each announcement in the test period was selected and reviewed for relevance. Share repurchase announcements relating to specific repurchases have been excluded. As a result, the initial sample of 264 share repurchase announcements has been reduced to 195 share repurchase announcements. The analysis included companies that have been suspended during the test period or have been voluntarily winded-up. Selected instances were noted where there was insufficient data, those observations were removed. A final sample of 167 share repurchase announcements made by 62 companies, free from unrelated events, was used in the final analysis. Appendix A shows the

proportion of announcements per sector per year in the final sample and includes the number of shares repurchased. A summarised version is shown in Table 4 below.

Table 4: Distribution of share repurchase announcements and number of shares repurchased in the final sample per calendar year

Year	Number of announcements	%	Number of shares repurchased	%
2003	18	10.78	28,119,309	1.74
2004	11	6.59	76,080,806	4.70
2005	25	14.97	537,033,650	33.17
2006	33	19.76	351,844,410	21.73
2007	13	7.78	40,441,680	2.50
2008	16	9.58	319,016,531	19.71
2009	7	4.19	71,460,322	4.41
2010	13	7.78	69,284,795	4.28
2011	13	7.78	39,345,515	2.43
2012	18	10.78	86,268,445	5.33
Total	**167**	**100%**	**1,618,895,463**	**100%**
Average	**17**		**161,889,546**	

It is observed that in 2006 the highest number of share repurchase announcements (33) was made which represents about 20% of the entire final sample. At the same time we note that in 2006, the second highest number of shares repurchased (351 million) was recorded. 2005 represents the year in which the second highest number of share repurchase announcements was made (15%) but is also the year with the highest number of shares repurchased (537 million).

In comparison to Table 3 above, the JSE sectors in the final sample that have been the most active in repurchasing their shares during the test period based on the number of announcements is the shown in Table 5 below. The table is ranked based on the number of repurchase announcements in the final sample. The difference in the type of announcements is indicated to show which sectors

perform more general share repurchases than a specific share repurchases. This table is shown to provide context in relation to the sector and total number of shares repurchased during the test period for the final sample.

Table 5: Number of repurchase announcements in final sample per sector

Sector	Number of shares repurchased	Number of general announcements	Difference in type of announcements to Table 5-2
Industrial Goods & Services	163,001,072	37	25
Financial Services	108,753,241	20	5
Retail	172,214,871	13	7
Construction & Materials	113,753,413	12	4
Personal & Household Goods	50,583,367	12	5
Basic Resources	259,553,965	11	10
Technology	21,558,145	10	4
Banks	19,099,138	10	1
Insurance	459,715,432	7	11
Telecommunications	23,303,873	6	3
Food & Beverage	16,531,280	6	1
Real Estate	39,355,412	5	2
Investment Instruments	21,576,667	4	7
Media	14,981,207	4	0
Healthcare	130,312,734	3	5
Consumer Services	2,166,705	2	0
Travel & Leisure	436,849	2	3
Debt	102,500	2	0
Chemicals	1,895,592	1	2
Oil & Gas	0	0	2
Totals	**1,618,895,463**	**167**	**97**

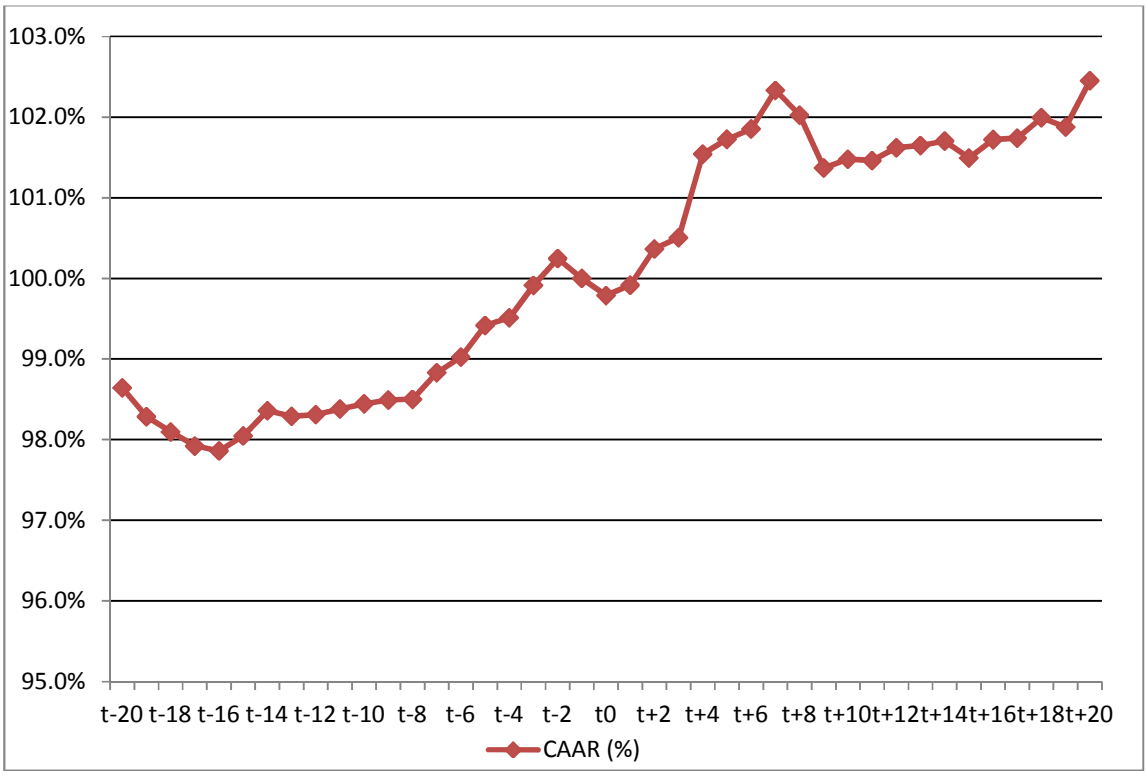
Examining the sectors and repurchase announcements in the table above, it can be noted that industrial goods & services and financial services sectors are ranked with the highest and second highest number of repurchase announcements respectively. In addition, the retail sector is shown with third highest number of announcements. At the same time we also note that industrial goods & services, insurance and basic resources sectors have the highest number of differences in announcements respectively. Further analysis of the

data indicates that insurance, basic resources and the retail sectors repurchased the highest number of shares.

5.4 Research Question 1: What type of abnormal returns is associated with share repurchase announcements on the JSE?

Figure 2 below shows the graph of the daily CAAR for the final sample. The graph indicates that from days before the repurchase announcement (t -20) to (t -16), the share prices where trending downwards with a slight recovery on day (t -15). Share prices stabilised for a few days further until day (t -7) after which the share prices trend upwards until day (t -3). The graph shows a second decline from days (t -3) to the event day (t 0) after which there is a steep increase in the share price until day (t +7). Another decline is observed until day (t -9) after which there is a gradual upward trend of the share price until the end of the event window (t +20).

