

THE INFORMATIONAL CONTENT OF TRADING STATEMENT RELEASES ON THE JSE

Prepared under the supervision of **Professor Paul van Rensburg** and presented to the **Department of Finance and Tax** at the **University of Cape Town** in partial fulfillment of the requirements for the degree of **Master of Commerce (Investment Management)**.

| **Alastair Murie** | **February 2014** |

Supervisor: Professor Paul van Rensburg

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ABSTRACT

A prevalent finding in prior literature, both internationally and domestically, is the association between earnings information, contained in earnings announcements, and share returns leading up to and following the publication. This study pulls together evidence across stock exchanges worldwide on which to draw comparisons of market efficiency.

For the first time on the Johannesburg Stock Exchange (JSE), an event study analysis is conducted on the effects of a cautionary announcement known as a trading statement. While most research has focused on the official earnings announcements, this pioneering study synthesizes methodology adopted in related prior research to create a robust, relevant study of efficiency on the JSE. The aim of this study is to identify whether there is a relationship between unexpected earnings measures (often referred to as 'earnings surprises'), conveyed by trading statements, and future share returns. This study examines the importance, timeliness and financial exploitability of trading statement releases for both the regulator and investor.

Lack of depth in trading statement history limits sample size and renders traditional earnings expectation models, which rely on comparative period figures, useless. Resultantly, numerous return-based unexpected earnings models had to be adopted to estimate earnings surprises and gauge the predictability of future share returns.

This study proves empirically that trading statements have significant informational content by providing evidence of a significant relationship between earnings information, conveyed by trading statements, and the corresponding abnormal share returns in the pre-release and post-release period. Significant post-release drift is found for ranked quintile and 'good' and 'bad' news portfolios based on certain variations of the short term unexpected earnings models. Findings showed that the (-2;+1) and (0;+1) short term unexpected models encompassing the few days around the release date showed significant predictability of future share returns. Based on these findings, predictability of abnormal return generation renders semistrong-form market efficiency on the JSE a misperception. This study incorporates a sample of 58 trading statement releases occurring between 2010 and 2013.

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CHAPTER ONE

INTRODUCTION

1.1. Background

Substantial research in the area of efficient markets has been conducted from the late 60's onward to ascertain the impact of new information on share prices. More specifically, the information content of earnings announcements. Early discussions of predictive information and efficient markets were set forth by Fama (1965). Fama mentions how investors wishing to capitalize on new information leads to immediate inclusion of that new information into share prices Fama (1965).

The question of whether the information content of earnings and cautionary releases has been factored into share prices building up to that release date or whether the announcement is wholly, or partly, regarded as new information remains an important notion. Pioneers of empirical research in this area were Ball and Brown (1968) and later Beaver (1968). Ball and Brown presented empirical evidence showing that share prices do react to information contained in earnings announcements. Using a stock's return residual, Ball and Brown (1968) established the impact of new information on share price as positive (negative) when earnings were higher (lower) than expected.

Beaver (1968) solidified Ball and Brown's (1968) findings through different empirical methodology. Beaver (1968) analyzed trading volume and return variance surrounding the earnings release date and found both to be abnormal, suggesting timely, new informational content of earnings announcements. Although Beaver's (1968, p. 67) reasons for his study were more focused toward the issue of 'measurement controversies in accounting', his results are decision-useful across the board.

Numerous studies have been conducted in the area of earnings announcements internationally. However, South African evidence remains thin with the sole comparable studies on the Johannesburg Stock Exchange (JSE) having been conducted by Knight (1983) and Kornik (2005). Using event study methodologies, both found that new information was contained in the earnings releases and that evidence of the post earnings announcement drift (PEAD) phenomenon was observable.

This thesis does not address earnings announcements, but rather a cautionary announcement known as a trading statement release. In South Africa, JSE listing requirements dictate under section three, 'Continuing Obligations', that companies publish material, price sensitive information. A required publication denoted under section 3.4 is the trading statement. In April 2010, listing requirements were amended to dictate more detailed circumstances under which companies are required to publish a 'trading statement' to the Security Exchange News Service (SENS). In summary, this occurs when the company is satisfied that a reasonable degree of certainty exists that results for the period to be reported on will differ by more than 20%¹ from the most recent of:

- Financial results for the prior comparable period; or
- Forecasted projections of profit or guidance given by the issuer.

Trading statement requirements are discussed further in chapter 4 and an excerpt from the JSE Listing Requirements is presented in appendix A.

1.2. Objectives of this research

This study aims to test the existence of efficient market hypothesis (EMH) suggested by Fama (1965) within the South African context. For the first time, an event study methodology will be adopted surrounding the release of trading statements on the JSE's Top 60 shares with the intent of examining the extent of market efficiency and the reaction of share prices to potentially new information contained within trading statement releases.

Earnings are a core component of company financial health and well-being. Consequently, the proverbial microscope is placed over a company's share price around the trading statement release. A trading statement release containing potentially surprising earnings changes could be deemed material information that has yet to be impounded into share prices. Indications of significant abnormal return leading up to the trading statement release indicate the inclusion of more timely sources of information by investors. Non-random movements in share price following the release of trading statements would reflect inefficiencies in the market and also confirm that trading statements contain new, decision useful information.

¹ Property entities – 15%

Numerous stocks comprising the JSE Top 60 have been selected on which to conduct this study. Only top 60 stocks are selected due to exchange-specific restraints such as concentration and liquidity which are discussed further in Chapter 4. The event study window will be split into five sections:

1. The pre-release period,
2. The period surrounding the release,
3. The post-release period,
4. Momentum analysis, and
5. Share return variance (SRV) and trading volume activity (TVA) tests

This study hopes to enlighten the savvy investor, both institutional and retail, about the potential for abnormal return-making through exploitation of a trading statement releases.

In summary, the objectives of the event study are to determine:

- If there is a relationship between unexpected earnings surprises conveyed by trading statement releases and future share returns;
- The extent to which investors impound other, more timely sources of information into share prices leading up to the trading statement release; and
- Whether post trading statement drift is observable and significant.

1.3. Thesis structure

Chapter 2 provides the theoretical underpinnings widely discussed in the area of finance. **Chapter 3** reviews prior empirical literature on analysis of earnings announcements, information content, event studies and other closely related material. **Chapter 4** reviews the Johannesburg Stock Exchange (JSE) on the basis of efficiency and size. It also outlines the full requirements for trading statement releases. **Chapter 5** outlines proposed hypotheses, methodology and data collection information. **Chapter 6** discusses empirical results and finally, **chapter 7** concludes and outlines areas for future research.

CHAPTER 2

THEORETICAL OVERVIEW

2.1. Efficient market hypothesis (EMH)

2.1.1. Background

This chapter discusses the evolution and development of EMH theories starting with Fama (1965) and more recent literature exhibiting evidence of inefficiencies challenging traditional theory. The relevance for this study relates to the market's haste in factoring new information into asset prices. Slow reactions to new information would not only violate traditional efficient market theory, but could provide an area for financial exploitation.

The idea of an efficient market was brought to life by Eugene Fama (1965) who argues in favor of a random walk model of stock prices first proposed by Kendall (1953). The random walk explains successive share price deviations as being independent of each other i.e. that there is no serial correlation in share price changes. Fama (1965) formalizes EMH as an environment where share prices reflect all available information and that any changes in share prices are a result of new information being impounded into the share price. The 'new information' alluded above must itself be random and sporadic such that resulting share price changes are themselves, unpredictable. All share prices should reflect their intrinsic value and investments in such shares should have a net present value of zero from the outset.

Later, Fama (1970) described three forms of market efficiency: weak-form, semistrong-form and strong-form efficient markets.

- **Weak-form efficiency** suggests stock prices reflect past prices and historical information. If this holds, the job of technical analysts is, to use Fama's (1965, p. 7) own words, "like that of an astrologer, is of no real value in the stock market".

- **Semistrong-form efficiency** asserts that stock prices reflect currently available information and all historical information discussed previously. Because trading statements contain both earnings and financial performance data, this is particularly pertinent for this study. Results of this study have the potential to invalidate semistrong-form efficiency within the South African context. Appealingly, the use of an event study to gauge efficiency is thinly covered within the South African area of academia with many studies being conducted on return predictability² of various ‘anomalies’.
- **Strong-form efficiency** asserts that stock prices reflect all information, both public and non-public. Strong-form is conceded as a benchmark by Fama (1970) against which to measure the states of various markets.

This hypothesis of market efficiency was later supported by another prominent economist, Michael Jensen (1978) who suggested EMH was the most empirically supported economic proposition. Lo and MacKinlay (1988) show that prices do not follow a random walk but are hesitant to reject EMH completely.

According to a book written by Shleifer (2000), EMH is underpinned by three main arguments or assumptions:

1. Investors are assumed to act rationally (in terms of valuing securities).
2. Irrational decisions made by some investors will be offset by the irrational decisions of other investors.
3. If irrational investors don't net each other off, rational arbitrageurs will exploit the mispricing and restore equilibrium.

² See (Kruger, Evidence of Return Predictability on the Johannesburg Stock Exchange, 2011) for further reading.

2.1.2. Problems with EMH

Shleifer (2000) elaborates further, analyzing comprehensively that the above assumptions cannot hold. In the context of this study, delays in responses to new, timely information can be potentially attributed to the shortcomings of EMH discussed below:

Rationality of investors:

According to Shleifer, individual investors conduct irrational investing frequently. Shleifer references Kahneman and Tversky (1979) who show comprehensively that investors act irrationally. They examine investors' random deviations from fundamental values and find they are not normally distributed and resultantly will not net the decision of the others off (Shleifer, 2000, pp. 10-12). Institutional investors are also included in the grouping for irrationality where Shleifer alludes to performance measures for institutions leading to irrational decisions. Examples set forth in Shleifer (2000) include factoring in competitor holdings to avoid comparative underperformance, and window dressing⁴. Other proof of irrationality is shown by Nofsinger (2001) who looks at the 'disposition effect' where investors hold 'loser' shares too long, and sell 'winners' too soon. Chang, Pinegar and Ravichandran (1998) discuss day of the week effects and asymmetric responses to macroeconomic news.

Impossibility of arbitrage:

The argument remains that even if irrationality exists and it fails to be netted off, arbitrageurs⁵ will force prices back to their fundamental values. Shleifer (2000) goes on to show that substitutes are generally non-existent in the market for arbitrageurs to utilize. Further, Shleifer asserts that even when opportunities do arise arbitrageurs don't always take advantage of them. Shleifer argues that the existence of irrational investors creates substantial risk for arbitrageurs i.e. that irrationality creates further deviation from fundamental values and resultantly, losses for the arbitrageur. This renders risk free arbitrage not so riskless after all.

⁴ Window dressing: Changing holdings from poor performing securities to high flying performers to appear more desirable as a fund or asset manager.

⁵ Blake (1990) defines 'arbitrageurs' as traders who profit from deviations in share prices from their respective fundamental values.

2.1.3. Tests of Semistrong-form efficiency

This study focused upon the market's ability to reflect currently available information and historic information into share prices. The test for semistrong-form efficiency therefore weighs heavily on the success of tests processed in this regard. Invalidation of semistrong-form market efficiency would contribute to our understanding of how and to what extent trading statement information is factored into share prices.

While some studies have shown results in favor of market efficiency⁶ or at least fail to reject the notion completely, there are substantially more critics. If the JSE is semistrong-form efficient, share prices should adjust instantaneously to new information and render post trading statement release drift non-existent. Drift was observed in the Ball and Brown (1968) study. Does this then invalidate EMH at the semistrong level? This is alluded to later in this study. A number of studies relating to return predictability are offered to test the validity of semistrong-form market efficiency in both an international and South African context. Typically, these studies try to identify 'anomalies' within the market where the informational efficiency is in question.

International evidence of the relationships between share returns and various metrics such as price-to-earnings ratio, book-to-market ratio and dividend yield have been promoted by various studies. On a basic level, evidence of predictability in returns using these metrics would invalidate EMH at the semistrong level as the market has failed to factor in currently available information present in a company's financial statements. Similarly, in an event study of share returns, the release of financial data into the market should be reflected instantaneously thereby rendering post announcement drift non-existent.

2.2. Asset pricing – the CAPM

Asset pricing theory refers to a framework for prescribing value to assets with uncertain future cash flows within an efficient market. The Capital Asset Pricing Model (CAPM), set forth by Sharpe (1964), remains a prominent asset pricing model but has inherent shortcomings that could contribute to observed mispricing in this study.

⁶ See Ferson and Harvey (1991) and Fama (1991) for further reading.

Markowitz (1952) pioneered quantifying the relationship between risk and return when investors were already aware of the benefits of holding a diverse range of assets. Markowitz promoted the measurement of the effects of diversification and the limits thereof. He showed that the risk of individual assets were less important than the variance they contributed to a portfolio of assets. Markowitz (1952) established assumptions relating to investor behavior i.e. investors prefer higher returns to lower returns, and prefer lower risk given a set return. And so the efficient frontier of return-risk tradeoffs was born.

Tobin (1958) extended the work of Markowitz (1952) through introducing a risk-free asset to portfolio allocation. The risk-free asset allowed investors to satisfy their specific risk appetite by either borrowing or lending. The allocation between a set of risky assets set forth by Markowitz (1952) combined with the risk-free component set forth by Tobin (1958) became known as separation theorem. However, the academic pioneering of both Markowitz (1952) and Tobin (1958) had yet to yield a model for expected returns that could be used to generate an efficient frontier of securities.

Sharpe (1964) resolved this problem with the Capital Asset Pricing Model (CAPM) as a model for market equilibrium. Sharpe expanded to say that all investors will hold an identical optimal risky portfolio, a combination of the market portfolio and varying proportions of the risk-free asset set forth by Tobin (1958). Sharpe (1964) proposed, growing on Markowitz (1952), that there are two components of risk: unsystematic (or specific) risk which is unique to a certain asset and can be eliminated via diversification. The other, systematic (or non-specific) risk is common amongst all assets in the market. Beta measures systematic risk i.e. risk of a single asset relative to the market portfolio. The CAPM is outlined below:

Expected returns according to CAPM:

$$E(r_i) = r_f + \frac{\text{Cov}(r_i, r_m)}{\sigma_m^2} [E(r_m) - r_f]$$

Alternatively,

$$E(r_i) = r_f + \beta_i [E(r_m) - r_f]$$

Where:

$E(r_i)$ is the expected return on asset i

r_f is the return on the risk-free asset

$E(r_m)$ is the expected return on the market portfolio

β_i is the beta of asset i

Various shortcomings pointed out by Kruger (2011), in the context of the JSE, are: the assumption of a normal distribution of asset prices is questioned when empirical evidence suggests a leptokurtic distribution. A measurable market portfolio is required which is practically impossible to construct. And lastly, given the two shortcomings above, the distinction between failure of either the model or market portfolio proxy is therefore uncertain.

Ball and Brown (1968) utilized the work of Sharpe (1964) in formulation of their regression model to be discussed in Chapter 3.

CHAPTER 3

LITERATURE REVIEW

An important note regarding prior research for this study is that there is no existing research on the informational content of trading statements. Consequently, this study is forced to draw on similar event study methodology on earnings announcements as a foundation. Given that trading statements contain a variety of earnings information it will be interesting to examine the importance of this earnings information as well as its link to share prices.

3.1. Financial statements and earnings as sources of information for the investor

Information acts as the core foundation underlying any company's value. Financial statements provide the market with a variety of information surrounding the company's performance, financial position and, more recently, direction through integrated reporting. Earnings disclosure is the measure for overall annual performance and is consequently the most important figure in financial reporting. Earnings stand at the core of valuation theory. Kothari (2001) alludes to the intrinsic value of a company being equal to the present value of all future cash flows. As cash flow follows earnings, the importance of earnings and its relationship with share value become evident. However, important questions remain: how much new information content does an earnings announcement or trading statement contain? Do investors utilize more timely sources of information? And, how well does the market factor this information content into share prices? The event study conducted in this thesis hopes to investigate these questions further.

Financial statements serve to provide the user with decision-useful information. Recognition of earnings is done so on the accrual basis at the transaction date when criteria stipulated by International Financial Reporting Standards (IFRS) are met. Cash flow is not considered and therefore a lag is created between accounting income and economic value - at least in the short term. Ball and Kothari (1994) suggest the relationship between earnings and share prices is less recognizable in the short term. What these

observations show is that the underpinnings for valuing companies depend largely on imperfect link between earnings information (an accounting concept) and economic value.

Although imperfect, earnings still serves as a logical measure of value. Earnings results crucially summarize historic performance of a firm and acts as a benchmark on which to compare future performance. Earnings data, in many cases, serves as a predictor of future performance of company. For the purposes of this study, historical earnings play an important role when considering that trading statements outline significant deviations from the previous year.

3.2. Earnings and share prices

The literature listed hereunder will contribute to the construction of the hypotheses listed under the 'Methodology' of this study. A large amount of past empirical research has been conducted in the area of earnings announcements, often with differing methodology and findings. Although this study incorporates the release of trading statements as the event rather than earnings announcements, this study hopes to initiate a new line of research and provide comparative evidence to the literature discussed below. It will also provide valuable insight into the usefulness and level of necessity of trading statements for JSE regulators and investors.

3.2.1. Event Study Methodology

Mackinlay (1997) asserts that the greatest successes of event studies has been in the area of corporate finance and goes further to say that event studies dominate empirical research done in these areas. A vital characteristic of a successful event study is to identify precisely the date of the event. This very often determines the usefulness of the study. The event date for the purpose of this study is the date on which the trading statement is released. Another underlying assumption of the study is rationality in the market i.e. prices respond immediately to new information.

Event studies focus on trading volume, share price variation, abnormal returns and, expected and unexpected return residuals surrounding an event. The methodology for a typical event study draws on efficient market theory and asset pricing to assess and analyze the impact of new information on security returns. Typically abnormal share trading volume, price variation or returns around the event date would advocate for market inefficiency and potential financial exploitability.

Fama, Fisher, Jensen, & Roll (1969) developed a pioneering event study technique for assessing event induced variance on a distribution of security returns. This study utilizes stock splits as the event to test the speed at which stock prices adjust to the new information. Other noteworthy studies are outlined below.

3.2.2. Ball and Brown (1968)

Ball and Brown (1968) were the first to provide evidence showing that share prices do react to newly released annual financial statements and the information contained therein. The study, conducted on the New York Stock Exchange (NYSE), provided evidence that annual earnings announcements convey new information to investors. Although 85 to 90 percent of this information is said to be captured in the share price by the release of annual earnings, there is a portion of new information in the earnings figure. It seems the market has turned to interim reports and has found other data sources to be more than adequate for preempting the earnings announcement.

Important sets of data used in this study were: contents of financial statements, announcement dates and movements of the underlying share price. A sample of 261 NYSE listed firms was examined over the period 1957 to 1965. Here, the release of the preliminary report was used as the event date as earnings and EPS figures were typically the same. Criteria for data inclusion were:

- i) Earnings data available for each of the years between 1946 and 1966;
- ii) The study only included firms with 31 December year ends;
- iii) Price data available for at least 100 months;
- iv) Finally, Wall Street Journal announcement dates available.

A common preposition regarding capital markets was that they were efficient and unbiased. If this were the case, any new information would immediately factored into asset pricing and abnormal gains would be deemed impossible. The methodology used by Ball and Brown (1968) is intended to ascertain whether stock price revisions are evidence of useful information contained in earnings announcements. To find supporting evidence for this, Ball and Brown utilized two methods for determining what the market expects earnings to be (the naïve and regression models) for a specific firm, and what happens when this proves to be different to expectations. Unexpected earnings figures act as a numerical proxy for any earnings 'surprises'. The expected earnings models are explained below:

- i) The **naïve model** assumes that the current year's earnings will equal the previous year's earnings. The naïve model implies that any change in earnings would be unexpected.
- ii) The **regression model** attempts to factor in the fact that earnings of firms typically move together over time as a result of economy-wide conditions. Using regression analysis, a beta quantifying the sensitivity of the firms change in earnings to a change in the market's earnings was calculated. Therefore, each firm's expected earnings is calculated after incorporating the beta against the change in market earnings. The regression model is formulated below:

$$E(r_i) = r_f + \beta_i [E(r_m) - r_f]$$

Where:

$E(r_i)$ is the expected return on asset i

r_f is the return on the risk-free asset

$E(r_m)$ is the expected return on the market portfolio

β_i is the beta of asset i

Firms were classified into two portfolios according to the sign of their unexpected earnings figure. Firms with actual earnings greater than expected earnings were deemed 'good news' portfolios, conversely firms with actual earnings less than expectations were classified as 'bad news' portfolios. The unexpected earnings calculation is shown below:

$$\text{Unexpected earnings} = \text{actual earnings} - \text{expected earnings}$$

Three earnings measures were utilized and illustrated below in figure 1. The regression model used net income (variable 1) and Earnings per Share (EPS) (variable 2). The naïve model used EPS (variable 3).

After constructing 'good' news and 'bad' news portfolios, abnormal share returns for each share within the portfolios was calculated using a CAPM-based market model and then cumulated. Abnormal share returns were calculated by subtracting market return from actual return:

$$ar_{it} = r_{it} - E(r_{it})$$

Where:

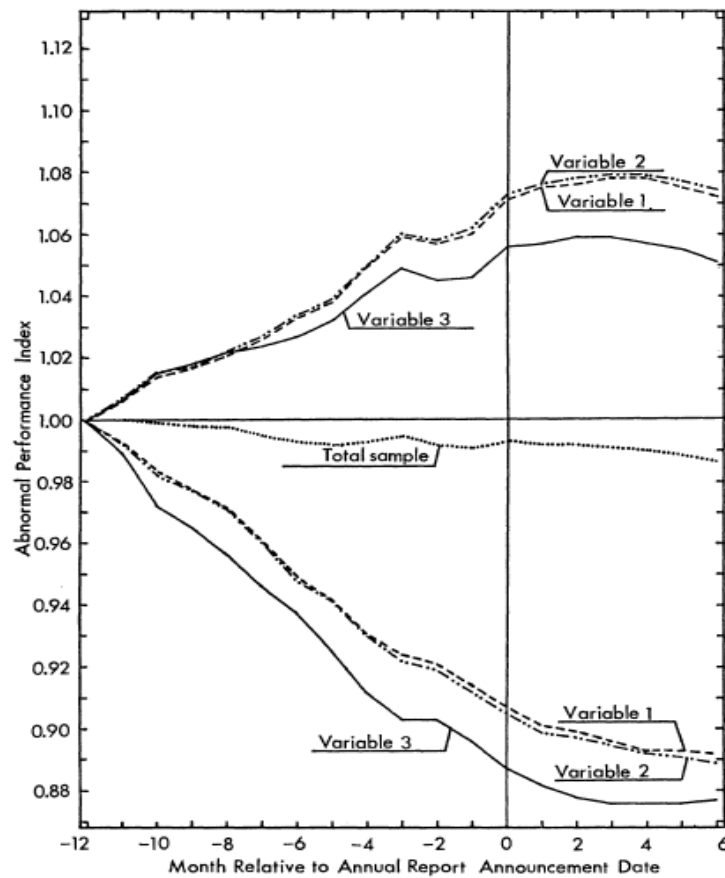
$E(r_{it})$ is the return on the market predicted by the CAPM (outlined in section 2.1.3) model in time t

r_{it} is the actual return observed on share i in time t

ar_{it} is the abnormal return on share i in time t

Legend: Figure 1 (next page)	
T_0	The release date of the earnings announcement
Total sample	The CAR of the entire sample
Abnormal performance index	A term for grouping shares based on their respective expected earnings measures, and measuring abnormal returns for the period.
Variable 1	Cumulative abnormal return (CAR) of the portfolio classified according to the sign of the regression model unexpected earnings measure.
Variable 2	CAR of the portfolio classified by the sign of earnings per share (EPS) contained within the earnings announcement.
Variable 3	CAR of the portfolio classified according to the sign of unexpected earnings surprises based on the naïve model.

