

NATURE AND MISUSE OF NON-MANDATORY NON-GAAP (ADJUSTED) EARNINGS BY JSE-LISTED FIRMS

A research report submitted by Michael Howard

Student number 530130

In partial fulfilment of the degree Master of Commerce (Accounting)

Supervisors: Prof. Warren Maroun and Prof. Robert Garnett

University of the Witwatersrand

Abstract

This research report evaluates the nature of, and gathers evidence of, the potential misuse of the non-GAAP 'adjusted earnings' by JSE-listed firms in South Africa. The prior literature is explored and applied to the South African context which is a unique environment due to the mandatory use of the non-GAAP 'Headline Earnings'. The prior literature provides the grounding for the research methods which enhance the validity of the study.

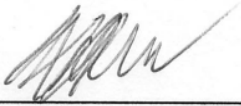
Adjusted earnings are analysed through 3 research questions and sub-questions. The first research question focuses on the nature of the use of adjusted earnings in South Africa, by examining the extent of use of adjusted earnings by a population of JSE firms, as well as the most common types of adjustments used. It is evaluated using descriptive statistical methods from data from databases and company annual financial reports. Research question 2 gathers evidence for misuse through the identification of 'valid' and 'invalid' adjustments made in the determination of adjusted earnings, as well as the identification of the repeated use of particular adjustments, which are indicators of misuse from the prior research of Bhattacharyaa, Black, Christensenb and Larsonc (2003) and Doyle, Lundholm and Soliman (2003). This question uses an ANOVA and repeated measure approach respectively using the same data from research question 1. The third research question examines whether there is an association between adjusted earnings and whether firms meet or beat analyst earnings forecasts more often (the dependent variable) as set out in Doyle, Jennings and Soliman (2013). This is assessed using logistic regression analysis using analyst earnings forecast data and company results data

The results indicate that types of firms and adjustments made in South Africa are similar to U.S. literature. It raises questions around use of adjusted earnings as a performance metric and the use of Headline Earnings in South Africa. Evidence of misuse of adjusted earnings was found. In addition, a strong relationship similar to the Doyle et al. (2013) findings was found between the use of upwardly adjusted earnings and the propensity of firms to meet or beat analyst forecasts. Whether a firm's accounting earnings met or beat

the forecast was also found to have significant influence on the dependent variable. It was also found that South African firms met or beat analyst forecasts significantly less often than U.S. firms, suggesting that there may be structural differences in the analyst forecasts environment in South Africa when compared to the U.S. The results suggest that adjusted earnings may be misused in South Africa, and one of the motivations to do so is to meet or beat analyst earnings forecasts.

Declaration

I declare this research report to be my own work. It is submitted in partial fulfilment of the requirements for the degree of Master in Commerce in Accounting in the School Of Accounting, University of the Witwatersrand. It has not been submitted for any degree or examination at any other university.



Michael Howard

31 August 2016

Date

Acknowledgements

I would like to thank my supervisors Professor Warren Maroun and Professor Robert Garnett for their guidance, assistance and motivation throughout the research process. I would also like to thank Dina Venter for her valuable assistance and insight into the statistics used in this report, Professor Elaine Rabin for her assistance with the earnings management aspect of this report and Khotso Malherbe from INET BFA for his assistance with the analyst earnings forecast data. I also greatly appreciate the support my family and friends have given me which allowed me to complete this report.

Table of Contents

1. Introduction	10
1.1 Background of the study	10
1.2 Purpose of the study	12
1.3 Significance of the study	13
1.4 Delimitations, limitations and assumptions.....	14
1.4.1 Population and selection of firms	14
1.4.2 Analysis of adjustments	15
1.4.3 Meeting or beating analyst EPS forecasts	16
1.4.4 Efficient Market Hypothesis	17
1.5 Definition of terms	17
2. Literature review.....	19
2.1 Theoretical framework – the efficient market hypothesis	19
2.2 GAAP (accounting) earnings and non-GAAP earnings.....	20
2.2.1 Mandatory non-GAAP earnings	21
2.2.2 Voluntary non-GAAP earnings.....	21
2.2.3 Adjusted earnings	22
2.3 The analyst earnings forecast process and adjusted earnings	24
Research question 1	26
2.4 Manipulation of earnings figures	26
2.4.1 Earnings management (EM)	26
2.4.2 Expectations management	28
2.4.3 Misuse of adjusted earnings	29
Research question 2	33
Research question 3	37
3. Research methodology	38
3.1 Population and sampling.....	38
3.2 Data	40
3.2.1 Research question 1 and 2:	40
3.2.2 Research question 3:	44

3.3 Research design	45
3.3.1 Research question 1 – Understand non-GAAP adjusted earnings in South Africa	45
3.3.2 Research question 2 – Valid/invalid adjustments.....	47
3.3.3 Research question 3 – Meeting or beating analyst earnings forecasts	50
3.4 Validity and reliability	56
4. Results and discussion.....	58
4.1 Research question 1 – The nature of non-GAAP adjusted earnings in South Africa	58
(a) To what extent are non-GAAP adjusted earnings used in South Africa?	58
(b) What significant adjustments are most frequently used?	62
4.2 Research question 2 – valid/invalid adjustments	65
(a) Results of the categorisation of adjustments	65
(b) Results of the repeated use of valid adjustments	67
4.3 Research question 3	70
4.3.1 Descriptive statistics	70
4.3.2 Results of the logistic regression analysis	75
4.4 Summary.....	82
5. Conclusion	83
5.1 Implications and recommendations.....	86
6. References.....	88

List of tables, diagrams, equations and graphs

Tables

Table 1: Condensed adjustment categories and valid, invalid or other categorisation

Table 2: Doyle et al (2013) H1 control variables

Table 3: Independent variables of Doyle et al (2013) H2 model

Table 4: Search terms used to detect evidence of use of non-GAAP earnings

Table 5: Number of firms contributing data by number of years

Table 6: Scenarios to indicate the necessity of the DilutedHEPSMBEForecast variable

Table 7.1: Frequency of adjusted earnings use classified by year (2010-2014)

Table 7.2.1: Top 5 industries making up the proportion of firms using adjusted earnings (at the 4 different ICB industry category levels) (on a firm year basis)

Table 7.2.2: Top 5 industries making up the proportion of firms using adjusted earnings (at the 4 different ICB industry category levels) (on a firm basis)

Table 7.3: Use of non-GAAP earnings versus market capitalization

Tables 8.1 – 8.3: ANOVA results

Tales 8.4 – 8.6: Wilcoxon Signed Ranks test results

Table 9.1: Proportion of different earnings that met or beat analyst forecasts for the original population (pre-census) of 570 firm years

Table 9.2: Proportion of different earnings that met or beat analyst forecasts for the firm years (191) where adjusted earnings were used

Table 9.3: Proportion of different earnings that met or beat analyst forecasts for the firm years (365) where adjusted earnings were not used

Table 10.1 – 10.3: Results from the logistic regression analysis significant variables

Table 10.4: Results from logistic regression analysis all variables

Table 11: Summary of research questions, approach and results

Diagrams

Diagram 1: Different data groups used in this study and how they were derived

Equations

Equation 1: Original Doyle et al (2013) H1 model

Equation 2: Original Doyle et al (2013) H2 model

Equation 3: RQ3 planned model

Equation 4: RQ3 post-Forward Stepwise selection model

Equation 5: RQ3 logistic regression results equations

Graphs

Graph 1: Relative frequency of valid and invalid adjustment categories (9 categories)

Graph 2: Repeated use of valid adjustments

1. Introduction

1.1 Background of the study

Company earnings figures are among the most important financial measures of firm performance (Jerris, 1998, Bhattacharyaa et al., 2003). There are 3 main types of earnings figures in South Africa: (1) accounting earnings, calculated in accordance with International Accounting Standard (“IAS”) 33 (IASB, 2003) which is a Generally Accepted Accounting Practice (“GAAP”) earnings figure, (2) headline earnings which are determined and mandated by the Johannesburg Stock Exchange (“JSE”) regulations (JSE, 2015) and is a mandatory (for JSE-listed firms) non-GAAP earnings figure, and (3) adjusted earnings which are a voluntarily presented non-GAAP earnings figure. All of the above earnings figures may be presented as a per share figure (Earnings per Share – “EPS”) which may further be ‘basic’ or ‘diluted’. EPS is useful to investors and users of financial reports who seek a single figure to communicate the performance of a firm which is easy to use and is comparable across firms and years (SAICA, 2013). (See Section 1.5 for more detailed definitions of all of these terms).

Equity analysts and other users of financial results develop firm valuations and make other judgements which may be relied on by investors to make investment decisions (Bradshaw & Sloan, 2002). In line with the efficient market hypothesis, the information conveyed by analyst earnings forecasts is often priced into a firm’s share price (Fama, Fisher, Jensen & Roll, 1969). The failure of a firm’s reported earnings to at least meet forecasts often results in a negative reaction from investors and this is reflected in a sudden fall in the firm’s share price (Burgstahler & Eames, 2006). As a result, there is pressure on firms and managers to meet or exceed analyst forecasts (Matsumoto, 2002, Brown, 2001, Burgstahler & Eames, 2006).

Although earnings figures derived using accounting principles may appear to provide users of financial results with the necessary information to develop valuations and make other judgements and decisions, there are a number of problems with accounting figures,

such as the inclusion of once-off, unusual and non-cash items that diminish their usefulness and their ability to predict future earnings (Bradshaw & Sloan, 2002). This has led to the more widespread use of a number of non-GAAP earnings figures (Abarbanel & Leheavy, 2007) which claim to provide more useful information to users (Doyle et al., 2013); in particular the non-GAAP earnings figure 'adjusted earnings' (and EPS) which are the focus of this report. Adjusted earnings are termed 'pro-forma' earnings in the U.S. literature (Marques, 2010) and are often referred to by other terms such as 'normalised', 'core', 'recurring' or other similar terms outside of the U.S. literature (Wallace, 2002, Bhattacharyaa et al., 2003).

Adjusted earnings can be distinguished from other non-GAAP earnings figures (such as 'adjusted' operating profit, EBITDA and others) because adjusted earnings are treated as being the most comparable non-GAAP earnings figure to accounting (net) earnings. This is achieved by the figure being below the line, after tax, being attributable to equity holders of the parent and also by presenting the adjusted earnings as a per share figure, as well as a total figure.

In this context, it has been suggested that adjusted earnings can be misused. (Bradshaw & Sloan, 2002). 3 broad forms of misuse have been identified in the literature (Section 2.4.3), including: (1) the emphasis of adjusted earnings (and other non-GAAP earnings) on firm results announcements (Marques, 2010), (2) the determination of adjusted earnings by making adjustments that have been found in prior literature to include value relevant earnings information (Bhattacharyaa et al., 2003, Doyle et al., 2003) and, as a result, should not be adjusted for in the determination of adjusted earnings i.e. 'invalid' adjustments (Bhattacharyaa et al., 2003, Doyle et al., 2003) (3) the use of adjusted earnings as an alternate (or additional) tool to manage expectations or enhance (at least in appearance) the earnings of a firm (Doyle et al., 2013)¹. The extent of the use of this

¹ The use of invalid adjustments to meet or beat analyst forecasts is not classified as earnings management ("EM") as EM involves "using judgement(s) in financial reporting and structuring transactions to alter financial reports to mislead investors" (Healy and Wahlen, 1999). As non-GAAP earnings are not defined in financial reporting standards, and aren't derived through accounting principles or transactions, they can't be subjected to these techniques (Doyle, 2013). They are also not classified as a form of expectations management as these figures are communicated with the firm's results and not beforehand to guide forecasts lower (Matsumoto, 2002).

tool is measured by the propensity of adjusted and accounting earnings to meet or beat analyst earnings forecast figures. (Bradshaw & Sloan, 2002, Bhattacharyaa et al., 2003, Doyle et al., 2013).

1.2 Purpose of the study

This research report:

- Identifies the types of adjustments made by firms listed on South Africa's Johannesburg Stock Exchange ("JSE") in the determination of their adjusted earnings to gain an understanding of what types of adjustments are most frequently used as well as to understand the general nature of adjusted earnings in South Africa (research question 1).
- Uses tests to identify the extent of the use of 'invalid' adjustments as described by Bhattacharyaa et al. (2003), Doyle et al. (2003) and Doyle et al. (2013) made in the determination of adjusted earnings (research question 2) to gather evidence of possible misuse of adjusted earnings in South Africa. The 'emphasis of adjusted earnings in earnings announcements is not tested as it has previously been tested in South Africa).
- The research report then considers whether adjusted earnings may be used to meet or beat analyst earnings forecasts. In this report, the analyst earnings forecast figures are determined on a per share basis. This results in the use of adjusted EPS (and not earnings) for this part of the report only. To determine whether adjusted EPS is used to meet or beat analyst earnings forecasts, the report examines whether there is an association between firms using income increasing adjustments i.e. the instances where adjusted EPS exceeds accounting EPS and adjusted EPS subsequently meeting or beating analyst forecasts as described by Doyle et al. (2013).

1.3 Significance of the study

This paper adds to the existing literature in the non-GAAP earnings field, in particular to research relating to 'adjusted earnings'. There is a large body of research on these topics in the United States (Burgstahler & Eames, 2006) but relatively little in a South African context (Venter, Emanuel & Cahan, 2014). Of the themes identified which suggest misuse of adjusted earnings, the use of adjusted earnings as a tool to meet or beat analyst earnings forecasts is one of the least thoroughly explored (Doyle et al., 2013). By analysing this topic in a different region and by considering the types of adjustments being used in the determination of adjusted earnings, the findings may enhance or question the validity of the existing findings.

As investors place reliance on earnings figures in making investment decisions, the misuse of adjusted earnings may cause investors to make erroneous decisions (Bhattacharya, Black, Christensen & D.Mergenthaler, 2007). A greater understanding of the nature of adjusted earnings may assist investors in South Africa, particularly due to the number of different earnings figures used that may confuse users (Bhattacharya et al., 2007). By identifying adjusted earnings as possibly being misused, investors may consider this risk in their choice of which earnings figures to rely on. It has already been noted in South Africa that adjusted/non-GAAP earnings pose a problem to users and may obfuscate the underlying performance of firms leading to erroneous investment decisions (Venter et al., 2014, van Eck, 2014, Pillay & Pascoe, 2014). As no new regulations have yet been proposed by South African regulators like in the USA (refer to Section 2.2.3) South African markets are still impacted by adjusted earnings.

1.4 Delimitations, limitations and assumptions

1.4.1 Population and selection of firms

The study is limited to firms which are covered by analyst forecasts on INET BFA McGregor's database (amounting to 136 companies), due to limitations in the availability of data for other firms and from other sources. It is likely that this selection of firms includes those with larger market capitalisations due to increased institutional demand for analyst data for larger firms (Bradshaw, Drake, Myers & Myers, 2012). Furthermore, it is not possible to distinguish between variations in the number of analysts following each firm due to the nature and form of the South African capital market (Venter et al., 2014).

Firms in the property sector are excluded from the population because of the changes in the structure and tax legislation of property companies in South Africa from Property Loan Stocks and Property Unit Trust structures to Real Exchange Investment Trusts ('REIT's'). Most conversions of property firms in South Africa occurred in 2013 and 2014 (SA REIT, 2013, JSE, 2014). In the U.S. literature it was found that the distribution profile of REIT's earnings is significantly different to Property Loan Stock structured companies, as REIT's can raise different and larger provisions and depreciation allowances than firms structured as Property Loan Stocks (Baum & Devaney, 2007). This may result in these firms not being comparable over the time period under review in this study. Furthermore, the most frequently used non-GAAP earnings figure by property firms is distributable earnings, which aims to adjust for the mismatch between earnings and cash to arrive at a figure representative of the maximum possible distribution the firm can make (SA REIT, 2013). This figure has a different objective to headline earnings and adjusted earnings and is not comparable to other non-property firms. In addition distributable earnings are defined by REIT trust deeds and are not subject to arbitrary adjustments (SA REIT, 2013).

As a result of the above on the selection of firms used, it may not be possible to make inferences from these results to other JSE-listed firms that use adjusted earnings which don't fall into this population. The use of the same population across the entire study was done to ensure consistency across the research questions.

1.4.2 Analysis of adjustments

Only income and expense adjustments made in the determination of adjusted earnings are considered in this research. Adjusted EPS is determined by dividing adjusted earnings (the numerator, whose adjustments are considered by the report) by a number of shares (the denominator). Adjusted EPS can consist of further adjustments than those made in the determination of adjusted earnings through adjustments to the number of shares in the denominator (Bhattacharya et al., 2007). When adjustments to the number of shares in the denominator are made, they are only made when determining diluted adjusted EPS and not basic adjusted EPS. Very few firms in the data in this research presented diluted adjusted earnings and, when they did, only minor adjustments to the number of shares in the denominator were made. This, as well as the impact share-based denominator adjustments would have on income/expense numerator adjustments, resulted in their exclusion from this research. As a result this research only considers adjustments made in the determination of adjusted earnings and not adjusted EPS (although for the most part, the same adjustments will be made).

The adjustment categorisation approach used in research question 2 has several limitations. Firstly, the classification of adjustments involves a degree of subjectivity as the information provided on the adjustments in firm reports is limited and inconsistent due to the use of blanket and vague terms such as 'other adjustments' among others. To reduce the extent of subjectivity, adjustments were categorised, based only on the name/description of the adjustment and not on other more detailed information which was only sometimes provided in the description below the adjustment reconciliations (which may more accurately reflect the underlying economic reality of the adjustment). Where there was a degree of uncertainty around a particular adjustment, it was classified as indeterminable. Secondly, the use of adjustment descriptions provided in firm reports may not reflect the reality underlying the adjustment, which may result in a misclassification of some adjustments as valid or invalid.

The limitations resulted in a number of adjustments being categorised as 'other', 'multiple in one' or 'indeterminable' adjustments which may not be useful. Unfortunately this limitation cannot be wholly avoided due to the limited information provided in many firm reports. The impact of this is that the results should be interpreted with the knowledge that 'other', 'multiple in one' and 'indeterminable' adjustments may have affected the results had more information been provided, and different researchers may have classified certain adjustments differently. Efforts as discussed in Section 3.4, were undertaken to reduce the subjectivity in the classification of adjustments.

1.4.3 Meeting or beating analyst EPS forecasts

The analyst forecast data used in research question 3 was determined on the basis of diluted headline earnings per share ('HEPS') (INET BFA, 2015) i.e. it is per share and not an earnings figure, necessitating the use of adjusted EPS instead of adjusted earnings figures (for this part of the report only).

Additionally, adjusted EPS is not often (in this research's data) defined as 'basic' or 'diluted' but due to the lack of adjustments to the number of shares adjusted is generally a basic figure by default but the analyst forecast data is determined on the basis of diluted HEPS. It may appear that analyst forecasts and basic adjusted EPS are not comparable but the purpose of the study is to gather evidence of misuse of adjusted earnings and EPS. This may be permitted as the terms 'adjusted EPS' and 'analyst EPS forecasts' are treated as being comparable in company results announcements and media articles (Naspers Ltd, 2014). However, where a company does present a diluted adjusted EPS figure, that is used instead of the basic EPS figure.