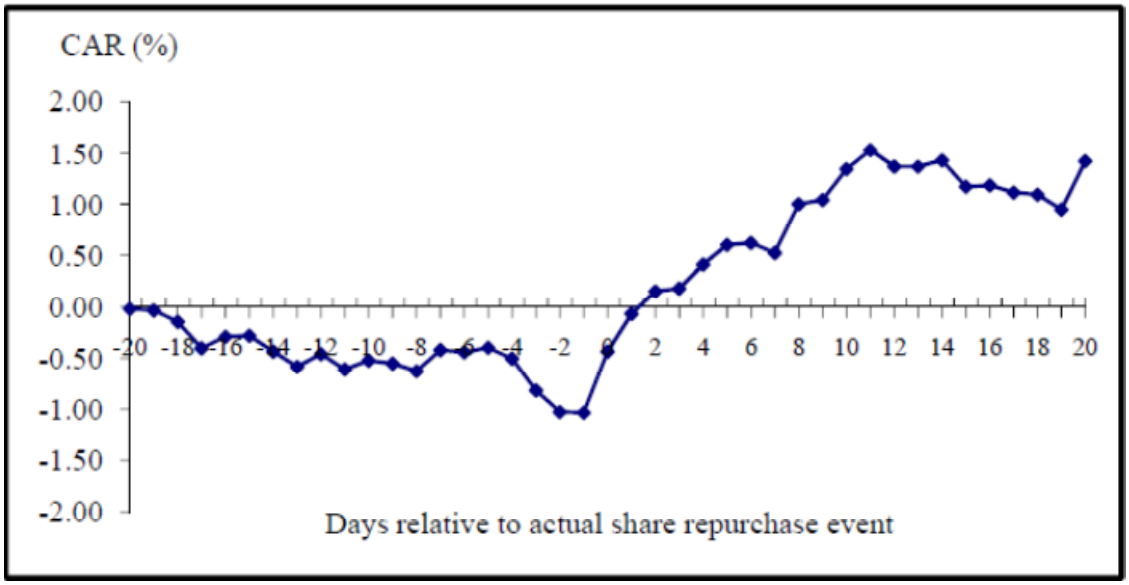
Figure 2: Daily CAAR for the final sample



The results from the graph indicate an observable trend of price increase from the announcement day (t 0). The result is therefore consistent with the signalling theory and "announcement effect" that share repurchase announcements are associated with positive returns.

Figure 3 below shows the results obtained of the event study by Isa *et al.* (2011) who examined the share price reaction surrounding actual share repurchases made by Malaysian listed companies between 2001 and 2005. Isa *et al.* (2011) noted that about one month before the initial repurchase, prices tend to be trending downwards and just a few days before the event day, the prices show a steep decline. It can be observed that from the event day, there is an upward trend in the cumulative abnormal retrun (CAR) until day (t +10) after which the price stablises toward the end of the event window.

Figure 3: Daily CAR of Malaysian firms



Isa *et al.* (2011) also concluded that their results are consistent with the signalling theory and "announcement effect" that share repurchases are associated with positive returns.

Panel A in Table 6 below shows a parallel comparison of the daily AAR and CAAR analysis throughout the event window, with day 0 as the event day, defined as the day a share repurchase announcement was made. A 100% benchmark parameter is set on day (t -1) which was used to measure the CAAR from the announcement day (t 0) to the end of the event window (t +20).

Table 6: Daily AAR and CAAR for the final sample

Panel A: Average abnormal returns and cumulative average abnormal returns around the share repurchase announcement for the final sample (01/01/2003 – 31/08/2012) (N = 167 share repurchase announcements)					
Pre-announcement Period			**Post-announcement Period**		
Day	**AAR**	**CAAR**	**Day**	**AAR**	**CAAR**
t-20	0.11%	98.82%	t+1	0.13%	99.97%
t-19	-0.36%	98.46%	t+2	0.45%	100.43%
t-18	-0.19%	98.36%	t+3	0.14%	100.64%
t-17	-0.18%	98.10%	t+4	1.03%	101.49%
t-16	-0.06%	98.04%	t+5	0.18%	101.68%
t-15	0.19%	98.22%	t+6	0.13%	101.81%
t-14	0.32%	98.54%	t+7	0.47%	102.23%
t-13	-0.07%	98.73%	t+8	-0.30%	102.07%
t-12	0.02%	98.75%	t+9	-0.64%	101.40%
t-11	0.07%	98.81%	t+10	0.11%	101.50%
t-10	0.07%	98.87%	t+11	-0.02%	101.55%
t-9	0.05%	98.84%	t+12	0.16%	101.71%
t-8	0.01%	98.85%	t+13	0.03%	101.74%
t-7	0.34%	99.19%	t+14	0.05%	101.86%
t-6	0.20%	99.40%	t+15	-0.21%	101.65%
t-5	0.40%	99.50%	t+16	0.22%	101.88%
t-4	0.10%	99.52%	t+17	0.02%	101.90%
t-3	0.40%	99.92%	t+18	0.25%	102.08%
t-2	0.33%	100.25%	t+19	-0.11%	102.04%
t-1	-0.25%	**100.00%***	t+20	0.56%	102.62%
t0	-0.21%	99.92%	**Event Day**		

Panel B: AAR and CAAR over different intervals		
Event Period	**AAR**	**CAAR**
(t 0, t +2)	0.66%	0.51%
(t -20, t +20)	0.46%	3.81%

*denotes the 100% benchmark parameter used to measure the announcement effect from t0

Further analysis of the results which are presented in Panel B in the table above indicates that the difference in the CAAR for the event period (t -20, t +20) is 3.81% and the difference in the AAR for (t -20, t +20) is 0.46%. This indicates a positive return during the event period. Although the AAR on day (t 0) is negative indicating that on the day of the announcement, the market reacted negatively, we observe that there is a positive reaction noted for the CAAR and AAR in the period (t 0, t +2) = 0.51% and 0.66% respectively.

Appendix B shows the abnormal returns analysis of Isa *et al.* (2011) who noted that the market reacted positively to the repurchase with day 0 abnormal returns of 0.6%. The difference in the CAR for the event period (t -20, t +20) is 1.42% and for (t 0, t+2) is 1.18%.

5.5 Research Question 2: Is there a significant price effect in the pre-announcement period?

The hypothesis is concerned with the correlation between means of the AAR in the post-announcement period and pre-announcement period. According to the hypothesis, there is no significant difference between the means of the AAR in the post-announcement period and pre-announcement period. The alternative hypothesis states that there is a significant difference between the means of the AAR in the post-announcement period and pre-announcement period. The paired sample t-test results from SPSS, indicating the means can be located in Table 7 below.

Table 7: Mean AAR in the pre and post-announcement period

Variable	Observations	Missing data	Min	Max	Mean	Std. deviation
Pre - AAR	20	0	-0.004	0.004	0.0007	0.002
Post -AAR	20	0	-0.006	0.010	0.0013	0.003

The average in the pre-announcement period is 0.0007 while the average in the post-announcement period is 0.0013. This indicates that there was a price effect in the post-announcement period that is stronger than in the pre-announcement period.