Figure 1: Cumulative abnormal returns (CARs) for ‘good’ news and ‘bad’ news firms [Ball and Brown, (1968)]



Ball and Kothari (1994) elaborate on Ball and Brown’s (1968) study and draw four main conclusions from figure 1 above:

- i. **Annual earnings are positively correlated with share returns:** ‘Good’ (‘bad’) news companies exhibited abnormally high (low) share returns over the twelve months preceding the earnings announcement. Known as an association study, this reveals that some information contained in earnings does affect share price.
- ii. **Earnings announcements are not a timely source of information:** As discussed above, 85-90% of share price movement occurred in the twelve months preceding the earnings announcement. This shows that investors have utilized other, more timely, sources of information such interim or quarterly results.

- iii. **Earnings announcements do contain new information:** Abnormal share returns still existed for both 'good' and 'bad' news companies at the time earnings were released. So if 85-90% was captured before the event date, the remainder was captured on or after that date, showing the inclusion of new information into the stock price.
- iv. **Evidence of post-announcement drift in share prices:** Share prices continued to drift in the same direction for at least two months after the release date showing contradiction to efficient market theory.

3.2.3. Subsequent Variations of Earnings Studies

Magnitude of market responses

As elaborated on above, Ball and Brown (1968) show the relationship between news and share prices i.e. that 'good' news causes share prices to increase and 'bad' news causes prices to fall. Ball and Brown's study does not examine the extent of the relationship between the size of unexpected earnings and the magnitude of abnormal share returns.

Beaver (1974) utilizes an identical methodology to Ball and Brown (1968) to investigate the impact of the magnitude of unexpected earnings on share prices. However, in addition to ranking portfolios by sign, he ranks portfolios by the size of the respective earnings surprise measure. Beaver found portfolios with the higher unexpected earnings exhibit the greatest abnormal share returns. Similarly, Patell (1976) uses similar methodology but utilizes management earnings forecasts as expected earnings. The same findings are observed here. Beaver, Clarke and Wright (1979) used similar processes to Ball and Brown's (1968) regression model where they identify the magnitude of market responses by classifying an NYSE sample based on unexpected returns. The study found high correlation between unexpected returns and abnormal share returns, rendering the size and sign of the earnings surprises very influential.

Empirical evidence surrounding magnitude of market responses to unexpected earnings shows that the greater the unexpected earnings, the greater the share price movement. This is consistent with the theory of share prices adjusting to their intrinsic value proposed in section 3.1 of this study.

Quarterly earnings announcements

On the NYSE, companies are required to release quarterly earnings results. These serve as a timelier source of information than annual announcements for investors. Following Ball and Brown (1968), a

variety of studies have investigated the impact of quarterly earnings on share prices. In the context of this study, only certain internationally dual listed companies will release quarterly earnings results.

In similar vein to Ball and Brown, Foster, Olsen and Shevlin (1984) divide their sample of over 56000 observations into quintiles based on unexpected earnings (this time quarterly). Foster, Olsen and Shevlin's (1984) study forms a crucial component of this trading statement study. Their methodology is discussed separately in section 3.2.4 but like the findings in Ball and Brown (1968), top ranked quintiles i.e. highest positive unexpected earnings, exhibit the largest positive return. The opposite can be said of the bottom ranked quintiles which showed the most negative returns.

Longer investment horizons

New economic developments taking place in the current year of assessment may only partly be reflected by the previous earnings announcements and the results of the current year end. In other words, material positives or negatives for a firm may only be partly incorporated into current earnings as the economic benefits have yet to be fully consumed or exploited. Therefore, for longer investment horizons we perceive a stronger relationship between earnings and share prices. Easton, Harris and Ohlson (1992) investigate this over periods of up to ten years and find that the before said relationship does in fact strengthen over horizons longer than a year.

Extending this logic further, Kothari and Sloan (1992) take the perspective that share prices lead earnings i.e. that prices anticipate future earnings changes. Growing on work done by the before mentioned Ball and Brown (1968) study, Kothari and Sloan (1992) extend the horizon and find that share prices lead earnings figures by as much as four years. As per the logic proven by Easton, Harris and Ohlson (1992) above, it can take prolonged periods of time for new information e.g. economic developments that have already been factored into the share price to reflect in earnings figures. Foster, Olsen and Shevlin (1984) grow on traditional unexpected earnings models by creating share return driven models rather than models based on historic earnings like those in the Ball and Brown (1968) study. Ball and Kothari (1994) formulate that these event studies form the basis for our understanding of accounting earnings and share prices and how we perceive earnings to reflect firm value.

3.2.4. Foster, Olsen and Shevlin (1984)

Foster, Olsen and Shevlin (1984) draw on past earnings announcement research with predominant focus on post-announcement drift. After using four different unexpected earnings models to rank quintiles,

cumulative abnormal returns are calculated (table 1). They summarize that both sign and magnitude of unexpected earnings being correlated with abnormal share returns in the post-announcement period is consistent with new information gradually being factored into share prices rather than being impounded instantaneously. Foster, Olsen and Shevlin (1984) find contradicting evidence to market efficiency and assert that the assumptions of efficiency in accounting regulation studies are incorrect.

Table 1: Cumulative average residuals for Forecast Error Portfolios (quintile groupings) (Foster, Olsen, & Shevlin, 1984)

Forecast Error Portfolio	Days [-1, 0]				Days [-60, 0]				Days [+1, +60]			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
1	-1.36*	-1.34*	-6.54*	-1.38*	-5.57*	-5.94*	-5.39*	-21.50*	-3.02*	-3.08*	0.04	0.17
2	-0.94*	-0.88*	-3.70*	-0.86*	-4.01*	-3.95*	-2.65*	-14.48*	-2.59*	-2.73*	0.40	0.47
3	-0.50*	-0.49*	-2.44*	-0.56*	-2.29*	-2.37*	-1.04*	-10.19*	-1.58*	-1.78*	0.06	0.42
4	-0.25*	-0.25*	-1.36*	-0.24*	-1.19*	-0.32*	-0.54*	-6.33*	-1.34*	-0.92*	-0.06	0.16
5	0.04	0.19	-0.50*	0.06	-0.18*	0.93	-0.25*	-2.55*	-0.48*	0.22	0.00	0.39
6	0.28	0.44*	0.34*	0.28	0.96*	1.51*	0.92*	1.41*	0.55*	0.79*	0.14	-0.02
7	0.54*	0.73*	1.24*	0.52*	1.71*	2.38*	1.12*	5.52*	1.31*	1.32*	-0.02	0.07
8	0.90*	0.81*	2.38*	0.80*	3.41*	2.75*	1.99*	9.99*	2.46*	1.70*	0.03	-0.13
9	1.40*	1.03*	3.91*	1.18*	5.35*	3.78*	3.10*	15.20*	3.22*	2.21*	0.13	0.12
10	1.44*	1.26*	8.16*	1.65*	5.83*	4.83*	6.50*	26.73*	2.93*	3.23*	0.11	-0.37

Legend: Table 1 (above)	
Day 0	The release date of the earnings announcement
Forecast error portfolio	Also known as a ranked quintile portfolio (or decile).
Model 1 and 2	Cumulative abnormal return (CAR) of quintiles classified according to the sign and size of unexpected earnings measures. Model 1 and 2 base unexpected earnings measures on historical earnings releases.
Model 3 and 4	Cumulative abnormal return (CAR) of quintiles classified according to the sign and size of unexpected earnings measures. Model 3 and 4 use return-based formulas to calculate unexpected earnings measures. A short term (2 day) and medium term (61 day) model are used respectively.

Post earnings announcement drift (PEAD) in share prices is the most significant finding in the study. However, it is only found for some of the expected earnings models used. Four models were utilized in total. Two models were based on past earnings releases. PEAD was found for these models between 1974 and 1981. Two models were based on a time-series of security returns. Here, PEAD was not found. Foster, Olsen and Shevlin (1984, p. 575) assert that return-based expectation models are “less vulnerable to the ‘proxy effect’ criticism that has been made of results in previously reported literature.” This is particularly applicable to the JSE where dichotomy of share returns between two main sectors (industrial and mining) makes finding appropriate market proxies less certain (van Rensburg, 1997). The

models used to estimate unexpected earnings are formulated below and followed by illustrations of results in figure 2. Note the comparable cumulative abnormal return drift apparent for models 1 and 2, and the similarities to Figure 1 (Brown & Ball, 1968).

Models based on historical earnings releases

Model 1:

$$FE_{1,i} = \frac{Q_{i,t} - E(Q_{i,t})}{|Q_{i,t}|}$$

Model 2:

$$FE_{2,i} = \frac{Q_{i,t} - E(Q_{i,t})}{\sigma[Q_{i,t} - E(Q_{i,t})]}$$

Where:

FE_i is the forecast error of share i i.e. the unexpected earnings of share i for the respective model applied.

$Q_{i,t}$ is quarterly earnings for the i th firm in period t

$E(Q_{i,t})$ is the quarterly earnings forecast derived using the time-series model:

$$E(Q_{i,t}) = Q_{i,t-4} + \Phi_i(Q_{i,t-1} - Q_{i,t-5}) + \delta_i$$

(Where the parameters, Φ_i and δ_i , are estimated using the previous twenty quarters of earnings data)

Models based on security returns

Trading statements are, like most cautionary announcements, sporadic i.e. only companies meeting the materiality requirements will publish them. The date on which publication occurs also varies. This differs from earnings announcements which have prespecified dates and prior comparable periods. Financial information exhibited in trading statements lacks of historical depth making an unexpected earnings

models based on historic trading statement figures (models 1 and 2) impossible to apply. The benefit of return-based prediction models is that they utilize share price data around the event date. Therefore, return-based models (models 3 and 4) used by Foster, Olsen and Shevlin (1984) can be applied to trading statements and will form a vital component of this study's methodology. Model 3 is a short term model spanning one day before the event and the event date. Model 4 is a medium term model which incorporates share returns in the sixty days preceding the event date and the event date itself.

Model 3 (short term)

$$FE_{3,i} = \frac{\sum_{t=-1}^0 \tilde{u}_{i,t}}{\sigma(\tilde{u}_{i,t})}$$

Model 4 (medium term)

$$FE_{4,i} = \frac{(\sum_{t=-60}^0 \tilde{u}_{i,t}) / 61}{\sigma(\tilde{u}_{i,t})}$$

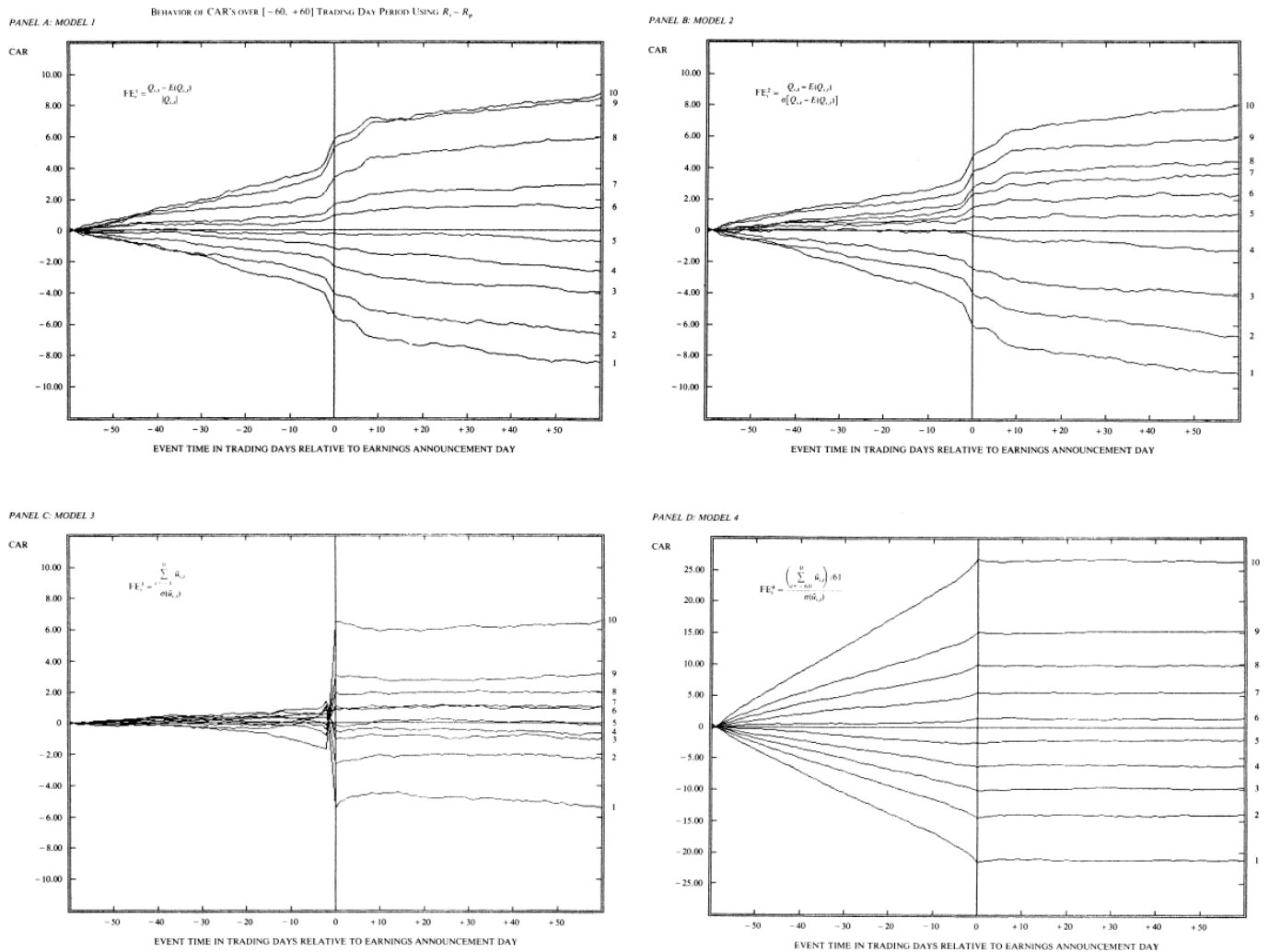
Where:

$\sum \tilde{u}_{i,t}$ is the cumulative abnormal return in the days before the announcement

$\sigma(\tilde{u}_{i,t})$ is the standard deviation of $\tilde{u}_{i,t}$ in the 250 trading day period prior to the period being examined.

FE_i is the forecast error of share i i.e. the unexpected earnings of share i for the respective model applied.

Figure 2: Cumulative abnormal returns (CAR) in response to quarterly earnings announcements (Foster, Olsen, & Shevlin, 1984)



3.2.5. Post-earnings announcement drift in share prices

As observed in Ball and Brown's (1968) study, the prices continue to move in a predictable direction for at least two months after the earnings release. Indicating market under reaction to earnings data, this phenomenon has become known as post earnings announcement drift (PEAD) anomaly alluded to earlier. Subsequent studies⁷ have reinforced the findings of Ball and Brown showing distinct cases of

⁷ (Rendleman, Jones, & Latane, 1982), (Foster, Olsen, & Shevlin, 1984), (Bernard & Thomas, 1990), (Ball & Bartov, 1996), and (Kraft, 1999)

drift in share prices. Foster, Olsen and Shevlin (1984) also find evidence of 'drift' in their study. This is illustrated in figure 2 following the event date for models 1 and 2.

The contents of this study will give special attention to the PEAD anomaly. Shivakumar (2007, p. 434) refers to this drift as the 'longest standing anomaly in the finance and accounting literature'. Reasons for such a phenomenon pertain to an inefficient market. Efficient market theory sets forth that prices should adjust instantaneously to new information rendering abnormal returns impossible. Empirical evidence promotes invalidation of EMH, at least at the semistrong-form level. In lieu of the existence of PEAD, investment strategies to exploit this anomaly and gain abnormal returns become a possibility.

Other studies such as Fama (1991) capitulate to efficient markets saying CAPM and other models used to estimate abnormal return and expected return are inadequate due to poor proxies and omission of key variables. Criticism of the beta used in return models is that it is prone to change over time and cannot be the foundation on which market efficiency is judged. Another argument blames hindsight associated with studies which look back as they include information not available to investors at the time.

Studies showing exploitable evidence of PEAD include Bernard and Thomas (1990) who divided observations into quintiles based on size of unexpected earnings. Creating a mock index, they track the performance of an equally weighted portfolio of shorting bottom quintile shares and longing top quintile shares. The index displayed positive abnormal returns of 4.19% (60 trading days after announcement) and 7.74% (180 trading days beyond announcement) sternly invalidating market efficiency. Bernard and Thomas outline two possible reasons for PEAD:

- i) Part of the price response is delayed due to the inability or failure to assimilate new information, or the cost of immediately exploiting this information exceeds the potential gains;
- ii) Drift is often observed when research has been conducted using normal returns estimated by the CAPM. Studies have shown that this model fails to properly adjust the securities for risk.

Under section 2.1.3., 'Tests of semistrong-form efficiency', certain documented anomalies were listed. According to Erlie (2011), questions of whether post-earnings announcement drift exists independently of these other anomalies exist. In other words, could observed post earnings announcement drift be a result of omitted variable bias? Kothari (2001) refers to a study by Kraft (1999) who found that drift is not integrated with the other anomalies. Fama and French (1996) find contradictory evidence that PEAD can possibly be explained by their three-factor model proposed in a previous study of theirs.

The implications of PEAD are outlined by Kothari (2001, p. 196): “post earnings announcement drift appears to be incremental to a long list of anomalies that are inconsistent with the joint hypothesis of market efficiency and an equilibrium asset-pricing model”. Moreover, Kothari (2001, p. 208) asserts, “fundamental analysis can yield rich return in an inefficient market”. PEAD exploitation strategies were found to be profitable by Shivakumar (2007). Questions of how this known anomaly still generates abnormal returns are answered by Francis et al. (2007) who suggest under/over reaction is a result of informational uncertainty. Informational uncertainty being representative of the quality of accounting earnings recognition practice. Therefore, the less restrictive the standards for earnings recognition, the greater the informational uncertainty and the slower information will be factored into share prices, thereby generating greater PEAD.

In Summary, Ball (1992) acknowledges that the ability to generate abnormal returns from publically available information exists. He weighs this against evidence supporting the contrary and concludes that markets are, to an extent, efficient.

3.2.6. Beaver (1968)

Beaver (1968) differentiates the earnings event study methodology by focusing on the relationship between earnings announcements and share return variance, and the relationship between earnings announcements and trading volume. Unlike other studies discussed previously, this study uses none of the assumption-heavy expectations models. Instead, the results have the ability to complement other findings later in this study. The goal of the study is to ascertain if investors do react to earnings announcements i.e. whether announcements contain new information.

The study is split into price tests and volume tests. Beaver (1968, pp. 69-70) attributes large fluctuations in volume to lack of consensus regarding the price on the side of individual investors. He goes on to say that “lack of consensus is induced by a new piece of information, the earnings report” and that share price variance will be caused when the market changes expectations and not just the individual. Consensus changes on the side of the individual and the market can happen concurrently, however only one needs to break through the average to portray the infusion of new information.

The Price Test: Share return variance (SRV)

As deduced from Foster, Olsen and Shevlin (1984) and later Ball (1992), estimating expected earnings puts any findings under scrutiny. Beaver (1968) uses residual share return distribution variance and not earnings expectations. Therefore, results are independent of estimation models.

Share Return Variance (SRV) as used by Beaver in this study:

$$SRV_{i,t} = \frac{u_{i,t}^2}{\sigma^2(u_{i,t})}$$

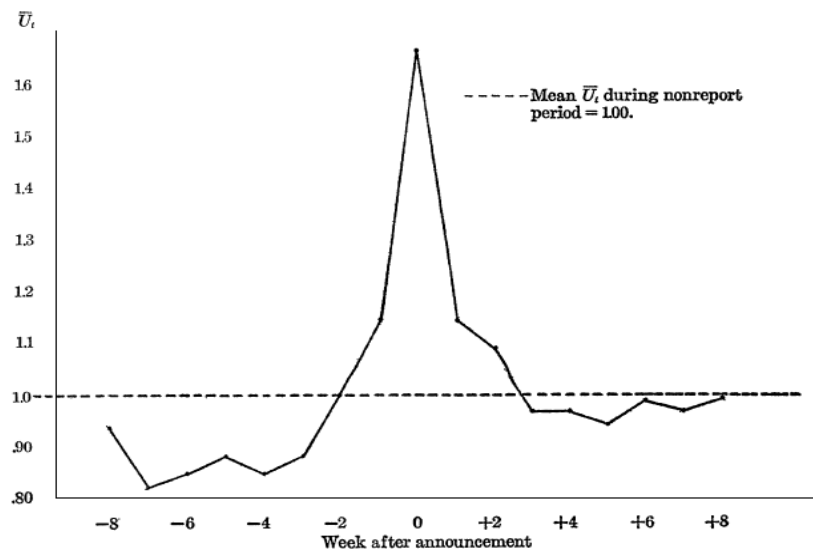
Where:

$u_{i,t}$ is the abnormal return of share i in time t

$\sigma^2(u_{i,t})$ is the variance of abnormal returns in a non-announcement period

Referring to figure 3 below, variation in weekly share returns prevalent during weeks closest to the announcement date is substantially higher than the mean. The variability illustrated here is consistent with the theory that investors factor new information into their intrinsic valuations, thereby increasing share price volatility relative to the sample period's mean.

