Earnings Management in South Africa: Evidence and Implications

Carol Elaine Rabin

Doctoral thesis submitted to the University of the Witwatersrand, Faculty of Commerce, Law and Management in fulfilment of the requirements for the degree of the Doctor in Philosophy

Supervisor

Professor Minga Negash

Date

9 December 2016

Synopsis

Healy and Wahlen (1999:368) define earnings management as an event that "occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers." Management's intent to mislead users distinguishes accruals that signal managers' inside information about future cash flows from earnings management which intends to misrepresent performance (Dechow and Skinner, 2000; Parfet, 2000). Earnings management is a very serious issue; if it is not detected it can result in large financial losses for investors and creditors. Earnings data is a fundamental input to valuing a firm's shares and prospects. Erroneous assessments of future cash flows because of misleading information will result in invalid share valuations and incorrect lending decisions which can have negative consequences on capital markets. The severe negative consequences of earnings manipulation, if undetected, suggest that investors, auditors and regulatory bodies should be aware of the prevalence of earnings management in an economy, whether investors are able to detect and price suspected earnings management and the most efficient way to detect it. This thesis aims to answer two fundamental questions:

Does earnings management exist in South Africa?

Are investors in South Africa misled by earnings management?

How to detect earnings manipulation is the predominant theme in earnings management literature. The majority of research has been conducted in advanced economies and has transformed from identifying discontinuities in earnings distributions and measuring discretionary accruals to sophisticated predictive models, such as the *F-score (*Dechow, Ge, Larson and Sloan, 2011). Yet, research into the subject is sparse in emerging markets and tends to replicate existing methodology.

The objective of this thesis is to examine earnings management in the South African economy, with the specific aim of identifying a databank of suspected earnings management firms that can be used for further research. Because the number of firms that have been forced to restate earnings is small in this environment, this thesis resorts to identifying suspected earnings management firms using discontinuities in earnings distributions. South Africa is similar to other emerging economies in that it is characterised by concentrated ownership, weaker legal enforcement and a smaller stock exchange. The South African

environment is dissimilar to emerging economies as the JSE is considered to be well regulated, accounting and auditing standards are world class and accounting transparency and disclosure are satisfactory (Leuz, Nanda, and Wysocki, 2003). The results of this thesis are relevant in an institutional and macroeconomic setting where incentives to manipulate earnings, enforcement, legal protection, rule of law and sample size may differ from those in developed economies. This thesis firstly, focuses on methodological issues that may be encountered by researchers in identifying discontinuities in earnings distributions in emerging economies and secondly, validates kernel density estimation, Lahr (2014), as a viable methodology to test for earnings management by comparing total accruals, discretionary accruals and working capital accruals between suspected earnings management and non-earnings management firms. Thirdly, deferred tax expense is considered as a predictor variable in place of discretionary accruals in detecting suspected earnings management firms. Finally, in order to investigate investors' reaction to suspected earnings management this thesis investigates whether the market prices suspected earnings management firms differently from non-earnings management firms.

Pre- selected researcher binwidths (Burgstahler and Dichev, 1997, Coulton, Taylor and Taylor, 2005, Glaum, Lichtblau, and Lindemann, 2004; Holland and Ramsay, 2003) prove to be unsuitable in this milieu. Consequently kernel density estimation Lahr (2014), which derives bandwidths from the empirical earnings distributions, is used to identify discontinuities and to concurrently investigate the effect of deflation on the location of discontinuities. Discontinuities are shown to exist in earnings levels and changes distributions and emerge around zero in earnings levels distributions where number of shares is the deflator. Two important results emerge from this analysis. Firstly, when kernel density estimation is used in levels distributions, there is evidence that deflating by market value of equity and total assets shifts the location of suspected earnings management firms to the second and third intervals to the right of zero. Scaling does not alter the location of suspected earnings management firms in earnings changes distributions. Secondly, in the earnings deflated by number of shares distribution there is evidence that the band of suspected earnings management firms contains the results of firms that have upwardly and downwardly manipulated earnings. The implication of these findings are that deflating by number of shares is probably the most efficient scalar and that if doubt exists, alternative deflators should, at least, be compared between profit and loss firms. In addition, in the presence of evidence of downwards earnings management, researchers should evaluate whether and how to identify firms that are suspected of having reduced earnings. Specifically in emerging market research, these results indicate that it is inappropriate to merely replicate distribution research based on researcher selected binwidths and that kernel density estimation is probably more efficient in identifying discontinuities as it gives researchers a much broader perspective on the location of discontinuities.