The histograms presented in Figures 4 and 5 below present the distribution of the AARs in the pre and post-announcement periods respectively. The histograms plot the distribution of the 20 data points in each sample: pre-announcement (t -20, t -1) and post-announcement (t +1, t +20). It is clear that in the pre-announcement period, AARs are loosely distributed around the mean of 0.07%. In the post-announcement period, AARs are tightly concentrated around mean 0.13%. The summary statistics are provided in detail further below.

Figure 4: Histogram of the AARs in the pre-announcement period

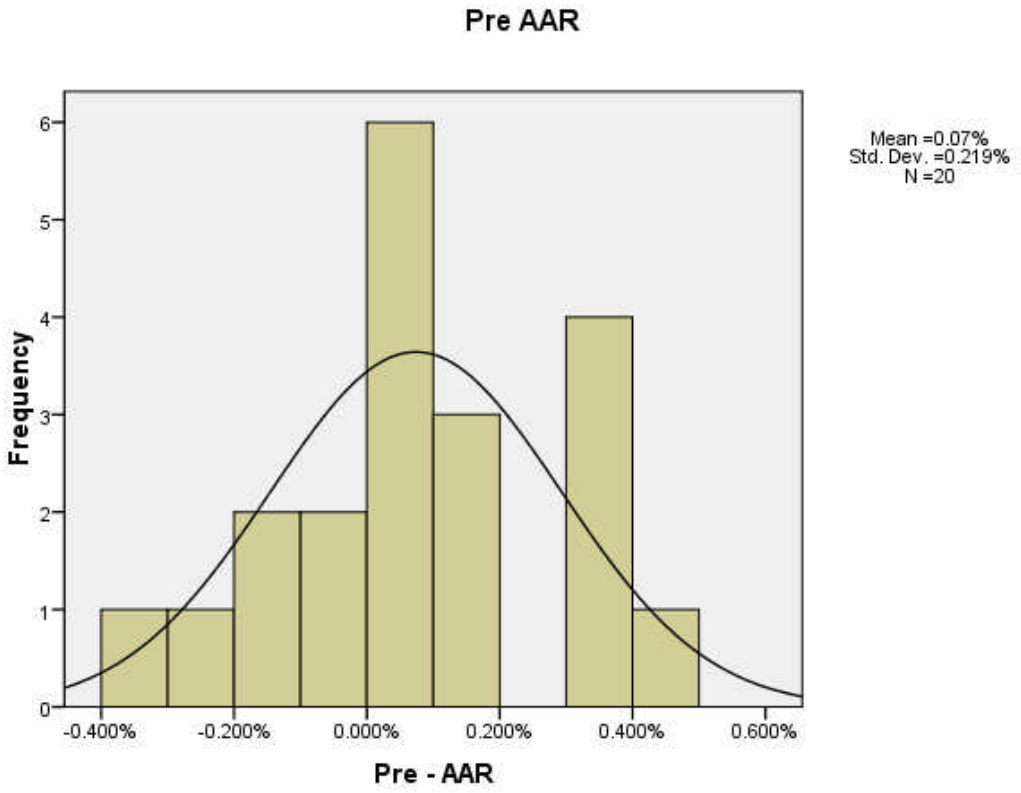
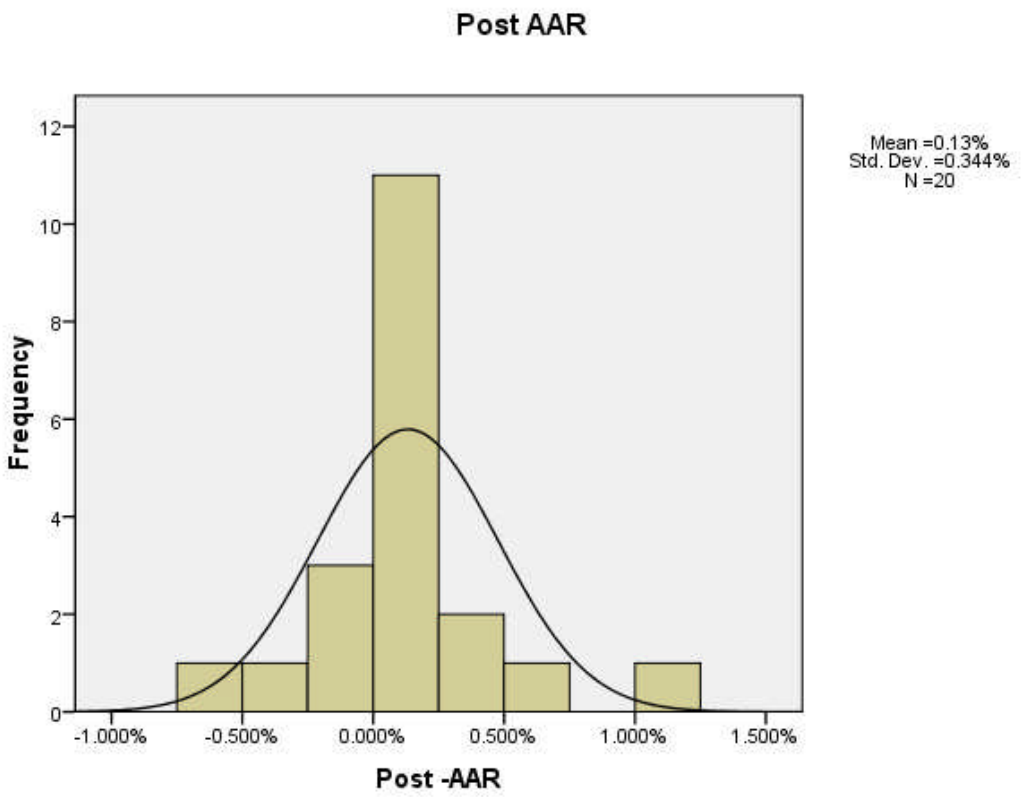
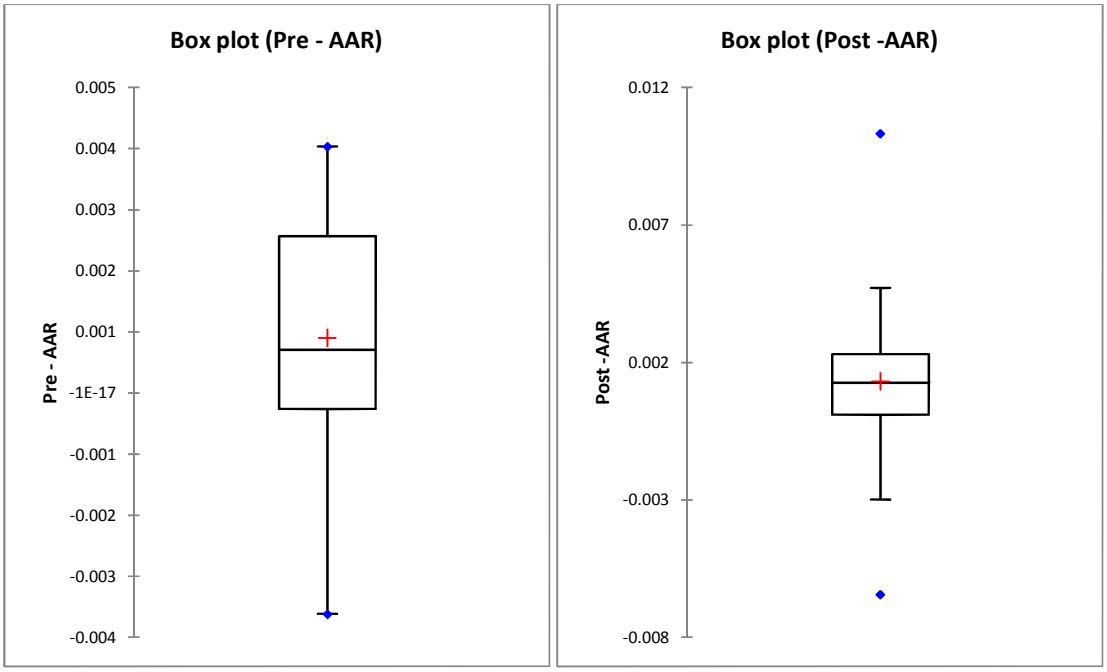