Figure 3: Share return variance (SRV) over annual earnings announcements [Beaver (1968)]



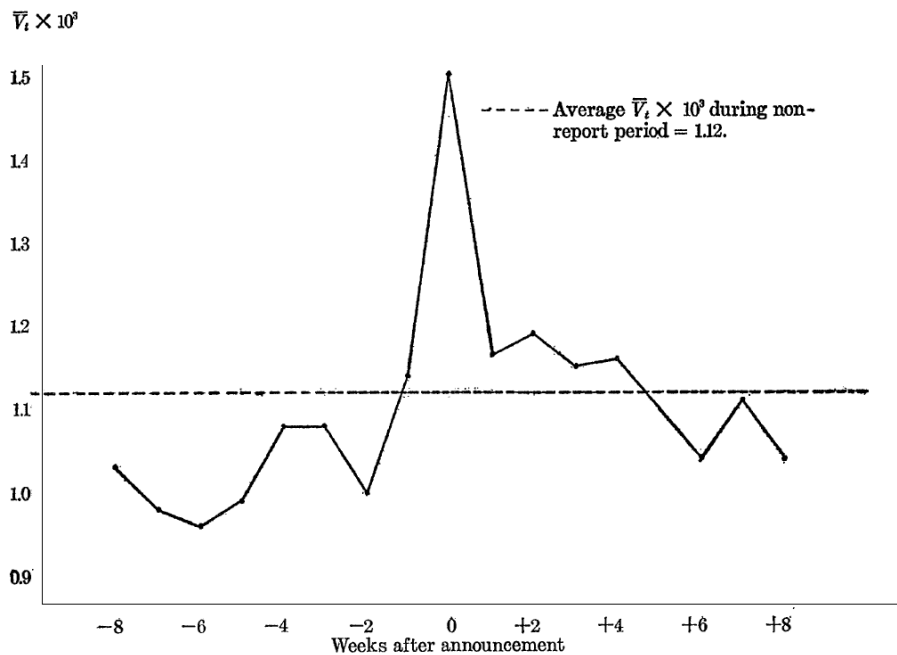
Findings by Beaver (1968) utilized weekly data from the NYSE. Morse (1981) as well as Patell and Wolfson (1981) use daily data and transaction-by-transaction stock prices to confirm results ascertained by Beaver i.e. that share price variance is significantly higher at the time of earnings announcements than over the remainder of the period examined.

The Volume Test: Trading volume activity (TVA)

As mentioned above, Beaver analyses trading volume as an indicator of new information filtering into the market. The measure used is referred to as trading volume activity (TVA) which expresses weekly volume traded as a percentage of total shares outstanding.

$$TVA_{i,t} = \frac{\text{Number of shares of firm } i \text{ traded in time } t}{\text{Number of shares of firm } i \text{ outstanding in time } t}$$

Figure 4: Trading volume activity (TVA) over annual earnings announcements [Beaver (1968)]



In similar fashion to the distribution of the price test, volume spikes above average in the period surrounding the earnings announcement showing that earnings announcements do carry new informational content. The slow reversion back to a mean volume could indicate individual investors revising expectations for some time before the market reaches consensus. This slow revision may be a contributor to the drift anomaly rendering this study directly transferable to a trading statement based event study.

3.3. International earnings evidence

The NYSE has fostered the bulk of earnings studies. Foster (1978) reiterates the need for evidence surrounding earnings on exchanges other than the NYSE to give support or supply counter evidence to NYSE findings. Studies have been conducted on some of the other leading stock exchanges worldwide. The Australian, English, Israeli, Japanese, New Zealand and Swedish stock exchanges will be reviewed below.

Australia

Brown (1970) applies the study by Ball and Brown (1968) on the Sydney Stock Exchange. A sample of 118 firms was examined from 1959 to 1968. Brown finds a near identical reaction to earnings announcements that Ball and Brown (1968) had uncovered two years earlier. Using similar methodology, 'good' news portfolios achieved a positive abnormal return of 5.0% and 'bad' news portfolios negative abnormal return equal to 9%.

New Zealand

Emanuel (1984) uses similar methodology to Beaver (1974). He examined 1196 earnings announcements in New Zealand from 1967 to 1979. Earnings announcements were split into quintiles based on the size of unexpected earnings. Emanuel finds that portfolios are perfectly ranked based on cumulative abnormal returns (CAR) over a 50 week period leading up to the earnings announcement i.e. that share returns are positively correlated to the magnitude of unexpected earnings.

Japan

Deakin, Norwood and Smith (1974) find significantly higher trading volume activity in the week of the earnings announcement on the Tokyo Stock Exchange. This is consistent with the volume test conducted in the Beaver (1968) study discussed above. Contrary to Beaver (1968), the price test for price variation yielded insignificant results in the same week. Consequently, we conclude that individual expectations have changed but not market consensus⁸. Knight (1983) suggests that this observation could be due to shortcomings with the methodology used in the study. All 42 firms within the sample are all characterized by the same calendar week for earnings release. Knight (1983, p. 66) says further that

⁸ Refer to subsection 3.2.5 for a review of Beaver's (1968) study and deductions made therein.

“this dramatically weakens the power of the test as the results are in effect based on only one observation and thus confounding errors are not adequately controlled”.

Sweden

Forsgardh and Herten (1975) study 19 earnings announcements on the Stockholm Stock Exchange. The basis for estimating expected earnings for each company was through direct communication with leading Swedish investors. A similar approach was adopted in a South African study by Kornik (2005) where consensus analyst EPS forecasts are used. Findings indicate that consensus expectations did change as investors revised share valuations following the earnings release.

London

Firth (1981) uses absolute residuals on 120 firms using the method set forth by Beaver (1968) on the London Stock Exchange. By ranking each firm’s mean absolute weekly residual in descending order of magnitude he finds the preliminary announcement week ranks first while the annual report week ranked second. Consistent with Beaver (1968), Firth concludes that the preliminary report contains significant information content.

Maingot (1984) uses security return variability (SRV) measure on 100 companies from 1976 to 1978. Studies in England fall prey to dividends and earnings being announced simultaneously. The observed result is therefore a combination of the two effects. Beaver (1968) specifically excludes observations where the above applies. Maingot (1984) finds the announcement week to exhibit the highest mean SRV which is substantially higher than the preceding eight weeks. Findings are resultantly in favor of earnings having significant information content.

Israel

Lev and Yahalomi (1972) use Beaver’s (1968) trading volume study. No significant trading volume was found on the Tel Aviv Stock Exchange and found that financial statements have insignificant information content. Knight (1983) assesses the findings of this study and suggests the reason for Lev and Yahalomi’s findings is Israel’s informal manner of submitting reports to the exchange as there is no formal earnings announcement to the public. Knight (1983) suggests that information is easily leaked out between the financial year end and when annual reports are released.

A summary of international earnings event study results and their respective methodologies is outlined in table 2 below. Not all have been discussed in detail. Although these studies relate to earnings announcements and not trading statements, gauging informational efficiency is a fundamental feature.

Legend: Table 2	
Information content	Fluctuations in share returns surrounding the earnings release date. Increases or decreases in share price indicate new information being synthesized by the market. Depending on the study, these fluctuations can be examined in the days leading up to the release, and/or following it.

Table 2: Studies of Information Content of Annual Earnings Announcements (Knight, 1983)

Author (s)	Market (s)	No. Firms Included	No. Years Studied	Period Studied	Return Interval	Methodology	Result
Ball & Brown (1968)	NYSE	261	9	1957-1965	Monthly	API – Price	IC
Beaver (1968)	NYSE	143	5	1961-1965	Weekly	Absolute Residual • Price • Volume	IC IC
Brown (1970)	Sydney	118	10	1959-1968	Monthly	API – Price	IC
Deakin, Norwood & Smith (1974)	Tokyo	42	1	1971-1972	Weekly	Absolute Residual • Price • Volume	NIC IC
Firth (1981)	London	120	3 x 1	1976, 1977, 1978	Weekly	Absolute Residual • Price	IC
Forsgardh & Herten (1975)	Stockholm	19	1	1969	Weekly	Absolute Residual • Price	IC
Foster (1975)	OTC	73	8	1965-1972	Monthly	API – Price	IC
Grant (1980)	NYSE OTC	110 211	5 5	1960-1964	Weekly	Absolute Residual • Price	NIC IC
Lev & Yahalomi (1972)	Tel Aviv	62	1	1968	Weekly	Average • Volume	NIC
Morse (1981)	OTC NYSE ASE	25 20 5	4 4 4	1973-1976	Daily	Absolute Residual • Price • Volume	IC IC
Key: IC = Information content NIC = No information content							

3.4. Earnings studies on the Johannesburg Stock Exchange (JSE)

3.4.1. The First Earnings Study on the JSE: Knight (1983)

Knight (1983) presented the first earnings based event study on the JSE. The study investigated both mean and variance of residual returns surrounding the earnings announcement for the years 1973 to 1980. 41 companies and 261 announcements were used from interim, preliminary and annual reports.

Knight utilizes the same methodology as Ball and Brown (1968) for calculating abnormal returns relative to market returns⁹ using company betas for each firm and linking sensitivity of share returns to the market. To investigate the information content of earnings releases using the methodology of Beaver (1968), Knight performs absolute residual analysis where squared residual returns are divided by estimated variance for the full 404 weeks of data. This way, unusually large residual returns can be identified.

Findings and conclusions drawn from Knight (1983):

- An association exists between the sign of unexpected earnings and the sign of abnormal returns. This is consistent with Ball and Brown (1968).
- In the announcement week no association is observed. However, abnormal returns are significantly positive for both 'good' news and 'bad' news portfolios, while the magnitude of the change is larger for 'good' news.
- Contrary to findings by Ball and Brown (1968) on the NYSE, the JSE appears pessimistic in that 'good' news requires confirmation of 'hard information' received from the earnings announcement. While 'bad' news is to a large extent factored into share returns.
- Results comparable to the study done by Beaver (1968) on residual variation are observed to be 78.4% higher than average during the preliminary announcement week. Beaver (1968) showed residual variation to be 67% higher than the mean. Resultantly, Knight (1983) cautiously concludes that South Africa's preliminary report is more informative than the US counterpart as a result of the US having more abundant alternative information sources.

⁹ See Ball and Brown (1968) regression model synopsis under subsection 3.2.2.

- The second highest residual variation occurs in the week of the interim report while the third highest occurs in the week of the annual report.
- Non-random drift in share returns is observed for a number of weeks following the announcement showing that there is in fact some level of market inefficiency.

3.4.2. Subsequent Earnings Studies on the JSE: Kornik (2005)

Following Knight (1983), a few deviations¹⁰ from the focus of this study have been investigated. However, no subsequent studies using similar methodology on the JSE have investigated unexpected earnings and the share price reaction thereto until Kornik (2005).

The study by Kornik (2005) aims to assess the relationship between unexpected earnings and abnormal share returns much like Ball and Brown (1968) conducted. Three different investigation periods are analyzed:

- I. The **association study** examines abnormal returns over the 9 months leading up to the announcement.
- II. The **event study** examines abnormal returns for 2 days before the announcement until 2 days after.
- III. The **post-announcement drift study** analyzes the 60 days beyond the announcement date.

Kornik (2005) utilizes (a) a random-walk earnings per share (EPS) model and (b) an analyst forecast EPS model. Much like Ball and Brown's (1968) 'naïve model', under the random-walk EPS model earnings are expected to remain unchanged year to year and consequently any change in earnings is unexpected. The analyst forecast EPS model uses forecasts available to the public through information service providers. Here expected earnings equal analyst forecasted EPS at the start of the investigation period. Two different analyst forecasts are required for the start of the association study and the event study respectively.

¹⁰Gevers (1992) and Van Heerden (2001) study into other avenues such as inflation-adjusted income and share price behavior, and relationships between firm size and the share price reaction to earnings announcements respectively.

Share portfolios are similarly classified into ‘good’ and ‘bad’ news portfolios as per the Ball and Brown (1968) study. Following this, ranked quintiles are developed using the formula:

$$U(EPSt) = \frac{EPSt - E(EPSt)}{|EPSt|}$$

Where:

$U(EPSt)$ = unexpected percentage EPS

$EPSt$ is the actual announced EPS, and

$E(EPSt)$ is the expected EPS for share i in period t

Kornik measures abnormal returns (ar_{it}) using the formula:

$$ar_{it} = r_{it} - r_{mt}$$

Where:

r_{it} is the actual return on share i in period t , and

r_{mt} is the return on the market in period t

Importantly, adjustments are made for capitalization issues, share splits and cash dividends to provide an accurate measure of overall return. Kornik (2005) uses an economic group based¹¹ approach to apply a market proxy. Sector indices were not used as concentration on the JSE saw index movements being dominated by few firms.

Alternative approaches to cumulating abnormal returns were considered:

- I. Cumulative Abnormal Return (CAR) used in the study by Foster, Olsen and Shevlin (1984) is obtained by calculating an arithmetic average of sample firm’s abnormal returns in each time

¹¹ Examples of economic groups include resources, basic industrials, financials etc. See Kornik (2005), Appendix B for a breakdown of groups.

period, then summing time period returns over the investigation period. Cumulative abnormal returns are calculated as follows:

$$CAR_t = \frac{1}{n} \sum_{i=1}^n \sum_{t=1}^w ar_{it}$$

Where:

ar_{it} is the abnormal return of share i in period t

w is the number of time periods, and

n is the number of shares in the portfolio.

Here, the effects of compounding are ignored and so investor return is biased, especially as t increases. For shorter time periods, the bias is mitigated substantially.

- II. Abnormal Holding Period Return (AHPR) does take into accounting the effects of compounding to enhance the accuracy of returns. AHPR is calculated using the formulas:

HPR is the geometric mean of daily returns of share i for w days.

$$HPR_{iw} = \prod_{t=1}^w (1 + r_{it})$$

Similarly, the market (m) proxy's HPR is:

$$HPR_{mw} = \prod_{t=1}^w (1 + r_{mt})$$

Finally, the portfolio AHPR for w days is the arithmetic mean of individual share AHPRs (Barber & Lyon, 1997).

$$AHPR_w = \frac{1}{n} \sum_{i=1}^n (HPR_{iw} - HPR_{mw})$$

Kornik (2005) selected AHPs results in the calculation of return to achieve a more accurate and unbiased figure.

Findings and conclusions drawn from Kornik (2005):

- Correlations between the sign of unexpected earnings and AHPs in both the analyst forecast model and the random walk model. The relationship appears weaker when the random walk model is used. Drawing on Lev and Ohlson (1982), Kornik (2005) infers that since the analyst forecast model produces abnormal returns of larger magnitude than the random walk model, it can be deemed a better model for expected earnings. Ball and Brown (1968) did not find significant differences between their two models but, unlike Kornik (2005), did not use analyst forecasts.
- A significant positive correlation exists between the size of annual unexpected earnings and magnitude of abnormal share returns over the 9 months leading up to the announcement. The same is found for the period surrounding the event date.
- Unexpected earnings cause share prices to fluctuate significantly i.e. actual earnings greater than expected earnings causes a positive abnormal return i.e. announcements do include new, timely information. The reaction is asymmetrical in that 'good' news portfolios cause larger share return reaction than 'bad' portfolios.
- Mean abnormal returns for the post announcement period are greater for 'good' news portfolios than 'bad' news portfolios showing the existence of post earnings announcement drift and therefore invalidating market efficiency at the semistrong-form level.
- Analyst forecasts serve as the best earnings expectations model i.e. abnormal share returns are more correlated to unexpected earnings than a random walk model based on the previous year's earnings.

CHAPTER 4

THE JOHANNESBURG STOCK EXCHANGE

For the sake of comparing findings of this study to prior JSE and internationally based studies, it is important to give the JSE perspective. Distinguishing factors unique to the JSE may cause observed relationships between earnings information and share prices to differ across international stock exchanges. This chapter serves to outline key characteristics of the JSE and preempt some of the possible shortcomings evident in future findings.

The JSE started operations in 1887 shortly after the discovery of gold in Witwatersrand in 1886. The exchange is usually ranked (looking back from 2013) around 20th among the world's exchanges on the basis of market capitalization and value of shares traded. This poises the JSE as a rather small player on a world scale, especially when compared with the USA's New York Stock Exchange (NYSE).

Three main topics are discussed in this section: (1) the liquidity and concentration on the JSE, (2) JSE disclosure requirements and most applicably, (3) trading statements.

4.1. Liquidity and concentration on the JSE

Low liquidity and high concentration are consequences of the comparably small nature of the JSE. Thin trading of shares below the top 60 is a characteristic strongly associated with the JSE. Low liquidity on the JSE often brings the level of efficiency into question. Consequently, numerous studies have investigated efficiency (as outlined in chapter 2) on South Africa's primary stock exchange. Bhana (1994) reviews major studies of efficiency on the JSE and uses an efficiency scale ranging from perfect efficiency to complete inefficiency. Results of Bhana's evaluation suggest that South Africa is operationally efficient which equates to Fama's (1970) semistrong-form, i.e. abnormal returns can only be achieved through utilization of inside information not privy to the majority of investors. However, transactions on the JSE have been rising consistently which theoretically could prompt improvements in efficiency.

An observation by Bowie (1994), applicable to this study, pertains to how there is a distinct possibility of a smaller sample on JSE due to low liquidity and thin trading. Trading statement releases amongst the top 60 are incredibly limited. In a more liquid market, where the option to use the top 100 to 200 shares

was available, sample size would increase dramatically. Smith, Jefferis and Ryoo (2002) constantly reiterate lack of liquidity in African markets saying that low of liquidity or lack thereof is a distinct problem. Smith, Jefferis and Ryoo (2002) discuss low liquidity on the JSE and link it to high levels of concentration. Taken further, Kruger (2011, p. 105) and Kruger and Van Rensburg (2008, p. 5) discuss resource industry concentration on the Johannesburg Stock Exchange (JSE) as “excessive”. Kruger (2011) suggests improved liquidity has become a feature following the introduction of Johannesburg Equities Trading (JET) automated system in 1996.

4.2. JSE disclosure requirements

Companies listed on the JSE are required to publish three earnings reports annually:

- The ‘interim report’ conveys the financial results for the first six months of the financial year.
- The ‘preliminary report’ summarizes the annual results to be published in the annual report. This is published in the weeks leading up to the release of the annual financial statements.
- The ‘annual report’ conveys the company’s financial performance for the year in the annual financial statements. Integrated reporting detailing business segments, reports from executives and other operational information is also included.

The New York Stock Exchange (NYSE) does not require interim reports although the SEC (Securities Exchange Commission) does. Quarterly earnings releases are used which serve as a timelier source of information than interims. The JSE only requires interim results (bi-annual). Therefore, comparisons of the speed at which information is factored into share prices on the NYSE and JSE should take this into account.

4.3. Trading Statements

In South Africa, the Johannesburg Stock Exchange (JSE) Listing Requirements have included trading statements under section 3, ‘continuing obligations’, since the early 2000s. Recent amendments in 2006 and 2010 have edited and solidified the circumstances in which companies are required to publish a ‘trading statement’ to the Security Exchange News Service (SENS). Publication of a trading statement

must occur when the company is satisfied that a reasonable degree of certainty exists that results for the period to be reported on will differ by more than 20%¹² from the most recent of:

- Financial results for the prior comparable period; or
- Forecasted projections of profit or guidance given by the issuer.

The disclosure requirements for trading statements outline that any trading statement published should include the period to which it relates, the difference in expected earnings, a range to describe such differences and a minimum percentage difference. If the company, after publishing a trading statement, feels reasonably certain that the previously published number has changed, another trading statement must be published. The JSE Listings Requirements provide further guidance for the use of certain words and specific earnings variation quotes. An excerpt from the official JSE listing requirements is found in appendix A.

¹² Property entities – 15%

CHAPTER 5

HYPOTHESES, METHODOLOGY AND DATA

5.1. Hypotheses

This section outlines the problem statement, along with a set of sub problems, to be formally addressed in this study.

The problem statement

Is there a relationship between unexpected earnings measures conveyed by trading statement releases and future share returns?

Sub problems

The following sub problems are structured around analyzing the relationship between earnings information, contained within trading statement releases, and abnormal share returns over the event study period. Furthermore, results will be analyzed for any unusual reactions such as abnormal fluctuations in share return variance and trading volume surrounding the trading statement release. The following six sub problems, structured as hypotheses, have been compiled:

- 1) Hypothesis 1: Investors make use of timelier sources of information than trading statements to revise share valuations leading up to the release date.
- 2) Hypothesis 2: Trading statements contain new information that elicits investor reaction surrounding the release.
- 3) Hypothesis 3: The sign of unexpected earnings measures calculated by the short term models¹³ and medium term model show no correlation with the sign of corresponding abnormal share returns in the (+3;+60) post-release period.
- 4) Hypothesis 4: The sign and size of unexpected earnings measures calculated by the short term models and medium term model show no association with the sign and magnitude of abnormal

¹³ These models (short and medium term) are constructed over the following windows: (-2;+1), (0;+1), (-1;0), (-5;0), (-60;-5).

- 5) share returns in the (+3;+60) post-release period i.e. there is no evidence of drift following the trading statement release for all unexpected earnings models.
- 6) Hypothesis 5: There is no evidence of momentum effects over the event study period.
- 7) Hypothesis 6: Trading volume activity (TVA) and share return variance (SRV) are observed to be normal¹⁴ over the one week period surrounding the trading statement release.