A further limitation of this paper arises because of the complexities and data requirements (Dechow, Ge, Larson & Sloan, 2011) of detecting earnings management and expectations management, using established tests for these factors such as the Jones (1991) and Matsumoto (2002) tests. Controlling for earnings management and expectations management using established tests (see Section 2.4.1 and 2.4.2 for

examples) is beyond the scope of this report due to the data requirements of these tests (Lemma, 2013, Dechow et al., 2011). As a result, the study does not effectively control these factors, and needs to be considered in the interpretation of the results.

1.4.4 Efficient Market Hypothesis

Lastly, the theoretical base for the study is the Efficient Market Hypothesis (EMH), as prior US based literature in this area of research relies on the EMH. It is appropriate to apply this research to the South African context as the JSE is at least weak form efficient (Jefferis & Smith, 2004) (discussed in Section 2.1) so the EMH still holds for this market. The EMH, however, has limitations in that its validity has been questioned by advances in behavioural finance and econometric research. It has been argued that share prices are driven by factors other than information (including psychological and irrational behaviour) and that prices are to an extent predictable (Malkiel, 2005). Nevertheless, the EMH is used as the theoretical framework for this research as analyst forecasts and earnings reporting are grounded in valuation and asset management theory underpinned by the EMH (Danielson, 2010). The criticism raised against the EMH would need to be considered in the interpretation of the results of the study and whether the results would be interpreted differently under a different framework (for example the behavioural finance framework). Refer to Section 2.1 for further discussion on the EMH.

1.5 Definition of terms

(IFRS) Earnings: “For the purpose of calculating basic earnings per share, [earnings are] the amounts attributable to ordinary equity holders of the parent entity in respect of:

- (a) profit or loss from continuing operations attributable to the parent entity; and
- (b) profit or loss attributable to the parent entity”

(IASB, 2003)

Basic EPS: “Basic earnings per share shall be calculated by dividing profit or loss attributable to ordinary equity holders of the parent entity (the numerator) by the weighted

average number of ordinary shares outstanding (the denominator) during the period” (IASB, 2003).

Diluted EPS: “An entity shall calculate diluted earnings per share amounts for profit or loss attributable to ordinary equity holders of the parent entity and, if presented, profit or loss from continuing operations attributable to those equity holders. For the purpose of calculating diluted earnings per share, an entity shall adjust profit or loss attributable to ordinary equity holders of the parent entity, and the weighted average number of shares outstanding, for the effects of all dilutive potential ordinary shares.” (IASB, 2003).

Generally Accepted Accounting Principles (GAAP): are U.S. accounting principles that are set and prescribed by the U.S. Financial Accounting Standards Board (FASB) (EY, 2011). The comparable accounting principles used by South African listed companies in the preparation of financial statements are International Financial Reporting Standards (IFRS) (JSE, 2015).

Non-GAAP: is accounting data not prepared in accordance with accounting principles (Bhattacharyaa et al., 2003).

Headline Earnings Per Share (HEPS): “is an additional earnings number that is permitted by IAS 33. The starting point is earnings as determined in IAS 33, excluding “separately identifiable re-measurements” (as defined), net of related tax (both current and deferred) and related non-controlling interest, other than re-measurements specifically included in headline earnings (“included remeasurements”, as defined)” (SAICA, 2013). It is required to be disclosed by JSE listed companies in terms of the JSE listing requirements (JSE, 2015).

Adjusted earnings: are non-GAAP earnings figures that are adjusted (at management's discretion) from accounting earnings. They are a below the line, net after tax figure, attributable to equity holders and must be presented on a per share basis and total basis.

2. Literature review

2.1 Theoretical framework – the efficient market hypothesis

The efficient market hypothesis (EMH) (Fama, 1965, Malkiel & Fama, 1970) proposes that markets process information efficiently and that share prices follow a 'random walk' – that historic data cannot be used to predict future prices (Fama, 1965). There are several assumptions on which the EMH is based. There must be market participants who analyse and value shares independently, new information is brought into the market randomly, and share prices will react to this new information which will discount this information into share prices (Danielson, 2010). Earnings figures are among the most value-relevant items of financial information (Bradshaw & Sloan, 2002) and, as a result, are important information for users (Jerris, 1998, Bhattacharyaa et al., 2003). If the information is misleading, it may affect shareholders returns (Dechow et al., 2011).

In terms of market efficiency, however, it should not matter whether firms meet or beat analyst forecasts as this would already be discounted into market prices. In terms of the classifications of types of market efficiency by Malkiel and Fama (1970), this would be the case for all 3 forms of market efficiency. In terms of strong-form efficient markets, forecasts won't impact prices as information, private and public, is priced in and forecasts won't convey any additional information. In terms of semi-strong form efficient markets, forecasts are unlikely to impact prices, as prices are the reflection of all publically available information – and most forecasts are (in theory) derived from publically available information (Burgstahler & Eames, 2006). In terms of weak form efficient markets, forecasts won't impact prices as they reflect all currently available information. As analyst forecasts are derived from financial results (Danielson, 2010) they offer no additional information that is not known. As most equity markets are considered weak form efficient (Chan, Gup & Pan, 1997) this is expected to be the case. In confirmation with this theory, Malkiel (2005) found that asset managers did not outperform their benchmark indexes over the long run – i.e. their forecasting techniques did not result in greater performance.

Despite this, analyst forecasts are still respected by markets (Das, Levine & Sivaramakrishnan, 1998). This may be due to the perceived cost of information by some market participants and the irrationality of markets explained by behavioural finance (Shiller, 2003) where forecasts and valuations may be out of sync with the information in the market leading to false expectations (in the form of earnings forecasts).

Notwithstanding the above criticisms of the applicability of the EMH, most finance literature in the US is grounded in the EMH, and all prior research on non-GAAP/adjusted earnings is grounded in the EMH.

The EMH is, therefore, the theoretical grounding for this report as earnings figures provide the basis for market participants to develop company valuations to make investment decisions (Bradshaw & Sloan, 2002) and adjusted earnings may influence these decisions (Bhattacharya et al., 2007). Negative earnings 'surprises' which usually result in negative share performance (Burgstahler & Eames, 2006) may occur because of the failure of a company's actual earnings results to meet analyst forecasts. This places pressure on companies and managers to meet or exceed analyst earnings forecasts (Matsumoto, 2002, Brown, 2001, Burgstahler & Eames, 2006) which may be a driving factor in the misuse of adjusted earnings.

The US literature is applicable to South Africa as although the South African JSE is less efficient than the U.S. capital markets (Magnusson & Wydick, 2002), it is at least, weak form efficient (Jefferis & Smith, 2004). Consequently, the incentives to make use of adjustments to earnings information in order to influence the share price, as found in the U.S. and European literature (Matsumoto, 2002) would hold in a South African setting.

2.2 GAAP (accounting) earnings and non-GAAP earnings

Per the definitions in Section 1.5, GAAP (accounting) earnings (and EPS) are earnings figures prepared in accordance with accounting frameworks. In the U.S., the applicable accounting framework is U.S. GAAP; while in South Africa, it is IFRS. Non-GAAP

earnings and EPS are earnings figures not prepared in accordance with accounting frameworks. For the purpose of this thesis, 2 broad types of non-GAAP earnings are defined: mandatory and voluntary:

2.2.1 Mandatory non-GAAP earnings

South Africa is unique in the field of earnings reporting due to the requirement for JSE-listed firms to prepare and present a non-GAAP earnings figure, namely headline earnings (per share) (JSE, 2015). No other country mandates the presentation of a non-GAAP figure in this manner (Venter et al., 2014). Headline earnings was developed in the United Kingdom in the early 1990's by what is now the Chartered Financial Analyst (CFA) society for the *Financial Times* to use in the calculation of their price-earnings (PE) figures (Venter, Cahan & Emanuel, 2013).

Headline earnings can be distinguished from adjusted earnings as it is prepared consistently according to predefined rules across listed firms in South Africa and is audited (Venter et al., 2014). Headline Earnings is not likely to be involved in the same controversy surrounding adjusted earnings as these controversies arose primarily due to the discretionary nature of adjusted earnings (Bhattacharya et al., 2007).

2.2.2 Voluntary non-GAAP earnings

Voluntary non-GAAP earnings figures are prepared at management's discretion and have no common rules to guide their preparation (Bhattacharyaa et al., 2003). They are determined by making adjustments to accounting earnings (Bradshaw & Sloan, 2002). They are not required by any legislation in any country to be presented (Venter et al., 2014). Adjusted earnings is a particular type of non-mandatory non-GAAP earnings figure.

Adjusted earnings is referred to by a number of different terms, including any of the following terms with reference to earnings, profit or income: “excluding,” “normalised”, “pro-forma”, “core”, “recurring”, “before”, “once-off” and “underlying” (Wallace, 2002, Bhattacharyaa et al., 2003). In the U.S., adjusted earnings figures are termed “pro-forma” earnings (Marques, 2010). In South Africa, the term “pro-forma” earnings conveys a different meaning. It is the term ascribed to earnings forecasts provided by JSE-listed and prospective JSE-listed firms undertaking various corporate transactions which are required to be presented in a formal circular to prospective and/or current shareholders per JSE regulations (JSE, 2015).

2.2.3 Adjusted earnings

Adjusted earnings are widely used in the U.S. (Marques, 2010) as they are intended to provide users with more useful information to develop valuations (*Bradshaw & Sloan, 2002*). The 2 features of adjusted earnings that enable this are information usefulness and earnings persistence, which are explained below.

Information usefulness with regards to earnings figures relates to the information content of earnings figures and their impact on the pricing of shares. It has been suggested that adjusted earnings are more information useful than accounting-earnings (*Bradshaw & Sloan, 2002*). It was found that adjusted earnings are more value-relevant than GAAP earnings in the U.S., providing support for the use of adjusted earnings as an information enhancing tool (*Bhattacharyaa et al., 2003, Bradshaw & Sloan, 2002*). However, earlier research may no longer hold true due to changes in accounting standards. In the South African context, *Venter et al. (2014)* found that HEPS (a particular type of non-GAAP earnings figure) is more value relevant than GAAP/IFRS earnings. In addition, it has been found that the market pays attention to adjusted earnings and they may be preferred to GAAP/IFRS earnings by some investors (*Bradshaw & Sloan, 2002, Allee, Bhattacharya, Black & Christensen, 2007*).

Earnings persistence refers to the likelihood that earnings will recur in future (Nichols & Wahlen, 2004). Most valuation models require recurring operating earnings in their determination of value as the use of earnings figures that contain non-persistent items can distort the valuation (Barker, 2012). Adjusted earnings, therefore, assist analysts to determine the expected recurring cash flows from the firm's operations (Bhattacharyaa et al., 2003).

The literature in the U.S. suggests that adjusted earnings should be determined by adjusting accounting earnings for non-recurring and unrepresentative incomes and expenses (Doyle et al., 2003, Bradshaw & Sloan, 2002, Bhattacharyaa et al., 2003). The resulting adjusted earnings figure should assist users in understanding the operating performance of the firm and assist in developing valuations (Barker, 2012). There is no reason to suppose that SA earnings that have been similarly adjusted would not achieve a similar purpose and result, due to the similar intentions of both figures.

There has been renewed interest in adjusted earnings in 2016 from accounting standard bodies and regulators. In May 2016, the US Securities Exchange Commission (SEC) updated its regulations on non-GAAP (adjusted) earnings with significant new requirements and changes (EY, 2016). These new regulations include:

1. Clarity on when an adjusted earnings measure is misleading. The SEC is of the view that if the figure excludes normal recurring expenses, is presented inconsistently between periods without adequate disclosure of the change, and/or excludes non-recurring expenses but does not exclude non-recurring gains; it is misleading to users. As a result these practices are now prohibited.
2. Disclosure of adjusted earnings: adjusted earnings may not be disclosed in more prominence than GAAP earnings. In most cases if any discussion is made regarding adjusted earnings performance, a similar discussion regarding the corresponding GAAP figure must be provided.

These changes address a number of problems with adjusted earnings identified in Section 2.4.3, especially the issues relating to disclosure (prominence) and consistency.

In May 2016 it was communicated by the International Accounting Standards Board (IASB) that non-GAAP adjusted earnings were to be a key focus for the Board. It was noted that it is the responsibility of regulators to manage the use of adjusted earnings, but that standard setters need to provide more useful performance measures in standards so that companies are less inclined to report adjusted earnings that they perceive to be more useful. It was suggested that better structuring of the income statement and more defined subtotals could be a possible approach (Hoogervorst, 2016).

2.3 The analyst earnings forecast process and adjusted earnings

According to the principles of the efficient market hypothesis, the share price of a firm is the present value of the future cash flows of the firm (Fama et al., 1969). This principle supports the role of analyst earnings forecasts in equity markets. In determining forecasts, equity analysts use historic accounting data and adjust it for various factors that are expected to differ in the future. This information is then disseminated to users for use in their investment decisions (Danielson, 2010).

As discussed in Section 2.2.3, as part of the adjustment process to arrive at a representative earnings figure, analysts need to adjust for unusual, once-off and non-cash items included in historic accounting earnings (Danielson, 2010). Adjusted earnings are suggested to provide this and are purportedly presented to save analysts and users from having to determine these figures themselves (Doyle et al., 2013), however, professional analysts have been found rather to make the adjustments themselves as different analysts employ different techniques and adjustments in their valuation processes (Bradshaw et al., 2012). As a result, the main users of adjusted earnings where a user is defined as someone who uses the information to make an investment decision appear to be retail (amateur) investors, who lack the information capacity of equity analysts and institutional investment firms. (Bhattacharya et al., 2007, Allee et al., 2007).

This form of use may be twofold. Firstly, these users may use these figures either in their own valuation exercises as they may not have the capacity or information to determine the extent of adjustments themselves or they may rely on these figures as a performance measure to compare to professional equity analysts forecasts (Bhattacharya et al., 2007). Less informed investors may be led to believe that these figures are the optimal measure of a firm's performance (Marques, 2010) due to the emphasis placed on these figures in shareholder communications (discussed in Section 2.4.3).

Analyst forecasts are valued in markets as, on average, they are more accurate at forecasting future earnings than extrapolations of past performance (Das et al., 1998). In line with the efficient market hypothesis, this information is often priced into a firm's share price (Fama et al., 1969). The failure of results to meet or beat the forecast may result in negative earnings 'surprises' which may result in share price decreases (as discussed in Section 2.1). This places pressure on firms and managers to meet or exceed analyst earnings forecasts (Matsumoto, 2002, Brown, 2001, Burgstahler & Eames, 2006).

Analyst forecasts are developed over time, with analysts publishing updated figures on a regular basis to reflect changes in assumptions and new information (Danielson, 2010). The last forecast before the release of a firm's earnings is generally most accurate due to the most amount of information being obtainable at this point. As a result it is the most commonly used reference to compare actual firm results with analyst forecasts and whether the forecast was met or beaten (Brown & Kim, 1991).

As a result of biases of individual analysts (Das et al., 1998) – the average of a number of analysts forecast data is commonly used in referring to a forecast. This average forecast is termed "consensus data" (Danielson, 2010). The analyst earnings forecast process is affected by expectation management where information is communicated by firms to analysts to lower their forecasts to make them more beatable. This is discussed in detail in Section 2.4.2.

Research question 1

The above literature led to the development of research question 1:

RQ1: What is the nature of non-GAAP ‘adjusted’ earnings in South Africa,

- a. to what extent are non-GAAP ‘adjusted’ earnings used in South Africa?**
- b. what types of adjustments are most commonly used by JSE-listed firms in determining their adjusted earnings?**

Research question 1 arises due to the prior literature detailing the extent of use of adjusted earnings and why they are used. It seeks to gain an understanding of the South African environment in relation to adjusted earnings. It relies on the application of the EMH environment in South Africa for the reasoning behind firms using adjusted earnings.

2.4 Manipulation of earnings figures

In instances when it may be difficult for management to produce improved earnings or the firm is unable to meet or beat analyst forecasts, it has been found that managers may use dubious techniques to ‘improve’ the firm’s results (Doyle et al., 2013). The 2 most common techniques include earnings management (‘EM’) and expectations management (earnings guidance) (Doyle et al., 2013, Matsumoto, 2002, Cotter, 2006). Doyle et al. (2013) proposed the use of income increasing adjustments which may be invalid to increase earnings to meet or beat analyst earnings forecasts as another manipulation technique. As a result, the various methods of manipulation of adjusted earnings need to be considered.

2.4.1 Earnings management (EM)

EM involves misrepresenting actual transactions in the financial statements either through accrual manipulation (Burgstahler & Eames, 2006) and/or real activities manipulation (Gunny, 2010). Accrual manipulation involves processing discretionary (non-obligatory)

amounts and accruals to affect profit (Jones, 1991). Real activities manipulation involves management practice which deviates from normal or accepted business practices (Roychowdhury, 2006).

To test whether a firm's earnings exhibit signs of earnings management a sample of EM firms needs to be obtained. This sample can be obtained either from databases listing firms that misstated their earnings or were required to restate their financials or the distribution of earnings curves using kernel density estimations (Dechow et al., 2011, Lahr, 2014). The database approach has been criticised as databases are likely to be biased towards extreme cases (Dechow et al., 2011), and their limited scope in jurisdictions outside of the U.S. (Dechow et al., 2011). For example, only 38 JSE-listed firms had financial statement restatements in the period 2002-2012 (Watson & Rossouw, 2012). The alternative “kernel density approach” is data intensive and is difficult to use as there are a number of different approaches to this method the applicability of which varies depending on the market being observed (Lahr, 2014).

Once the sample has been obtained, it is tested via one of several approaches to gather evidence of earnings management. Discretionary accruals can be detected via the following: (1) the Jones (1991) and modified Jones (1991) models² that estimate the non-discretionary accruals of companies; (2) using deferred tax as a proxy for discretionary accruals; (Phillips, Pincus & Rego., 2003); (3) using items on the cash flow reconciliation accruals explain the difference between earnings and cash (Healy & Wahlen, 1999) and (4) using fundamental financial statement analysis although this has shown promising results in the literature is in its infancy and there is a diverse range of figures and ratios found to detect EM (Dechow et al., 2011)). Real activities manipulation is primarily tested using the Roychowdhury (2006) test³ (Doyle et al., 2013).

² Jones (1991) test: calculate, using serial correlation, the performance adjusted discretionary accruals. Data required: changes in non-cash assets, sales, PPE, accounts receivable, lagged ROA (net income divided by lagged total assets).

³ Roychowdhury (2006) test: determine the extent of sales manipulation (due to timing or discounts), reduction of discretionary expenses and over-production of inventory. This is calculated by using cross sectional regression of cash flows from operations (sales manipulation), inventory changes and production costs and discretionary costs

There is little earnings management research and literature in the South African context, and the prevalence of EM in South Africa has not been determined, but, economic crime surveys suggest that it may be a significant concern (PwC, 2014).