Figure 5: Histogram the AARs in the post-announcement period



In cases where there seem to outlier data points, it is better to look at the median as this is less influenced by the outliers (Ramloutan, 2008). According to Albright *et al.* (2009) the median is the "middle" observation when the data is arranged from smallest to largest. Figure 6 below shows the box plots of the above variables. The box plots indicate that the median of the pre-announcement AARs differs although the post-announcement has a narrow distribution around the median.

Figure 6: Box plot of AARs in pre and post announcement period



The box plots shown above can be interpreted as follows:

- The top and bottom ends of the box are the first and third quartiles respectively. The length of the box equals the interquartile range (IQR) while the box itself represents the middle 50% of the observations in either announcement period.
- The horizontal line inside the box represents the location of the median. The cross (+) inside the box indicates the location of the mean for each sample.
- Vertical lines are extended from the top and bottom of the box to point out the most extreme observations in the sample. These lines are also useful to understand the variability and skewness of the data in each period.
- The pre-announcement period is characterised by extreme outliers which influences the mean while the post-announcement period is tightly centred around the mean and median value.

The t-test results from SPSS are shown in Tables 8, 9 and 10 below. A parametric t-test was used to compare the means of the two samples (pre-announcement AARs and post-announcement AARs). Albright *et al.* (2009) explains that the t-test is known as parametric based on the assumption that the samples are normally distributed. According to histograms in Figures 4 and 5 above, we observed that the samples are normally distributed.

A 95% confidence interval was therefore used. The significance value, alpha (α), is 0.05 which will determine the size of the rejection region. If the significance value is less that 0.05, it indicates that there is a significant difference, however if the significance value is greater than 0.05, there is no significant difference. The rejection region is the set of sample data that leads to the rejection of the null hypothesis (Albright *et al.*, 2009). The *p*-value measures how unlikely the observed sample results would be, given that the null hypothesis is true (Ramloutan, 2008). Therefore a low p-value provides evidence of rejecting the null hypothesis and accepting the alternative (Albright *et al.*, 2009).

This test gives us a *p*-value of 0.572 which indicates that the sample evidence is statistically not significant at the 5% level. The data provides evidence that the null hypothesis (H_0) cannot be rejected. This implies that although there may be an observable trend of declining prices in the pre-announcement period as indicated in Figure 2 above, the decline is price has no significant difference when compare to the post-announcement period.

Table 8: Paired samples statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	AARs - Post	0.0132	20	0.003444	0.000770
	AARs - Pre	0.00074	20	0.002190	0.000490

In the table above, we note that the post-announcement AAR mean is higher. Table 9 below shows the correlation between the two variables.

Table 9: Paired samples correlations

		N	Correlation	Sig.
Pair 1	AARs - Post & AARs - Pre	20	-0.264	0.260

In the above table, we note a negative correlation between the pre and post-announcement AARs. The table below shows the results of the paired samples t-test.

Table 10: Paired samples test

Paired Samples Test								
	Paired Differences					t	Df	*p*-value
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 (AARs – Post) – (AARs – Pre)	0.000584	0.004544	0.001016	-0.001542	0.002711	-0.575	19	0.572

In the above table, we noted the t-value = -0.575. We have 19 degrees of freedom. The significance value is 0.572. As explained above, the data provides evidence that the null hypothesis (H_0) cannot be rejected. This risk to reject the null hypothesis (H_0) while it is true is 57.21%.

5.6 Research Question 3: What evidence exists of firms displaying market timing ability when repurchasing their shares?

Table 11 shows the distribution of announcements made during the sample period. We have observed companies that make varied number of share repurchase announcements. Some companies pursue a share repurchase program in an aggressive manner, making repurchase announcements more frequently in a short period of time while other companies seem to have made

their share repurchase announcements less frequently which is spread over a longer period of time. 24 companies in the sample were noted to have made one share repurchase announcement

Table 11: Distribution of share repurchase announcement per year

Year	One Announcement	Two Announcements	3 or More Announcements
2003	7	4	1
2004	8	0	1
2005	7	7	1
2006	9	3	5
2007	11	1	0
2008	6	2	2
2009	7	0	0
2010	5	2	1
2011	5	1	2
2012	7	2	2

Examining the trend of general share repurchase announcements during the sample period, it can be noted that there has been a decline in the number of share repurchase announcements since its peak of 33 announcements in 2006. The lowest number of share repurchase announcements, which was seven, was recorded in 2009. The average number of general repurchase announcements is 17. Figure 7 below indicates the trend.