5.2. Methodology

The methodology outlined below draws on various sources listed in the literature review to give a comparable, unique method for analyzing the information content of trading statement releases. Note that this is the first trading statement based event study on the JSE, as such numerous processes have been adopted, manipulated and applied to this unique study. This study utilizes and adapts methodology from Ball and Brown (1968), Kornik (2005), Foster, Olsen and Shevlin (1984) and Beaver (1968) to create a robust analysis of trading statement releases and the informational content thereof. To test the informational content of trading statement releases, portfolios need to be classified in the following ways:

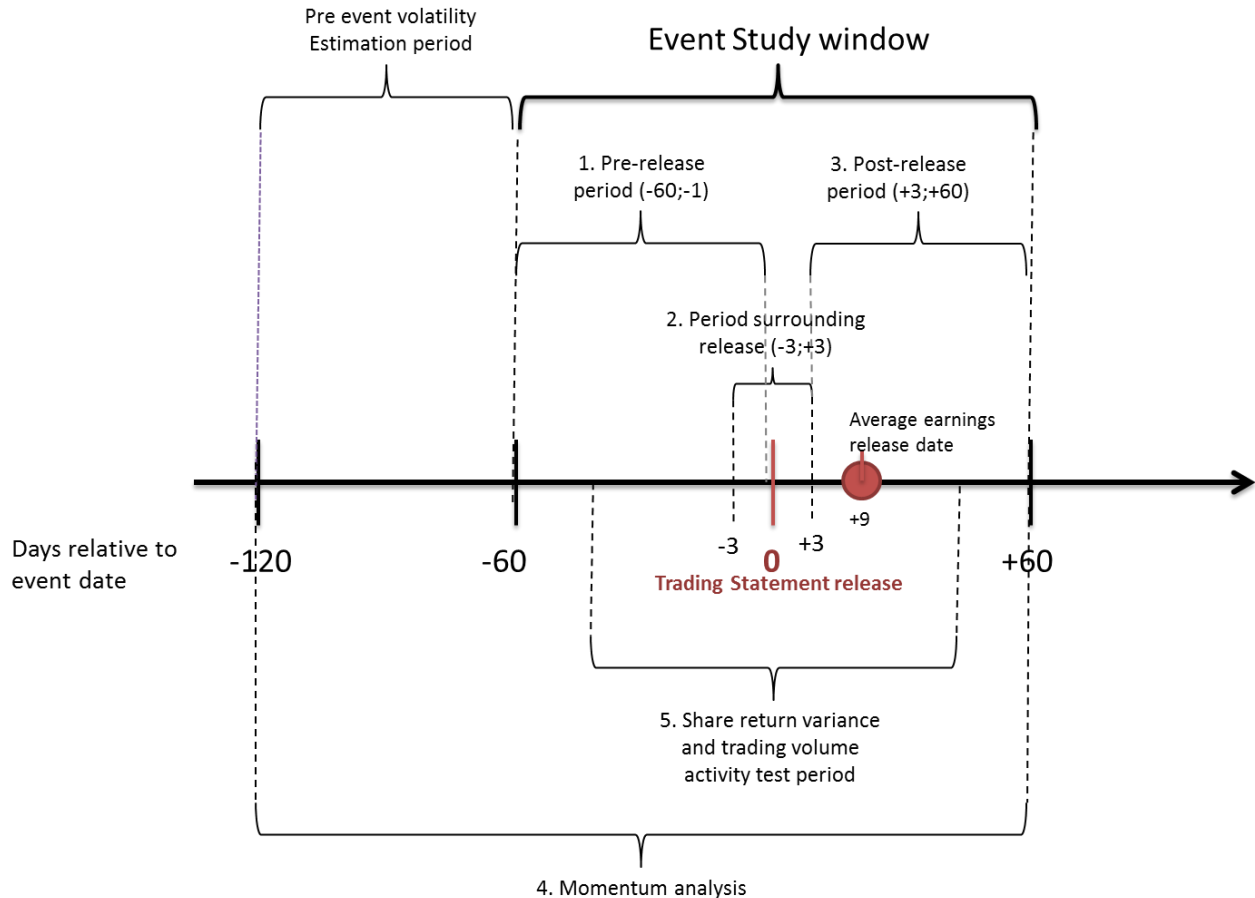
- I. 'Good' news and 'bad' news portfolios are constructed based on the **sign** of trading statement releases and unexpected earnings measures calculated using the short term and medium term models to be discussed in section 5.2.1.
- II. Ranked quintiles based on the **sign and size** of unexpected earnings measures are also calculated using the short term and medium term unexpected earnings models. Due to the comparably low number of observations in this study, five quintiles are used rather than the ten used by Foster, Olsen and Shevlin (1984).

Cumulative abnormal returns (CARs) are then computed for 'good' and 'bad' news portfolios as well as the ranked quintile portfolios. The 'good' and 'bad' news portfolios are then tested for any significant correlations between the sign of the trading statement information, as well as the unexpected earnings measure, and their respective CARs. 'Good' and 'bad' news portfolios are then tested for deviations in share return variance (SRV) and trading volume activity (TVA). Ranked quintile portfolios are tested for

¹⁴ "normal" referred to here is the observation that share return variance and trading volume activity are not largely different from the whole sample period.

correlation between the sign and size of unexpected earnings measures and the magnitude of the corresponding CARs.

Figure 5: Trading statement event study timeline



The examination of the informational content of trading statement releases is split into five areas as illustrated in figure 5 above.

1. **The pre-release period** spans the days (-60;-1) and is primarily used to ascertain whether the information contained in trading statement releases is factored into share returns through other, timelier sources of information.
2. **The period surrounding the release** covers the brief (-3;+3) day period surrounding the release. The core goal of this period is to analyze whether new information is being impounded into share valuations in the days immediately preceding and following the release.
3. **The post-release period** spans the days (+3;+60) and is scrutinized for post trading statement release drift, the primary focus of this study.

4. **Momentum analysis**, and
5. **Share return variance (SRV) and trading volume activity (TVA) tests** serve as compliments to any findings relating to the informational content of trading statements.

The relationship between the sign of the trading statement, as well as unexpected earnings measures, and the corresponding CARs is examined and mapped graphically for the time periods listed above. The foundation of this event study is the calculation of the various unexpected earnings measures and abnormal share returns (and the accumulation thereof). The methods and processes for calculating these variables are explained in the sections to follow.

5.2.1. Unexpected earnings models

Unexpected earnings measures will act as the ranking mechanism for 'good' and 'bad' news portfolios, as well as ranked quintile portfolios. Consequently, it is important to offer more than variation to enhance the study's robustness and to determine the model offering the best return predictability.

The first classification method uses the sign of the trading statement's earnings contents. For example, portfolios are classified as 'good' news and 'bad' news based on whether earnings numbers in the trading statement are higher or lower respectively than the prior comparable period.

Due to trading statements containing 'estimates' of earnings changes and results, investors may perceive trading statement data to be immaterial. Further shortcomings of trading statements include the lack of historical depth and the unpredictability of the trading statement releases. Resultantly, traditional expected earnings estimation models, used in several earnings event studies, must be discarded. Traditional models utilize historical earnings information (usually past earnings announcements dating back five to ten years). These models are not transferable to this study and return-based unexpected earnings models must be used. The second and third classification methods are detailed below. Note that these classification methods, in addition to testing correlations between **sign** of the unexpected earnings measure and **sign** of CARs, also test correlations between **size** of the unexpected earnings measure and **magnitude** of the corresponding CARs.

Return-based unexpected earnings models as used by Foster, Olsen and Shevlin (1984) are adopted and renamed for the purpose of this study.

- i. A short term model with four variations is used. Relative to the event date, the variation of days used in the model were (-2;+1), (0;+1), (-1;0) and (-5;0). An example of the first variation, (-2;+1) is shown below:

$$FE_i^{ST} = \frac{(\sum_{t=-2}^1 \tilde{u}_{i,t}) / 4}{\sigma(\tilde{u}_{i,t})}$$

Note that the period denoted (-2;+1) is inclusive of the two days prior to the release, the event date and the day following the release i.e. four days in total. All notations used in this study follow the same structure such that all days presented in the notation are included in the model.

- ii. Secondly, a medium term model was used to capture share returns over a longer term period leading up to the event date. The only variation of this model is for the period (-60;-5).

$$FE_i^{MT} = \frac{(\sum_{t=-60}^{-5} \tilde{u}_{i,t}) / 56}{\sigma(\tilde{u}_{i,t})}$$

Where:

FE_i is the forecast error of share i i.e. the unexpected earnings of share i for the respective model applied.

$\sum \tilde{u}_{i,t}$ is the cumulative abnormal return in the days surrounding the announcement, specified by the type of model.

$\sigma(\tilde{u}_{i,t})$ is the standard deviation of $\tilde{u}_{i,t}$ in the 60 trading day period prior to the period being examined. This is replicated for both models.

5.2.2. Calculating abnormal returns

I. Calculation

The formula adopted by Kornik (2005) ignores adjustments for systematic risk of individual shares. Betas for the FTSE/JSE All Share Index (ALSI), Financial and Industrial Index (FINDI) and Resources Index (RESI) are available. However, Kornik (2005) found enormous fluctuations in betas over the six-year study period on the JSE. Consequently, considerations were made on the suitability of using beta for its benefits versus the increased estimation risk associated with unstable betas. Normally, return on the market proxy would be beta-adjusted, however after testing of betas over the estimation period, this study confirmed betas as being too unstable. The Kornik (2005) study assumes betas are equal to one. This study adopts the same methodology.

Additionally, due the dichotomy of the JSE as found by Van Rensburg (1997), the FTSE/JSE All Share Index is deemed too broad a proxy. For this study, the Resources Index (RESI) and Financial and Industrial Index (FINDI) are used to best address this. Shares returns are then applied to their corresponding market proxy to compute abnormal return. The formula for abnormal return of individual firms is detailed below:

$$ar_{it} = r_{it} - r_{mt}$$

Where:

r_{it} is the actual return on share i in period t , and

r_{mt} is the return on the relevant market index (FINDI or RESI) in period t

ar_{it} is the abnormal return of share i in period t

II. Cumulating abnormal returns

Cumulative abnormal return (CAR) will be used to sum returns corresponding the applicable period. CAR ignores the effects of compounding, however, this is shortcoming is rendered negligible by the short

time periods used in this study. Using CARs is also more congruent with the return-based unexpected earnings models used by Foster, Olsen and Shevlin (1984). The formula for cumulating abnormal returns is presented below:

$$CAR_t = \frac{1}{n} \sum_{i=1}^n \sum_{t=1}^w ar_{it}$$

Where:

ar_{it} is the abnormal return of share i in period t

w is the number of time periods, and

n is the number of shares in the portfolio.

5.2.3. Momentum analysis

As stated previously, momentum analysis was used to add further substance to the analysis of the event window. An important question will be whether momentum is observable following the trading statement release and whether there is any association between the momentum component and any observable drift in the post-release period. Various periods over the duration of the event study are tested for by regressing past CARs against the corresponding forward CARs using the regression equation:

$$Y_i = \alpha + \beta \cdot X_i + \varepsilon_i$$

Where:

α is the intercept coefficient

β_i is the slope coefficient

X_i is the explanatory variable, in this case prior period CAR

Y_i is the dependent variable, in this case the CAR for the period following that corresponding to that of the explanatory variable.

ε_i is the error term

5.2.4. Share return variance (SRV) and trading volume activity (TVA) tests

By construction, expected earnings models have large estimation risk. Share return variance and trading volume activity have far fewer overbearing assumptions. Resultantly, the use of share price variation and trading volume to analyze the dissemination of new information into the market acts as supporting material and also adds robustness to the study.

The methodology used by Beaver (1968) was replicated in this study. Test results for time intervals of 1 week (5 trading days) will be computed for a 15 week period surrounding the trading statement release i.e. seven weeks before, the week of the trading statement release and seven weeks following the release. The share return variance and trading volume will be analyzed for (1) positive trading statement ('good' news) portfolios, (2) negative trading statement ('bad' news) portfolios and (3) the entire sample.

Share return variance (*SRV*) measures share price variation and was calculated individually for each trading statement release using the formula below:

$$SRV_{i,t} = \frac{u_{i,t}^2}{\sigma^2(u_{i,t})}$$

Where:

$u_{i,t}$ is the abnormal return of share i in time t

$\sigma^2(u_{i,t})$ is the variance of abnormal returns in a non-announcement period. This non-announcement period is the -120 day to +60 day window, excluding the 75 day period (15 weeks) surrounding the trading statement release date i.e. periods (-120;-38) and (+38;+60)

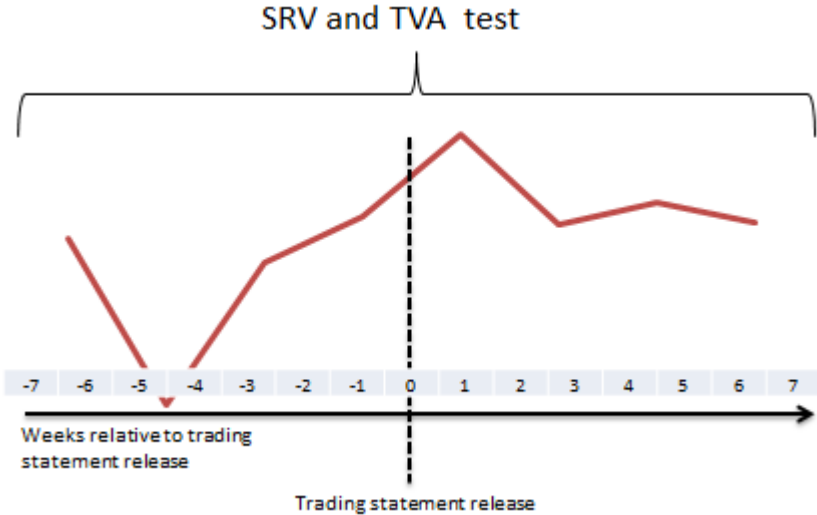
Trading volume activity (TVA) measures fluctuations in trading volume using a standardized measure. The formula is presented below:

$$TVA_{i,t} = \frac{\text{Number of shares of firm } i \text{ traded in time } t}{\text{Number of shares of firm } i \text{ outstanding in time } t}$$

Note: Where the number of shares outstanding changed over the event period, a time-weighted average of shares outstanding was calculated and used.

See figure 6 for a proposed illustration of results.

Figure 6: Proposed illustration and setup of SRV and TVA results



5.3. Data collection

A total sample of 58 trading statement releases (30 'good' news and 28 'bad' news releases) was compiled for use in this study. Selection criteria, sources and limitations are expanded upon below:

5.3.1. Sample selection

The criteria for the selection of companies:

- The company must fall within the top 60 listed companies by market cap on the JSE (some companies were used more than once).
- A trading statement must have been published
- Required data listed below must be available
- Voluntary trading statements (i.e. where the company elects to publish a statement without meeting the requirements) were excluded

For each company the data requiring collection is:

- Trading statement release information:
 - Company name and ticker
 - Date of release (where releases occur after 5pm the statement release was deemed to be the following day)
 - The trading statement sign i.e. positive or negative
- Daily share return data on the above shares
- Daily share trading volume and shares outstanding
- Daily sector index returns for both RESI and FINDI

5.3.2. Sources of data

1. **Bloomberg** for all daily return and volume data
2. **McGregors BFA** for all trading statement information and news

5.3.3. Limitations to data collection

- I. Given the JSE's recent bullish trend within the 2010 to 2013 data period, the existence of negative trading statements for the top 60 shares is thin. It is noticeable that many of the negative trading statement releases are published by the same companies over different periods.

- II. Liquidity constraints, as alluded to in chapter 4, render the use of smaller companies on the JSE unavailable. This puts limitations on the sample size. In this study, only the JSE's top 60 shares were used.

Chapter 6

EMPIRICAL RESULTS

The investigation of the link between abnormal share returns and the information content of trading statement releases has been split into five distinct areas. The results will be split identically into:

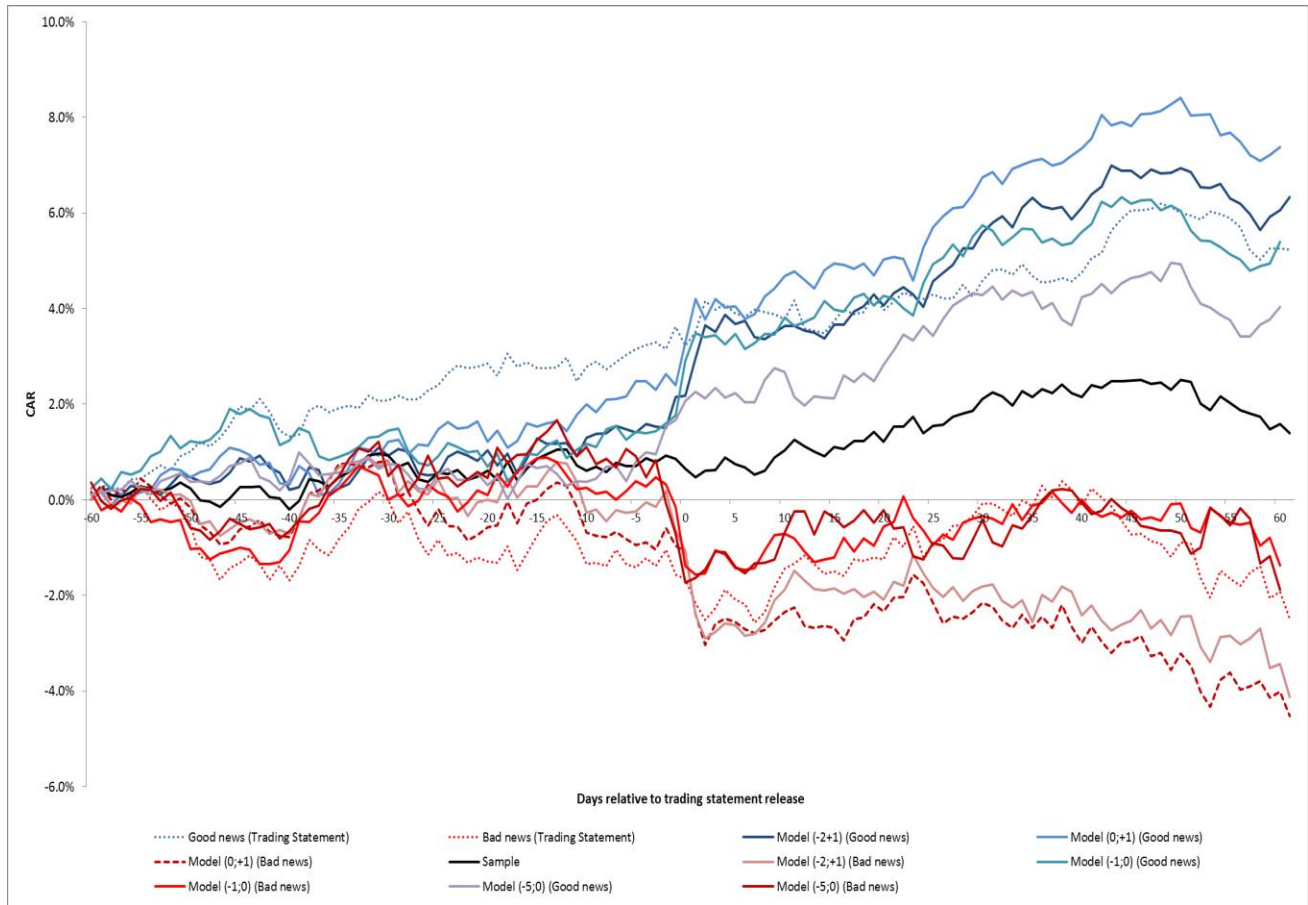
1. The pre-release period,
2. The period surrounding the release,
3. The post-release period,
4. Momentum analysis
5. Share return variance(SRV) and trading volume activity (TVA) tests

Positive unexpected earnings measures are expected to yield positive abnormal share returns over the corresponding period. Conversely, negative unexpected earnings measures are expected to be associated with negative abnormal returns. An inclusion not normally utilized in traditional earnings event studies is the sign of the trading statement release i.e. whether results are predicted to be significantly higher ('good' news) or lower ('bad' news) than the prior comparable period. An important distinction to make for the pre-release period is that the purpose of this hypothesis is not to test if the trading statement causes share price movement, but rather if the information in the trading statement release has been factored into the share price over the pre-release period through the use of timelier sources of information. The post-release study, or drift study, focusses on whether information in the trading statement causes gradual impounding of that information rather than an instantaneous reaction – a test of informational and market efficiency.

Figure 7 shows the CARs for 'good' and 'bad' news portfolios based on the various unexpected earnings models. Figures 8 to 11 show the CARs of ranked quintile portfolios based on the various unexpected earnings models for the entire span of the event study.

Legend	
T_0	The release date of the trading statement
'Sample'	The average CAR of the entire sample
Shaded area	This shows the days used as inputs for the respective model
Q1 to Q5	Q1 denotes the lowest quintile based on the respective unexpected earnings measure whilst Q5 denotes the highest ranked quintile.

Figure 7: CARs of 'good' and 'bad' news portfolios



Early evidence of correlation between 'good' and 'bad' news is visually evident in figure 7 above. It is noticeable that 'good' ('bad') news portfolios tend to have positive (negative) CARs over the duration of the study. Note that over the days of return built into a particular model, the CARs for the same few days will, by definition, be highly correlated with the unexpected earnings measure. Results in the pre-release period are consistent with those of Ball and Brown (1968) i.e. share prices incorporate other, timelier sources of information leading up to the trading statement release. Similar to Ball and Brown (1968), there is a small portion of variation in share price observed after the release date showing that the trading statement may contain extra information not yet impounded by the market.

6.1. The pre-release period

The pre-release period is intended to investigate if investors factored in other, more timely sources of information into the share price during the trading days leading up to the trading statement release.

6.1.1. 'Good' and 'bad' news portfolios based on trading statements

The pre-release period between days (-60;-1) will only examine 'good' and 'bad' news portfolios based on the sign of trading statements. Unlike a trading statement, the unexpected earnings models are not an information source to the market. Overlaps between the unexpected earnings models and CARs in the days prior to the release, cause false correlations and the results will have limited applicative use. As stated previously, the goals of the pre-release period is to ascertain if the market utilises more timely sources of information to make investment decisions and the extent to which the trading statement contains new information.

Referring to the 'good' and 'bad' news portfolios in figure 7, correlation between the sign of the trading statement and cumulative abnormal return is evident. There is, however, stronger correlation for 'good' news portfolios than 'bad' news portfolios. 'Good' news and 'bad' news portfolios generate mean abnormal return for the (-60;-1) pre-release period of 3.22% and -1.52% respectively. Note that these returns are not annualized, they are merely sixty day abnormal returns. An important clarification needs to be made here. The objective in the pre-release period is to ascertain whether the market impounds more timely sources of information into the share price, not to identify opportunity for investment. However, lack of inclusion of new information may allow for future profiting after the release date. These findings are in line with Ball and Brown (1968) who show that abnormal share returns are correlated with earnings and that the market utilizes more timely sources of information available in the market to revise share valuations. These findings suggest that information contained in trading statements is important to the market, it may just not be timely enough.

6.1.2. Hypothesis testing

One-tail t-tests are used to ascertain whether the sign of the trading statement contents are significantly positively correlated with abnormal share returns. The t-tests are conducted on the CARs of both 'good' news and 'bad' news portfolios to determine if their CARs are significantly greater or less than zero respectively. The null hypothesis (H_0) and alternative hypothesis (H_1) are detailed below, followed by the t-test results:

H_0 : The sign of trading statement releases and CARs for the (-60;-1) pre-release period are independent of each other

H_1 : The sign of trading statement releases and CARs for the (-60;-1) pre-release period are correlated

Table 3: One-tail t-tests of CARs (-60; -1) for ‘good’ and ‘bad’ news portfolios based on the sign of trading statements

One-tail t-test summary (-60;-1)		
	Trading statements	
‘Good’/ ‘bad’ news portfolio	Good	Bad
CAR (-60;-1)	3.22%	-1.52%
Observations	30	28
t-stat	3.178	-0.923
p-value	0.0018	0.1822

The results detailed above in table 3 indicate that ‘good’ news portfolios based on positive trading statement releases show significant correlation with CARs for the (-60;-1) period. The null hypothesis can therefore be rejected at the 5% significance level. The same is not true of ‘bad’ news portfolios based on negative trading statement releases where insignificant correlations were found. ‘Bad’ news portfolios are, however, significantly different from ‘good’ news portfolios. This is contrary to earnings announcement correlation results found by Kornik (2005) where significant correlations were found for both ‘good’ and ‘bad’ news portfolios. The JSE recently reaching all-time highs and its continued bullish trend over the 2010 to 2013 period could explain this study’s positive bias. What this t-test result shows is the market’s inclusion of more timely information into the share price leading up to the trading statement release. This is consistent with Ball and Brown (1968).