2.4.2 Expectations management

Expectations management involves specific communication from management to analysts, aimed to reduce their forecast figures, especially if their initial estimates are too high (Bartov, Givoly & Hayn, 2002). Analysts are likely to issue final forecasts that firms are more likely to meet or beat when management provides guidance, whether specific or general to analysts regarding the firm's performance (Cotter, 2006). Specific earnings guidance is now prohibited (Eiger & Sur, 2015) but general earnings guidance (Cotter, 2006) is still used although to a lesser extent (Eiger & Sur, 2015). Due to the nature of the capital market in South Africa which features a lower number of analysts and a lower profile of analyst forecasts than in the U.S., expectations management is less relevant in a South African context (Venter et al., 2013)

The Matsumoto (2002) test⁴ is an established expectations management test (Doyle et al., 2013) which assesses the possible extent of expectations management for firms. The variables used in this test are based on findings that expectations management occurs more often when initial analyst estimates are overly optimistic (i.e. early forecasts exceed later estimates) and when analyst forecasts are closely grouped together and have a narrow range (i.e. a low standard deviation) (Cotter, 2006).

⁴ Matsumoto (2002) test: calculate the abnormal analyst forecast for the period which equals the estimated analyst forecast minus the actual analyst forecast. The estimated forecast is determined by modelling the seasonal change in earnings as a function of the prior period's seasonal change in earnings and returns cumulated over the current year, controlled for data available to analysts at that time. Data required: EPS, share price, cumulative daily excess returns around earnings announcements.

2.4.3 Misuse of adjusted earnings

Doyle et al. (2013) suggested the use of (misleading) adjusted earnings as an additional tool to EM and expectations management to improve (at least at face value) the earnings of a firm in order to meet or beat analyst earnings forecasts. Doyle et al. (2013) suggested that similar motivations which drive managers to engage in earnings management and expectations management drive them to misuse adjusted earnings. This association between inflated adjusted earnings and meeting or beating analyst forecasts is cited to explain the motivation to misuse adjusted earnings. In addition, prior research has suggested that this intention to mislead investors is effective and does mislead certain groups of investors. Bhattacharya et al. (2007), Allee et al. (2007) and Frederickson and Miller (2004) found that amateur/retail investors were influenced and misled by adjusted earnings while experienced investors were not influenced. It was also found that amateur/retail investors traded on adjusted earnings while experienced investors did not (Bhattacharya et al., 2007). 3 main types of misuse have been identified in the prior literature:

(1) Emphasis of adjusted earnings figures in press release

It was found that retail/amateur investors were influenced by the placement of adjusted earnings in earnings announcements i.e. that they gave preference to the emphasised results, whether those were accounting or adjusted earnings (Elliott, 2006, Marques, 2010). It was also found that when accounting earnings did not meet forecasts or expectations the adjusted earnings figures were emphasised. Adjusted earnings are emphasised in a number of JSE listed firms annual reports with statements such as, “For many years we have held our core headline earnings as the most reliable indicator of sustainable operating performance” (Naspers Ltd, 2014), despite the existence headline earnings. This indicator of misuse has previously been tested in a South African environment and similar results to the international literature were reported (van Eck, 2014) As discussed in Section 2.2.3 2016 SEC rules now require equal prominence

disclosure between GAAP and adjusted earnings – this is expected to resolve many of the issues addressed in the literature above (EY, 2016).

(2) Valid and invalid adjustments made in the determination of adjusted earnings

In Bhattacharyaa et al. (2003), Doyle et al. (2003), Bradshaw and Sloan (2002), and Doyle et al. (2013), the adjustments made by U.S. firms to calculate their adjusted earnings were classified into different categories to ascertain whether they were ‘valid’ or ‘invalid’. Valid adjustments are consistent with producing a recurring earnings figure while invalid adjustments were more likely opportunistic and suggested manipulation (Bhattacharyaa et al., 2003). It was found that many of the adjustments made in the U.S. were invalid and not conducive to producing informationally useful adjusted earnings.

Doyle et al. (2003) and Doyle et al. (2013) used high level categories to classify adjustments. These categories were “special item or once off exclusions” or “other adjustments”. “Special item or once off exclusions” per Doyle et al. (2003) consist of merger and acquisition costs, asset write down costs, losses on disposal of assets and restructuring costs only. “Other adjustments” according to Doyle et al. (2003) include amortisation of goodwill⁵, share based compensation costs, research and development costs and legal costs. “Special item or once off exclusion” adjustments are considered valid and appropriate adjustments to make in the determination of adjusted earnings, because of their unusual or once off natures they are not expected to recur (Venter et al., 2013). “Other adjustments” are likely to recur and are usual in operations and, as a result, adjusting for these figures is more likely to suggest manipulation and invalid adjustments. Further evidence of the existence of a ‘valid’/‘invalid’ distinction arises from the findings of Doyle et al. (2003) that most “other adjustments” made in the determination of adjusted earnings were value relevant and their exclusion was not warranted or valid in the determination of adjusted earnings while Venter et al. (2014) found that HEPS adjustments (which are similar to valid adjustments) are largely value irrelevant (validating their exclusion/adjustment).

⁵ Amortisation of goodwill is specific to U.S. GAAP and is not required or permitted by IFRS

Bhattacharyaa et al. (2003) developed the following additional categories to classify adjusted earnings adjustments: (1) depreciation and amortisation, (2) share based compensation costs (3) merger and acquisition costs (4) research and development costs, (5) gains or losses on asset disposals, (6) “below the line” adjustments – i.e. operating income and expense adjustments, (7) adjustments to the number of shares outstanding used in the denominator of the EPS calculation (8) other specific adjustments and (9) indeterminable adjustments where it cannot be determined what type of adjustment was made due to 2 or more adjustments being grouped together or because of unexplained terminology.

Doyle et al. (2003) classified similar adjustment categories to those used in the Bhattacharyaa et al. (2003) study as ‘valid’, ‘invalid’ and ‘other’. All the adjustment categories from Bhattacharyaa et al. (2003) can be directly allocated to the Doyle et al. (2003) study’s categories except for ‘tax adjustments’; ‘other’ (any adjustments not classifiable into any of the previous categories) and ‘indeterminable adjustments’. Using the findings of Rabin and Negash (2007) and Phillips et al. (2003) that deferred tax can be a method used by firms to manage their earnings upwards, as well as the recurring nature of tax, tax adjustments can be categorised as “invalid adjustments”. The studies grouped ‘other’ and ‘indeterminable’ adjustments separately as, due to limited descriptive information, it is sometimes not possible to distinguish what category the adjustment fell into, making it indeterminable. The various categories described above are summarised into Table 1, along with the grouping of each adjustment category as ‘valid’, ‘invalid’ or ‘other’:

Table 1: Condensed adjustment categories and valid, invalid or other categorisation		
Valid adjustments		
1	1	Impairment of assets (Doyle et al., 2003)
2	2	Transaction (merger and acquisition) and restructuring costs (Doyle et al., 2003)
3	3	Gains and losses on asset disposals (Doyle et al., 2003, Bhattacharyaa et al., 2003)
Invalid adjustments		
4	1	Depreciation and amortisation (Bhattacharyaa et al., 2003)
5	2	Share based compensation costs (Doyle et al., 2003)
6	3	Operating income and expense adjustments (particularly legal expenses) (Bhattacharyaa et al., 2003)
7	4	Tax adjustments (Rabin & Negash, 2007)
Other and indeterminable		
8	1	Other (Bhattacharyaa et al., 2003)
9	2	Indeterminable (Bhattacharyaa et al., 2003)

The above category typology simplifies the classification process of whether adjustments are valid or invalid, however, in practice accurate classification requires a case-by-case analysis of each adjustment to capture fully the nature of the transaction.

A second method used in the above studies to identify and suggest whether adjustments were valid or invalid was to identify valid adjustments that are repeatedly used by firms over a number of years (or other time frames) as this suggests that these adjustments are not unusual and/or once-off as they recur and as a result are more likely to be inappropriate adjustments to make. For the purpose of this study, repeats are considered at 2, 3, 4 and 5 year repeats, with 5 years providing strong evidence of repetition, and 2 years providing only limited evidence of repetition.

As discussed in Section 2.2.3 in 2016 SEC rules became more prescriptive on the types of adjustments firms may process in deriving their adjusted earnings. For example, firms are not allowed to add back any recurring operating expenses and if non-recurring expenses are added back they must also deduct all non-recurring gains (EY, 2016). Although effective for US listed firms, these principles are not yet effective in South Africa. In addition, the IASB noted with concern that many firms' bonus and share schemes performance metrics use adjusted earnings (Hoogervorst, 2016) which is a further possible explanatory factor for firm's misuse of adjusted earnings. To the researcher's knowledge, no information on the extent of use of adjusted earnings as bonus performance criteria is available for South Africa.

Research question 2

The above literature led to the development of research question 2:

RQ2: To what extent are adjustments made in the determination of adjusted earnings valid or invalid according to the indicators of misuse developed by Bhattacharyaa et al. (2003) and Doyle et al. (2013)

- a. using the typology of valid/invalid adjustment categories?**
- b. using the principles of the repeated use of valid adjustments?**

Research question 2 is based on the findings in the literature that there is evidence of misuse of adjusted earnings in the US, and this research is applicable to South African research due to the EMH holding in South Africa. Research question 2 focuses on 2 types of misuse identified: invalid adjustments are processed and recurring items are also adjusted for.

(3) The use of adjusted earnings to meet or beat analyst earnings forecasts

Prior studies have compared accounting earnings and adjusted earnings to analyst forecasts (Bhattacharyaa et al., 2003, Bradshaw & Sloan, 2002, Doyle et al., 2013) and have found that adjusted earnings meet or beat analyst earnings up to twice as often as

accounting earnings. This suggests that adjusted earnings can be used to make it appear as if firms meet analyst forecasts. Doyle et al. (2013) identified the use of adjusted earnings as a tool used to meet or beat analyst earnings forecasts that is incremental to, but distinct from, earnings management and expectation management techniques used to enhance earnings.

In the first part of their research, Doyle et al. (2013) used a multivariate logistic regression analysis approach to show the relationship between positive earnings exclusions and the likelihood of firms meeting or beating the analyst earnings forecast, as set out below:

Equation 1: Original Doyle et al. (2013) H1 model
$MBE_t = \gamma_0 + \gamma_1 Pos\ Excl\ Use_{i,t} + \gamma_2 Book - to - Market_{i,t} + \gamma_3 Sales\ Growth_{i,t} + \gamma_4 LnSize_{i,t} + \gamma_5 Profitable_{i,t} + \gamma_6 ROA_{i,t} + v_{i,t}$

This model seeks to determine the association between firms' adjusted earnings meeting or beating analyst earnings forecasts (MBE) (i.e. the dependent variable) and whether or not that firm used income increasing adjustments in the determination of their adjusted earnings (i.e. the adjusted earnings were greater than the accounting earnings figure) (the independent variable). Doyle et al. (2013) also identified several control variables that have been found to be associated with meeting or beating analyst earnings forecasts due to real company performance and to an extent earnings management including: (1) book-to-market ratios, (2) sales growth, (3) firm size, (4) whether the firm is profitable or not and (5) ROA (return on assets). The reasoning behind including these control variables in the model is discussed in the table on the following page:

Table 2: Doyle et al. (2013) H1 control variables	
Control variable	Reason for including control variable
Book to market ratio	The book-to-market ratio identifies overvalued and undervalued firms. Overvalued firms are under greater pressure to meet or beat forecasts and are more likely to engage in manipulation (Doyle et al., 2013).
Sales growth	To control for real firm performance during the year – as above-the line growth is the most untainted indicator of growth (Doyle et al., 2013).
Firm size	Firm size is used as analyst forecasts for larger firms have been found to have less optimistically biased (Das et al., 1998) resulting in it being easier for larger firms to meet or beat analyst forecasts, as well as more frequent use of adjusted earnings by larger firms due to increased analyst scrutiny (Doyle et al., 2013).
Profitability	Profitability controls for the finding in (Brown, 2001) that analyst forecast errors are significantly larger for firms with positive earnings than with firms with negative earnings.
ROA	ROA and changes in ROA is used to control for firm performance (Doyle et al., 2013) and to a limited extent detect accruals manipulation (earnings management) arising from changes in assets and working capital amounts (Dechow et al., 2011).

Doyle et al. (2013) also proposed that adjusted earnings manipulation (through the use of income increasing adjustments) was an alternate tool to mislead users in addition to earnings management and expectations management. As a result, in the second part of their research, they expanded on their initial experiment by considering the association between firms' adjusted earnings meeting or beating forecasts and multiple variables representing indicators of earnings management and expectations management.

These factors were represented by the results of the Jones (1991) test for discretionary accrual manipulation, the Roychowdhury (2006) test for real activities manipulation and the Matsumoto (2002) test for expectations management. The Doyle et al. (2013) study identified its sample of firms at risk of earnings management using the non-compliance and misstatements database approach (Section 2.4.1). The logistic regression model for the second part of their testing is set out on the following page and the variables in the equation are set out in Table 3:

Equation 2: Original Doyle et al. (2013) H2 model

$$\begin{aligned}
MBE_t = & \gamma_0 + \gamma_1 Pos\ Excl\ Use_{i,t} + \gamma_2 Pos\ Disc\ Acc_{i,t} + \gamma_3 Pos\ Disc\ CFO_{i,t} \\
& + \gamma_4 Pos\ Disc\ Prod_{i,t} + \gamma_5 Pos\ Disc\ Exp_{i,t} + \gamma_6 Neg\ Exp\ Mgmt_{i,t} \\
& + \gamma_7 Book - to - Market_{i,t} + \gamma_8 Sales\ Growth_{i,t} + \gamma_9 LnSize_{i,t} \\
& + \gamma_{10} Profitable_{i,t} + \gamma_{11} ROA_{i,t} + v_{i,t}
\end{aligned}$$

Table 3: Independent variables of Doyle et al. (2013) H2 model

Variable	Represents
$\gamma_2 Pos\ Disc\ Acc_{i,t}$	Represents evidence that discretionary accruals were used based on the modified Jones (1991) model.
$\gamma_3 Pos\ Disc\ CFO_{i,t}$	Controls for earnings management using discretionary cash flows.
$\gamma_4 Pos\ Disc\ Prod_{i,t}$	Controls for earnings management using discretionary production costs.
$\gamma_5 Pos\ Disc\ Exp_{i,t}$	Controls for earnings management using discretionary expenses.
$\gamma_6 Neg\ Exp\ Mgmt_{i,t}$	Represents whether expectations management was detected using the Matsumoto (2002) test.

As discussed in Section 1.4 (the delimitations of the study), earnings management and expectations management are not considered in this study.

Research question 3

The above literature led to the development of research question 3:

RQ3: Is there an association between JSE-listed firms using income increasing adjustments (positive exclusions) in the determination of adjusted earnings (specifically adjusted EPS) to meet or beat analyst forecasts (determined on the basis of EPS)?

Research question 3 is based on one of the other forms of misuse identified in the literature – that adjusted earnings are used (and misused) by firms to achieve performance targets, in this instance, analyst earnings forecasts. Management are motivated due to the occurrence of negative earnings surprises when analyst forecasts are missed, which can be explained through the EMH (Section 2.1).

3. Research methodology

The research questions were answered using quantitative methods as established research on adjusted earnings has been conducted primarily via quantitative studies (Bhattacharya, Black, Christensen & D.Mergenthaler, 2004). This is due to the main data sources being publically available from databases and likely to exhibit less bias than data obtained via qualitative means as well allowing a greater understanding of the use of adjusted earnings across industries. The research questions were answered using separate quantitative methods as explained in Section 3.3.

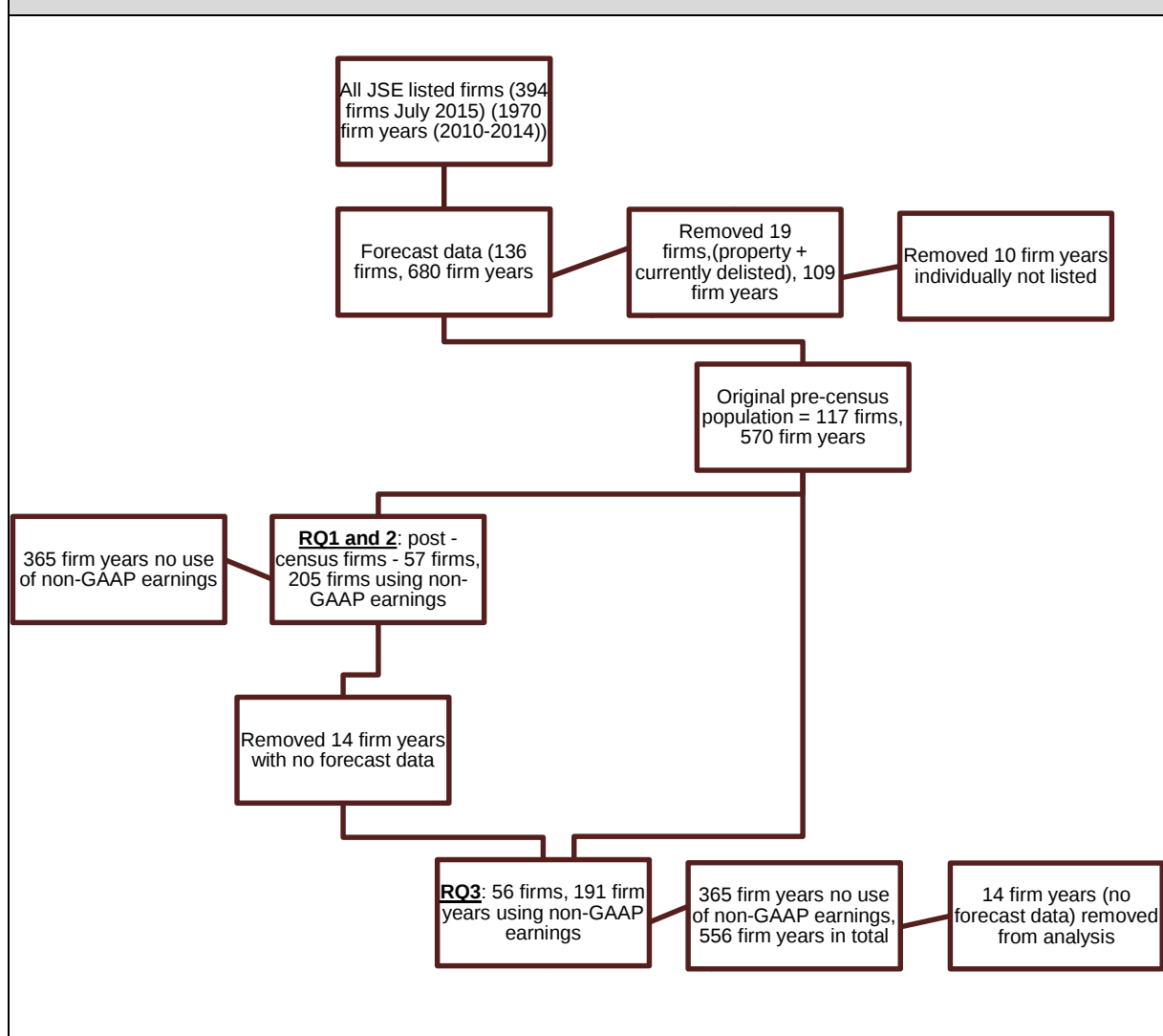
3.1 Population and sampling

The final population used for the research was obtained via a census data approach by selecting data based on certain attributes (which are discussed below and in Section 3.2). The pre census population for all 3 research questions started with the JSE-listed companies which were covered by analyst earnings forecasts obtained from INET BFA (136 firms) for the years 2010-2014 inclusive (680 firm years). From this population, 3 currently delisted firms were removed due to unavailability of data. As discussed in Section 1.4.1 (delimitations of the study) all property firms (16 firms in total) were removed. This left a population of 116 firms (580 firm years). 10 firm years in which firms were not listed for that particular year were then removed from the population, leaving a useful population of 570 firm years (termed the “original population” hereafter).