Figure 7: Share repurchase announcement trend pre calendar year

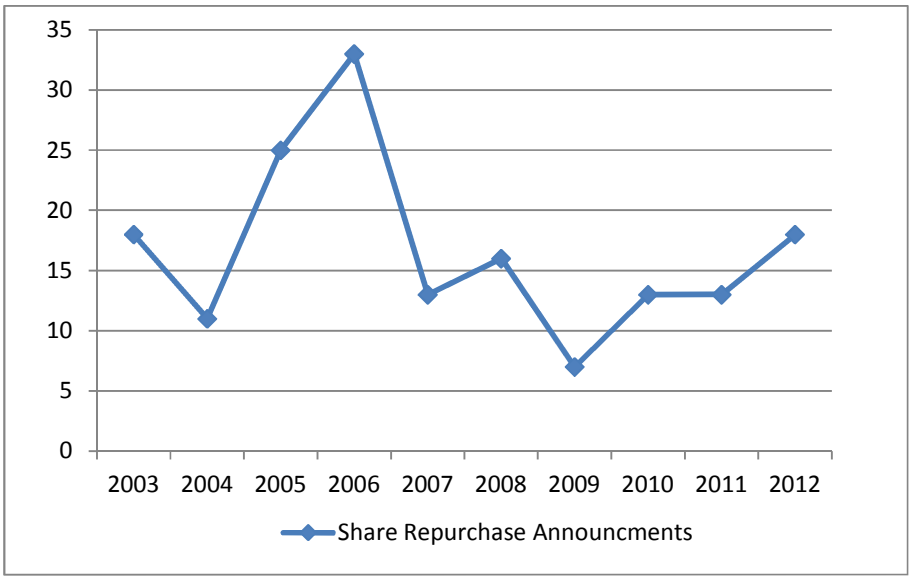


Table 12 below shows the AAR per year based on the number of announcements recorded. The results in the main entry are the AARs for the different days within the event window that surrounds the share repurchase announcement. The results in parentheses are the associated *p*-values. The mean AAR value for the pre-event days (t -20, t -1) is 0.07% and is not significantly different from zero. This result suggests that companies making a share repurchase announcement when their stocks were not significantly under-performing the market. It is noted that none of the pre-event AARs (t -20, t -1) is significant, although three years (2007, 2009 and 2012) show negative returns within this window period. The remaining years show a small positive return.

The average AAR value for the three day event window (t 0, t +2) is 0.14% which is higher than in the 20 day period (t -20, t -1) mentioned above. The *p*-value (0.474) is not significant although Figure 2 above indicates an observable increase in the CAAR during these three days (t 0, 7 +2). In 2010 a significant value of 0.005 is noted indicating some evidence of timing the repurchase

announcement. However, in the 21-day window (t 0, t +1) for 2010, the average AAR is 0.01% with a *p*-value of 0.720.

The 21-day AAR (t 0, t +20) is 0.12% with a *p*-value of 0.076. A significant *p*-value of 0.013 has been noted in 2005 during the 21-day window indicating evidence of timing ability. As mentioned in section 5.3.1 above, that share repurchase announcements are associated with positive abnormal returns however the ability to time a share repurchase announcement has not been consistent over the sample period.

Table 12: Abnormal share price performance surrounding the event day by sub-window and calendar year

Year	Sample Size	Description	Sub-window		
			(t -20, t -1)	(t 0, t +2)	(t 0, t +20)
Final Sample	167	AAR	0.07%	0.14%	0.12%
		p-value	0.239	0.474	0.076
2003	18	AAR	0.14%	0.33%	0.30%
		p-value	0.713	0.616	0.563
2004	11	AAR	0.02%	0.00%	0.20%
		p-value	0.866	0.995	0.226
2005	25	AAR	0.12%	0.06%	0.18%
		p-value	0.146	0.771	0.013*
2006	33	AAR	0.02%	-0.03%	0.03%
		p-value	0.835	0.901	0.766
2007	13	AAR	-0.09%	0.27%	0.11%
		p-value	0.592	0.368	0.378
2008	16	AAR	0.11%	-0.04%	0.08%
		p-value	0.441	0.926	0.565
2009	7	AAR	-0.08%	0.41%	0.12%
		p-value	0.766	0.605	0.428

Year	Sample Size	Description	Sub-window		
			(t -20, t -1)	(t 0, t +2)	(t 0, t +20)
2010	13	AAR	0.07%	-0.13%	0.01%
		p-value	0.466	0.005*	0.878
2011	13	AAR	0.18%	0.28%	0.04%
		p-value	0.052	0.253	0.780
2012	18	AAR	-0.01%	0.69%	0.18%
		p-value	0.923	0.323	0.271
* denotes that the p-value is lower than the significance level alpha = 0.05, which means that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted.					

Based on the results in Table 12 above, the data provides evidence that the null hypothesis (H_0) cannot be rejected for the sample as a collective. However for the sub-windows (t 0, t +20) and (t 0, t +2) that have been noted in 2005 and 2010 respectively, the null hypothesis (H_0) can be rejected and the alternative hypothesis (H_1) can be accepted.

5.7 Summary of Key Findings

The results presented above have been structured around the three research questions. An analysis of the data indicates that:

1) Consistent with the signalling theory and "announcement effect", share repurchase announcements on the JSE are associated with positive abnormal returns.
2) Although there may be an observable trend of declining prices in the pre-announcement period of a share repurchase, the decline in the share price has no significant difference when compare to the AAR in post-announcement period.
3) There is no significant difference in timing a share repurchase announcement although some evidence of timing ability was found in 2005 and 2010 which suggests that repurchasing firms behave opportunistically in buying back their share when there is a price decline.

5.8 Conclusion

In this chapter, the population was described highlighting the characteristics of the data and the selection criteria that was applied to obtain the final sample. Descriptive statistics of the final sample was presented to provide context in understanding the data that was used to obtain the results for the three research questions listed in chapter three.

The three research questions were presented separately highlighting the findings for each question along with the relevant tables and figures. A summary of the key findings per research question was also presented. A detailed discussion of the above results for each research question follows next in chapter 6.

CHAPTER SIX: DISCUSSION OF RESEARCH RESULTS

6.1 Introduction

Chapter five of this study described the population highlighting key characteristics of the data and some descriptive statistics of the final sample. The results of the three research questions were presented which was intended to show the market reactions surrounding the announcement of a share repurchase by listed companies on the JSE. The CAAR was examined when a share repurchase announcement was made and through a series of statistical analysis, the results show that there is an "announcement effect" which is associated with positive abnormal returns.

The results also indicate that while there may be an observable trend of declining prices in the pre-announcement period of a share repurchase, the decline in the share price which is measured by the pre-announcement AAR has no significant difference when compared to the AAR in the post-announcement period. The results further indicate that there is no significant difference in timing a share repurchase announcement although some evidence of timing ability was found in 2005 and 2010 which suggests that repurchasing firms behaved opportunistically in buying back their shares when there was a decline in the share price. In this chapter the results will be discussed further by providing insight in terms of the literature presented in chapter two and in relation of the three research questions.

6.2 Research Question 1: What type of abnormal returns is associated with share repurchase announcements on the JSE?

The study was conducted on share repurchase announcements made by listed companies on the JSE. The CAAR was examined along with the daily changes in the share price to determine the AAR. A benchmark parameter was set to measure the abnormal returns after a share repurchase announcement was

made. The results indicate that share repurchase announcements are associated with positive AARs and CAARs (0.46% and 3.81% respectively) over the event period (t -20, t +20). As a result this indicates that there is a higher gain in relation to the benchmark which provides support that an "announcement effect" exists. Similar results were found by Isa *et al.* (2011) and Lin *et al.* (2011) who noted positive differences in the CAR (1.44% and 0.52% respectively) for the event period (t -20, t +20).

The results of the study conducted by Lin *et al.* (2011) found support for the "announcement effect" stating that share repurchase announcements cause a significantly positive response from the market. On the contrary, Lee *et al.* (2010) found no significant abnormal returns for French companies that announcmed a share repurchase. Lee *et al.* (2010) noted that the market did not respond to the share repurchase announcments which differs strongly to evidence from the US market on share repurchases.