A shortcoming inherent in this study’s sample is that CARs do not sum to zero, this detracts from the power of the t-test. An argument could be made to test portfolio CARs against the sample’s CAR rather than zero. This does however infer that you end up testing CARs against themselves.

6.2. The period surrounding the release

This short (-3;+3) period will provide insight regarding the extent of new information contained in trading statement releases. Significant revisions or fluctuations in share price would indicate the synthesis and integration of new information into share prices by investors. One-tail t-tests were performed to determine whether ‘good’ and ‘bad’ news portfolios yielded CARs that are significantly greater or less than zero respectively. The hope is that this would give insight into the inclusion of a significant amount of new information into share returns around the event date. If no correlation is found, a two-tail t-test will be performed to determine if returns are significantly different from zero. The null hypothesis (H_0) and alternative hypothesis (H_1) for the one-tailed t-tests are detailed below, followed by the t-test results:

H₀: The sign of trading statement releases and CARs for the (-3;+3) period are independent of each other

H₁: The sign of trading statement releases and CARs for the (-3;+3) period are correlated

Table 4: T-tests of CARs (-3; +3) for ‘good’ and ‘bad’ news portfolios based on the sign of trading statements

One-tail t-test summary (-3;+3)		
	Trading statements	
‘Good’/ ‘bad’ news portfolio	Good	Bad
CAR (-3;+3)	0.243%	0.245%
Observations	30	28
one-tail t-stat	0.350	0.294
p-value	0.3645	0.3854
two-tail t-stat	2.045	2.052

Low one-tail t-statistics shown in table 4 indicate that insignificant correlations were found between the sign of the trading statement releases and the sign of CARs of both ‘good’ and ‘bad’ news portfolios for the period (-3;+3). The null hypothesis, resultantly, fails to be rejected at the 5% significance level. As is the trend for ‘good’ and ‘bad’ news portfolios thus far, CARs are positively skewed for the (-3;+3) period.

Two-tail t-tests were conducted to ascertain if the release of the trading statement had a significant bearing on share returns for the (-3;+3) period. With both two-tail t-stats greater than 2, the release causes significant deviations in share returns from zero as earnings information either beats or underperforms investor expectations. This indicates that large revisions in share valuations by investors take place preempting or following newly released information contained in trading statements.

These results are in contradiction to Kornik (2005), who found that ‘good’ news portfolios exhibit a significant correlation with abnormal returns. Knight (1983) finds that ‘bad’ news portfolios have positive CARs and puts this down to the market being pessimistic with earnings expectations. As alluded to by Kornik (2005), the large portions of the reaction occurring in the three days preceding the trading statement release could be attributed to leakage of material, non-public information.

6.3. The post-release period – the drift study

The post-release period hopes to empirically prove the existence of the post trading statement release drift anomaly on the JSE. ‘Good’ news and ‘bad’ news portfolios were established using three methods: (1) the sign of the trading statement, the sign of the unexpected earnings using (2) a variety of short term models and (3) a medium term model. Where trading statements only show sign as a measure,

return-based unexpected earnings measures portray both sign and size. This creates the option of splitting portfolios into ranked quintiles as demonstrated by Foster, Olsen and Shevlin (1984) and later Kornik (2005).

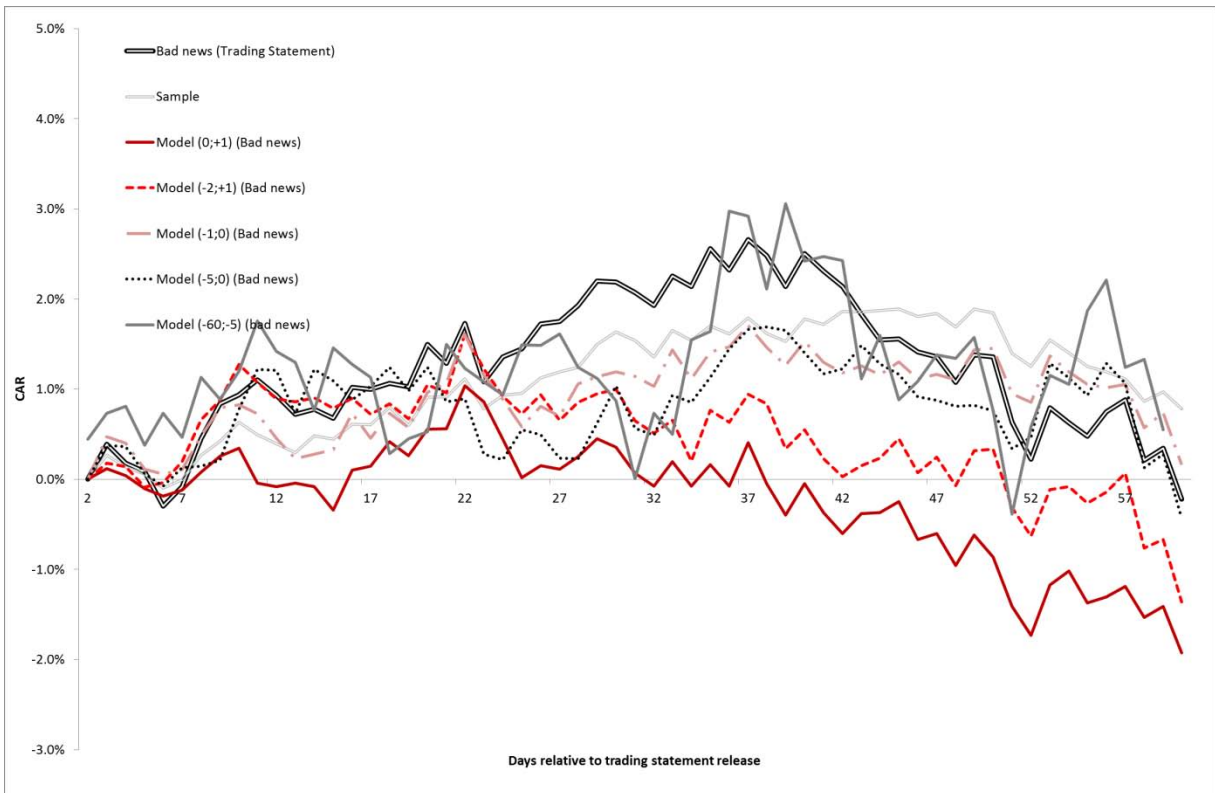
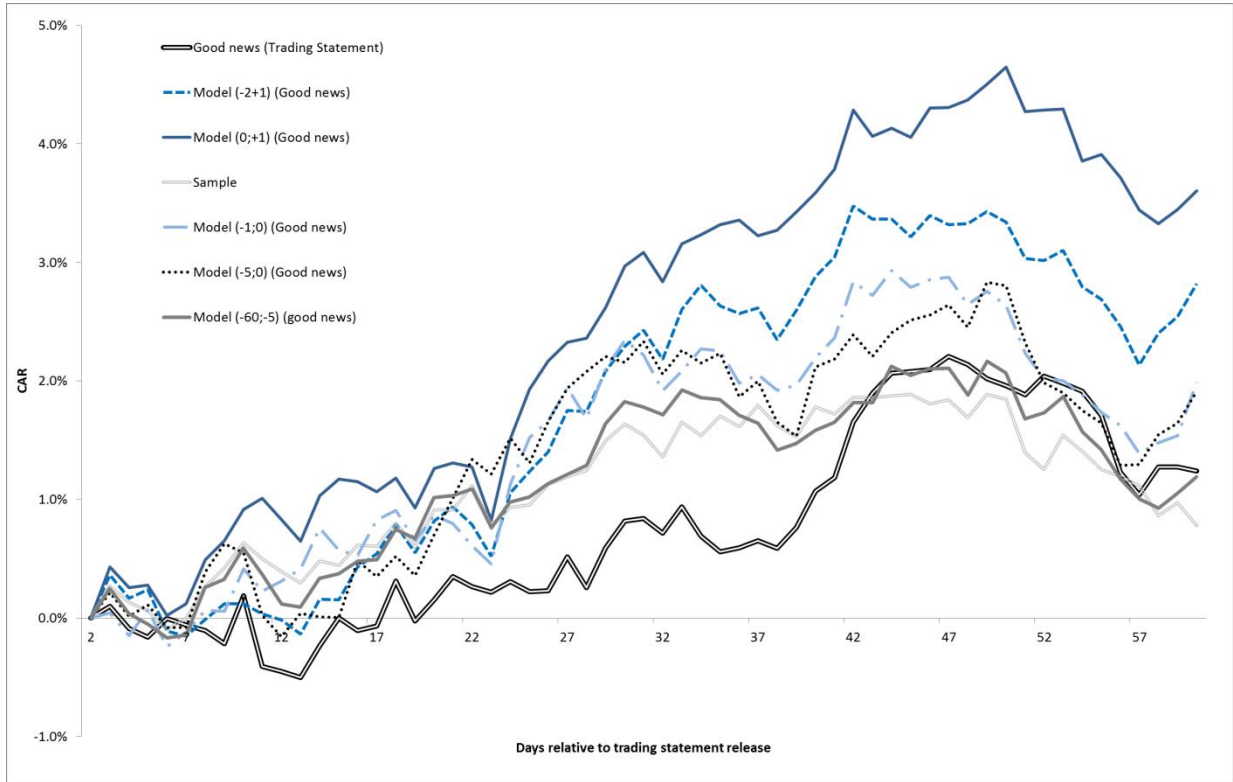
In this section, the (+3;+60) post-release period is studied for any observable drift. This section splits the analysis of 'good' and 'bad' news portfolios, and ranked quintile portfolios. An important consideration is the potential impact of the earnings announcement that follows the trading statement release. The sample data in this study found that, on average, earnings announcements follow trading statement releases by approximately 9 trading days. This could infer that drift may not be a direct result of investors being slow to impound information contained in the trading statements, but rather that investors await confirmation from the earnings announcement before making their investment decisions.

As stated in the literature review, in an efficient market share prices respond immediately to new information rendering abnormal returns impossible. Post trading statement release drift would violate efficient market theory and open up avenues for further research in this area.

6.3.1. 'Good' and 'bad' news portfolios

Unlike the periods discussed previously, 'good' and 'bad' news portfolios were constructed based on the sign of the trading statement and on the sign of short term and medium term unexpected earnings measures. Below, figure 8 illustrates CARs for the post-release period for 'good' and 'bad' news portfolios in two separate graphs. The top and bottom graphs illustrate the CARs of 'good' and 'bad' news portfolios respectively.

Figure 8: An excerpt from figure 7 showing CARs of 'good' (top) and 'bad' (bottom) news portfolios in the (+3;+60) post-release period



a) Trading statements

Correlation between the sign of the trading statement release and cumulative abnormal return is evident for 'good' news portfolios. 'Bad' news portfolios based on trading statement releases exhibit negligible correlation over the (+3;+60) post-release period depicted in figure 8. 'Good' news and 'bad' news portfolios based on trading statements generate mean abnormal return for the (+3;+60) post-release period of 1.24% and -0.22% respectively. While the 'good' news portfolio exhibits signs of post trading statement release drift, the 'bad' news portfolio shows a positive skew and fails to follow any drift pattern. These findings remain consistent with those of Ball and Brown (1968) which indicated that most of the information (85% to 90%) is impounded prior to the event date and the remainder in the ensuing weeks. Whether it is enough to invalidate efficient market hypothesis remains to be seen.

b) Short term models

'Good' news and 'bad' news portfolios generated based on the short term unexpected earnings measures show evidence of positive and negative post trading statement release drift. Figure 8 shows the models with the strongest correlation and clearest signs of drift to be the (0;+1) and (-2;+1) models. While all models exhibited at least some evidence of drift for 'good' news portfolios, these were the only two models to show meaningful drift for 'bad' news portfolios. 'Bad' news portfolios for (-5;0) and (-1;0) period showed positive CARs for a large portion of the post-release period, much like the portfolios based on trading statement signs.

Shown in figure 8, 'good' news portfolios based on the (-2;+1) and (0;+1) models yielded CARs of 2.82% and 3.60% respectively. 'Bad' news portfolios based on the same models drifted in a negative direction to reach -1.36% and -1.92% respectively. This indicates that the certain variations of the short term model are relatively sound predictors of future return. This is contrary to efficient market hypothesis as information is impounded into the share price over time rather than instantaneously. Investors are now privy to a simple trading rule: buy (sell) companies with positive (negative) unexpected earnings generated by the (-2;+1) and (0;+1) models.

Reason for concern is the upward trend in the sample's CAR when it should ideally be centered about a CAR of zero. Instead the sample's (+3;+60) mean CAR is equal to 0.8%. Possible reasons for this phenomenon are survivorship bias of sample firms and a bullish market over the 2010 to 2013 period on the JSE where even fundamentally weak firms exhibit more favorable returns than normal. Another potential reason for this skew is the effect of small market capitalization shares comprising the

applicable market proxy index when calculating abnormal returns. These small capitalization shares have been excluded from this study's sample due to liquidity constraints.

c) The medium term model

'Good' and 'bad' news portfolios based on the medium term model illustrated in figure 8 show that drift is only observable for 'good' news portfolios based on the medium term model. 'Bad' news portfolios exhibit positive returns which could be a symptom of the positively skewed sample. 'Good' news and 'bad' news portfolios exhibit CARs of 1.19% and 0.55% respectively. Given that the medium term model uses the previous (-60;-5) return as an input, a loose inference can be made about the existence of mean reversion in the (+3;+60) post-release period.

6.3.2. Hypothesis testing – 'good' and 'bad' news portfolios

One-tail t-tests are used to ascertain whether the sign of the trading statement contents are significantly positively correlated with abnormal share returns in the post-release period. The t-tests are conducted on the CARs of both 'good' news and 'bad' news portfolios based on trading statements to determine if their CARs were significantly greater or less than zero respectively. The null hypothesis (H_0) and alternative hypothesis (H_1) are detailed below, followed by the t-test results in table 5:

H_0 : The sign of trading statement releases and the sign of CARs for the (+3;+60) post-release period are independent of each other

H_1 : The sign of trading statement releases and the sign of CARs for the (+3;+60) post-release period are correlated

Table 5: One-tail t-test results for 'good' and 'bad' news portfolios classified according to the sign of trading statements and the numerous unexpected earnings measures

One-tail t-test results of 'good' and 'bad' news portfolios based on differing unexpected earnings models												
Unexpected Earnings model	Trading statement sign		Model (-2;+1)		Model (0;+1)		Model (-1;0)		Model (-5;0)		Model (-60;-5)	
	"good" news	"bad" news	"good" news	"bad" news	"good" news	"bad" news	"good" news	"bad" news	"good" news	"bad" news	"good" news	"bad" news
CAR (+3;+60)	1.24%	-0.22%	2.82%	-1.36%	3.60%	-1.92%	1.99%	0.16%	1.91%	-0.43%	1.19%	0.55%
Observations	30	28	32	26	31	27	25	33	34	24	49	9
t-stat	0.479	1.423	2.199	-0.194	2.478	-0.567	1.972	0.285	1.741	0.033	1.053	0.674
p-value	0.318	0.083	0.018	0.424	0.010	0.288	0.030	0.389	0.046	0.487	0.149	0.260

Although visual evidence of drift exists, ‘good’ and ‘bad’ news portfolios classified according to the sign of trading statements yielded some, yet insignificant correlation with CARs. Unexpected earnings models (-2;+1) and (0;+1) showed CARs significantly greater than zero for ‘good’ news portfolios but CARs were not significantly less than zero for ‘bad’ news portfolios. This is consistent with the findings of Kornik (2005). CARs for (-2;+1) and (0;+1) ‘good’ and ‘bad’ news portfolios are, however, are significantly different from each other. The null hypothesis for the (-2;+1) and (0;+1) models is therefore rejected at the 5% significance level. The (-1;0) model showed promising results, none of which were significantly different from zero. However, like the before mentioned models, CARs of ‘good’ and ‘bad’ news portfolios are significantly different from each other.

The (-5;0) short term unexpected earnings measure and the medium term (-60;-5) measure yielded insignificant results and the null hypothesis fails to be rejected for this subset of results. The (-60;-5) medium term model’s CARs were positive for ‘bad’ news portfolios indicating that there may be mean reversion of returns in the post-release period following negative returns in the (-60;-1) pre-release period.

6.3.3. Ranked quintiles

Quintiles were formed by ranking the size of unexpected earnings measures calculated by the respective unexpected earnings models. Figure 9 to 11 outline ranked quintile portfolios based on the unexpected earnings measure calculated by the various short term models. Note that the sign of trading statements cannot be used to adjudicate size and therefore is excluded from this section. Quintiles based on the medium term unexpected earnings measure yielded insignificant results and were excluded. A summary of CARs for the short term unexpected earnings measures are shown in table 6 below:

Table 6: A summary of ranked quintile CARs for the short term unexpected earnings models for the period (+3;+60)

Model	CAR (+3;+60)				
	Q5	Q4	Q3	Q2	Q1
(-2;+1)	5.74%	0.58%	1.55%	-1.01%	-2.55%
(0;+1)	4.44%	2.83%	0.64%	-5.51%	1.95%
(-1;0)	2.11%	2.73%	0.71%	-0.61%	0.75%
(-5;0)	4.39%	0.94%	0.41%	-0.46%	-0.14%

Mean unexpected earnings measures presented below in table 7 correspond to the ranked quintile portfolios shown in table 6.

Table 7: Mean unexpected earnings measures for each model and its respective quintiles for the period (+3;+60)

Model	Q5	Q4	Q3	Q2	Q1
(-2;+1)	0.84	0.41	0.06	-0.26	-0.75
(0;+1)	1.46	0.45	0.01	-0.27	-0.86
(-1;0)	0.98	0.29	-0.08	-0.46	-1.02
(-5;0)	0.57	0.25	0.05	-0.15	-0.48

Figure 9: CARs of ranked quintile portfolios based on short term (-2;+1) unexpected earnings measures

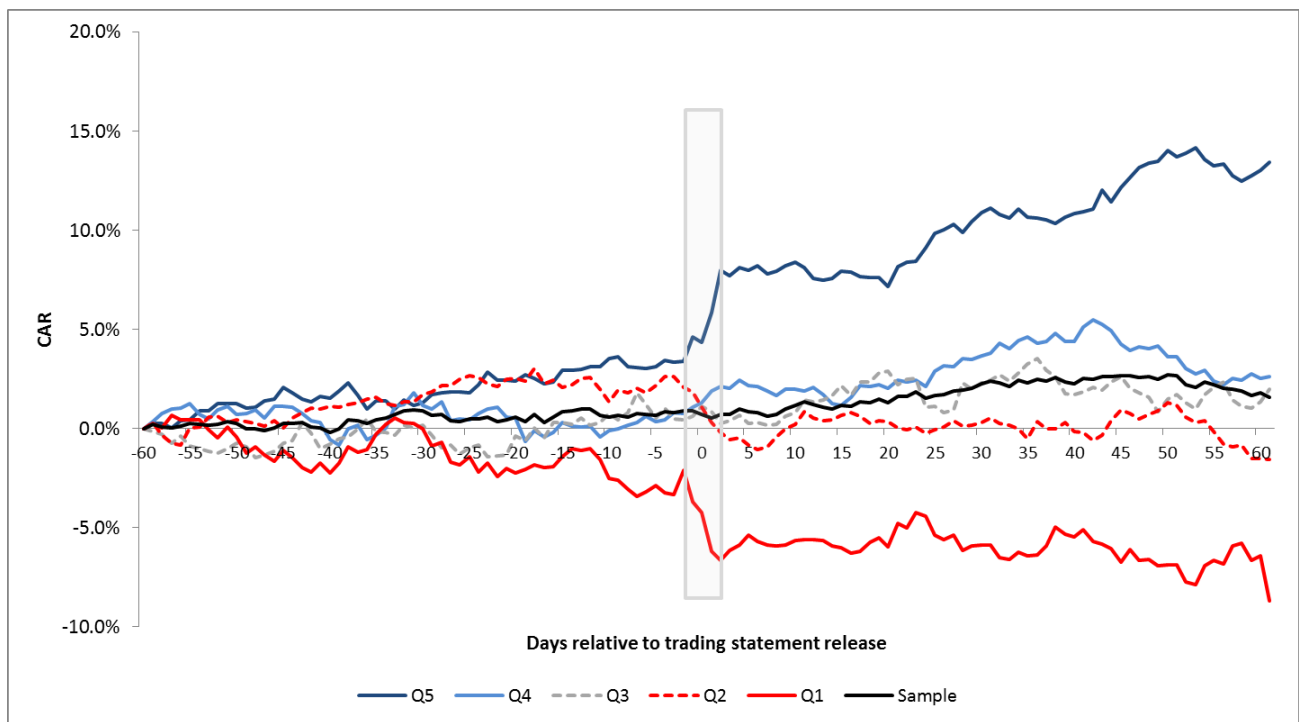


Figure 10: CARs of ranked quintile portfolios based on short term (0;+1) unexpected earnings measures