From the original population, all the firm years in which adjusted earnings figures were used were included for RQ1 and RQ2. This resulted in a census population of 205 firm years. A further census for RQ3 required each firm year to have a valid analyst earnings forecast for that firm year (as some firms only started to be covered by analysts during the 5-year period, while others ceased to be covered by analysts during the period). 14 firm years out of the 205 firm years used for RQ1 and RQ2 did not have analyst forecast data for that year and were removed from the population for RQ3 only. This left 191 firm years for RQ3. Data analysis was conducted on a firm year basis and not a per firm basis

to ensure that the data was not time series panel data (as the logistic regression model cannot accommodate time series panel data) and to allow for a greater population size. Running the Durbin Watson test on the data (a measure of serial correlation) returned a test statistic of 1.756 (with the F statistic being 19.098 (at the 5% confidence interval) and R square (on a linear regression model) equalling .235). As the Durbin Watson test statistic is close to 2 (and within the 1.5 to 2.5 range) it can be concluded that serial correlation is not significant and that it is acceptable to treat the 5 years of data as cross sectional data instead of time series data. The lack of serial correlation over time is likely due to the varying adjustments processed each year by firms and independent analyst forecasts prepared by analysts each year. Sampling was not used as RQ3 required census data that exhibited particular attributes, resulting in each item in the population being reviewed in any case to ascertain whether it exhibited these characteristics. The same census population data (barring the additional census for RQ3) was used across all 3 research questions to ensure consistency across the results.

Diagram 1: Different data groups used in this study and how they were derived



3.2 Data

3.2.1 Research question 1 and 2:

Adjusted earnings and EPS

The period under review was 5 years from 2010 to 2014. This period was selected to make the research timely, avoid the effects of the 2008 financial crisis on earnings (Andre, Cazavan-Jeny, Dick, Richard & Walton, 2009), to ensure the continuity of behaviour across several years and to gather sufficient data.

The first step in the data collection process was to access each company's results on the INET BFA Research Platform. If INET contained adjusted earnings – shown on the INET platform as the line items “375 – core headline earnings – total value” and “376 – core headline earnings per share” this indicated that the company used adjusted earnings for that firm year. If INET contained no data for a firm year, it did not mean that the company didn't use adjusted earnings as INET sometimes contradicted the annual reports of companies for those line items – likely due to these figures being non-GAAP, non-mandatory and non-standardised and difficult to collect for database purposes.

The second step in the data collection process involved searching each firm year's annual report for their earnings per share note, headline earnings reconciliation note, and all other earnings reconciliations. This is because non-GAAP earnings must be presented with reconciliation between GAAP and non-GAAP earnings (JSE, 2015, Allee et al., 2007, Marques, 2010). These notes/reconciliations were reviewed and where adjusted earnings were found, recorded along with their adjustments.

The third step involved ensuring that all firm years in which adjusted earnings were used were detected. This was achieved by searching each company's annual report for the search terms set out in Table 4 on the following page (the initial terms identified in Section 2.2 in the literature review as well as terms found during the course of data collection up until this point). Any indicators that suggested a firm year used adjusted earnings that contradicted the data already collected in the 2 previous steps was investigated and adjusted accordingly.

Table 4: Search terms used to detect evidence of use of non-GAAP earnings:	
Branch term	Tree term
Normalised	Earnings, EPS, HE, profit, operating, EBIT, per share, income, basic, diluted
Adjusted	
Underlying	
Core	
Cash equivalent	
Earnings	...before ⁶
EPS	
Headline earnings	
Per share	
HEPS	
EBIT	...excluding/...pre
Earnings	
EPS	
Per share	
Profit	
EBIT	Other specific searched for terms: non-GAAP, non GAAP, pro-forma, pro forma, recurring, non-recurring, non-recurring, exceptional item, exceptional charge, abnormal item, abnormal charge, significant item, once off, once-off
Income	

It was then necessary to ensure that each adjusted earnings figure represented a below the line, after tax, attributable to ordinary shareholders, per share and non-mandatory earnings figure – this was done to ensure comparability across all firms and years and to achieve greater comparability to the analyst earnings forecasts in RQ3. Once this was done it was known whether in that firm year adjusted earnings were used or not and what

⁶ It is not possible to search for profit before and income before as this returns too many results

term was used. Adjusted EPS figures were collected at the same time as the adjusted earnings.

Adjustments

The adjustments made by a firm in the determination of their adjusted earnings were collected at the same time as the identification of whether the firm used adjusted earnings (as described above). There were 4 distinct and different formats used by firms to describe the adjustments made in the determination of adjusted earnings: (1) a reconciliation from headline earnings to adjusted earnings; (2) a reconciliation from profit to adjusted earnings; (3) exceptional item disclosures and (4) no reconciliation.

Only adjustments that would not have been made in the determination of headline earnings were considered for RQ1 and 2 due to the requirement to present headline earnings in South Africa. However, reversals of headline earnings adjustments were included as a reversal of a headline earnings adjustment is effectively not a headline earnings adjustment. Following on from the different reconciliation formats discussed in the paragraph above, reconciliations in format (1) were the simplest to collect data from as all adjustments were relevant. Formats' (2) and (3) required identifying those transactions that were already adjusted for in headline earnings per the separate headline earnings reconciliation. In situations where no reconciliation was provided (4) the entire difference between adjusted earnings and headline earnings was deemed 1 adjustment. There were limited cases of this format of reconciliation.

Where a firm presented discontinued operations, the adjustments made in total i.e. continuing and discontinued operations were considered as it has been found that companies may shift losses to discontinued earnings as a form of earnings management (Barua, Lin & Sbaraglia, 2010). If the company reported in a foreign currency (a currency other than South African Rand), the foreign currency figure was converted into Rand at the rate used by INET to report earnings for that firm year.

Each adjustment was collected individually and initially resulted in 58 unique adjustment categories based on the adjustment name/description only. 3 categories were used to collect adjustments that were vague, inseparable or lacking detail – namely: ‘other’ adjustments, ‘multiple adjustments in 1’ and ‘indeterminable’. Where a firm did not disclose a reconciliation table, the full difference between accounting and adjusted earnings was treated as a ‘multiple adjustments in 1’ adjustment. These 58 adjustments were then grouped into the condensed valid/invalid adjustment categories which were influenced by the Bhattacharyaa et al. (2003) and Doyle et al. (2003) studies typologies as explained in Table 1 in Section 2.4.3.

As discussed in Section 1.4.2, it is important to note that adjustments were categorised based on the description provided in the financial statements explaining that adjustment. This may not truly capture the underlying reality of that transaction although this is consistent with the Bhattacharyaa et al. (2003) and Doyle et al. (2003) studies. A more accurate approach would be to consider the economics of each individual adjustment but this would be feasible and the extent of difference between the 2 approaches may not be significant.

3.2.2 Research question 3:

The data requirements for this method were analyst EPS forecast figures, actual EPS figures, both accounting and adjusted, and control variables. The analyst earnings forecast data was obtained directly from INET BFA and consisted of 136 firms. The EPS forecasts reflect the consensus analyst EPS forecasts of 6 independent brokers that INET BFA collects data from. It is important to note that the analyst earnings forecasts reflect estimates for diluted HEPS. It may not appear as if actual adjusted EPS can be compared to forecasted diluted HEPS but as discussed earlier in Section 1.4.3 adjusted earnings are used to mislead investors and are treated as being comparable in company press releases and media articles. These differences are not the focus of the report.

The INET BFA forecast data covers the full period under review (2010 – 2014). Analyst earnings forecasts are continually updated in response to new information until the release of the firm's results (Danielson, 2010). As a result, the data contains a number of consensus forecast earnings figures for each financial year. The last reported EPS forecast was extracted for each company as the last forecast figure before the release of the actual results is the figure most commonly referred to in the press about whether or not the company met or beat the forecast (Doyle et al., 2013).

The other data requirements including all actual EPS figures (besides adjusted EPS) and control variables were obtained from the INET BFA Expert database. Actual adjusted EPS were collected in RQ1 and 2 (along with adjusted earnings) using the process described in Section 3.2.1. Adjusted EPS are more frequently basic earnings figures (i.e. no share adjustments), however, where a firm presented diluted adjusted EPS, this figure was used instead of basic adjusted EPS.

3.3 Research design

3.3.1 Research question 1 – Understand non-GAAP adjusted earnings in South Africa

(a) The prevalence of adjusted earnings in South Africa

The first part of RQ1 is exploratory in nature and seeks to gain an understanding of the non-GAAP adjusted earnings environment in South Africa as no prior research regarding the adjustments made in the determination of adjusted earnings has been conducted in South Africa (to the best of the researcher's knowledge).

To answer the first part of RQ1 (to what extent are adjusted earnings used in South Africa), the percentage of firm years where adjusted earnings were used out of the original (pre-census) population was calculated (the 136 firms for which analyst forecasts were available minus the 3 delisted firms and 16 property firms, minus 10 other unlisted firm

years resulting in a total of 570 firm years). The percentage use of adjusted earnings on a year and individual firm basis were also determined and any trends identified.

To understand better the census population of firms and the nature of the firms making use of adjusted earnings in South Africa the firms were compared based on industry categories and market capitalisation and the relative use of adjusted earnings across these categories was also determined. This was done due to the findings in the literature that the use of adjusted earnings is more prevalent in certain industries and among larger firms. This analysis was done on a firm year basis. Although a firm in 1 industry using adjusted earnings for all 5 years under review would 'count' more than another firm (and its corresponding industry) which only used adjusted earnings for 1 year, the use of adjusted earnings for 5 years compared to 1 (or another number of) year(s) suggests an increased prevalence of adjusted earnings for that firm and corresponding industry in any case, so no distinction was made for this in this research question. To ensure that the results were reasonable, the same analysis was also performed on a firm basis.

In determining the industry data, the 4 different levels of the Industry Category Benchmark ('ICB') industry codes were used to reflect industry coverage at the different levels of firm categorisation. The 4 levels are: industry, supersector, sector and subsector (Industry Classification Benchmark, 2015).

(b) What adjustments are used by firms in South Africa

The purpose of the second part of RQ1 (what adjustments are most frequently used) is again exploratory in nature. This question was answered using a multiple response analysis approach. Many adjustment categories could be involved per firm year – meaning that the groups of company years are not independent among the categories of adjustment. The adjustments collected as described in Section 3.2.1 were used for this part of the study. The 9 grouped categories (per Table 1 in Section 2.4.3) were tested to

determine the most frequently used adjustment categories while individual adjustments within in these 9 categories were then discussed.

The categories of adjustments represent nominal categorical data. Each adjustment category was weighted for that firm year's attributable profit to express each adjustment as a percentage of profit to increase the comparability of the data across different firms (as firms with larger profits may have larger adjustments which would influence the data towards larger firms adjustments).

3.3.2 Research question 2 – Valid/invalid adjustments

The objective of this question was to identify to what extent the adjustments made in the determination of adjusted earnings of South African firms were valid or invalid. The approach for RQ2 was adopted from the Bhattacharyaa et al. (2003), Doyle et al. (2003) and Doyle et al. (2013) studies, and 2 indicators to determine the extent of invalid compared with valid adjustments were used. These studies can be applied in a South African context as the EMH holds in the South African market (Magnusson & Wydick, 2002, Jefferis & Smith, 2004) and also as adjusted earnings (South Africa) are determined on a similar basis to pro-forma earnings (the U.S. term for adjusted earnings) (Bhattacharyaa et al., 2003, Venter et al., 2014).

The first indicator considered the nature of the adjustments made in the determination of adjusted earnings and classified them as either valid or invalid (or other) according to a typology influenced by Bhattacharyaa et al. (2003) and Doyle et al. (2003). The second indicator considered the repeated use of adjustments that are supposedly once-off or unusual (i.e. 'valid' adjustments) – which was identified by the Bhattacharyaa et al. (2003) and Doyle et al. (2003) studies as a sign of misuse of non-GAAP earnings.

(a) – Valid/invalid adjustment categories

The grouped data classified as ‘valid’, ‘invalid’ and ‘other’ was measured by the adjustment weighted for each respective firm year’s attributable earnings. This was done to reduce the size issue, in that an adjustment by a large firm would appear more significant than an adjustment by a small firm. The adjustment value was standardised by earnings to consider the size effect as well as handle cases where a number of adjustments were made by some firms while other firms only made 1 adjustment. Weighting the adjustment by total adjustments by that firm year would not be representative of cases where firms made different numbers of adjustments. Using earnings achieves a fair representation of the significance of each adjustment – standardised for size and number of adjustments. Where a firm did not use a valid, invalid or other adjustment, that adjustment category for that firm year was allocated a nil value – with this nil value consequently impacting the results from the testing approach.

The resulting data in the 3 category classification was then interpreted using a Friedman’s ANOVA on a firm year basis. Friedman’s ANOVA is a non-parametric ANOVA approach and was used due tests for normality (the Kolmogorov-Smirnov and Shapiro-Wilk tests) indicating that the distributions of the 3 scale variables (“valid”, “invalid” and “other”) deviated significantly from the normal distribution.

Where a ‘nil’ value was assigned, this was done in order to increase the number of cases involved in the ANOVA analysis and, as a result, enhance the statistical power of the study as treating the nil adjustments as ‘missing’ values in the ANOVA analysis only resulted in 41 firm years being included in the analysis. This is due to the Friedman’s ANOVA not being able to treat missing values pairwise (i.e. it ignores all the other adjustment categories for a firm year where 1 is missing data). To verify the results of the Friedman’s ANOVA, the valid and invalid categories of adjustments were submitted to a Wilcoxon Signed Ranks test (a non-parametric hypothesis test). A Bonferroni adjustment in the Wilcoxon Signed Ranks test to avoid Type I errors was not necessary as only a single test was performed and not multiple tests (Laerd Statistics, 2016).

(b) – Repeated use of valid adjustments over time

The second indicator of misuse involved the repeated use of similar adjustments/exclusions. The repeated use of similar adjustments in the determination of adjusted earnings suggests that that adjustment which may not actually be “once off” or unusual and is further evidence of misuse (Bhattacharyaa et al., 2003). This test applies only to supposedly ‘valid’ adjustments determined to be valid by RQ2 (a) as the repeated use of invalid adjustments does not impact them as they are already invalid Doyle et al. (2003). The adjustment categories from the original 58 categories that form part of the ‘valid’ adjustments category were used to conduct this research, instead of the 9 grouped adjustment categories as repetition of individual adjustments is more informative than repetition of grouped data. To answer this question, all firm years where the same category of valid adjustment was made consecutively for 1, 2, 3, 4 and 5 times in the period 2010-2014 were identified. The table below shows the number of firms that contributed 1 – 5 years data for the 5 years of the study.

Table 5: Number of firms contributing data by number of years					
Number of years of data		Frequency	Percent	Valid Percent	Cumulative Percent
	1	10	17.5	17.5	17.5
	2	7	12.3	12.3	29.8
	3	7	12.3	12.3	42.1
	4	5	8.8	8.8	50.9
	5	28	49.1	49.1	100.0
	Total	57	100.0	100.0	

10 companies contributed only 1 year of data.

Almost half (49.1%, n=28) of the companies contributed 5 years' data.

To investigate this type of misuse, the number of times in the 5 (or less) years a firm repeatedly used valid adjustments of the same category was determined. These “repeats” were classified as follows:

1. One ‘repeat’:
 - a. if a company contributed only one year’s data, it was not possible to determine whether they would have used the adjustment repeatedly and this was labelled: 1=Repeat unknown.
 - b. where a company contributed more than 1 year’s data and used a particular adjustment only once, this was labelled: 2=No repeat
2. If a company used a specific adjustment category twice, three times, four times or five times this constituted a repeat, regardless of whether the company contributed 2 or more years’ of data. This was labelled: 3=Repeated twice, 4=Repeated three times, 5=Repeated four times and 6=Repeated five times.

In addition to the test above, the total number of repeated ‘valid’ adjustments with any case where the same adjustment was present more than three times in a 5 year period (2 occurrences in the 5 year period were deemed incidental) weighted for the total ‘valid’ adjustments was compared to the same measure of the ‘invalid’ adjustments from RQ2 (a) (that were not tested in the above repeated measures test). This was to provide a benchmark to the level of repetition and to assess whether valid or invalid adjustments were repeated more often.

3.3.3 Research question 3 – Meeting or beating analyst earnings forecasts

This question was answered using an approach based on the Doyle et al. (2013) study. The same logistic regression analysis model as used in H1 of the Doyle et al. (2013) study was applied, however, the H2 model where earnings management and expectations management were tested was not considered because the data requirements of testing for these 2 factors are outside the scope of this study – as discussed in Section 1.4.3 and

2.4. Also, as the analyst earnings forecast data was a per share figure, adjusted EPS was compared to the analyst EPS forecast figures instead of earnings

Logistic regression is appropriate for this data as the dependent variable, whether the analyst earnings forecast was met or beaten, is not continuous or categorical – it is binary (the forecast was met or beaten or it was not). The preliminary logistic regression model including additional variables which are discussed below for this study is set out below:

Equation 3: RQ3 planned model $ \begin{aligned} MBE_t = & \gamma_0 + \gamma_1 Pos\ Excl\ Use_{i,t} + \gamma_2 Book - to - Market_{i,t} + \gamma_3 Sales\ Growth_{i,t} \\ & + \gamma_4 LnSize_{i,t} + \gamma_5 Profitable_{i,t} + \gamma_6 ROA_{i,t} + \gamma_6 Forecast\ Movement \\ & + \gamma_7 \sigma\ Annual\ Analyst\ Forecast + \gamma_8 Diluted\ HEPS\ MBE\ forecast \\ & + \gamma_9 Directors\ emoluments + v_{i,t} \end{aligned} $
--

As discussed in Section 2.4.3, the Doyle et al. (2013) H1 model determined the association between whether a firm's adjusted earnings met or beat the analyst earnings forecast ('*MBE*') for that year and whether income increasing adjustments resulting in an adjusted earnings figure that exceeded the firm's actual earnings were used ('*PosExclUse*'). A number of control variables found to be associated with firms meeting or beating analyst forecasts were used. The same multivariate logistic regression model was used as a starting point in this study, however, additional control variables were identified to control for expectations management (rather than test for it using the Matsumoto (2002) test as done in H2 of the Doyle et al. (2013) study). Earnings management was not considered at all due to the data requirements of established earnings management tests, as well as the uncertain current research findings on the use of fundamental financial statement ratio analysis as a tool to detect earnings management (Section 1.4.3 and 2.4.1); these make determining a control variable a challenge. Additional variables were also used to consider alternate relationships. In line with the approach in the Doyle et al. (2013) study, the model was clustered by time and firm to correct for cross-sectional and serial-correlation.