The results of this finding are also consistent with the signalling theory by Grullon and Ikenberry (2000) which states that repurchase announcments are intended to convey a positive signal, indicating that management has correctly forecasted future cash flow and does not need the excess cash to cover future commitments such as capital expenditures or interest payments. While there may evidence which are consistent with the signaling theory, Ikenberry and Vermaelen (1996) argue that signaling theory also predicts the information content may be greater in company's that announced larger share repurchase programs. The data indicated that in 2005 and 2006, the highest number of share repurchase announcments, 58 in total and highest number of shares repurchased (about 888 million representing 55% of all shares repurchased in the period) was recorded. The average number of announcments per calendar year for the sample period as indicated in Table 4 is 17 and the average number of shares repurchased in a calendar year is about 161 million shares. This indicates that 2005 and 2006 are outliers as the number of announcements and number of shares repurchased is

above the norm. The top three sectors that repurchased shares in 2005 and 2006 collectively are the insurance, healthcare and retial sectors. respectively It can therefore be infered that the information content was greatest in 2005 and 2006 among companies in the insurance, healthcare and retail sectors.

Another feature of the results is the continuation of the price increase for several days after the event. Isa *et al.* (2011) who conducted an event study on share repurchases of Malaysian firms also found a continuation of price increase for days after the event. Isa *et al.* (2011) points out that traditionally, this observation of a price increase after the event is seen to be inconsistent with the notion of an efficient market however, it may interpreted as being due to the market reaction of subsequent repurchase announcements made by the company.

In summary the data analysed to this question shows that share repurchase announcements are associated with positive abnormal returns. The results therefore provide support for the "announcement effect" and signalling theory.

6.3 Research Question 2: Is there a significant price effect in the pre-announcement period?

A company that decides to make a share repurchase announcement is less likely to do so when their share price is trading on an upward trend. Lin *et al.* (2011) points out that a company which experiences a large share price decline before the announcement will be more likely to repurchase its shares. This is often referred to as a "price effect". Lin *et al.* (2011) further states that if the company views the market price as being temporarily undervalued and is optimistic about its future prospects, it is also more likely to repurchase its shares as a low share price will make it an excellent investment opportunity. This implies that companies that repurchase their shares experience a significant price decline before an announcement is made.

The analysis for the hypothesis stated in chapter three for this research question investigated the relationship between the AAR before and after a share repurchase announcement. It tested whether companies experienced a significant price decline before making an announcement to repurchase its shares. This was done by testing the null hypothesis that there is no significant difference between the means of AAR is the pre-announcement period and means of the AAR in the post announcement period. The alternative hypothesis stated that there is a significant difference between the means of the AAR in the pre-announcement period and post-announcement period. By testing the means in both the periods, we found that the mean AAR in the pre-announcement period was lower than the mean in the post-announcement period, indicating the existent of a "price effect". The AARs where then tested to identify outliers which could influence the means in both the samples. Extreme outliers were observed in the pre-announcement period. The post-announcement period showed the AARs tightly centred close to the mean. A paired sample t-test was conducted to determine the significance level of the two data sets. The pre-specified significance level of alpha (α) = 0.05 and a higher *p*-value = 0.572, revealed that there was insufficient evidence to conclude in favour of the alternative hypothesis. The return in the pre-announcement period was noted as -0.20% while the t-value = 0.575.

A large price decline also known as a "price effect" was observed for repurchasing firms in Hong Kong. Zhang (2005) found that repurchasing firms bought back their shares following price drops, which suggested that those firms behaved opportunistically when implementing a share repurchase program. Similar observations were made by Ginglinger and Hamon (2007) who found that French firms act against the trends, executing their share repurchase programs to take advantage of falling prices. Ginglinger and Hamon (2007) conclude that the result of their findings is consistent with a price stabilisation motive for share purchases.

A study of US listed firms by Yook (2010) on the "price effect" focused on open-market repurchases, which have been associated with significantly negative returns prior to the announcment followed by positive returns post the announcement. Consistent with these findings, Yook (2010) found that the average monthly abnormal return is -0.71% during the 6 month time period prior to the announcment and 1.12% in the announcement month. Yook (2010) further analysed these US listed firms by splitting them into a sub-sample of firms that actually performed a share repurchase and firms that merely made a share repurchase announcement but did not complete their repurchase. Yook (2010) found that the difference of the monthly adnormal returns between the two sub-samples was statistically significant. The sginificanatly negative pre-announcement return was -0.59% (t = -2.85) for the first sub-sample (firms with actual repurchases) while the insiginificant negative pre-announcement return was -0.39% (t = -1.40) for the second sub-sample (firms which made an announcement only).

In summary, the data analysed provided evidence in support of the null hypothesis which states that there is no significant difference between the means of the AAR in the post-announcement period and pre-announcement period. This indicates that there was no significant "price effect" in the pre-announcement period. Although we found some evidence of a "price effect" the results indicate that it is insignificant at the 5% level. The results of this study provides support to the findings of Yook (2010) who also found that firms that make share repurchase announcements did not experience a "price effect".

6.4 Research Question 3: What evidence exists of firms displaying market timing ability when repurchasing their shares?

The option to repurchase shares is only valuable to the extent that managers within the company who are responsible for authorising a share repurchase

program can detect valuation errors (Ikenberry and Vermaelen, 1996). The risk of getting the valuation of a share incorrect may lead the company to repurchasing an overvalued share. The ability to correctly time the share repurchase will ensure that company does not repurchase overvalued shares to the detriment of long-term shareholders. Within this context, the quantitative attributes of the share price changes have been analysed per year to determine if evidence exists of firms displaying market timing ability when making a share repurchase announcement.

The distribution of share repurchase announcements during the sample period is analysed to determine the frequency of announcements per calendar year and for the final sample. The analysis for the hypothesis stated in chapter three for this research question investigated if there is a significant difference in timing a share repurchase announcement. The null hypothesis stated that there is no difference in timing a share repurchase announcement. The alternative hypothesis states that there is a significant difference in timing a share repurchase announcement. Three sub-windows ((t -20, t -1), (t 0, t +2), (t 0, t +20)) were defined which were used to measure the short-term price performance within the overall event window. A one-sample t-test was used to compare the mean of the final sample AAR in each sub-window to the known value which was the population mean. The pre-specified significance level of alpha (α) = 0.05 and a higher *p*-value for each sub-window = 0.239, 0.474 and 0.076 respectively, revealed that there was insufficient evidence to conclude in favour of the alternative hypothesis for the final sample as a collective. However, further analysis per calendar year revealed support for the alternative hypothesis in 2005, sub-window (t 0, t +20) and in 2010, sub-window (t 0, t +2).

Ginglinger and Hamon (2007) found that French firms repurchased shares at a lower price than that paid by other investors since the shares were repurchased after an observable decline in the share price. Ginglinger and Hamon (2007) point out that their results provide little evidence to support on timing ability and

concluded that the share repurchases reflected a contrarian style trading rather than managerial timing ability. Park and Sabourian (2011) define contrarain style trading as a style in which a person takes up a trading position that is opposed by the majority and is seen to be acting against the crowd.