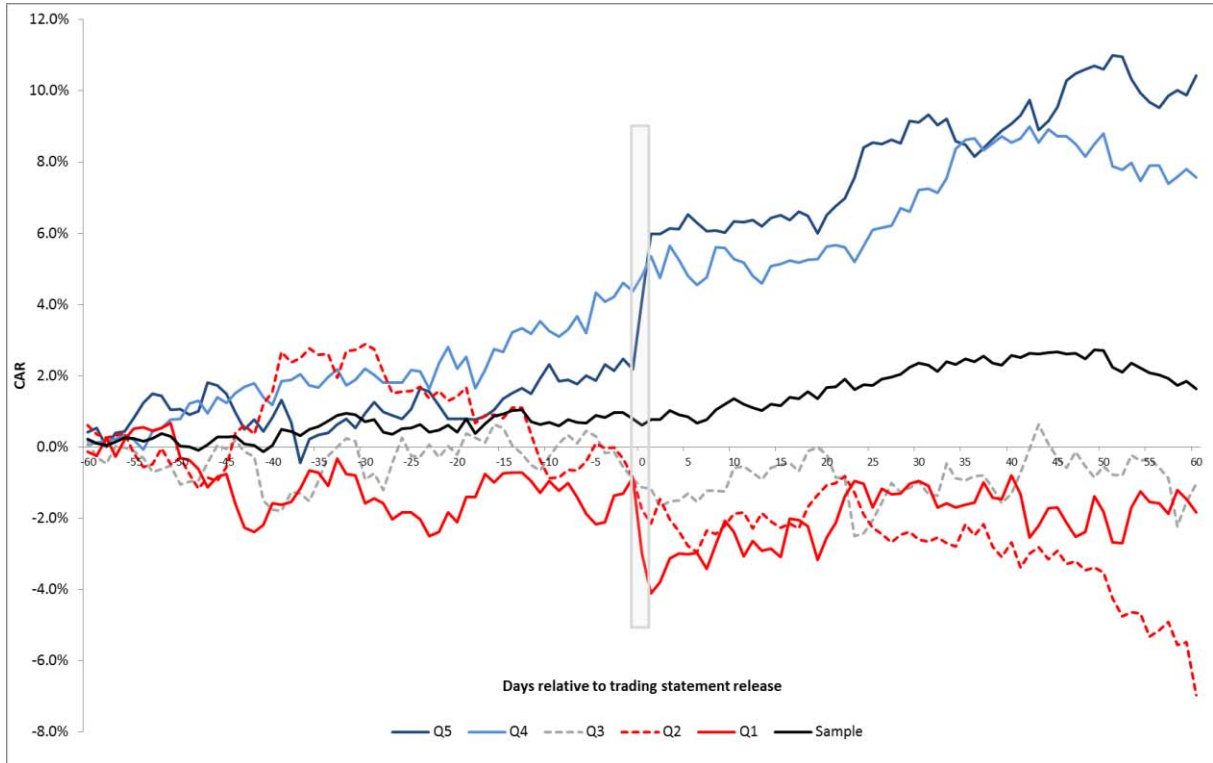


Figure 11: CARs of ranked quintile portfolios based on short term (-1;0) unexpected earnings measures

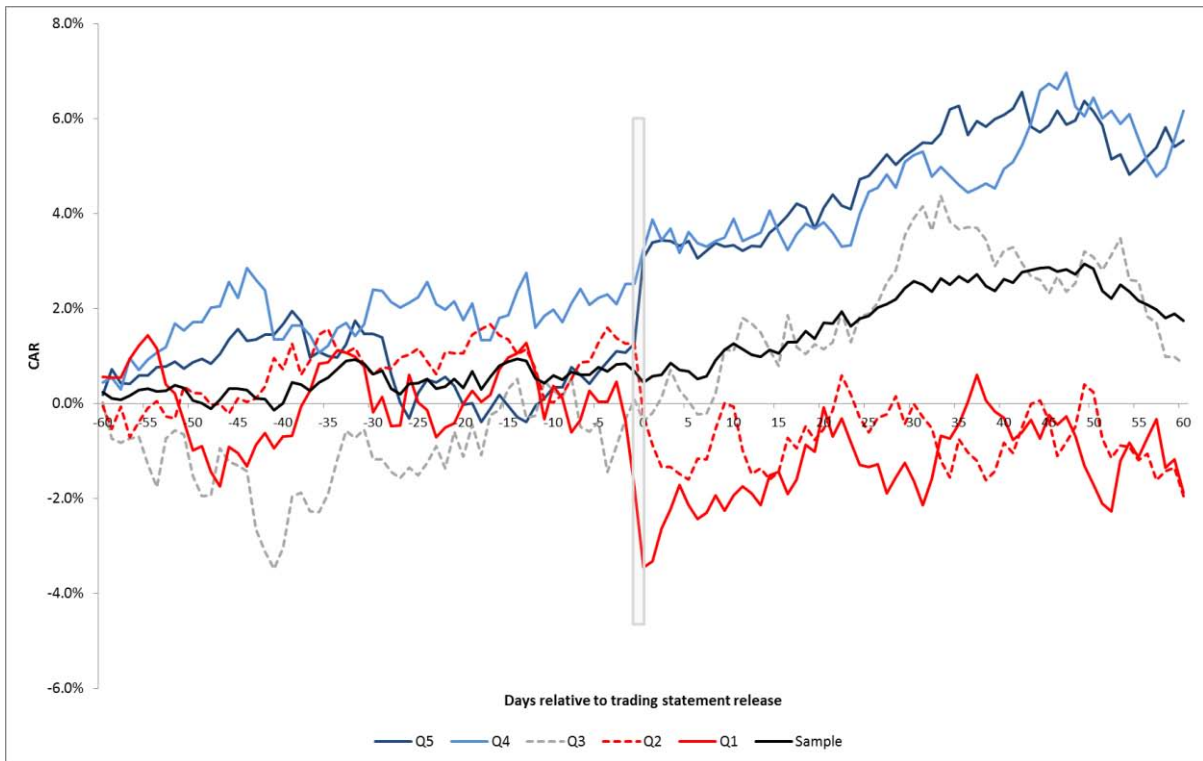


Figure 12: CARs of ranked quintile portfolios based on short term (-5;0) unexpected earnings measures

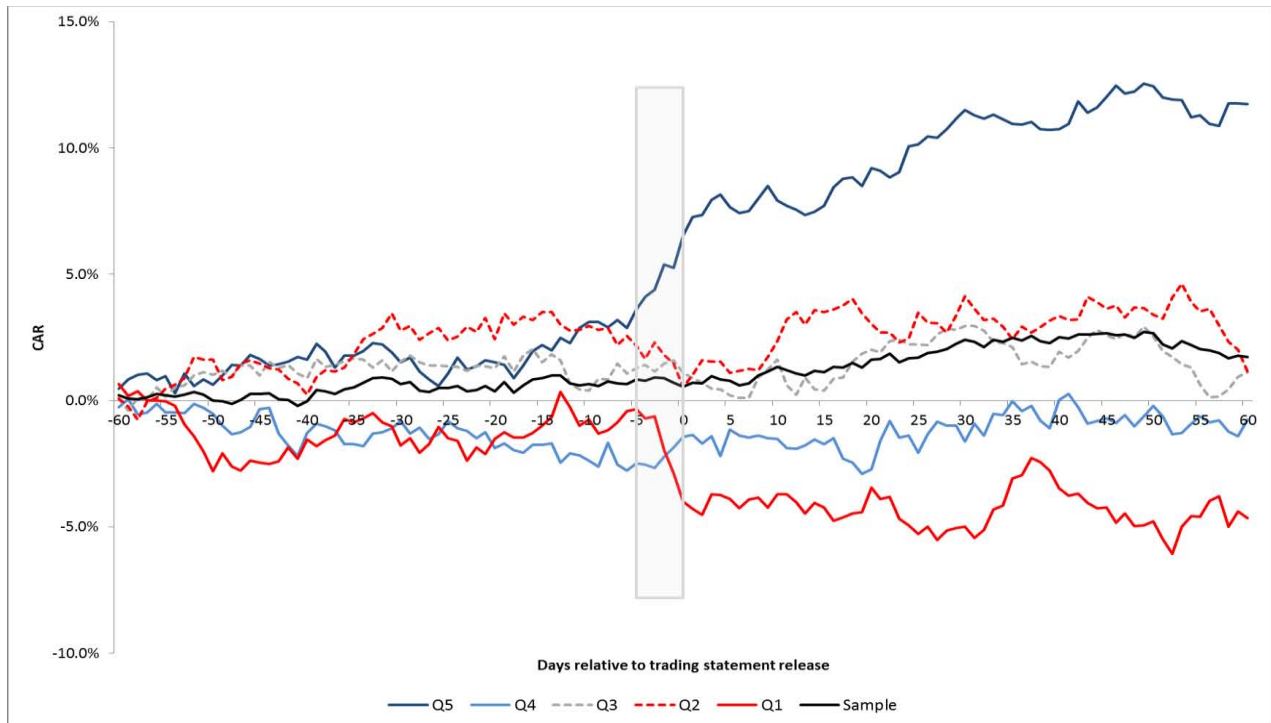


Figure 9 illustrates that both top (Q5) and bottom (Q1) quintiles exhibit strong correlations with CARs showing that the size of unexpected earnings using the (-2;+1) short term model is correlated with the magnitude of the corresponding CARs. Evidence of drift is observable for these quintiles which achieve post-release period CARs of +5.74% and -2.55% respectively for the (+3;+60) post-release period. Quintiles 2, 3 and 4 exhibit negligible drift with CARs of 0.58%, 1.55% and -101% respectively. As in the 'good' and 'bad' news portfolios section, a positive bias is evident in the data with three out of five quintiles exhibiting positive CARs and the sample mean greater than zero. Similar results were found for the (-5;0) unexpected earnings measure, illustrated in figure 12.

Results for the (0;+1) unexpected earnings measure and post-release CARs are shown in figure 10. Post trading statement release drift is observable for all quintiles except the lowest quintile, Q1. Note that return for Q1 for the span of the entire event study is negative, CARs just move in the opposite direction in the post-release period possibly indicating a degree of reversion from returns experienced before the release. This observation is replicated in figure 11 for the (-1;0) unexpected earnings measure with the extent of drift being less substantial.

Contrary to the findings of Foster, Olsen and Shevlin (1984), a return based unexpected earnings model used to rank quintiles does show correlation with CARs and exhibit drift. Foster, Olsen and Shevlin (1984) only found evidence of drift when utilizing historical earnings models and not return based models. It seems the South African market fails to adequately price companies in the short term and that value is realized over longer horizons. This assumption is drawn by referring to the trend in CARs for both Q5 and Q1 shown in table 6 over the differing time intervals.

Results for all short term unexpected earnings models exhibit an interesting symmetry. 'Good' news portfolios and top-ranked quintiles exhibit stronger correlation with CARs than 'bad' news portfolios and bottom-ranked quintiles. A sign that perhaps the market sees trading statement releases as a buy signal rather than sell signal i.e. investors exhibit pessimistic earnings expectations.

6.3.4. Hypothesis testing – ranked quintiles

Regressions were conducted to ascertain if significant correlation exists between the various unexpected earnings measures and cumulative abnormal returns.

Regression analysis was conducted on the unexpected earnings measures of the constituents of the different unexpected earnings models, against those constituents respective CARs for the (+3;+60) period. The aim of the regression analysis is to ascertain the strength of the previously discussed and perceived relationships between the unexpected earnings measures and CARs for the (+3;+60) period.

The regression equation is shown below:

$$Y_i = \alpha + \beta.X_i + \varepsilon_i$$

Where:

α is the intercept coefficient

β_i is the slope coefficient

X_i is the explanatory variable, in this case unexpected earnings measure generated by one of the various unexpected earnings models

Y_i is the dependent variable, in this case the CAR for the period (+3;+60)

ε_i is the error term

The null hypothesis (H_0) and alternative hypothesis (H_1) are detailed below, followed by the regression results in table 8:

H_0 : The sign and size of unexpected earnings (based on each of the pre specified models) and CARs for the (+3;+60) post-release period are independent of each other.

H_1 : The sign and size of unexpected earnings (based on each of the pre specified models) and CARs for the (+3;+60) post-release period exhibit significant correlation with each other.

Table 8: Output for regressions of unexpected earnings measures against corresponding (+3;+60) CARs

Unexpected Earnings model	Model (-2;+1)	Model (0;+1)	Model (-1;0)	Model (-5;0)	Model (-60;-5)
R Square	0.085	0.050	0.012	0.044	0.011
Observations	58	58	58	58	58
Beta	0.044	0.021	0.013	0.048	-0.085
t-stat	2.279	1.709	0.808	1.599	-0.802

The regression analysis detailed in table 8 above reinforces many of the findings of the t-tests conducted in the 'good' and 'bad' news section for the (-2;+1) model. The (+2;-1) unexpected earnings model rejects the null hypothesis at the 5% significance level and finds there to be significant correlation between the sign and size the unexpected earnings measures and the magnitude of the corresponding CARs. These results deem the (-2;+1) unexpected earnings model the most effective classification method and a useful predictive model for post trading statement release drift. This is evidence of the market's sluggish response to new information and a violation of efficient market hypothesis as information fails to be factored into share prices instantaneously.

Correlations for the (-1;0) unexpected earnings measure were insignificant, while correlations for the (0;+1) and (-5;0) models showed promising results with reasonably strong correlations. In summary, however, the null hypothesis for these three models failed to be rejected as correlations of the sign and size of unexpected earnings measures with the magnitude of CARs were deemed insignificant at the 5% level.

Unexpected earnings using the (-60;-5) medium term model did not exhibit a significant relationship with abnormal share returns after the announcement. The relationship showed a negative t-statistic. This indicates CAR movement in the opposite direction to the unexpected earnings measure generated by the (60;-5) model and a reversion in returns in the post-release period.

6.4. Momentum analysis

Tests for momentum were conducted for numerous periods over the span of the event study by regressing historical returns on forward returns and analyzing the significance of results. This process was conducted at an individual share level.

For the purposes of this study, expectations are that momentum will be caused by the gradual assimilation and impounding of timely information into the share price leading up to the trading statement release date and that there should be continued momentum (drift) in share prices following the release. Given that drift was found in section 6.3, it is reasonable to assume some extent of momentum spanning the event study window. Numerous behavioral influences have been suggested as reasons for delayed responses to new information. These include loss aversion and mental accounting where investors anchor, sell winners prematurely or hold losing shares too long in the hope of a turnaround. Behavioral factors curtail market efficiency as share prices don't adequately reflect all available information.

Past CARs of individual shares were regressed against forward returns to give insight into whether past returns lead forward returns. Results of the regression analysis are outlined in table 9 below. Tests for momentum were conducted before and after the event date. Although no momentum was found to be significant, evidence of momentum was found for the (-11;-1) period on the (0;+10) period, as well as the (-30;-1) on (0;+10) period. This is congruent with results found for the (-60;-5) medium term unexpected earnings model and share returns following the release date. Neither momentum, nor correlations with the medium term model unexpected earnings measures are found to be significant.

Table 9: Regressions of past returns against forward returns for individual shares

Days relative to release	(-60; - 31) against (-30; - 1)	(-60; -31) against (-30;- 1)	(-30; -11) against (-10; -1)
R Square	0.0043	0.0004	0.0129
Observations	58	58	58
Beta	0.064	-0.025	0.086
t-stat	0.499	-0.148	0.872
Confidence interval	95%	95%	95%

Days relative to release	(-30; -1) against (0; +10)	(-11; -1) against (0; +10)	(0; +10) against (+11; +30)
R Square	0.0342	0.0437	0.0319
Observations	58	58	58
Beta	0.125	0.246	0.207
t-stat	1.434	1.629	1.382
Confidence interval	95%	95%	95%

Days relative to release	(0; +30 against +31; +60)
R Square	0.0238
Observations	58
Beta	0.128
t-stat	1.189
Confidence interval	95%

6.5. Share return variance and trading volume tests

The methodology from the Beaver (1968) study was replicated to test the investor reaction to trading statement releases. This was done by analyzing the changes in share return variance (SRV) and trading volume activity (TVA) in the weeks surrounding the release. Formulas and methodology for the calculation of SRV and TVA are outlined in section 5.2.4. 15 weeks were used in total including the event week (week 0). This analysis was split into ‘good’ news and ‘bad’ news portfolios based on the sign of the trading statement releases, thereafter the total sample was analyzed. Importantly, the y-axis in the following diagrams represents standardized measures for both share return variance (SRV) and trading volume activity (TVA) - the purpose of which is to identify fluctuations.

6.5.1. Interpretation of results

Figure 13: SRV for ‘bad’ news trading statement releases

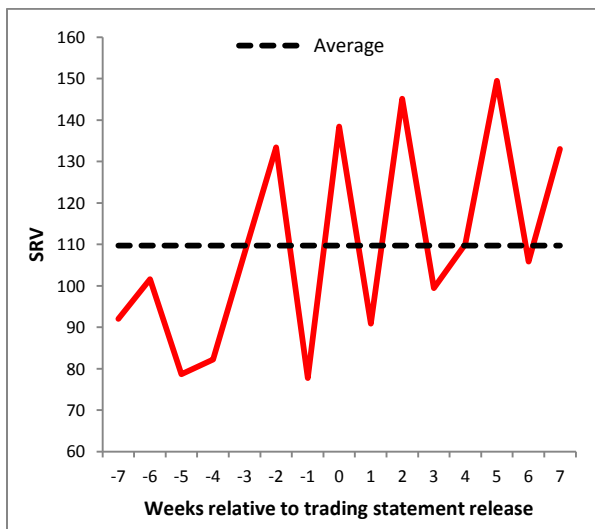


Figure 14: Trading volume activity for ‘bad’ news trading statement releases

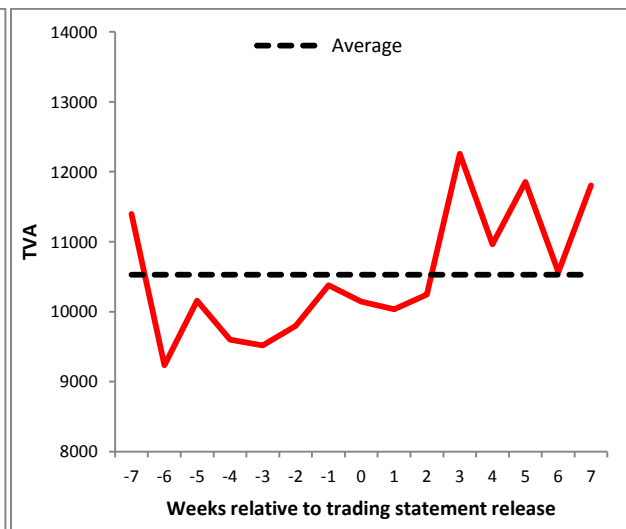
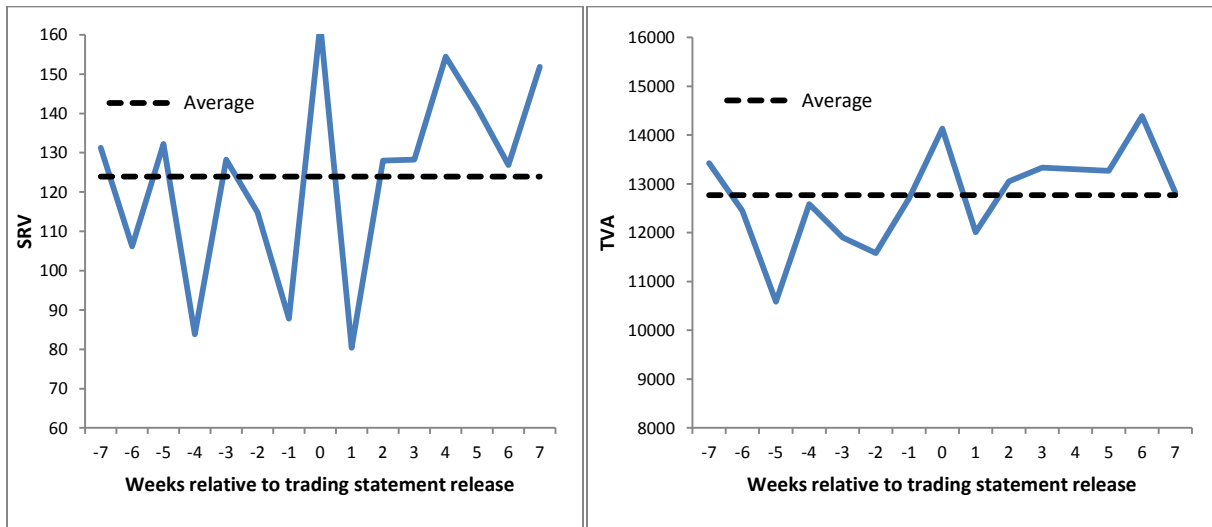


Figure 13 and 14 show the share return variance (SRV) and trading volume activity (TVA) for ‘bad’ news portfolios based on negative trading statement releases. SRV as illustrated in figure 13 is erratic with spikes and troughs occurring continuously. TVA of the ‘bad’ news portfolio is relatively low building up to

the trading statement release. Consistent with Beaver (1968), this may be a result of investors postponing trading of securities until they get confirmation of expectations in the earnings announcement. Thereafter, TVA escalates dramatically by 22.18% between weeks 1 and 3. According to Beaver (1968) this is a result of lack of investor consensus regarding the price. Varying opinions of newly released information contained in the trading statement release evoke different company revaluations. This induces increased trading volume as the market tries to reach consensus on company value.

Figure 15: SRV for 'good' news trading statement releases

Figure 16: Trading volume activity for 'good' news trading statement releases



SRV and TVA for 'good' news portfolios based on the sign of trading statement releases are depicted in figures 15 and 16 respectively. SRV illustrated in figure 15 spikes over the event week to 28.9% above the mean and falls dramatically thereafter by 50.56%. This result is consistent with the Beaver (1968) study. According to Beaver (1968), this indicates a strong price reaction to the release indicating that the trading statement includes new information not impounded by the market. The subsequent drop represents market consensus on the share price, although temporary. As evidenced in figure 16, TVA breaks through the mean to reach a record high in the event week. This is indicative of individual investors synthesizing new information without market consensus being reached and, more importantly, that the trading statement release have informational content. TVA drops off in the subsequent weeks showing the market moving toward a consensus value.

Figure 17: SRV for the sample

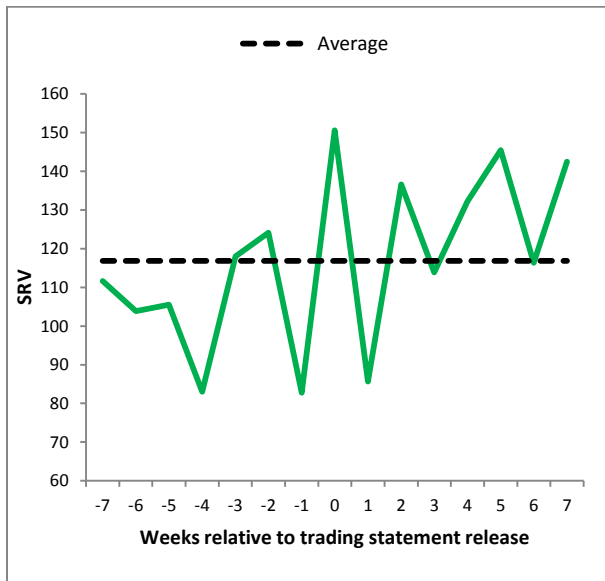
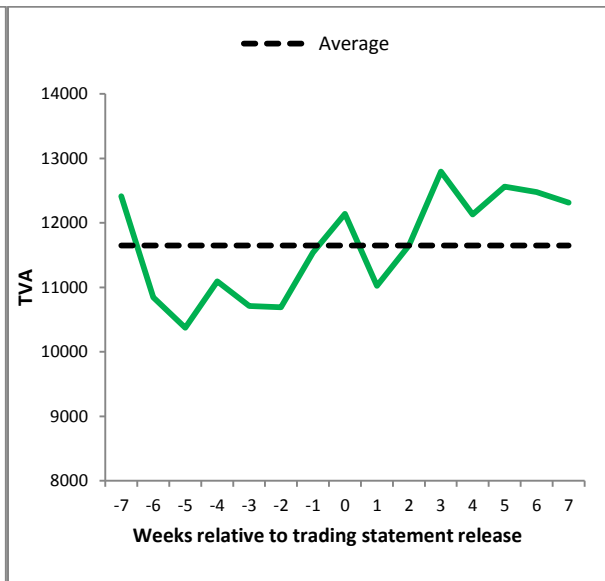


Figure 18: Trading volume activity for the sample



An important consideration is the change in the SRV and TVA in the 1 to 2 week period following the trading statement release as this is when the earnings announcement would typically take place. Although a trading statement release can be seen as a form of confirmation for the investor, numbers are still quoted in ranges and estimates. The earnings announcement in the ensuing weeks could offer more solidarity for the investor and allow consensus to be reached faster.