Main dependent variable – ‘MBE’

In determining whether the firm year met or beat the forecast, the respective firm year adjusted EPS was compared the analyst forecast. As discussed in Section 2.3, the last forecast is used to represent the analyst forecast figure to be used in the data analysis as it is the most commonly used reference to compare actual firm results with analyst forecasts. This is consistent with prior research. This variable was represented in the logistic regression model as a dichotomous (dummy) variable, with 1 representing: adjusted EPS met or beat the last analyst EPS forecast and 0: adjusted EPS did not meet or beat the last analyst EPS forecast.

Independent variable – ‘PosExclUse’

The independent variable ‘PosExclUse’ was derived by determining whether positive exclusions (Doyle et al., 2013) were used in adjusting a to non-GAAP (adjusted) earnings – i.e. whether adjusted EPS was greater than accounting EPS. To determine this, adjusted EPS was compared to accounting EPS (basic or diluted EPS, depending on whether the adjusted EPS figure was a basic or diluted figure). The results were represented in the logistic regression model as a dichotomous (dummy) variable, with 1 representing: adjusted EPS were greater than accounting EPS and 0: adjusted EPS were less than accounting EPS.

Additional variables

The *Book-to-Market*, *Sales Growth*, *LnSize*, *Profitable* and *ROA* control variables were used in the Doyle et al. (2013) study and were discussed in Section 2.2.3. This study introduced additional variables – namely: *Forecast Movement*, σ *Annual Analyst Forecast*, *Diluted HEPS MBE forecast* and *Directors Emoluments*. These additional variables were used to control for expectations management and to test other incentives impacting a firm’s decision to misuse adjusted earnings as a tool to meet or beat analyst forecasts, as discussed below.

Forecast movement and σ *Annual Analyst Forecast* provide a limited control for expectations management. Expectations management is found to be more prevalent when the last analyst forecast for a year is significantly below the first forecast for that year due to a realisation that the initial forecast is unobtainable resulting in further downward guidance of earnings (Cotter, 2006, Matsumoto, 2002). *Forecast movement* provides a control for this by determining the negative difference between the first and the last forecast for a particular year. Also, as discussed previously, the close grouping together of analyst earnings forecasts is associated with expectations management, as it is indicative of more specific communication to all analysts by the firm (Cotter, 2006). This phenomenon is represented in the study by σ *Annual Analyst Forecast*.

The *Diluted HEPS MBE forecast* variable compares each firm year's actual diluted HEPS to the average analyst EPS forecast to determine whether diluted HEPS met or beat the forecast. This was added to the model to control for the finding that firms are more likely to misuse adjusted earnings to meet or beat analyst forecasts when accounting earnings (diluted HEPS is a proxy for accounting earnings as the analyst forecasts are forecasts of diluted HEPS, i.e. this is the most comparable figure) do not meet or beat the forecast as there is little incentive for firms to misuse adjusted earnings when they already have met or beaten the forecast (Marques, 2010, Bhattacharyaa et al., 2003). This figure was also added to reflect that the forecast data is on the basis of diluted HEPS and that the actual diluted HEPS (and not only EPS) performance may impact whether a firm uses adjusted earnings or not. This figure is presented as dichotomous (dummy) variable in the model, with 1 representing: diluted HEPS did not meet or beat the forecast and 0, diluted HEPS met or beat the forecast.

Although the additional variable adds complexity to the model it is necessary to include it as there is more incentive for firms to misuse adjusted earnings when GAAP earnings do not meet or beat forecasts. It is also necessary as the model does not only look at cases

with a positive outcome (i.e. when adjusted earnings beat the forecast, but GAAP earnings don't) but also negative outcomes. Other outcomes are set out in Table 6 below⁷:

Table 6: Scenarios to indicate the necessity of the DilutedHEPSMBEForecast variable			
MBE - did adjusted earnings beat the forecast	PosExclUse – are adjusted earnings greater than GAAP earnings	DilutedHEPSMBEForecast - did GAAP earnings meet or beat the forecast	Comment
Y	N	N	Impossible scenario as a downward adjustment would still result in adjusted earnings not meeting or beating the forecast
Y	Y	N	The upward adjustment resulted in adjusted earnings meeting or beating the forecast when GAAP earnings didn't
Y	N	Y	Both adjusted and GAAP earnings met or beat the forecast despite adjusted earnings being adjusted down. This implies significant headroom between earnings and the forecast
Y	Y	Y	Both adjusted and GAAP earnings met or beat the forecast, nevertheless, adjusted earnings were adjusted upwards
N	Y	N	Both adjusted and GAAP earnings did not meet or beat the forecast despite adjusted earnings being adjusted down. This implies significant headroom between earnings and the forecast
N	N	Y	GAAP earnings met or beat the forecast but adjusted earnings did not due to their downward adjustment
N	Y	Y	Impossible scenario as with an upward adjustment, adjusted earnings would have to meet or beat the forecast
N	N	N	No measure met or beat the forecast suggesting that there was significant headroom
	Y = yes – indicative of upward adjustment	Y = yes – less incentive to upwardly adjust	

It is important to note that despite the inclusion of the above variable which is technically GAAP based, the dependent variable is still based on adjusted earnings and is the focus of the model.

The *Director's Emoluments* variable was added to determine whether there is an association between firms (years) with high levels of director's emoluments (including salaries and bonuses) and those firms (years) using adjusted earnings to suggest that adjusted earnings were misused to meet or beat analyst forecasts (Ravenscroft &

⁷ This detail and Table 6 were included following comments from the reviewers of this paper to further justify the inclusion of this additional variable.

Williams, 2009). The director's emoluments amount was tested using a weighting for firm size (market capitalisation) and attributable profit to avoid distortions from firm size and performance.

All the additional/control variables (except *Diluted HEPS MBE forecast* as discussed) are represented in the model as continuous data.

Logistic regression model

When using logistic regression, it is preferable to include in the model only those variables that have a significant effect at predicting the outcome variable. This is especially true when the model has a large number of different variables (Freedman, Pee & Midthune, 1992). This results in a more accurate model, more efficient testing and results that are easier to interpret. Although the reasoning for using each variable has been explained in this study, a statistical method is still useful to confirm the significance of these variables. In regression analysis, the Forward Stepwise (likelihood ratio) approach is frequently used to identify these variables. The Forward Stepwise approach tests the addition of each variable to the model to determine whether each variable improves the model or not. As part of this, it tests whether variables can be deleted without increasing the residual sum of squares, and stops when this measure is optimised. The exclusion of a particular variable does not mean that it does not impact the model but rather that together with the other variables in the model it does not add significantly more value to the model (Robert Nau, 2015).

The Forward Stepwise approach has been criticised as it has been suggested that its selection of variables is highly influenced by the sample on which it is based, limiting the ultimate model's predictive ability (to the remainder of the population). However, its use in explorative research is considered acceptable (Freedman et al., 1992). As this study does not attempt to create a predictive model but rather to assess the relationship between meeting or beating analyst earnings forecasts and the use of upwardly adjusted earnings and other factors, it is appropriate to use the Forward Stepwise approach to select optimal variables for the logistic regression model.,

The result of the Forward Stepwise test on the variables found that 7 of the 10 variables (*Book to Market*, *Sales Growth*, *Profitable*, *ROA*, *Forecast Movement*, *σAnnual Analyst Forecast* and *Directors Emoluments*) did not increase the statistical impact on the dependent variable. As a result, the final logistic regression equation excluded these and retained the other 3 variables (*PosExclUse*, *LnSize*, and *Diluted HEPS MBE Forecast*) that most impacted the model. The final logistic regression equation and variables is set out below:

Equation 4: RQ3 post Forward Stepwise selection model
$MBE_t = \gamma_0 + \gamma_1 Pos\ Excl\ Use_{i,t} + \gamma_2 LnSize_{i,t} + \gamma_3 Diluted\ HEPS\ MBE\ forecast$

These variables were then submitted to the logistic regression test – using the ENTER method for Binary Logistic Regression on SPSS. Note that the data has a time series element but is treated as cross sectional data (there is no significant serial correlation as discussed in section 3.1), however, it is not appropriate for the LnSize variable to compare market capitalisations of some of the same firm’s year on year. This requires LnSize to be standardised by year.

Other testing

The resulting variables (after the Forward Stepwise selection) were tested for multicollinearity to ensure that none of the variables was strongly correlated with another as multicollinearity disturbs the data and may make the results unreliable. Multicollinearity was testing for using tolerance and Variance Inflation Factors (VIF). The data was also tested for influential cases.

3.4 Validity and reliability

The study’s validity and reliability is enhanced because of its use of a number of approaches to detect misuse, instead of just 1. The extent of confirmation or rejection of the research questions by all approaches provides a greater level of certainty around the

extent and nature of misuse of adjusted earnings by JSE listed firms than just 1 model. The main methods for detecting misuse of adjusted earnings are primarily based on journal articles Bhattacharyaa et al. (2003) and Doyle et al. (2013) which were both published in the Journal of Accounting and Economics – which was the fourth highest rated accounting journal worldwide in 2014 by Scientific Journal Rankings (SJR, 2014). Using census population data avoids many statistical issues with sampling and the applicability of sample results to the population and makes the interpretation of the results simpler.

Research question 1 classified adjustments made in the determination of adjusted earnings into several predefined categories. The categories used were based on the prior research of Bhattacharyaa et al. (2003) and Doyle et al. (2003) which, due to the credibility of these articles; suggests that the categories are sufficiently appropriate and valid. The process of classifying adjustments did involve a degree of subjectivity. To manage the extent of subjectivity involved in the classification, the adjustments were classified based on the name/basic description of the adjustment presented in the firm report and not on additional information that was sometimes disclosed below the adjustment reconciliation. This was done to ensure that each adjustment was classified in a similar manner by the researcher. It was also done as only a few firms did disclose additional information to clarify the adjustment reconciliation. The additional information, therefore, may have influenced the classification of adjustments in an inconsistent way across all companies. Each firm's adjustment reconciliation was saved (separate from the rest of the report) to allow for easy review. The classification of each firm's adjustments were subsequently checked and verified by the researcher. Despite all these efforts, a degree of inherent subjectivity remains, as discussed in Section 1.4.2.

As discussed in Section 3.3.3 and Section 4.3, the logistic regression model was extensively tested for validity and accuracy and all tests and measures indicated that it is reliable. A qualified and experienced statistician performed the data manipulation, ensuring valid statistical practices were applied and appropriate insights and interpretations of the results were made.

4. Results and discussion

4.1 Research question 1 – The nature of non-GAAP adjusted earnings in South Africa

(a) To what extent are non-GAAP adjusted earnings used in South Africa?

This research question was answered using descriptive statistics across (1) firm years, (2) firms and (3) years. The results were then compared to the firm's corresponding industry categories and market capitalisation.

Out of the 570 original (pre-census) population firm years⁸ adjusted earnings were used in (1) 205 firm years, representing a 35.9% use of adjusted earnings on a firm year basis out of the original population (570 firm years). (2) Out of the 117 unique firms in the population, 57 different firms (48.72%) presented an adjusted earnings figure in at least 1 year across the 5-year period. (3) Table 7.1 below illustrates the spread of firm years using adjusted earnings across the 5 years of the study. The results indicate that adjusted earnings were used more often in the later years in the period under review.

Table 7.1: Frequency of adjusted earnings use classified by year (2010-2014)

		Frequency	Percent
Valid	2010	35	17.1
	2011	40	19.5
	2012	39	19.0
	2013	44	21.5
	2014	47	22.9
	Total	205	100.0

⁸ The 570 original (pre-census) population firm years excludes 3 currently delisted firms and their respective firm years, 16 property firms and their respective firm years and 10 individual firm years when certain firms were not listed in those years.

These results suggest that adjusted earnings are used by a significant number of firms listed on the JSE, although their use falls short of the majority on all 3 measures. The prevalence of use of adjusted earnings is lower than that found in prior international literature – such as the Marques (2010) finding that 68% of S&P500 firms disclosed adjusted earnings measures at least once over a period of 12 quarters. The lower prevalence of use of adjusted earnings in South Africa may be explained by the use of headline earnings in South Africa as firms are already required to disclose a figure that is more informationally powerful than accounting earnings (Doyle et al., 2003, Venter et al., 2014). It could also be explained by less stringent criteria for defining adjusted earnings in international studies as compared to this study, as well as the increased number of periods under observation (12 quarters vs. 5 years) in the Marques (2010) study. The increasing use of adjusted earnings over time suggests that adjusted earnings are an increasingly relevant topic in accounting research in South Africa.

The results for the further analysis according to firm industry and market capitalisation are set out below. The percentage use of adjusted earnings according to the industry categories of the census population firms on a firm basis was determined at the 4 different ICB industry category levels. The summary data representing the top 5 industries (per ICB level) contributing towards the total number of firms using adjusted earnings at each of these levels is set out in Tables 7.2.1 and 7.2.2 overleaf. The results were determined on both a firm and a firm year basis.

Table 7.2.1: Top 5 industries making up the proportion of firms using adjusted earnings (at the 4 different ICB industry category levels), calculated on a firm year basis.

Rank	Industry level	%	Super level	Sector	%	Sector level	%	Sub Sector level	%
1	Financials	23.9	Basic resources		14.6	Life insurance	12.2	Life insurance	12.2
2	Consumer services	22.0	Insurance		12.2	Mining	11.2	Banks	7.3
3	Basic materials	14.6	Retail		11.7	General retailers	8.8	Apparel retailers	6.3
4	Consumer goods	11.7	Health care		8.8	Banks	7.3	Health care providers	6.3
5	Industrials	10.7	Food & beverage		8.8	Travel & leisure	7.3	Gambling	4.9

Table 7.2.2: Top 5 industries making up the proportion of firms using adjusted earnings (at the 4 different ICB industry category levels), calculated on a firm basis.

Rank	Industry level	%	Super level	Sector	%	Sector level	%	Sub Sector level	%
1	Consumer Services	21.1	Basic resources		15.8	Mining	12.3	Life insurance	8.8
2	Financials	17.5	Industrial Goods and Services		12.3	General Retailers	8.8	Apparel retailers	7.0
3	Basic materials	15.8	Retail		12.3	Life Insurance	8.8	Banks	5.3
4	Industrials	15.8	Food & Beverage		8.8	Banks	5.3	Food Products	5.3
5	Consumer goods	12.3	Health Care		8.8	Food Producers	5.3	General Mining	5.3

The results in Table 7.2.1 (and 7.2.2) show that firms in the financial services industry are the predominant users of adjusted earnings. Other industries frequently using adjusted earnings include retailers and mining/resources firms. These results are consistent with prior international research findings on the prevalence of use of adjusted earnings across industries, as in the findings of Allee et al. (2007); Black and Christensen (2009); Burgstahler and Eames (2006) that the majority of firms using adjusted earnings were in the manufacturing, financial and services industries. The technology industry does not feature as significantly in the results as in the Marques (2010) study; this is possibly due to technology shares constituting less of the JSE market than the S&P500 (Forrester Research, 2013). The results were for the most part consistent between firm (Table 7.2.1 and firm year Table 7.2.2).

As in Doyle et al. (2013) the increased competition in these industries is suggested to place pressure on these firms to meet or beat forecasts, resulting in the increased use of adjusted earnings. Another factor may be the particular accounting requirements of these industries that general accounting standards may not account for appropriately (in management of these firm's view). For example, the JSE-listed firm Sanlam included the following commentary on their use of adjusted earnings in their 2014 Annual Report:

(T)he IFRS prescribed accounting treatment of the policyholders' fund's investments in Sanlam shares and Group subsidiaries creates artificial accounting mismatches with a consequential impact on the Group's IFRS earnings. ...This is in the Group's opinion not a true representation of the earnings attributable to the Group's shareholders... The Group therefore calculates normalised diluted earnings per share to eliminate fund transfers... (Sanlam Ltd, 2014, p. 111)

The data was then evaluated in terms of firm market capitalisation. Only firm year's relating to the 2014 year from the original population's 570 firm year/117 firms was used, as market capitalisation would tend to recur over time and cannot be compared over time in this instance. There were 133 total firms for 2014 of which 47 unique firms used adjusted earnings. These 133 firms market capitalisations were ranked and grouped into decile categories (based on the number of firms in 2014 – i.e. each category contains +/-

13 firms). The number of firm years in each decile category where adjusted earnings were used was calculated. The results are set out in Table 7.3 below:

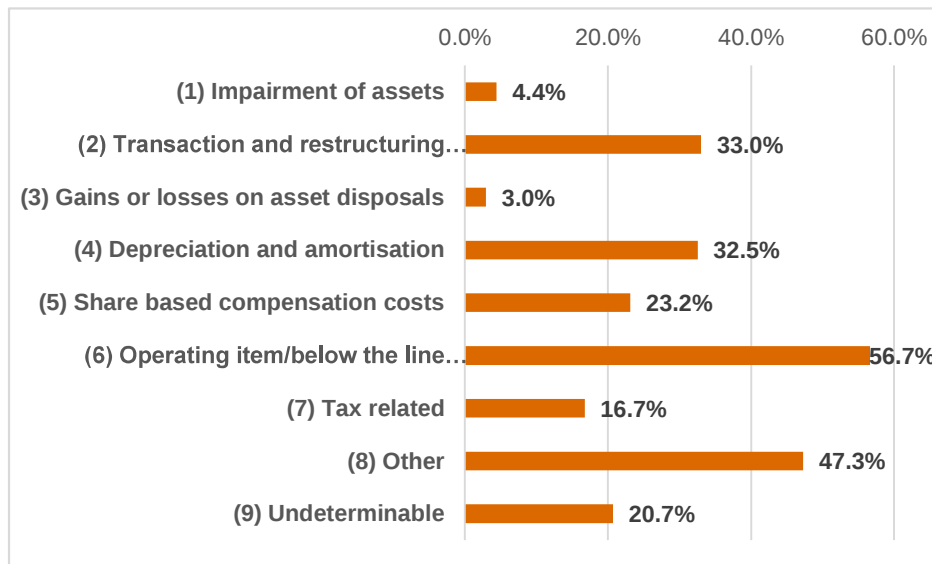
Table 7.3: Use of adjusted earnings versus market capitalisation (on a firm basis)			
Decile	Market capitalisation range (Rm) of pre-census population	Number of firms using adjusted earnings	Percentage firms where adjusted earnings were using out of the total number of firms for 2014 (%)
1	185,278 – 1,280,843	9	69.2
2	78,241 – 170,257	6	46.2
3	44,564 – 77,268	5	38.5
4	33,063 – 41,083	6	46.2
5	23,717 – 31,004	4	30.8
6	16,648 – 23,387	4	30.8
7	10,512 – 16,443	4	30.8
8	6,031 – 10,167	3	23.1
9	3,394 – 5,935	3	23.1
10	553 – 3,278	3	23.1
	TOTAL	47	

The analysis indicates that the use of adjusted earnings is biased towards larger firms: this is consistent with prior research findings (Bradshaw et al., 2012). This may be due to larger firms being exposed to greater analyst scrutiny and being under greater pressure by shareholders to meet or beat analyst forecasts (Brown, 2001).