The evidence presented by Zhang (2005) indicates that firms not only time their repurchase program announcements but also time their actual repurchase days. Zhang (2005) found that the avergare CAR for the sub-window period (t 0, t +2) is 0.43% with a highly significant *p*-value of 0.0007 which indicates that the markets responded positively to the share repurchases. The 21 day CAR (t 0, t +20) is 0.69% with a *p*-value of 0.102. Contrary to Ginglinger and Hamon (2007), Zhang (2005) found some evidence that managers do exhibit timing ability however they do not exhibit superior performance when they make open-market share repurchases.

By studying open-market repurchases versus tender offer repurchases, Yook (2010) found the average monthly abnormal return prior to the announcement is significantly negative for open-market repurchases with a return of -0.90% (t = -3.17) and in tender offers was not significant with an abnormal return of -0.40% (t = -0.69). Yook (2010) concluded that his finding provided additional evidence to support the contention that managers try to time the market when they repurchase their shares via open-market repurchase programs. The results strongly support the hypothesis that managers are likely to initiate repurchasing shares only when the performance of their shares will be better than expected by the market otherwise they would avoid repurchsing shares (Yook, 2010).

A bootstrapping procedure was used by De Ridder (2009) which identified repurchasing firms with managerial timing skills at the 5% significance level. De Ridder (2009) found 25% of observations within his sample displayed evidence of timing ability to repurchase shares at a lower price than a naïve investor.

An analysis of the daily AR and CAR in Appendix B by Isa *et al.* (2011) found that management deliberately timed their repurchases after a period of declining prices. Isa *et al.* (2011) noted that during bearish years, firms time their repurchases after a short period of consecutive daily price drops, while in bullish years, firms typically allowed for a longer time of price decline before making their repurchase.

Although some support for the alternative hypothesis is found in the sub-windows for 2005 and 2010, overall the data indicates that managers do not time their repurchase programs. The support for the alternative hypothesis found in 2005 could be attributed to the upward trend of the market in the boom years rather than pure timing ability. Conversely, support for the alternative hypothesis found in 2010 could be attributed to the recovery years when markets are characterised unstable and volatile returns where managers would be expected to show skill in timing the repurchase programs.

6.5 Conclusion

In this chapter, the results of the of the three research questions presented in chapter 5 was discussed in light of the literature presented in chapter two. This chapter was organized per research question highlighting the findings of this study in support of the relevant theories.

This chapter started with the discussion of the results to the first research question: What type of abnormal returns is associated with share repurchase announcements on the JSE? The data analysed in this study showed that share repurchase announcements are associated with positive abnormal returns. The results therefore provide support for the “announcement effect” and signalling theory.

The discussion continued with results of the second research question: Is there a significant price effect in the pre-announcement period? The data analysed provided evidence in that there was no significant “price effect” in the pre-announcement period although we found some evidence of a “price effect”, the results. This however was insignificant at the 5% level.

The discussion ends with the third research question: What evidence exists of firms displaying market timing ability when repurchasing their shares? The data analysed provided some support of timing ability in 2005 and 2010, but overall the data indicated that managers do not time their repurchase programs.

The next chapter concludes this study by highlighting the key findings. It also lists some managerial implications and provides ideas for future research.

CHAPTER SEVEN: CONCLUSION

7.1 Introduction

This study aimed to examine the market reaction surrounding the announcements of share repurchases by listed companies on the JSE. By examining the market reaction we were able to establish whether there was an "announcement effect". This question was answered by examining the AAR and CAAR when a share repurchase announcement was made. The existence of a price effect in the pre-announcement period and an assessment of timing ability were also investigated.

Research on share repurchase programs is limited in South Africa. Previous studies conducted around share repurchases on the JSE employed shorter periods (i.e. from 6 months to 5 years). This work adds to previous local research by studying a longer series of data from January 2003 to August 2012 under the assumption that a longer period will yield more reliable and conclusive results to the research questions.

The findings may also serve as a framework for managers when designing execution strategies for future share repurchase programs continue to deliver higher long-term returns to shareholders.

7.2 Key Findings

The study examined the existence of an "announcement effect" when a share repurchase announcement is made by a listed on the JSE. The results indicate that share repurchase announcements are associated with positive AARs and CAARs (0.46% and 3.81% respectively) over the event period (t -20, t +20). As a result this shows that there is a higher gain in relation to the share price before

an announcement is made which is indicative of an "announcement effect" and provides support to the signalling theory. The findings of this South African study is therefore consistent with those of similar studies done by Grullon and Ikenberry (2000) on the US market, Isa *et al.* (2011) on the Malaysian market and Lin *et al.* (2011) on the Taiwanese market.

The existence of a price effect was investigated to determine if companies that repurchase their shares experience a significant price decline before an announcement is made. Although there was an observable trend of declining prices in the pre-announcement period of the event, the decline in the share price was not statistically significant. This result is consistent with Yook (2010) who also found that US firms that make share repurchase announcements did not experience a "price effect".

The ability to correctly time the share repurchase will ensure that company does not repurchase overvalued by the market. Changes in the daily share price was analysed per calendar year to determine if evidence exists of firms displaying market timing ability when making a share repurchase announcement. The results indicated that there is no significant difference in timing a share repurchase announcement although some evidence of timing ability was found in 2005 and 2010 which suggests that repurchasing firms behave opportunistically in buying back their share when there is a price decline. This provided support to Zhang (2005) who also found some evidence of companies in Hong Kong timing their repurchases. However when tested on final sample as a collective, the data indicated that managers do not time their repurchase programs which is consistent with Ginglinger and Hamon (2007) who studied French firms.

7.3 Managerial Implications

This study is specifically aimed at managers who are tasked with repurchasing a company's shares and are typically from within a listed company's Treasury Department. Ikenberry and Vermaelen (1996) state that the decision to exercise repurchase options requires company resources and in firms where resources are rationed, the firm's ability to exercise these options may be limited thus reducing their value and making unattractive to investors.

Share repurchases can be used as a tool for stabilising a company's share price that has been following a downward trend for many consecutive days. Managers executing a share repurchase program should consider the effects of timing ability to protect the investments of long-term shareholders. Isa *et al.* (2011) points out that when the market is on an uptrend, there is no necessity for a company to signal under-pricing or make an effort to stabilise the price until there is a long enough period of consecutive declines in the price.

The prior record of managers who announce share repurchase programs but fail to commit to them may have an impact on subsequent repurchase announcements. Chang *et al.* (2010) found that share repurchase announcements without any follow through are not an effective and costless tool for boosting share prices, as investors learn from past experience about the managerial motives of such announcments.

Managers who are trying to signal hidden information about the future prospects of a company may be faced with market inefficiency when trying to communicate favourable information to shareholders. Bhana (2007) suggests that managers should provide shareholders a detailed explanation of future benefits likely to arise from a share repurchase program as this will remove any associated sceptism with a share repurchase program.