6.5.2. Potential limitations

Large fluctuations in both trading volume and price can be caused by other news and market-related events. Beaver (1968) recognizes this in his study and alludes to the most important period as the event week. Other news releases such as dividends and other material information are random and should cancel out over time. Beaver (1968) adjusted for market-related changes by adjusting for market influences. A regression based model was used. This adjustment method was ignored in this study due to the unstable betas tested discussed in section 5.2.2. Additionally, effects of JSE's dichotomy set out by van Rensburg (1997) may have proved a difficult obstacle and rendered market-adjusted results fruitless.

6.6. Summary of findings

This section serves to address the problems and hypothesis outlined in section 5.1 by summarizing the previously discussed empirical results.

- A significant correlation exists between the sign 'good' news portfolios based on the sign of trading statements and cumulative abnormal share returns during the (-60;-1) pre-release period. Correlation exists for 'bad' news portfolios but this is found to be statistically insignificant. This shows that investors make use of timelier sources of information, other than trading statements, to revise share valuations. This is consistent with Ball and Brown (1968) and Kornik (2005).
- No significant association exists between the sign of the trading statement release and cumulative abnormal returns in the (-3;+3) period surrounding the release. However, dissemination of new information to the market is found as cumulative abnormal returns were found to be significantly different from zero during this period. This is reflective of investors revising their share valuations in response to new information.
- Significant correlations between the sign of two short term unexpected earnings measures and the corresponding cumulative abnormal returns were found for the (+3;+60) post-release period. The (-2;+1) and (0;+1) exhibited substantial drift in returns following the release date. The drift was larger for 'good' news portfolios than 'bad' news portfolios showing asymmetry potentially caused by the positive skew in the sample. This is consistent with the Kornik (2005) study. The may also be due to 'good' news requiring confirmation of 'hard information' received from the trading statement, while 'bad' news is to a large extent factored into share returns.

Other short term models, along with the medium term model, showed insignificant correlations but in some cases 'good' news portfolios were significantly different from 'bad' news portfolios. 'Good' and 'bad' news portfolios based on the sign of trading statements yielded insignificant correlations although there was visual evidence of drift present. This perhaps suggests that the market incorporates a large percentage of information into the share price before the trading statement release.

- For ranked quintiles, short term unexpected earnings models, (-2;+1) and (0;+1), exhibited the most significant results. Significant correlations between the sign and size of unexpected earnings measures and the magnitude of cumulative abnormal returns were found for these models in the (+3;+60) post release period indicating evidence of post trading statement release drift in returns. The (-5;0) model also presented reasonable, although insignificant correlation with cumulative abnormal share returns for the post-release period. The (-1;0) model proved inconsequential while the (-60;-5) medium term unexpected earnings measure showed mean reverting tendencies by having a negative t-statistic. With minimal exceptions, the unexpected earnings measures were a strong ranking mechanism for quintiles.
- Although momentum was visually evident, no significant momentum effects were observed over the entire event window.
- Share return variance (SRV) for 'bad' news trading statement releases was found to spike over the trading statement release week. However, SRV was observed to be incredibly volatile over the span of the event study. SRV for 'good' news trading statement releases spiked substantially above average over the release week indicating the market's reaction to new information contained in the trading statement.

Trading volume activity (TVA) is low in the weeks leading up to the release of 'good' news trading statements. This implies that investors postpone trading until more concrete information is disseminated into the market via the trading statement. 'Good' news portfolios exhibit a spike in volume over the trading statement release indicating lack of investor consensus regarding the share price. This is followed by relatively more normal TVA in the ensuing weeks. For 'bad' news trading statements it appears that volume spikes 2 weeks after the announcement which could relate to the actual earnings announcement.

Chapter 7

Conclusions

With the findings of this report in mind, the following conclusions are drawn:

7.1. Significance of trading statement informational content

Attributes of the JSE are largely different to those of other large stock exchanges like the NYSE. Studies conducted across exchanges are not always directly comparable due to the JSE being smaller, having less liquidity and consequently, efficiency too. Nevertheless, the domestic importance of knowing that JSE's required disclosures carry informational content is valuable to regulatory bodies and investors alike.

Trading statements are a relatively unique feature for a stock exchange and in the absence of prior research it is easy to question their purpose and level of importance. That being said, this study empirically proves significant informational content of trading statement releases within a South African context, making them useful to investors.

- i. The information content of trading statements is captured in abnormal share returns over the event study window

After reviewing the findings for the pre-release period and post-release periods, trading statements do contain price sensitive information which the market synthesizes into share prices gradually, both in the period leading up to the release and following it. It is clear that investors synthesize portions of the information contained in the trading statement release from more timely sources of information before the release date. This does not detract from the information in trading statements being material; it merely implies that investors find more timely sources of information to base their expectations on. This was reinforced by significant fluctuations in share returns in the few days surround the release. Therefore, be it through the sign of the trading statement or the unexpected earnings measures conveyed by the trading statement, trading statement contents are reflected in share returns.

ii. Trading statement releases are more than just partial sources of timely information

'Good' news portfolios and top ranked quintiles are seen to move strongly in a predictable direction after the release date when ranked by the (-2;+1) and (0;+1) unexpected earnings models indicating that trading statements provide extensive new information that takes a while for the market to digest. This is also true for bottom ranked quintiles associated with some models. Other observed portfolios and ranked quintiles show that, like the findings of Ball and Brown (1968) and Kornik (2005), most of the reaction occurs before the announcement date, but that there is small percentage of movement in returns after the release date. This indicates the dissemination of some, albeit partial, pieces of timely information.

In many cases following the trading statement release, part of the price response to new information contained in the trading statement is delayed due to the inability or failure to assimilate the new information into share returns. This may also be due to the cost of immediately exploiting this information exceeding the potential gains. Therefore, investors factor in information over time or once they have stronger confirmation of a buy or sell. Significant correlations between earnings surprises and abnormal returns throughout this study have been found. These findings show that the trading statement contains an unexpected component that investors factor into their share valuations after the release. The slow integration of this unexpected information into share returns presents a potential explanation for post trading statement release drift.

iii. Recognition of trading statements as a noteworthy event by the market

Over and above the evidence set forth above, the share return variance (SRV) and trading volume activity (TVA) tests proved that the trading statement release causes an abnormal pricing and volume reaction in the week of the trading statement release as investors attempt to reach consensus on their share valuations.

The points above illustrate that although certain tests and models yielded insignificant results, strong and significant relationships were identified between the unexpected earnings, conveyed by trading statement releases, and future cumulative abnormal share returns.

7.2. Efficiency on the JSE

This study empirically proves the existence of post trading statement release drift on the JSE. This invalidates market efficiency at the semistrong-form level as share returns do not adjust instantaneously to new information contained in earnings releases, but rather over time. The earnings announcement following the trading statement release as well as transaction costs associated with exploiting information instantaneously should be considered. The earnings announcement may be a more concrete performance indicator than a trading statement or include timely information not contained in the trading statement. This means a portion of drift may be caused by similar earnings information released on average 9 days after the trading statement.

7.3. Practical implications for fund managers and suggestions for further research

Trading statements are cautionary announcements. Consequently, proponents of efficient markets may deem trading statement releases trivial as the information would have already been factored in through timelier sources such as news articles and other cautionary announcements, or that any new information will be factored in instantaneously. The findings of this study violate these assumptions held in a semistrong-form efficient market and indicate that post trading statement drift exists. This has two primary implications for fund managers: (1) the trading statement release does contain new, timely information yet to be factored in. Periodically, this additional piece of information may be small, however, (2) there is room for effective, profitable fund management through trading statement analysis as this study has proven. A simple, lucrative strategy, as conducted by Bernard and Thomas (1990), is to buy high quintile stocks and short sell bottom ranked quintile stocks as ranked by the (-2;+1) and (0;+1) short term unexpected earnings measures.

After reviewing the findings of this study, areas for further research present themselves. Future studies involving trading statements would allow for a greater sample as the number of releases increases and as the Johannesburg Stock Exchange's liquidity improves, shares outside of the top 60 can be included. A key point discussed throughout this study is the earnings announcement that follows the trading statement release. Relating trading statements to the earnings announcement would provide compelling, complimentary evidence for this study and the various earnings studies conducted on the JSE. Lastly, like the work of Bernard and Thomas (1990) who created a mock index to track performance

of a long-short portfolio of quintiles, testing economic exploitability of trading statement releases and post-release period drift would add substance to the findings of this study.

Appendices

Appendix A: JSE listing requirements, section 3 excerpt

Section 3

Continuing Obligations

General obligation of disclosure

3.4 (a) The following provisions apply in respect of material price sensitive information:

With the exception of trading statements, an issuer must, without delay, unless the information is kept confidential for a limited period of time in terms of paragraph 3.6, release an announcement providing details of any development(s) in such issuer's sphere of activity that is/are not public knowledge and which may, by virtue of its/their effect(s), lead to material movements of the reference price of such issuer's listed securities.

Save where otherwise expressly provided, the requirements of this paragraph are in addition to any specific requirements regarding obligations of disclosure contained in the Listings Requirements.

(b) Trading statements

All issuers, other than those who publish quarterly results, must comply with the detailed requirements of paragraph 3.4(b)(i) to (vi). Issuers with a policy of publishing quarterly results must comply with the general principles contained in paragraph 3.4(b)(vii), but may also elect to comply with paragraph 3.4(b)(i) to (vi) on a voluntary basis.

(i) Issuers must publish a trading statement as soon as they are satisfied that a reasonable degree of certainty exists (refer to 3.4(b)(ii)) that the financial results (refer to 3.4(b)(v)) for the period to be reported upon next will differ by at least 20% from the most recent of the following (collectively referred to as the "base information"):

- (1) the financial results for the previous corresponding period; or
- (2) a profit forecast (in terms of paragraphs 8.35 to 8.44) previously provided to the market in relation to such period.

Issuers may publish a trading statement if the differences referred to in 3.4(b)(i) are less than 20% but which are viewed by the issuer as being important enough to be made the subject of a trading statement.

(ii) The determination of a reasonable degree of certainty in terms of 3.4(b)(i) is a judgmental decision which has to be taken by the issuer and its directors and is

3.4(a) amended with effect from 15 October 2007.

3.4 (b) amended with effect from 1 April 2010

one in which the JSE does not involve itself. This determination may differ from issuer to issuer depending on the nature of business and the factors to which they are exposed.

- (iii) Trading statements must provide specific guidance by the inclusion of a specific number or percentage to describe the differences. Issuers will also be permitted to use ranges (i.e. XYZ is expecting an increase of between 15% and 25%) to describe the differences. Where an issuer elects to use a range, the range may not exceed 20% (e.g. 20% to 40%, 25% to 45% etc). If, after publication of a trading statement but before publication of the relevant periodic financial results, an issuer becomes reasonably certain that their previously published number, percentage or range in the trading statement is no longer correct, then the issuer must publish another trading statement providing the revised number, percentage or range in accordance with paragraph 3.4(b).
- (iv) In light of the existing Listings Requirements' definitions of "significant", "material" and "substantial", these words may not be used in trading statements because to do so would imply a range differing from that permitted in terms of 3.4(b)(i) (i.e. more than 20%).
- (v) Financial results in terms of 3.4(b)(i) are relevant criteria that are of a price sensitive nature which, in the first instance, comprise headline earnings per share ("heps") and earnings per share ("eps"), and, in the second instance, and only if more relevant (because of the nature of the issuer's business) net asset value per share ("navps"). If an issuer wishes to adopt navps, it must announce on SENS, in advance of the first period ending which uses such navps, that it will be adopting navps for trading statement purposes. Thereafter, such policy adoption must be confirmed annually in the annual financial statements.
- (vi) In the event of an issuer publishing a trading statement, such issuer must either:
 - (1) produce and submit to the JSE a profit forecast or estimate, and accountants report thereon in accordance with:
 - (aa) ISAE 3400 – The Examination of Prospective Financial Information and the SAICA Revised Guide on Forecasts, in respect of profit forecasts; or
 - (bb) ISAE 3000 (Revised) – Assurance Engagements other than Audits or Reviews of Historical Financial Information, in respect of the estimate;in compliance with paragraphs 8.35 to 8.44 and 8.48 (c); or
 - (2) include a statement (which is not deemed to be a cautionary statement and which does not give rise to the commencement of a closed period) in the trading statement advising securities holders that the forecast financial information has not been reviewed and reported on by the issuer's auditors either in accordance 3.4(b)(vi)(1)(aa) or 3.4(b)(1)(vi)(bb).

3.4(b)(v) amended with effect from 1 October 2006.

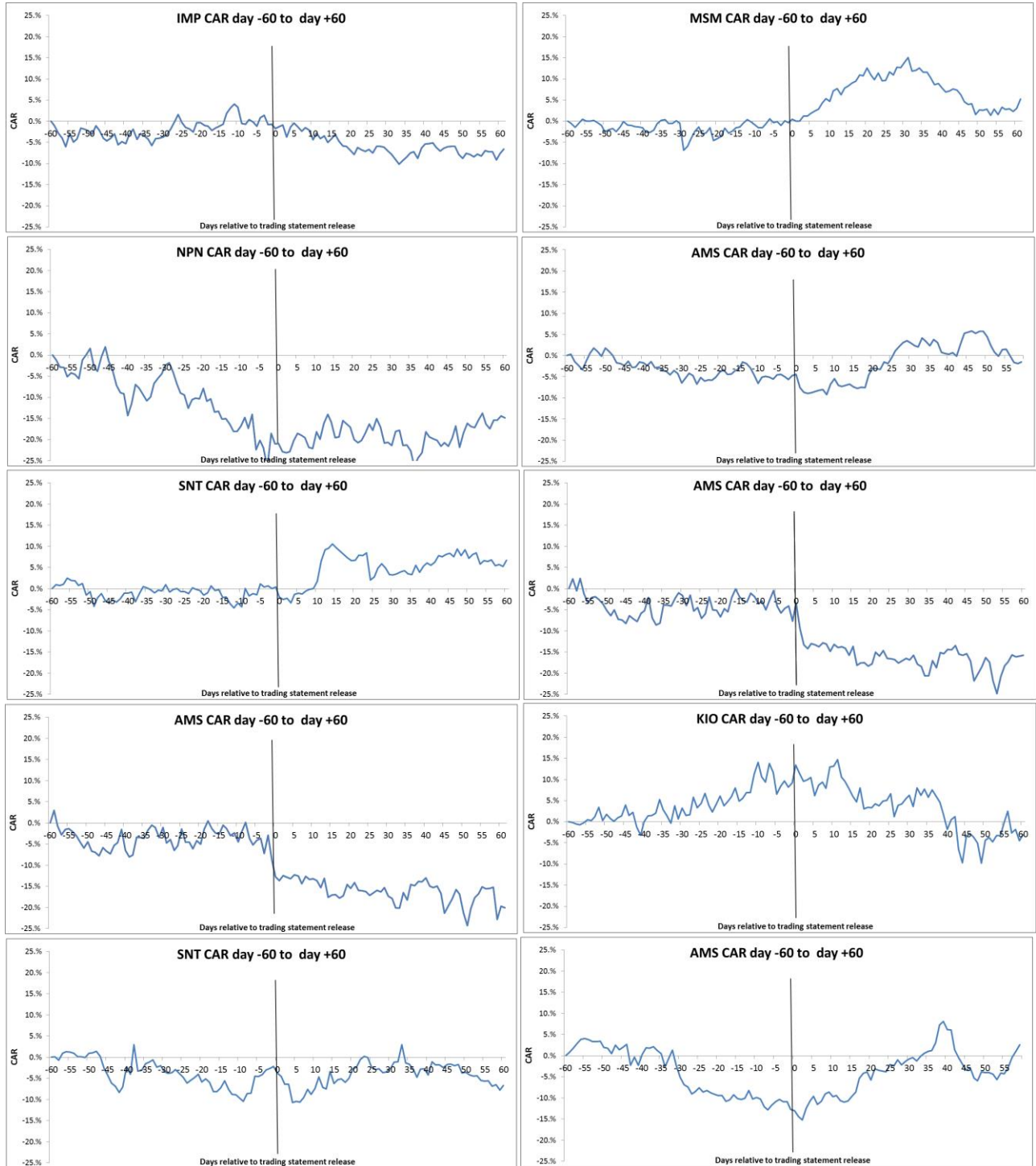
Further amendment to 3.4(b)(v) made on 31 July 2007, prior to this wording referred to Circular 7/2002 issued by SAICA.

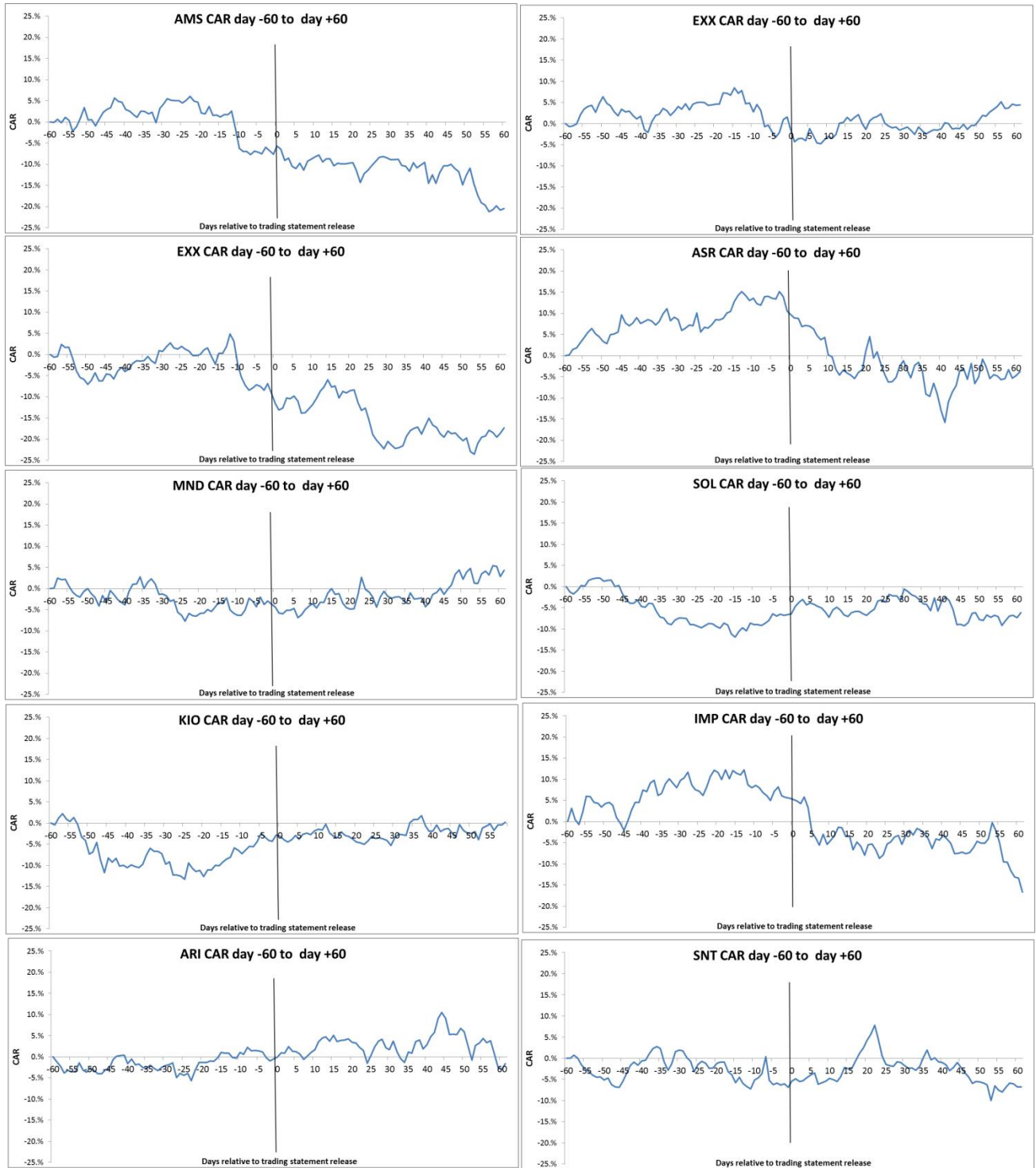
3.4(b)(vi)(1) amended with effect from 1 January 2006.