(b) What significant adjustments are most frequently used?

The results of the multiple response analysis for the 9 broad adjustment categories is presented graphically below, followed by a discussion about the individual adjustments (from the original 58 adjustment categories) making up the grouped adjustments.

Graph 1: Relative frequency of valid and invalid adjustment categories (9 categories)



Out of 205 firm years, 634 individual categories of adjustments (from the 58 preliminary adjustment categories as discussed in Section 3.2.1) were used with an average of 3.12 adjustments per firm year. The grouped (per Graph 1 above) “(6) Operating items/below the line items” category was the most used adjustment category. Within this category, frequently used adjustments included: fair value adjustments on financial instruments, foreign exchange gains and losses, employee benefits charges, deferred tax charges and treasury share adjustments. Along with the grouped category “(5) Share based compensation costs” many of these adjustments related to accounting data provided to users for purposes of information usefulness as opposed to providing accountability (performance) based accounting information (Ravenscroft & Williams, 2009). Firms could be of the view that this information does not assist users in understanding the firm’s performance. This may suggest that firms use adjusted earnings to provide users with a better figure (in their view) to assess the firm’s performance, as opposed to providing users with a recurring earnings figure to assist in valuations purposes as suggested by prior literature. A single performance measure is a key principle of headline earnings

(SAICA, 2013) and, as most adjusted earnings (for South African firms) are determined by making adjustments to headline earnings, it is possible that firms may view certain additional adjustments to headline earnings as necessary to convey the real performance of the firm. A number of firms reports included statements suggesting that adjusted earnings is a more valid measure of performance (Sanlam Ltd, 2014, Naspers Ltd, 2014)

The high incidence of adjustments in the category “(2) Transactions and restructuring costs” is likely due to a view by firms that many of these costs that are expensed should be capitalised to assets, projects and acquisitions that were incurred. Directly attributable acquisition costs relating to business combinations were previously required under the 2004 version of IFRS 3 Business Combinations to be capitalised to the cost of the acquisition (IASB, 2004). The 2008 version of IFRS 3 requires these costs to be expensed. This may suggest that some firms view the previous accounting requirements to be more appropriate.

Unfortunately, there were a significant number of ‘other adjustments’ and ‘indeterminable adjustments’. This is likely to have impacted the results because of a large number of adjustments not being classified into useful categories, resulting in less informative results than anticipated. This is discussed in Section 1.4.2 (delimitations of the study). This issue arose mainly due to limited disclosure of adjustments by firms. This raises a concern regarding adequate disclosure of adjusted earnings. This was also found to be a problem in prior literature (Marques, 2010, Elliott, 2006).

The category “(4) Depreciation and amortisation” was used 32.5% of the time. Unfortunately, this category label is misleading as almost all adjustments here related to reversals of amortisation, particularly the reversal of amortisation of intangibles acquired in business combinations. The few ‘depreciation’ adjustments related to adjustments for depreciation to be based on asset fair values as opposed to cost.

4.2 Research question 2 – valid/invalid adjustments

(a) Results of the categorisation of adjustments

This research question sought to assess the extent and significance of use of adjustments deemed ‘valid’ and ‘invalid’ per predefined adjustment categories. An ANOVA approach was used to assess the extent of use of ‘valid’ compared to ‘invalid’ adjustments, as ANOVA assesses the difference between the means of 2 or more different groupings, allowing the interpretation of which grouping is most frequently used (Seltman, 2012). In this research question the groupings were the ‘valid’, ‘invalid’ or ‘other’ adjustment categories. A Friedman’s ANOVA test was used as the data deviated significantly from normality, necessitating the use of non-parametric testing methods. The results from the test are set out below. The results tables consist of: 1. descriptive statistics, 2. the mean ranks of the different adjustment categories, 3. the test statistics table. The test statistic shown in the test statistic table is a Chi-Square measure. The p value (Asymp. Sig) indicates whether the Chi-Square test statistic measure is significant or not (it is significant if $p < 0.05$).

Tables 8.1 – 8.3: Friedman’s ANOVA results

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum	CV
(1) Valid	205	.0203945925	.07604577483	-.26742975	.58601554	3.72872267
(2) Invalid	205	.0768706907	.60161212118	-1.63365983	7.36263736	7.82628750
(3) Other or undeterminable	205	.0113961128	.24976446241	-3.20858283	.53034781	21.91664173

Ranks

	Mean Rank
(1) Valid	1.88
(2) Invalid	2.15
(3) Other or indeterminable	1.97

Test Statistics

N	205
Chi-Square (X2(2))	8.958
df	2
Asymp. Sig.	.011

a. Friedman Test

Tables 8.4 – 8.5: Wilcoxon Signed Ranks test results

		Ranks		
		N	Mean Rank	Sum of Ranks
(2) Invalid - (1) Valid	Negative Ranks	64 ^a	82.03	5250.00
	Positive Ranks	99 ^b	81.98	8116.00
	Ties	42 ^c		
	Total	205		

a. (2) Invalid < (1) Valid

b. (2) Invalid > (1) Valid

c. (2) Invalid = (1) Valid

Test Statistics^a

	(2) Invalid - (1) Valid
Z	-2.374 ^b
Asymp. Sig. (2-tailed)	.018

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

The Friedman's test found that there is a significant difference ($\chi^2(2)=8.958$ (this was a significant finding as Asymp. Sig. is $p<.05$ at 0.011) between the 'valid', 'invalid' and 'other/indeterminable' categories of adjustments. Invalid adjustments (mean=.0768706907) tended to be more frequent and significant than Valid (mean=.02039459) and other (mean=.01139611) adjustments. To confirm the significant finding of the Friedman's ANOVA, Wilcoxon Signed Rank analysis found at the 5% level of significance, that there is a significant difference ($Z=-2.374$, $p<.05$) between the ranks for valid and invalid adjustments with invalid adjustments tending to be higher than valid

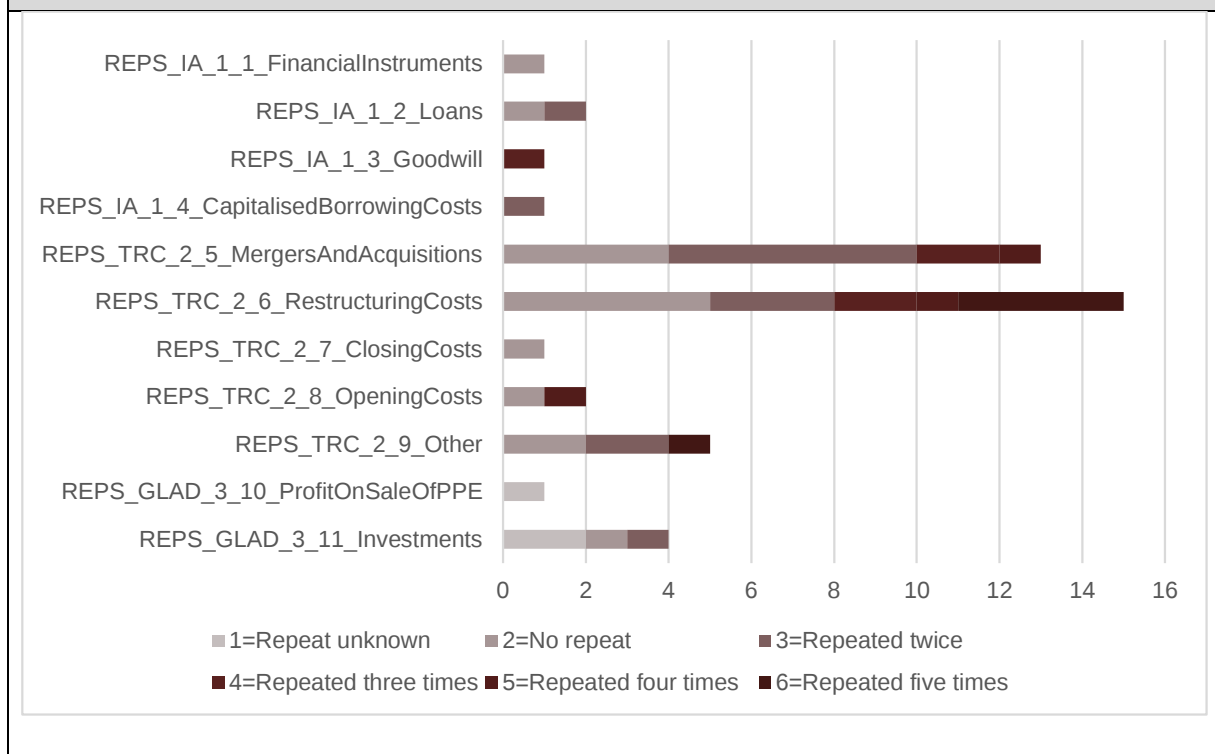
adjustments with invalid disclosures ($M=.0768706907$, $SD=.60161212118$) tending to be higher than valid ($M=.02039459$, $SD=.07604577$) disclosures.

The testing found that invalid adjustments are used to a greater extent by firms in the determination of their adjusted earnings than valid adjustments are. This is consistent with the findings of Bhattacharyaa et al. (2003) and Doyle et al. (2003). The results suggest that South African firms' adjusted earnings do not convey an accurate picture of these firms' recurring earnings (assuming the adjustment categories fairly represent this) and that this raises questions regarding their intention and validity in line with the problems identified internationally. However, in line with the limitations of the use of the adjustment categories to identify adjustments as valid or invalid (discussed in Section 1.4.2) it is likely that these results do not fully depict the reality of the invalidity of the adjustments. The impact of this is that, although evidence of misuse was found, its extent is difficult to measure when balancing the results with the limitations of the method.

(b) Results of the repeated use of valid adjustments

In addition to the classification of adjustments as valid or invalid in part (a) of RQ2, the repeated use of similar adjustments (another measure identified in the literature as evidence of misuse) was also analysed to gather further evidence of possible misuse of adjusted earnings in South Africa. The number of times that adjustments classified as 'valid' (as they are more likely unusual and/or once-off) were repeated by the population examined using a repeated measures test. The results from the repeated use of valid adjustments test is set out in graph 2 on the following page:

Graph 2: Repeated use of valid adjustments



The test for repeated use of valid adjustments was conducted on a firm basis. The results indicate that mergers and acquisition costs and restructuring costs are most frequently repeated 'valid' adjustments across the firms in the population. Although per the Bhattacharyaa et al. (2003) typology these adjustments are valid, their repeated use suggests that they may not be once-off or unusual as they recur .

Despite the findings of the study, it needs to be considered that the blanket approach of any repeated 'valid' adjustment being classified as invalid likely resulted in some adjustments being incorrectly identified as invalid. For example, as discussed in Section 4.1 (a), it can be argued that merger and acquisition costs and transactions costs should be capitalised and not expensed. This view is supported by the extent of repetition of these adjustments as set out in the graph. This suggests that the repeated measure test may not accurately identify invalid adjustments.

One finding that strengthens the results of the test is the finding that 46 individual adjustments were repeated (to varying extents) out of a total of 93 supposedly 'valid' (i.e. unusual and once-off) individual adjustments, meaning that almost half of all valid adjustments were repeated. However, the number of times the adjustments were repeated needs to be considered; as discussed in Section 3.3.2, 2 repeats of the same adjustment (in the 5 years under review) provides less convincing evidence of misuse than 5 repetitions of an adjustment. 13 adjustments (out of the total 46 repeated adjustments) were repeated 3 or more times, while 33 adjustments were repeated less than 3 times. This suggests that the measure provided weak evidence of misuse.

It is significant to note that besides 1 firm, all firms that contributed only 1 year of data (category 1=Repeat Unknown) did not use any valid adjustments. The once-off usage of adjusted earnings to reverse an operating expense (as there were no valid adjustments) suggests misuse.

The base test to compare repetition (defined differently to the testing above – any single adjustment present 3 or more times in the 5 year period) for the 'valid' adjustments and the 'invalid' adjustments (as classified by RQ2.1a) weighted for the total number of 'valid' or 'invalid' adjustments was compared to each other. This provides a base to interpret the results above and also to assess whether valid or invalid adjustments are repeated more often.⁹

The valid adjustment categories were repeated (using this measure) 27 times (for 11 adjustment categories) out of a total of 99 adjustments (for the full 5 firm years under review). The invalid adjustment categories (excluding the indeterminable categories) were repeated 110 times out of a total of 476 adjustments in the 5 firm year period under review. Weighting the repeats for the total number of adjustments gives the following: valid adjustments repeated: 0.27 and invalid adjustments 0.23. As this is not a statistical

⁹ It was not deemed necessary to test invalid adjustments in the same manner as valid adjustments, as they were already deemed invalid. However, for comparative purposes, the higher level test was performed for both valid and invalid adjustments.

test inferences cannot be made, however this base measure implies that repetition is fairly close between the valid and invalid adjustment categories.

4.3 Research question 3

4.3.1 Descriptive statistics

To gain an understanding of the extent that different earnings measures (basic EPS, diluted EPS and diluted HEPS, adjusted EPS) actually have on meeting or beating analyst forecasts, the percentage of each measure (on a firm year basis) that met or beat the analyst forecast (the last forecast) for that firm year are shown below. The descriptive statistics were performed for 3 populations: Table 9.1 – the original pre-census population of 570 firm years to consider firm years that didn't use adjusted earnings, however, this was limited to 527 firm years as there were only analyst forecasts for 527 years, Table 9.2 – the firm years that used adjusted earnings consisting of 191 firm years, Table 9.3 – the firm years that did not use adjusted earnings consisting of 365 firm years, however, this was limited to 335 firm years, as there were only analyst forecasts for 335 firm years. In addition, the results were calculated on a firm basis for the 2014 year as a reasonableness assessment in the event that certain firms were influencing the results by recurring each firm year. The results tables are set out on the pages that follow:

Table 9.1: Proportion of different earnings that met or beat analyst forecasts for the original population pre-census population of 570 firm years, limited to 527 firm years with analyst forecast data.

Accounting earnings measure	Number of firm years that met or beat the last analyst diluted HEPS forecast	% firm years where forecast was met or beaten	Number of firms in 2014 that met or beat the last analyst diluted HEPS forecast (out of 110 firms)	% firms in 2014 where forecast was met or beaten (110 firms)
Basic EPS	254	48.2%	49	44.5%
Diluted EPS	214	40.6%	44	40.0%
Diluted HEPS	215	40.8%	43	39.1%
Adjusted earnings	Not relevant for this population			

Table 9.2: Proportion of different earnings that met or beat analyst forecasts for the 191 firm years where adjusted earnings were used, excluding the 14 firm years with no analyst forecast data.

Accounting earnings measure	Number of firm years that met or beat the last analyst diluted HEPS forecast	% firm years where forecast was met or beaten	Number of firms in 2014 that met or beat the last analyst diluted HEPS forecast (out of 47 firms)	% firms in 2014 where forecast was met or beaten (47 firms)
Basic EPS	87	45.5%	19	40.4%
Diluted EPS	69	36.1%	17	36.2%
Diluted HEPS	62	32.5%	10	21.3%
Adjusted earnings	122	63.9%	26	55.3%

Table 9.3: Proportion of different earnings that met or beat analyst forecasts for the 365 firm years where adjusted earnings were not used, limited to 335 firm years with analyst forecast data.				
Accounting earnings measure	Number of firm years that met or beat the last analyst diluted HEPS forecast	% firm years where forecast was met or beaten	Number of firms in 2014 that met or beat the last analyst diluted HEPS forecast (out of 63 firms)	% firms in 2014 where forecast was met or beaten (63 firms)
Basic EPS	167	49.9%	29	46.0%
Diluted EPS	144	43.0%	25	39.7%
Diluted HEPS	153	45.7%	32	50.8%
Adjusted earnings	Not relevant for this population			

As per the tables above, the 2014 firm results are in almost all cases marginally lower than the firm year results – which is expected as not all firms that used adjusted earnings in the 5 year period were captured by the 2014 firms. Regardless, the results are relatively close to the firm year’s results and the presence of the same firms in the firm year data does not alter the results significantly. This is in confirmation with the serial correlation assessment in Section 3.1. As a result the remainder of the results discussion will only focus on the firm year results.

The analyst earnings forecasts in this reports dataset are forecasts of diluted HEPS. As a result, actual HEPS is the most accurate figure to compare to the analyst forecasts to determine whether the forecast was actually beaten or not. In the U.S. data used in Doyle et al. (2013) GAAP earnings met or beat the analyst forecast 63.3% of the time and non-GAAP earnings met or beat 65.6% of the time. In this study GAAP accounting (and HEPS) EPS met or beat the forecasts 32.5% - 49.9% of the time depending on the population observed and whether a basic or diluted figure was used. This is below U.S. performances. Non-GAAP adjusted earnings met or beat the forecasts 63.9% of the time which is in line with the U.S. data.

Although not the focus of this report, this could suggest that analyst forecasts are less achievable or overly optimistic in South Africa. It could also suggest that firms are not motivated to meet or beat analyst forecasts as they may not regard analyst forecasts as an important performance measure, or that these are simply unattainable. The higher rate of adjusted earnings meeting or beating forecasts (63.9%) could suggest that firms are not motivated to meet or beat forecasts and simply embellish their results through the use of adjusted earnings to appease those who are interested in whether the firm met or beat the forecast to make appear as if the firm did. However, this is countered by the emphasis placed by firms on adjusted earnings – they are not simply added to reports but emphatically emphasised by firms as being their most reflective earning metric.

The above is further countered by the proportion of adjusted EPS (63.9%) propensity to meet or beat forecasts being in line with the rate of U.S. non-GAAP earnings. As firms have more control in defining adjusted EPS than the other metrics, the results suggest that firms do care about meeting or beating forecasts as their earnings are adjusted to a level where firms meet or beat analyst forecasts which is in line with international norms. The implication of this is that the results suggest that there may be structural issues with analyst earnings forecasts in South Africa that prevent a reasonable proportion (if international norms are the definition of ‘reasonable’) of firms from meeting or beating forecasts. This results in firms using adjusted earnings in an attempt to mislead some investors by claiming that they are performing to avoid negative share price action from failing to meet or beat forecasts. Whether this is effective or not is not tested in this research and requires further research.