The findings contained in this study may also be used by investors, portfolio managers and share analysts who may regard share purchase announcements as a positive signal. Saville (2012) points out that a share repurchase program demonstrates that a company has surplus cash and that manager's see opportunity in their own share. From a value investors perspective, a share repurchase program conveys a very strong signal of a healthy company as it leads to upliftment of financial ratios such as return on equity, price-to-book multiple and future earnings prospects.

7.4 Recommendations for Future Research

Future research could be conducted on the announcement effect between various sectors to determine if the abnormal returns are significantly different. This study can also be expanded to compare the abnormal returns of country specific sectors, for example the abnormal returns of the announcement effect in the South African insurance, industrial goods and services and basic resources sectors as these were noted to be outliers during the sample period.

Only the time period 2003 to 2012 was included in this research. The initial years when share repurchases were allowed on the JSE have been excluded. Any future research on share repurchase programs in South Africa should aim to overcome this data constraint by being extended to include the earlier years of data i.e. 2000, 2001 and 2002.

The effect of the number of shares repurchased in relation to the announcement effect has not been tested in this research. We only focused on the "announcement effect". Future studies should be conducted to determine if the size of a repurchase (i.e. the number of shares repurchased) can be used as a proxy for abnormal returns.

The period of this study coincides with the boom years of financial markets (2003 – 2007), the global financial crisis (2008 – 2009) and the recovery years (2010 – 2012). This provides a landscape for future studies to test market behaviour in relation to share repurchases and examine the market's reaction in each of these periods as a form for robustness check. Isa *et al.* (2011) points out that this will indicate if the market is consistent in its response to the event regardless of market situations.

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9. Appendices

9.1 Appendix A: Sector Description in Final Sample per Calendar Year

Sector	Year	Number of announcements	Number of shares repurchased
Construction & Materials	2003	1	9,751,254
Financial Services	2003	1	963,569
Industrial Goods & Services	2003	10	8,708,092
Media	2003	2	2,870,008
Retail	2003	1	19,337
Technology	2003	3	5,807,049
Construction & Materials	2004	1	10,219,548
Debt	2004	1	2,500
Financial Services	2004	5	30,613,204
Industrial Goods & Services	2004	4	35,245,554
Banks	2005	4	10,164,515
Basic Resources	2005	1	1,000,000
Financial Services	2005	3	5,123,166
Industrial Goods & Services	2005	4	42,753,897
Insurance	2005	4	359,257,128
Investment Instruments	2005	1	4,512,667
Media	2005	1	7,119,825
Personal & Household Goods	2005	3	3,626,973
Retail	2005	2	91,388,559
Telecommunications	2005	2	12,086,920
Banks	2006	1	1,305,000
Basic Resources	2006	1	2,214,199
Financial Services	2006	4	37,628,271
Food & Beverage	2006	3	1,971,298
Healthcare	2006	3	130,312,734
Industrial Goods & Services	2006	4	37,385,407
Insurance	2006	2	70,350,000
Investment Instruments	2006	2	8,064,000
Personal & Household Goods	2006	9	46,956,394
Retail	2006	2	11,722,633
Telecommunications	2006	1	3,506,619

Sector	Year	Number of announcements	Number of shares repurchased
Travel & Leisure	2006	1	427,855
Banks	2007	1	6,370,888
Basic Resources	2007	2	12,870,529
Financial Services	2007	1	13,876,793
Food & Beverage	2007	2	5,575,513
Industrial Goods & Services	2007	2	25,636
Retail	2007	2	1,630,199
Telecommunications	2007	2	83,128
Travel & Leisure	2007	1	8,994
Banks	2008	4	1,258,735
Basic Resources	2008	2	237,025,800
Chemicals	2008	1	1,895,592
Construction & Materials	2008	2	55,360,362
Financial Services	2008	1	8,211,988
Real Estate	2008	1	1,740,178
Retail	2008	1	5,020,000
Technology	2008	3	876,670
Telecommunications	2008	1	7,627,206
Construction & Materials	2009	1	14,046,443
Consumer Services	2009	1	1,826,705
Debt	2009	1	100,000
Financial Services	2009	1	1,343,305
Industrial Goods & Services	2009	1	19,044,230
Insurance	2009	1	30,108,304
Real Estate	2009	1	4,991,335
Basic Resources	2010	2	2,049,573
Construction & Materials	2010	4	1,740,018
Financial Services	2010	2	3,287,171
Industrial Goods & Services	2010	1	2,123,775
Retail	2010	2	46,079,832
Technology	2010	2	14,004,426
Basic Resources	2011	3	4,393,864
Construction & Materials	2011	1	550,000
Food & Beverage	2011	1	8,984,469
Industrial Goods & Services	2011	3	3,389,497
Media	2011	1	4,991,374

Sector	Year	Number of announcements	Number of shares repurchased
Retail	2011	3	16,354,311
Technology	2011	1	682,000
Construction & Materials	2012	2	22,085,788
Consumer Services	2012	1	340,000
Financial Services	2012	2	7,705,774
Industrial Goods & Services	2012	8	14,324,984
Investment Instruments	2012	1	9,000,000
Real Estate	2012	3	32,623,899
Technology	2012	1	188,000
Total		**167**	**1,618,895,463**

9.2 Appendix B: Daily AR and CAR of Malaysian Firms

Adapted from Isa *et al.* (2011)

Panel A: Daily AR and CAR relative to actual share repurchase day			
Day	AR (%)	*t*-statistic	CAR (%)
-20	-0.0197	-0.1439	-0.0197
-15	0.0100	0.0734	-0.2795
-10	0.0870	0.6395	-0.5195
-9	-0.0292	-0.2147	-0.5487
-8	-0.0748	-0.5498	-0.6235
-7	0.2059	1.5133	-0.4176
-6	-0.0203	-0.1490	-0.4379
-5	0.0430	0.3158	-0.3949
-4	-0.1069	-0.7864	-0.5018
-3	-0.3114**	-2.2877	-0.8132
-2	-0.2120	-1.5574	-1.0252
-1	-0.0068	-0.0501	-1.0320
0	0.6002***	4.3982	-0.4318
1	0.3632**	2.6748	-0.0686
2	0.2192	1.6104	0.1506
3	0.0283	0.2088	0.1789
4	0.2330*	1.7152	0.4119
5	0.1895	1.3932	0.6014
6	0.0190	0.1402	0.6204
7	-0.0963	-0.7084	0.5241
8	0.4765***	3.5100	1.0006
9	0.0400	0.2946	1.0406
10	0.3028**	2.2289	1.3434
15	-0.2573*	-1.8927	1.1714
20	0.4791**	2.6671	1.4281

Panel B: CAR over different intervals		
$CAR_{T1,T2}$	CAR (%)	*t*-statistic
Day -20 to -1	-1.0320	-1.4246
Day 0 to 2	1.1826***	4.8444
Day 3 to 20	1.2775	1.4407
Day -20 to 20	1.4281	1.4682

Note: *, **, *** indicate significance at the 0.01, 0.05 and 0.01 levels, respectively