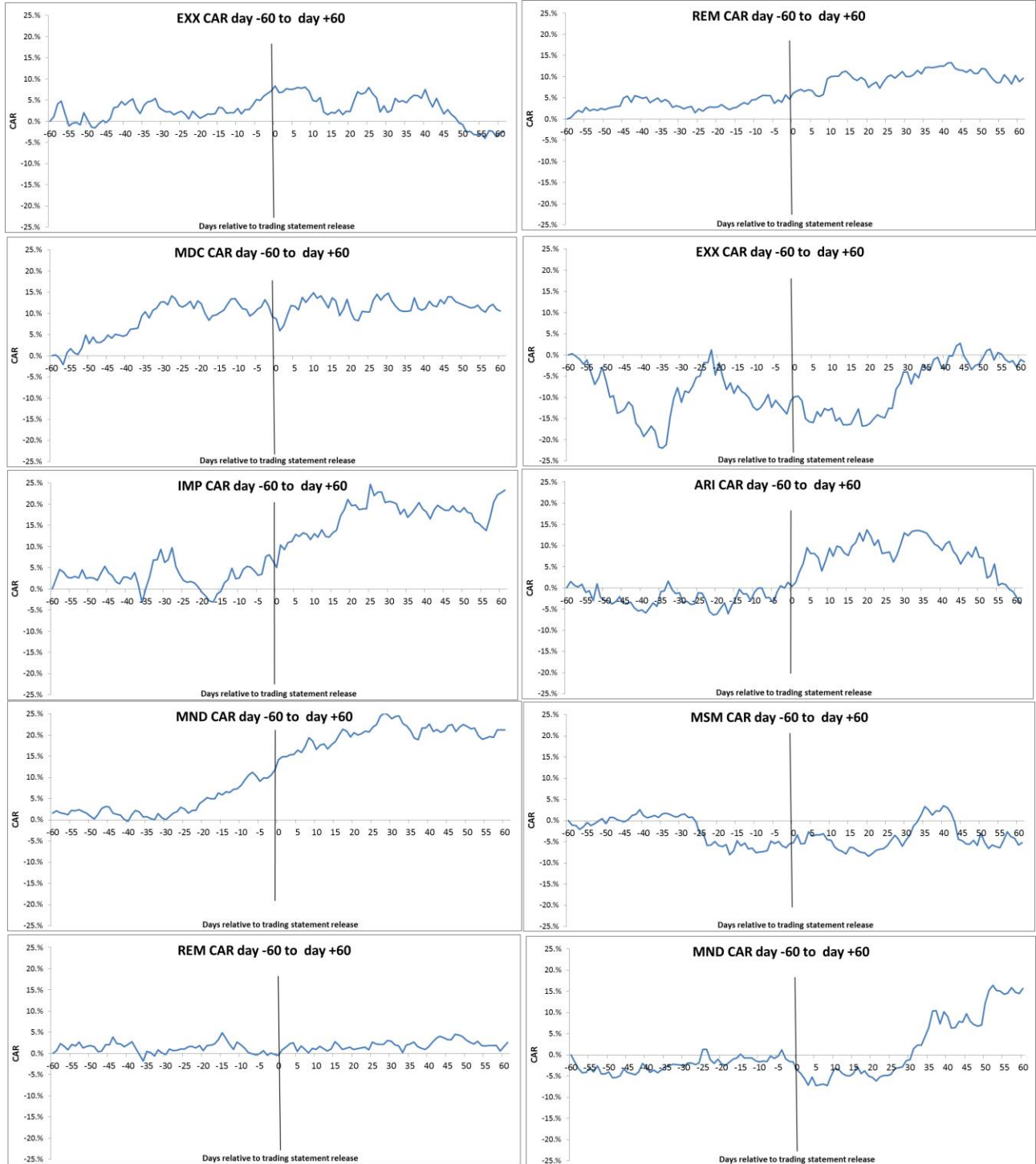
- (vii) Issuers who have a policy of publishing quarterly results will be exempt from the provisions of 3.4 (b)(i)-(vi) but must instead include a general commentary in each quarterly results announcement to ensure that shareholders are guided on the expected performance of the issuer for the next quarter (which may be as detailed or broad as the issuer chooses). Such guidance is exempt from compliance with paragraphs 8.35 to 8.44 of the Listings Requirements.
- (viii) Property entities can elect to adopt distribution per listed security as their relevant measure of financial results in terms of 3.4(b)(v) provided that they
 - (1) follow the procedures set out in 3.4(b)(v) for adopting a different relevant measure for financial results; and
 - (2) issue a trading statement if the financial results for the period to be reported on will differ by at least 15% from the base information, as opposed to the 20% referred to in 3.4(b)(i).

3.4(b)(viii) inserted with effect from 1 October 2006.

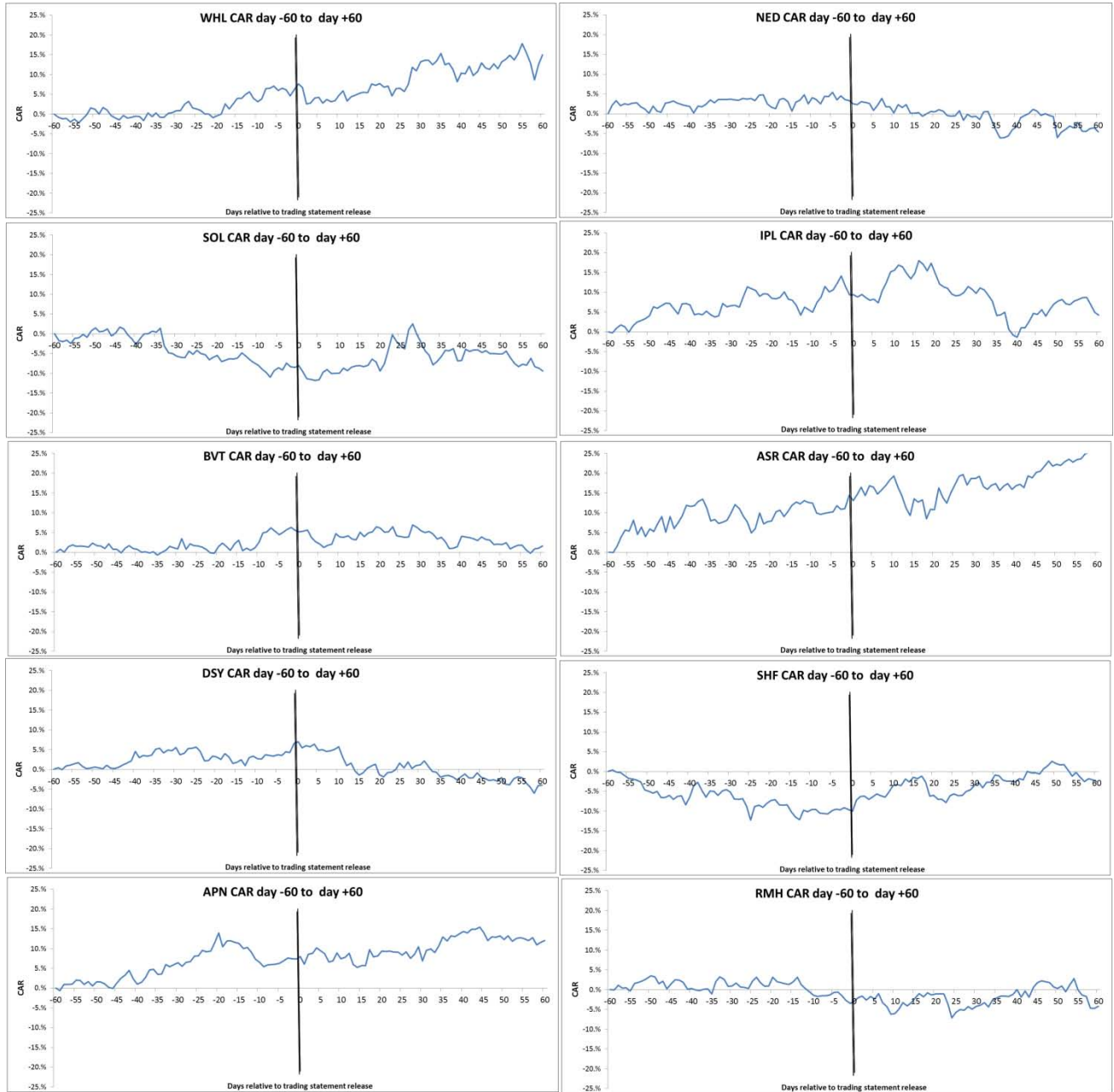
Appendix B: CARs of negative trading statement firms

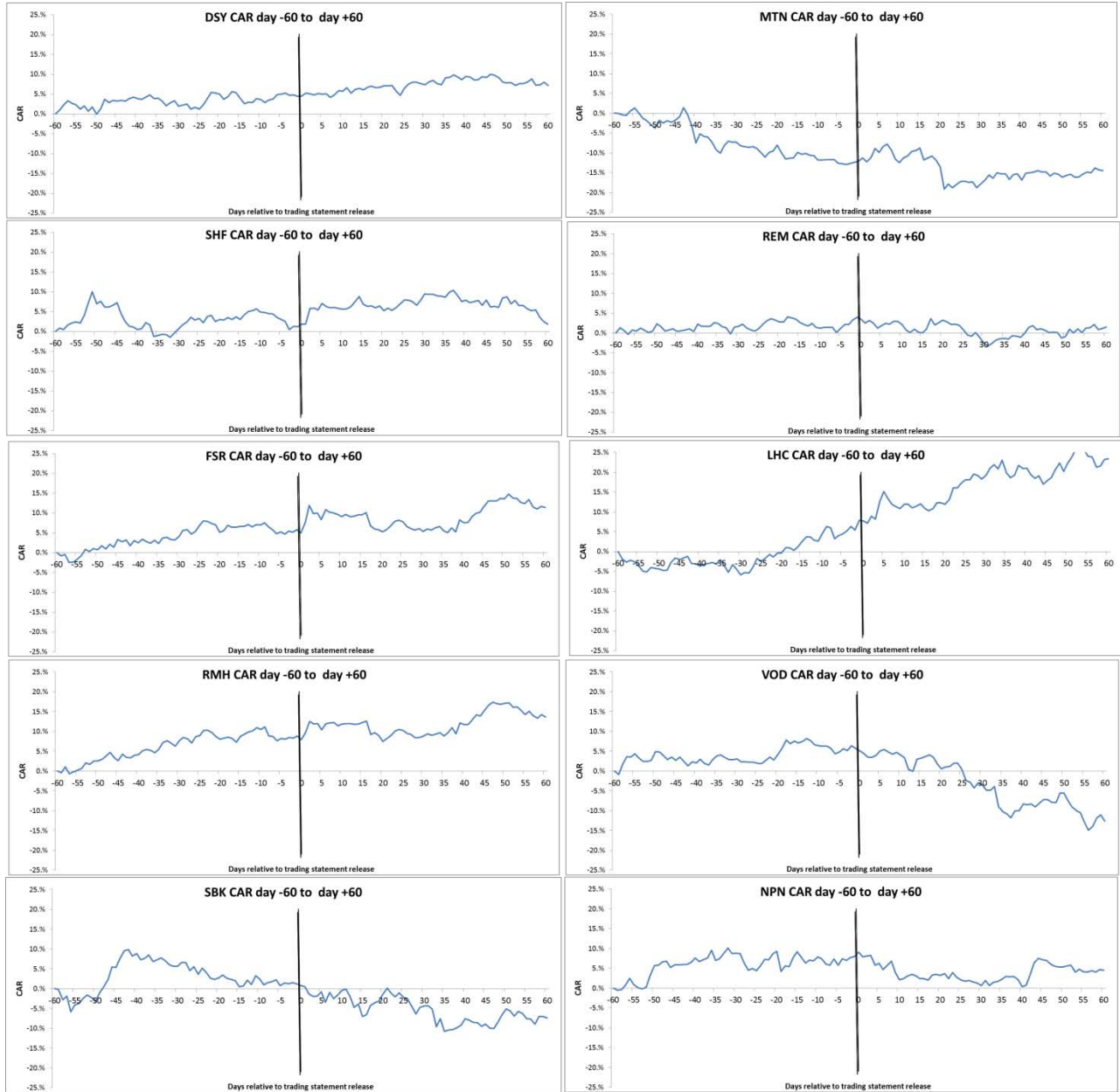


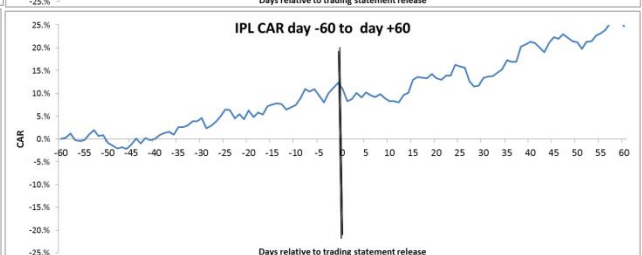
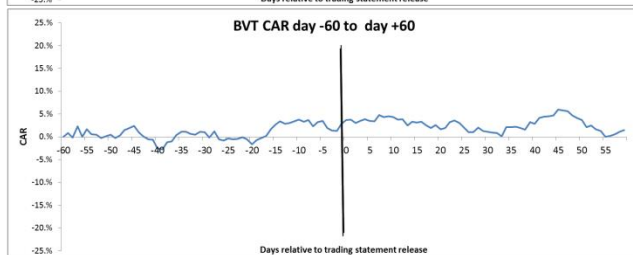
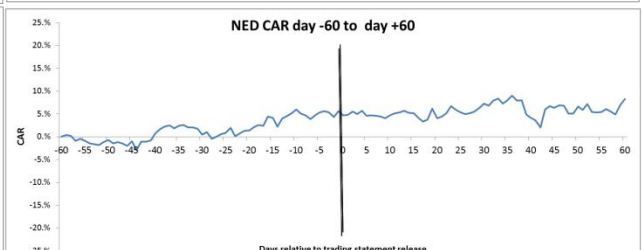
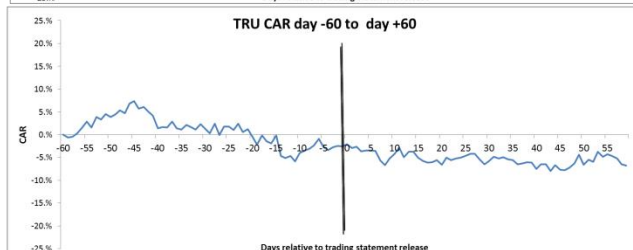
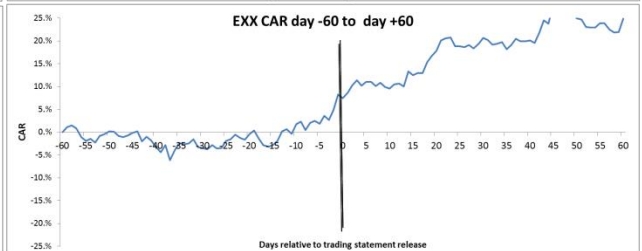
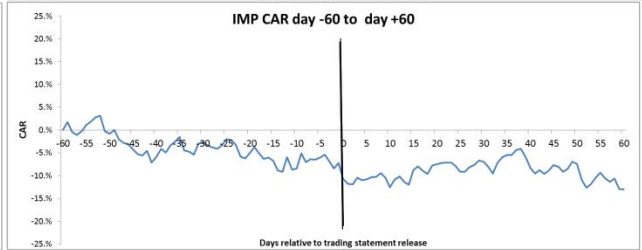
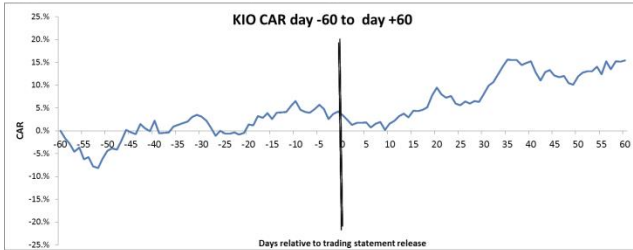
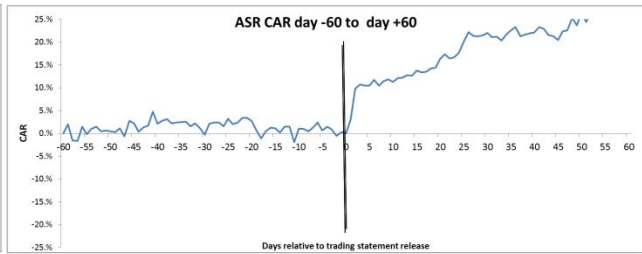
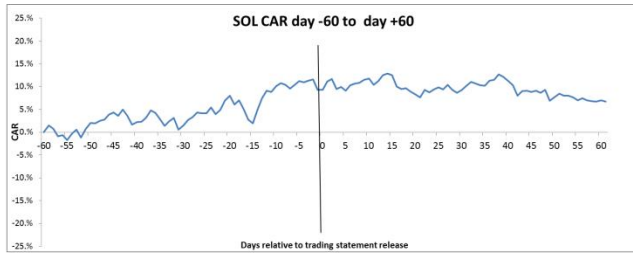




Appendix C: CARs of positive trading statement firms







Appendix D: A summary of the trading statement sample, unexpected earnings measures and CARs

Date	Ticker	Pos (1) /Neg (0)	Model (-2;+1)	Model (0;+1)	Model (-1;0)	Model (-5;0)	Model (-60;-5)	CAR (-60;-1)	CAR (-3;+3)	CAR (+3;+60)
12-Feb-13	FSR	1	0.69	-0.66	-0.38	0.43	0.34	0.07	0.02	-0.09
22-Aug-12	LHC	1	0.61	0.49	1.69	1.15	0.31	0.06	0.03	0.03
23-Feb-12	ASR	1	-0.28	0.08	-0.32	-0.15	0.25	0.09	-0.06	-0.03
17-Jan-12	ASR	1	0.03	0.48	0.39	0.15	0.24	0.05	-0.03	-0.03
27-Aug-12	RMH	1	0.22	0.19	-0.64	0.01	0.23	0.08	0.03	0.03
22-Feb-12	EXX	1	-0.41	-0.61	-0.41	0.03	0.23	0.05	-0.01	-0.15
28-Nov-12	WHL	1	0.99	1.04	1.31	0.56	0.22	0.12	0.05	0.06
08-Feb-13	SHF	1	1.06	1.26	-0.15	0.47	0.20	0.08	0.06	0.17
18-Jan-12	DSY	1	-0.99	-0.16	-0.78	-0.50	0.19	0.10	-0.08	-0.11
20-Aug-13	SHF	1	-0.10	0.68	0.42	-0.38	0.19	0.09	-0.01	-0.03
08-Aug-13	NED	1	0.91	1.01	0.13	0.40	0.14	0.13	0.06	0.15
26-Jul-12	NPN	1	0.08	-1.35	0.24	0.09	0.13	0.08	-0.02	0.15
18-Feb-13	DSY	1	-0.13	-0.45	-0.05	-0.17	0.13	0.05	-0.03	-0.23
30-Jan-12	TRU	1	0.13	0.08	0.33	-0.22	0.12	-0.03	0.00	-0.01
15-Feb-12	BVT	1	-0.73	-0.19	-0.98	-0.47	0.12	0.08	0.02	-0.10
16-Aug-13	APN	1	0.09	-0.16	-0.39	0.34	0.11	0.03	-0.01	0.00
22-Aug-12	MTN	1	0.35	0.21	1.03	0.24	0.10	-0.05	0.03	0.00
04-Sep-12	RMH	1	0.08	-0.18	-0.53	0.04	0.09	0.05	0.00	0.02
02-Mar-12	REM	1	0.06	0.10	0.02	-0.22	0.09	0.00	0.01	-0.04
17-Jul-12	WHL	1	-0.39	0.11	-0.93	-0.34	0.09	-0.02	-0.02	0.10
06-Feb-12	NED	1	0.52	1.10	0.08	-0.22	0.09	0.02	-0.02	-0.06
12-Feb-13	KIO	1	0.59	0.64	-0.25	0.50	0.07	0.00	0.09	-0.09
18-Feb-13	BVT	1	-0.11	0.13	-0.53	-0.34	0.06	-0.04	-0.04	0.22
08-Aug-12	SOL	1	-0.54	-0.58	-0.70	-0.14	0.06	-0.01	-0.02	0.08
11-Feb-13	IMP	1	-0.15	-1.03	-0.66	0.01	0.04	-0.04	-0.04	0.07
09-Feb-12	IPL	1	0.62	1.23	1.00	0.33	0.04	-0.06	0.02	-0.03
14-Aug-12	IPL	1	0.28	1.18	0.87	1.09	0.03	0.05	0.04	0.12
08-Aug-12	VOD	1	0.64	1.15	1.06	0.25	0.02	0.00	0.03	0.00
14-Nov-12	SBK	1	0.27	0.07	0.09	0.07	0.01	-0.02	-0.01	-0.03
02-Jul-12	SOL	1	-0.02	-0.19	-0.15	0.15	-0.04	-0.04	-0.01	0.09
23-Feb-12	MND	0	-0.63	-0.42	-1.93	-0.19	0.30	0.09	-0.01	0.01
17-Apr-12	REM	0	0.29	0.29	0.67	0.37	0.18	0.04	0.00	0.01
31-Jan-12	SOL	0	-0.42	-0.27	-0.27	0.01	0.17	0.01	-0.03	-0.06
03-Feb-12	REM	0	0.77	1.84	0.31	0.19	0.17	0.08	0.04	0.03

11-Mar-13	ARIM	0	1.18	2.60	0.61	0.28	0.15	0.05	0.05	0.02
18-Jun-12	EXX	0	0.68	1.20	0.00	-0.10	0.14	0.02	0.05	-0.04
30-Aug-12	MSM	0	-0.27	-0.64	-0.76	-0.05	0.13	0.11	-0.01	0.15
02-Mar-12	IMP	0	0.43	0.57	0.58	0.47	0.13	0.09	-0.01	-0.05
16-Jan-12	SNT	0	-0.46	-0.47	-0.66	0.04	0.07	-0.04	-0.08	0.00
15-Aug-12	ARIM	0	0.76	0.54	0.18	0.43	0.07	0.07	0.07	0.13
25-Jul-11	IMP	0	0.05	0.06	-0.24	-0.05	0.06	0.03	-0.01	0.12
06-Jul-12	MSM	0	0.95	2.30	0.34	0.10	0.06	0.00	0.10	0.18
23-Nov-11	KIO	0	-0.09	-1.54	-0.03	0.29	0.06	0.13	0.01	-0.12
26-Jul-12	MND	0	0.75	1.03	1.18	0.49	0.05	0.01	0.02	0.06
19-Jan-12	IMP	0	0.25	-0.16	-0.01	0.00	0.05	0.04	0.02	0.00
03-Feb-12	AMS	0	-0.41	0.21	-0.53	-0.37	0.04	-0.02	-0.03	-0.03
13-Aug-12	SNT	0	-0.08	-0.16	0.06	-0.09	0.03	0.00	0.02	0.04
14-Feb-12	IMP	0	-0.45	-0.78	-0.67	-0.42	0.02	-0.03	0.01	0.04
12-Aug-10	NPN	0	-0.25	-0.38	-0.89	-0.49	0.01	-0.11	-0.04	-0.01
02-May-12	KIO	0	0.71	1.55	1.23	0.53	0.01	-0.10	0.03	0.03
23-Feb-12	SNT	0	-0.56	-1.27	-0.63	0.23	-0.02	-0.08	-0.04	0.02
16-Nov-11	EXX	0	-1.00	-1.02	-0.90	-0.65	-0.04	-0.13	0.00	0.13
17-May-13	MDC	0	0.17	-0.09	0.45	0.29	-0.04	-0.12	0.04	-0.02
13-Nov-12	EXX	0	-0.44	-0.58	-0.18	-0.23	-0.11	-0.21	0.06	0.05
30-Nov-12	ASR	0	-1.44	-0.10	-1.33	-0.81	-0.11	-0.13	-0.06	-0.07
22-Feb-13	AMS	0	0.52	0.11	-0.16	0.19	-0.12	-0.10	-0.03	0.13
06-Feb-13	EXX	0	-1.04	-2.78	-0.55	-0.47	-0.13	-0.03	-0.08	-0.09
04-Jul-12	AMS	0	-1.01	-0.18	-1.39	-0.55	-0.20	-0.12	-0.02	-0.07

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