Firms that use an adjusted earnings/EPS figure meet or beat the forecast (on the basis of diluted HEPS) significantly less often (32.5%) than firms that do not use an adjusted figure (45.7%). This provides evidence to support the proposition that whether a firm’s accounting earnings meet or beat the forecast is a motivation for firms to use an adjusted figure (i.e. if accounting earnings meet or beat the forecast, there is less motivation to (mis)use an adjusted figure to make it appear as if the firm did). This justifies the inclusion of the *Diluted HEPS MBE* variable in the logistic regression model.

Diluted EPS meets or beats the forecast less often than basic EPS. This suggests that share based (denominator) adjustments do impact EPS figures. This is, however, not relevant in the analysis of adjusted earnings/EPS as most share based adjustments occur in diluted EPS and HEPS calculations and not in adjusted diluted EPS calculations which are primarily earnings (numerator adjustments). The smaller difference between the incidence of diluted EPS and diluted HEPS meeting or beating forecasts relative to different percentages of meeting or beating forecasts between basic EPS and diluted EPS may suggest that the effects of 'diluting' per share earnings for potential shares can have a greater effect on per share earnings than headline earnings adjustments which could suggest that the impact of headline earnings on per share earnings is less significant than the effects of diluting. This is further supported by the result that the incidence of diluted EPS meeting or beating the forecast differs only slightly from the incidences of diluted HEPS. Although not strictly part of the original research questions objectives, this is a unique finding and is worthy of reporting, however, more research is needed to confirm this observation.

As basic EPS meets or beat analyst forecasts more often than diluted EPS and diluted HEPS, this raises the question as to why firms do not simply emphasise basic EPS, instead of using adjusted earnings – an additional earnings figure. The reason could be twofold. Firstly, firms have to present a basic and a diluted accounting EPS figure (IASB, 2003). This may make it obvious to users that diluted EPS is the more useful of the 2 figures. Adjusted EPS solves this as it is not usually presented as a basic or diluted figure and, as a result, does not have to consider diluting adjustments. Secondly, firms may wish to increase EPS above basic EPS, possibly to be able to reach the analyst forecast, suggesting that simply emphasising basic EPS is not sufficient to make it appear as if the firm met or beat the forecast.

The independent variable *PosExclUse* which determines whether adjusted EPS is greater than HEPS returned a true value for 130 cases out of the 191 cases (68.1%) of firm years using adjusted earnings, indicating that adjusted earnings are frequently adjusted upwards in line with meeting or beating analyst forecasts more often. This is also apparent

from the mean adjusted EPS figure for the 191 census population firm years (693.88c) being significantly greater than accounting earnings: basic EPS (549.74c), diluted EPS (528.46c) and diluted HEPS (537.62c). This, together with all the preceding points, provides strong evidence that there is a relationship between the use of adjusted earnings and meeting or beating forecasts. This relationship is further analysed in the logistic regression model in Section 4.3.2 below. The results also suggest that peculiarities exist around the analyst earnings forecast environment in South Africa which leads to a low proportion of firms meeting or beating forecasts perhaps further motivating firms to (mis)use adjusted earnings. It also suggests that the impact of headline earnings is not as significant as initially expected.

4.3.2 Results of the logistic regression analysis

The logistic regression analysis results are set out below. The model's aim was to explain the relationship between the use of adjusted earnings that have been increased by firms i.e. adjusted EPS/earnings is greater than basic/diluted EPS – diluted EPS was used if firms presented a diluted adjusted EPS figure. It also sought to determine whether the prior research findings of Doyle et al. (2013) that firms use income increasing adjustments to meet or beat analyst forecasts more often holds in South Africa.

The initial statistics indicated that multicollinearity did not affect the model the model explained a modest amount of variance (UCLA, 2016). The Pseudo R² (measured by the Cox & Snell R Square and Nagelkerke R Square measures of variance explanation) found that the model explained 23.8% and 32.7% respectively of the variation. The Hosmer and Lemeshow test indicated that the model was a good fit for the data. This implies that the model has a modest to sufficient fit to the data and can be used to understand a reasonable amount of the variation.

The actual predictive ability of the model to the dependent variable was also examined. Although the objective of the research was not to develop a predictive model, the accuracy of the predictions the model can give an idea of the model's validity. It was found

that the overall predictive accuracy of the model was 74.3%, with the accuracy of the model to predict firms using upwardly adjusted EPS being 82.8% and the ability to predict firms not using upwardly adjusted EPS being 59.4%. These are adequate levels of accuracy to use the model as a predictor model and are sufficient for the exploratory nature of this research report.

The main output of the logistic regression is the 'Variables in the Equation' table (see Table 10.3). The different components of the table are explained as follows: the Beta (B) coefficients represent the relationship between independent variables and the dependent variable (*MBE*) and represent how much the dependent variable changes from a change of 1 unit in the particular independent variable. The Wald statistic tests whether or not a regression coefficient for an explanatory variable is different from zero i.e. whether or not the explanatory variable is making any substantial contribution predicting the outcome. The Wald statistic has a corresponding chi-square distribution denoted by the column 'Sig.' and the p values in this column that are $p < .05$ are considered statistically significant (those $p > .05$ are insignificant). The Exp(B) column contains the e exponential value of the B coefficient and represents the odds ratio. The odds ratio represents the association between each variable and the dependent variable i.e. a higher odds ratio means that that independent variable is more associated with the dependent variable than another independent variable with a lower odds ratio. Exp(B) also represents the extent of association of that variable with the dependent variable (compared to the opposing case of that variable – i.e. variable (if dichotomous) = 0). For example, an Exp(B) value of 5 for a variable in the "Variables in the Equation" table would mean that when that variable/characteristic is present, the dependent logistic variable outcome is 5 times more likely to occur. The results are presented in Tables 10.1 – 10.3 on the following page for all the significant variables. The log odds probability equation is presented below the tables.

Tables 10.1 – 10.3: Results from the logistic regression analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
MBE_LAST	191	0	1	.64	.482	-.582
PosExclUse	191	0	1	.68	.467	-.781
LAST_DilutedHEPSMBEFor ecast	191	0	1	.32	.469	.755
zLnSize	191	-2.38104	2.35837	.00	.989	.263
Valid N (listwise)	191					

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	PosExclUse	.887	1.127
	LAST_DilutedHEPSMBEForecast	.887	1.127
	LnSize (standardised)	.979	1.022

a. Dependent Variable: MBE_LAST

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	
Step 1 ^a	PosExclUse	1.347	.438	9.456	1	.002	3.847
	LAST_DilutedHEPSMBEFor ecast	2.771	.523	28.109	1	.000	15.967
	zLnSize	.749	.194	14.988	1	.000	2.115
	Constant	-.999	.396	6.362	1	.012	.368

Equation 5: RQ3 logistic regression results equations

$$\log\left(\frac{p}{1-p}\right) = -0.999 + 1.347PosExclUse + 0.749LnSize + 2.771DilutedHEPSMBEForecast$$

The predicted probability can be calculated with the following formula:

$$prob(MBE = 1) = \frac{1}{1 + e^{-0.999 + 1.347PosExclUse + 0.749LnSize + 2.771DilutedHEPSMBEForecast}}$$

The multicollinearity tests indicated that multicollinearity did not pose a problem to the data and the results. Tolerance ranged from a low of 0.887 to a high of 0.979, while VIF ranged from 1.022 - 1.127 for the variables above. Both of these results are within the acceptable range (generally tolerance values of <0.1 and VIF values in excess of 5 are indicative of the presence of multicollinearity in the data).

As discussed in Section 3.3.3, the Forward Stepwise selection of variables removed all variables that did not have a significant impact on the dependent variable i.e. the ‘Sig’ values for these variables was greater than the .05 threshold. Unfortunately, this resulted in the removal of 7 of the 10 independent variables. That these 7 variables do not have a significant impact on the dependent variable suggests that the adjusted earnings and analyst forecast environment in South Africa differs from that in the U.S. This is consistent with the differences in the environment found and discussed in the descriptive statistics of RQ3 (Section 4.3.1). On the other hand, as discussed in paragraphs below, when running the model for all the variables (ignoring the Stepwise selection) it was found that although the 7 variables had an insignificant impact on the dependent variable, their Beta (B) values behaved in the same way as in the original Doyle et al. (2013) study. This provides evidence that a similar association exists but it is just as significant as it was in the prior literature. This could be due to the smaller number of observations in this study (191) compared to the Doyle et al. (2013) study. It could also be due to the smaller size of the South African equity market resulting in a more homogenous group of firms. The implication of this is that the results are less able to identify in more detail, the types of firms whose adjusted earnings meet or beat analyst forecasts more often. Despite these

differences, when running the model using the original 6 variables used in Doyle et al. (2013) only, to ensure that the additional variables of this study did not change the results, the same variables were also insignificant.

The 3 remaining independent variables that were tested all had a significant impact (all variables p-values were $<.05$) on whether firms adjusted EPS met or beat analyst forecasts. The *DilutedHEPSMBEForecast* variable that measured whether a firm's diluted HEPS met or beat the forecast (which is an accounting equivalent EPS figure for this study as the forecasts are measured on the basis of diluted HEPS) had the greatest impact, indicated by the significantly larger B and $\text{Exp}(B)$. This was followed by *PosExclUse* – whether the firm used income increasing adjustments in determination of adjusted earnings and lastly *LnSize* the size of the firm. This together with the findings in Section 4.3.1 provides significant evidence that whether firms accounting earnings meet or beat the forecast is the biggest motivator for whether firm's adjusted earnings meet or beat the forecast i.e. firms with a lower incidence of diluted HEPS meeting or beating the forecast are more likely to use adjusted EPS. As this was an additional variable to Doyle et al. (2013) this is a new finding which this study contributes to the literature. The relationship between *MBE* and *PosExclUse* is far more significant than that found in the Doyle et al. (2013) study: this is probably due to the use of only 191 firm years in the study. Larger firms, represented by *LnSize* in the model are more likely than smaller firms to have an adjusted EPS figure that meets or beats the forecast, with every 1% increase in firm size resulting in a 2.76% higher incidence of adjusted earnings meeting or beating the forecast. This confirms prior research that larger firms are more likely to manage adjusted earnings upwards.

Despite the 7 excluded independent variables not having a significant impact on the dependent variable, the direction of the B values is of interest as the relationship (although insignificant) should be in the same direction as the relationships of these variables with *MBE* in the Doyle et al. (2013) study. As a result, in addition to the significant variables selected by the Forward Stepwise selection, all variables were also, but separately, processed to assess the relationship of the insignificant variables. This is set out in Table 10.4 below:

Table 10.4: Variables in the equation – all variables – results from logistic regression analysis (all variables)							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1a	PosExclUse	1.426	.461	9.571	1	.002	4.163
	Booktomarket	-.265	.182	2.112	1	.146	.767
	SalesGrowth	.009	.011	.694	1	.405	1.010
	Profitable	-.485	.802	.365	1	.546	.616
	ROA	.007	.006	1.491	1	.222	1.007
	ForecastMovement	.000	.000	.018	1	.893	1.000
	sAnnualAnalystForecast	.000	.001	.000	1	.992	1.000
	LAST_DilutedHEPSMBEFor ecast	2.805	.535	27.505	1	.000	16.520
	DirectorsEmoluments	-.088	.477	.034	1	.854	.916
	zLnSize	.771	.234	10.899	1	.001	2.163
	Constant	-.467	.915	.261	1	.610	.627

Unfortunately, 3 of the 4 additional variables introduced in this study (*ForecastMovement*, *sAnnualAnalystForecast* and *DirectorsEmoluments*) did not have a meaningful directional impact of the results. This suggests that these variables are not effective as a measure to control for expectations management.

The original Doyle et al. (2013) control variables that were excluded from the model during the Stepwise selection of variables (due to there not having a significant impact on the results) are mostly consistent with Doyle et al. (2013) and the prior research on which they are based. Specifically, the coefficients for *Book-to-Market* and *SalesGrowth* are expected to be negative and positive respectively because low book-to-market (glamour) firms and high growth firms tend to meet or beat analyst forecasts more often. Profitability

and ROA are positive as expected as per the (Brown, 2001) study. The coefficient for *LnSize* (standardised) is expected to be positive since prior research suggests that larger firms have less optimistic bias in analyst forecasts. The findings in this paragraph suggest that the research was conducted in a sufficiently similar manner to Doyle et al. (2013) enhancing the credibility of this research report. Although the coefficients have a similar direction of impact as in the Doyle et al. (2013) study, their insignificance agrees with the prior suggestion that structural differences exist between the U.S. and South African forecast environments but further research is required to confirm this.

As the study does not control effectively for expectations management and does not attempt to control for earnings management, these may have impacted the results. A possible consequence of this may be that the significance of the results may be overstated by not removing the effects of these 2 phenomena.

4.4 Summary

Table 11: Summary of research questions, approach and results			
Research question number	Research question	Approach	Results
1 (a)	To what extent are non-GAAP 'adjusted' earnings used in South Africa?	Descriptive	-35-49% of population firm years (depending on measure) -Used increasingly often -Similar industries use adjusted earnings to prior literature -Larger firms use more often
1 (b)	What types of adjustments are most commonly used by JSE-listed firms in determining their adjusted earnings?	Multiple response analysis	-Operating items are most frequently adjusted but shouldn't be
2 (a)	To what extent are these adjustments valid or invalid – valid/invalid categories	ANOVA	-Invalid adjustments more frequently used and significant than valid adjustments
2 (b)	To what extent are these adjustments valid or invalid – repeated use of valid adjustments	Descriptive	-Frequently repeated (50% of valid adjustments have some evidence of repetition) -Mergers and acquisition costs and restructuring costs are most frequently repeated type of adjustment.
3	Is there an association between JSE-listed companies using income increasing adjustments (positive exclusions) in the determination of adjusted earnings to meet or beat analyst forecasts?	Descriptive statistics and logistic regression	-Adjusted earnings meet or beat forecasts more often than accounting earnings -Positive exclusions and whether accounting earnings met or beat the forecast are strongly associated with whether adjusted earnings meet or beat analyst forecast -Similar types of firms have adjusted earnings that meet or beat forecasts

5. Conclusion

The use of non-GAAP earnings has caused controversy and a large body of research to varying extents has found evidence of opportunism and misuse of non-GAAP earnings which can mislead investors (Bhattacharya et al., 2004, Doyle et al., 2003, Bhattacharya et al., 2007, Bradshaw & Sloan, 2002). Doyle et al. (2013) proposed the incentives for firms to meet or beat analyst earnings forecasts as a motivation to upwardly adjust earnings so that these figures exceeded analyst forecasts. In a South African context, the use of Headlines Earnings results in a unique market in which to study adjusted earnings. The research was conducted using 3 research questions and sub-questions using quantitative methods based on the prior research of Bhattacharyaa et al. (2003), Doyle et al. (2003) and Doyle et al. (2013) which provided the study with valid research methods. It is important to consider the impact of the delimitations, limitations and assumptions of the study in the interpretation of these results.

The results from research question 1 (a) indicated that adjusted earnings are used by a significant number of JSE firms (35-49% of all firms, depending on the measure used), and provides the basis for the importance and significance of the study. The increasing use of adjusted earnings suggests that non-GAAP and adjusted earnings are an increasingly significant accounting issue. The results also suggest that, despite the use of Headline Earnings in South Africa, the types of firms using adjusted earnings are similar (with regards to industry and market capitalisation) to those in U.S. studies. This may suggest that the factors (the type of industry and the pressure placed on larger firms) pose similar problems to South African firms as to U.S. firms. This may indicate that the use of Headline Earnings does not adequately address these challenges although the impact of Headline Earnings may be the reduced use of adjusted earnings in South Africa compared to the prior U.S. literature. The effectiveness of Headline Earnings as a non-GAAP reporting tool and the relationship between of the use of Headline Earnings and adjusted earnings are areas for future research.

Research question 1 (b) found the most common types of adjustments used by firms to include restructuring costs and operating item adjustments. Of the operating item adjustments, the most common adjustments are: depreciation, fair value adjustments to financial instruments and foreign exchange adjustments and share based payment expenses. It is interesting to note that these adjustments are more aligned with information-useful accounting data as opposed to performance measurement figures; several firms' reports propose that adjusted earnings are used to provide a better performance measure. As providing a performance measure is the stated objective of headline earnings, this suggests that some firms believe that additional adjustments are necessary to achieve an accurate performance figure. Whether this view is valid or invalid is not considered in this report; it is merely a different perspective identified by the research. This view is, however, questioned by the fact that adjusted earnings are persistently higher than accounting earnings. This finding differs to the findings of prior literature that firms may use adjusted earnings to provide a recurring earnings figure that is more useful for valuation purposes (although this was not the objective of this research). This finding lends itself to the information usefulness versus performance measurement debate in accounting

Research question 2 found evidence of misuse of adjusted earnings for both measures of misuse explored in the study. It was found that firms more frequently used invalid adjustments in the determination of their adjusted earnings than valid adjustments (in line with prior research) and also found evidence of the repeated use of 'valid' adjustments (which may render 'valid' adjustments 'invalid' through their repeated use as this suggests that they are not once-off or unusual). However, the results need to be viewed in light of the limitations of the 2 methods employed. This results in evidence of misuse being found, however, the measurement of the extent is difficult to ascertain. The categorisation of adjustments as valid or invalid could be refined in future research to consider the underlying substance of transactions i.e. whether the transaction is actually once-off or unusual rather than using the categorisation approach based on the adjustment description. This may lead to different, and potentially more accurate results. The criticism of these methods was particularly impacted by the opaque disclosure provided by firms

in their reports regarding adjusted earnings reconciliation. This suggests that disclosure of non-GAAP figures by JSE-listed firms could be improved.

Research question 3 sought to identify whether meeting or beating analyst forecasts was a source of motivation for firms to misuse adjusted earnings. A unique finding of this research was that South African firms meet or beat analyst forecasts significantly less often than U.S. firms. This raised several questions such as: do South African firms view analyst forecasts in a serious light, and is it of importance whether they meet or beat the forecast?; do South African firms 'window dress' adjusted earnings to meet or beat forecasts, just to say they did meet or beat the forecast?; are there structural differences in the South African analyst forecast environment that make forecasts less attainable than in U.S. literature?; and do South African firms take analyst forecasts seriously and strategically use adjusted earnings and emphasise them to make it appear to users as if the firm did meet or beat the forecast? The study concludes that the latter 2 points of view are the most appropriate. This is due to the emphasis placed by firms in their reports on adjusted earnings (suggesting they take them seriously) as well as the similar proportion of adjusted earnings meeting or beating forecasts as in the U.S. literature. The study suggests that there are structural differences in the analyst forecast environment and that firms do care about meeting or beating forecasts. Further research is required to confirm these initial conclusions.

The main results of Research question 3 were that the accounting earnings of firms that use adjusted earnings meet or beat forecasts less often than firms that do not use adjusted earnings figures. This suggests that the failure of accounting earnings to meet or beat analyst forecasts is a motivation to use adjusted earnings. The logistic regression model found that there is a strong relationship between firms' adjusted earnings and meeting or beating analyst earnings forecasts, in line with prior literature (Doyle et al., 2013). Positive earnings exclusions were found to be strongly related to whether adjusted earnings met or beat the forecast. The results also suggest that *Forecast movement and σ Annual Analyst Forecast* are ineffective controls for expectations management. The inclusion of more accurate earnings and expectations management controls in the

models, as well as considering (as done by Doyle et al. (2013)) whether adjusted earnings are used in addition to earnings management and expectations management, and the prevalence of each of these tools, could be used to improve research in the future. RQ3 could also be improved by also considering near misses of analyst forecasts (this study ignored near misses).

Another finding which was not in the scope of the report was that adjustments made to determine diluted EPS appear to be the most significant adjustments made in the entire adjustment process from accounting basic EPS to adjusted EPS (more than headline earnings adjustments and adjusted earnings adjustments). This suggests that research focused on dilutive events and adjustments would provide more significant findings than research on headline earnings and adjusted earnings. However, as dilutive adjustments are part of accounting standards, there may be less need to evaluate these kinds of adjustments than headline and adjusted earnings adjustments.

It is, however, important to note that the selection of companies used in this research mainly depended on the availability of analyst earnings forecasts. As only larger firms are likely to be covered by analysts, the research does not attempt to comment on all JSE listed firms, but rather a subset – that being the larger firms that are covered by analysts and make up the bulk of the market capitalisation of the JSE.

5.1 Implications and recommendations

It is suggested that market regulators respond to the risks presented by adjusted earnings. The SEC in the US has already responded with new rules that address most of the criticisms levelled against adjusted earnings in the literature. As the research determines that a number of these issues are also present in the South African market, it is recommended that the JSE, IRBA, SAICA or the Companies Act responds to these risks and adopt similar rules to the SEC's. It does, however, remain to be seen whether these rules will result in more appropriate non-GAAP adjusted earnings.

From the accounting standard setter's perspective, adjusted earnings are on the IASB's agenda. The focus on defining better performance measures at different levels on the Income Statement as suggested by Hans Hoogervorst (IASB Chairman) are possibly a better approach than attempting to develop a single full encompassing performance measure like Headline Earnings – as seen in the research despite Headline Earnings in South Africa, adjusted earnings are used and adjusted as extensively as in the US.

Further research could focus on more advanced analysis, including value relevance studies to the adjustments made, such as Venter et al. (2014). Other possibilities to extend the research include analysing motivations for the use of adjusted earnings, particularly with reference to management bonus scheme performance metrics and the extent to which these are GAAP or non-GAAP based. With the new SEC rules, future research could also consider the effectiveness of these rules and the impact they would have on adjusted earnings. Lastly, future research could explore possibilities for better performance metrics.

Overall, the study gathered evidence on the nature of adjusted earnings in South Africa which contributes to the literature because this data is unavailable in South Africa. Its findings on the misuse of adjusted earnings agree with prior research, which allows the application of more research in a South African context. However, the research raises questions around the effectiveness of Headline Earnings in South Africa, as well as whether structural differences exist in the analyst earnings environment in South Africa. The research provides some evidence to suggest that users of financial statements should be careful in placing reliance on adjusted earnings. The finding that meeting or beating analyst earnings forecasts is a motivator for firms to misuse adjusted earnings contributes to the literature and the additional findings on the nature of analyst earnings forecasts in South Africa contribute knowledge to the literature.

6. References

- ABARBANEL, J. S. & LEHAVY, R. 2007. Letting the "Tail Wag the Dog": The Debate over GAAP versus Street Earnings Revisited. *Contemporary Accounting Research*, 24(3), 675 - 723.
- ALLEE, K., BHATTACHARYA, N., BLACK, E. & CHRISTENSEN, T. 2007. Pro forma disclosure and investor sophistication: external validation of experimental evidence using archival data. *Accounting, Organizations and Society*, 32(3), 201-222.
- ANDRE, P., CAZAVAN-JENY, A., DICK, W., RICHARD, C. & WALTON, P. 2009. Fair Value Accounting and the Banking Crisis in 2008: Shooting the Messenger. *Accounting in Europe*, 6.
- BARKER, R. G. 2012. FRS3 and analyst's use of earnings. *Accounting and Business Research*, 30(2), 95-109.
- BARTOV, E., GIVOLY, D. & HAYN, C. 2002. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics*, 33(2), 173-204.
- BARUA, A., LIN, S. & SBARAGLIA, A. M. 2010. Earnings Management Using Discontinued Operations. *American Accounting Association*, 85(5), 1485-1509.
- BAUM, A. & DEVANEY, S. 2007. Depreciation, income distribution and the UK REIT. *Journal of Property Investment & Finance*, 26(3), 195-209.
- BHATTACHARYA, N., BLACK, E. L., CHRISTENSEN, T. E. & D.MERGENTHALER, R. 2004. Empirical Evidence on Recent Trends in Pro Forma Reporting. *Accounting Horizons*, 18(1), 27-43.
- BHATTACHARYA, N., BLACK, E. L., CHRISTENSEN, T. E. & D.MERGENTHALER, R. 2007. Who Trades on Pro Forma Earnings Information. *The Accounting Review*, 82(3), 581 - 619.
- BHATTACHARYA, N., BLACK, E. L., CHRISTENSEN, T. E. & LARSON, C. R. 2003. Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings. *Journal of Accounting and Economics*, 36(1), 285 - 319.
- BLACK, D. E. & CHRISTENSEN, T. E. 2009. US Managers' Use of 'Pro Forma' Adjustments to Meet Strategic Earnings Targets. *Journal of Business Finance & Accounting*, 36(3), 297-326.
- BRADSHAW, M. T., DRAKE, M. S., MYERS, J. N. & MYERS, L. A. 2012. A re-examination of analysts' superiority over time-series forecasts of annual earnings. *Review of Accounting Studies*, 17(4), 944-968.
- BRADSHAW, M. T. & SLOAN, R. G. 2002. GAAP versus The Street: An Empirical Assessment of Two Alternative Definitions of Earnings. *Journal of Accounting Research*, 40(1), 41 - 66.
- BROWN, L. 2001. A Temporal Analysis of Earnings Surprises: Profits Versus Losses. *Journal of Accounting Research*, 39(2), 221-241.
- BROWN, L. D. & KIM, K.-J. 1991. Timely Aggregate Analyst Forecasts As Better Proxies for Market Earnings Expectations. *Journal of Accounting Research*, 29(2), 382-385.
- BURGSTÄHLER, D. & EAMES, M. 2006. Management of Earnings and Analysts' Forecasts to Achieve Zero and Small Positive Earnings Surprises. *Journal of Business Finance & Accounting*, 33(5-6), 633-652.
- CHAN, K. C., GUP, B. E. & PAN, M. S. 1997. International stock market efficiency and integration: A study of eighteen nations. *Journal of Business Finance & Accounting*, 24(6), 803-813.
- COTTER, J., TUNA, I. AND WYSOCKI, P.D., 2006. Expectations management and beatable targets: How do analysts react to explicit earnings guidance? *Contemporary Accounting Research*, 23(3), 593-624.
- DANIELSON, M. G., THOMAS D. DOWDELL, AND MICHAEL P. SCHODERBEK. 2010. The Role of Analysts' Earnings Forecasts in the Valuation Process: An Introductory Overview. *Journal of Financial Education*, 36(3), 16-34.
- DAS, S., LEVINE, C. B. & SIVARAMAKRISHNAN, K. 1998. Earnings Predictability and Bias in Analysts' Earnings Forecasts. *The Accounting Review*, 73(2), 277-294.

- DECHOW, P. M., GE, W., LARSON, C. R. & SLOAN, R. G. 2011. Predicting Material Accounting Misstatements. *Contemporary accounting research* 28(1), 17-82.
- DOYLE, J. T., JENNINGS, J. N. & SOLIMAN, M. T. 2013. Do managers define non-GAAP earnings to meet or beat analyst forecasts? *Journal of Accounting and Economics*, 56(1), 40-56.
- DOYLE, J. T., LUNDHOLM, R. J. & SOLIMAN, M. T. 2003. The Predictive Value of Expenses Excluded from Pro Forma Earnings. *Review of Accounting Studies*, 8(2-3), 145 - 174.
- EIGER, Z.-E. & SUR, J. 2015. Practice Pointers on Earnings Guidance. In: FOERSTER, M. (ed.) <http://www.mofo.com/~media/Files/Articles/2015/06/1506PracticePointersonEarningsGuidance.pdf>.
- ELLIOTT, W. B. 2006. Are Investors Influenced by Pro Forma Emphasis and Reconciliations in Earnings Announcements. *The Accounting Review*, 81(1), 113 - 133.
- EY. 2011. *US GAAP versus IFRS* [Online]. Available: [http://www.ey.com/Publication/vwLUAssets/EY-US-GAAP-vs-IFRS-the-basics-2013/\\$FILE/EY-US-GAAP-vs-IFRS-the-basics-2013.pdf](http://www.ey.com/Publication/vwLUAssets/EY-US-GAAP-vs-IFRS-the-basics-2013/$FILE/EY-US-GAAP-vs-IFRS-the-basics-2013.pdf) Accessed 28 August 2016.
- EY. 2016. *To the Point - SEC staff updates guidance on non-GAAP financial measures* [Online]. Available: [http://www.ey.com/Publication/vwLUAssets/ToThePoint_01108-161US_Non-GAAPCDI_19May2016/\\$FILE/ToThePoint_01108-161US_Non-GAAPCDI_19May2016.pdf](http://www.ey.com/Publication/vwLUAssets/ToThePoint_01108-161US_Non-GAAPCDI_19May2016/$FILE/ToThePoint_01108-161US_Non-GAAPCDI_19May2016.pdf) Accessed 28 August 2016.
- FAMA, E., FISHER, L., JENSEN, M. & ROLL, R. 1969. The adjustment of stock prices to new information. *International economic review*. *International Economic Review*, 10(1), 1-21.
- FAMA, E. F. 1965. The Behaviour of Stock-Market Prices. *The Journal of Business*, 38(1), 34-105.
- FORRESTER RESEARCH. 2013. Global Tech Market To Grow By 5.4% In 2013, 6.7% In 2014. *Forbes* [Online]. Available: <http://www.forbes.com/sites/forrester/2013/01/03/global-tech-market-to-grow-by-5-4-in-2013-6-7-in-2014/#370fb43d79f3>.
- FREDERICKSON, J. R. & MILLER, J. S. 2004. The Effects of Pro Forma Earnings Disclosures on Analysts' and Nonprofessional Investors' Equity Valuation Judgments. *The Accounting Review*, 79(3), 667 - 686.
- FREEDMAN, L. S., PEE, D. & MIDTHUNE, D. N. 1992. The Problem of Underestimating the Residual Error Variance in Forward Stepwise Regression. *Journal of the Royal Statistical Society. Series D (The Statistician)*, 41(4).
- GUNNY, K. A. 2010. The Relation Between Earnings Management Using Real Activities Manipulation and Future Performance: Evidence from Meeting Earnings Benchmarks. *Contemporary Accounting Research*, 27(3), 855-888.
- HEALY, P. M. & WAHLEN, J. M. 1999. A Review of the Earnings Management Literature and Its Implications for Standard Setting. *Accounting Horizons*, 13(4), 365-383.
- HOOGERVORST, H. Performance reporting and the pitfalls of non-GAAP metrics. Annual Conference of the European Accounting Association, 2016 Maastricht. International Accounting Standards Board.
- IASB. 2003. *IAS33 - Earnings per share* [Online]. International Accounting Standards Board. Available: http://ec.europa.eu/internal_market/accounting/docs/consolidated/ias33_en.pdf Accessed 28 August 2016
- IASB. 2004. *IFRS3 - Business Combinations* [Online]. International Accounting Standards Board. Available: http://ec.europa.eu/internal_market/accounting/docs/consolidated/ifrs3_en.pdf Accessed 28 August 2016
- INDUSTRY CLASSIFICATION BENCHMARK. 2015. *Industry Structure and Definitions* [Online]. Available: http://www.icbenchmark.com/ICBDocs/Structure_Defs_English.pdf Accessed 28 August 2016
- INET BFA 2015. Historic Consensus Analyst Earnings Forecasts (2002 - 2015).
- JEFFERIS, K. & SMITH, G. 2004. Capitalisation and weak-form efficiency in the JSE securities exchange. *South African Journal of Economics* 72(4), 684-707.

- JERRIS, S. I. 1998. Earnings Per Share Reporting: A Movement Toward International Harmonization. *Journal of Applied Business Research*, 14(2), 11-19.
- JONES, J. J. 1991. Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, 29(2), 193-228.
- JSE. 2014. *Real Estate Investment Trusts* [Online]. Johannesburg Stock Exchange. Available: <https://www.jse.co.za/content/JSEPresentationItems/REITs.pdf> Accessed 28 August 2016
- JSE. 2015. *JSE Limited Listing Requirements* [Online]. Johannesburg Stock Exchange. Available: <https://www.jse.co.za/content/JSERulesPoliciesandRegulationItems/JSE%20Listings%20Requirements.pdf> Accessed 28 August 2016
- LAERD STATISTICS. 2016. *Friedman Test in SPSS Statistics* [Online]. Laerd Statistics. Available: <https://statistics.laerd.com/spss-tutorials/friedman-test-using-spss-statistics.php> Accessed 28 August 2016
- LAHR, H. 2014. An improved test for earnings management using kernel density estimation. *European Accounting Review*, 23(4), 559-591.
- LEMMA, T. T., MINGA NEGASH, AND MTHOKOZISI MLILO 2013. Determinants of earnings management: Evidence from around the world. *Available at SSRN 2370926*.
- MAGNUSSON, M. A. & WYDICK, B. 2002. How efficient are Africa's emerging stock markets? *Journal of Development Studies*, 38(4), 141-156.
- MALKIEL, B. G. 2005. The Efficient Market Hypothesis and Its Critics. *The Journal of Economic Perspectives*, 17(1), 59-82.
- MALKIEL, B. G. & FAMA, E. F. 1970. Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383-417.
- MARQUES, A. 2010. Disclosure strategies among S&P 500 firms: Evidence on the disclosure of non-GAAP financial measures and financial statements in earnings press releases. *The British Accounting Review*, 42(2), 119 - 131.
- MATSUMOTO, D. A. 2002. Management's Incentives to Avoid Negative Earnings Surprises. *The Accounting Review*, 77(3), 483-514.
- NASPERS LTD. 2014. *Annual Report* [Online]. Available: <http://www.naspers.com/NaspersPortal/media/Naspers/Pdf/full-integrated-annual-report-2014.pdf> Accessed 28 August 2016
- NICHOLS, D. C. & WAHLEN, J. M. 2004. How Do Earnings Numbers Relate to Stock Returns? A Review of Classic Accounting Research with Updated Evidence. *Accounting Horizons*, 18(4), 263-286.
- PHILLIPS, J., PINCUS, M. & REGO., S. O. 2003. Earnings management: New evidence based on deferred tax expense. *The Accounting Review*, 78(2), 491-521.
- PILLAY, P. & PASCOE, A. 2014. *ANALYSIS: BE AWARE OF ALTERNATIVE FINANCIAL REPORTING MEASURES* [Online]. AccountancySA. Available: <http://www.accountancysa.org.za/analysis-be-aware-of-alternative-financial-reporting-measures/> Accessed 28 August 2016
- PWC. 2014. *Global Economic Crime Survey* [Online]. Available: <https://www.pwc.co.za/en/assets/pdf/global-economic-crime-survey-2014.pdf> Accessed 28 August 2016
- RABIN, C. & NEGASH, M. 2007. Earnings Management and Deferred Taxes: Evidence from the Johannesburg Securities Exchange. *Paper for the 14th Doctoral Colloquium of the International Section of the American Accounting Association, San Diego*.
- RAVENS-CROFT, S. & WILLIAMS, P. 2009. Making imaginary worlds real: The case of expensing employee stock options. *Accounting, Organizations and Society*, 34(6), 770-786.
- ROBERT NAU. 2015. *Stepwise and all-possible-regressions* [Online]. Fuqua School of Business Duke University. Available: <http://people.duke.edu/~rnau/regstep.htm#top>

- ROYCHOWDHURY, S. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics*, 42335-370.
- SA REIT. 2013. SA REIT Association Launch [Online]. Available: http://www.sareit.com/docs/SAREIT_Presentation-23_May_2013.pdf Accessed 28 August 2016
- SAICA. 2013. Circular 2/2013 - Headline Earnings [Online]. Available: https://www.jse.co.za/content/jsecircularitems/circular_2_2013_headline_earnings.pdf Accessed 28 August 2016
- SANLAM LTD. 2014. Annual Report [Online]. Available: https://www.sanlam.com/investorrelations/Documents/Sanlam%20AR_Final_5Mar_12h00.pdf Accessed 28 August 2016
- SELTMAN, H. J. 2012. *Experimental design and analysis* [Online]. Available: <http://www.stat.cmu.edu/hselman/309/Book/Book.pdf> Accessed 28 August 2016
- SHILLER, R. J. 2003. From efficient markets theory to behavioral finance. *The Journal of Economic Perspectives*, 17(1), 83-104.
- SJR, S. J. R. 2014. *Journal Rankings - Accounting* [Online]. Available: http://www.scimagojr.com/journalrank.php?area=1400&category=1402&country=all&year=2014&order=sjr&min=0&min_type=cd Accessed 26 August 2015.
- UCLA. 2016. *Annotated SPSS Output Logistic Regression* [Online]. Institute for Digital Research and Education, University of California Los Angeles. Available: <http://www.ats.ucla.edu/stat/spss/output/logistic.htm> Accessed 28 August 2016
- VAN ECK, L. 2014. The Use of and the Emphasis Placed on Earnings Metrics in Press Releases of Firms Listed on the Johannesburg Stock Exchange. University of Pretoria.
- VENTER, E. R., CAHAN, S. F. & EMANUEL, D. 2013. Mandatory Earnings Disaggregation and the Persistence and Pricing of Earnings Components. *The International Journal of Accounting*, 48(1), 26 - 53.
- VENTER, E. R., EMANUEL, D. & CAHAN, S. F. 2014. The Value Relevance of Mandatory Non-GAAP Earnings. *ABACUS*, 50(1), 1 - 24.
- WALLACE, W. 2002. *Pro forma before and after the SEC's warning: A quantification of reporting variances from GAAP*, Morristown, NJ, Research in Accounting Regulation, 281.
- WATSON, S. & ROSSOUW, J. 2012. JSE efficiency and share price reaction to forced financial restatements. *Journal of Economic and Financial Sciences*, 5(2), 417-435.