Kernel density estimation is confirmed as a method to identify discontinuities in earnings levels and changes distributions by comparing total, discretionary and working capital accruals between suspected earnings management and non-earnings management firms. Evidence that discontinuities in earnings distributions may be attributable to earnings management activities is found where earnings levels and earnings changes are deflated by number of shares and market value of equity, both modified Jones and asymmetric BS discretionary accruals are significantly income increasing in suspected earnings management (EM) firms and income decreasing in non-EM firms. Scaling by total assets is not a suitable deflator in the South African context as it appears to affect the sign and statistical significance of the accruals metrics in the earnings levels before and after tax distributions. This result does not detract from the efficiency of kernel density estimation as it is attributable to the inefficiency of total accruals as a scalar in an emerging market environment. Furthermore, this research endorses Ball and Shivakumar's (2006) (BS) finding that an asymmetric discretionary accruals model is more efficient in estimating discretionary accruals in all the distributions, irrespective of deflators. In addition, the results of this thesis show that, in an emerging economy, deferred tax is incrementally useful to modified- Jones and the asymmetric BS discretionary accruals in detecting earnings management. The implication of this result is useful to investors, auditors and regulators because deferred tax movements and its components are a visible and identifiable numbers in financial statements. Deferred tax expense can be used, instead of complicated discretionary accrual models, to identify evidence of earnings management. This means that the components of the deferred tax asset or liability accounts can be analysed to highlight unusual movements which may in turn, focus attention on unusual accruals. For researchers, this result has important implications. Kernel density estimation can be used to identify suspected earnings management firms which can be used to further research.

The final chapter of this thesis explores whether investors price suspected earnings management and non-earnings management firms differently and finds that, in this South African sample, there is no difference in price levels or cumulative abnormal returns in suspected earnings management and non-earnings management firms. This result is in sharp contrast to Balsam, Bartov, and Marquardt (2002) and Baber, Shuping, and Sok-Hyong (2006) who report a negative association between unexpected discretionary accruals and cumulative abnormal returns and Keung, Lin, and Shih (2010) who find that investors react negatively to zero or small earnings surprises. To some extent the results of this section of the thesis supports the finding in Gavious (2007) that prices react to discretionary accruals only after the introduction of revised analysts' forecasts.The finding in this thesis implies that investors in South Africa are unable to detect earnings management. This outcome should be viewed in the context of prior research that reports that the JSE may be inefficient (Bhana, 1995, 2005, 2010; Hoffman, 2012; Ward and

Muller, 2012; Watson and Roussow, 2012) and may be attributed to the fact that there is no signal to investors that the quality of earnings may be questionable in the sample of suspected earnings management firms. All in all, the findings of this thesis indicate the existence of earnings management in listed companies in South Africa.

Declaration

I, Carol Elaine Rabin, do hereby certify that this thesis which is submitted to the University of the Witwatersrand, Johannesburg is my own work and all sources that I have used or quoted have been indicated and acknowledged by means of complete reference.

Elaine Rabin
December 2016

DEDICATION

This thesis is dedicated with love to the memory of my parents Marianne Margot and Helmut Bacharach, and in honour of my maternal grandparents, Clara and Adolf Stern, who were murdered in Auschwitz in 1943.

ACKNOWLEDGEMENTS

Most importantly I would like to thank my very special husband, Harvey Rabin, for his support, encouragement and never changing belief in me and especially for giving me the freedom to do things "my way". To my wonderful children and grandchildren thank you for bringing so much joy and pleasure to my life and especially to my daughter Sarah, thank you for helping me with the presentation of this thesis.

I would like to thank all the people at the University of the Witwatersrand who helped me in completing this thesis.

I am indebted to my supervisor Professor Minga Negash for his guidance and for sharing his expertise with me and especially for constantly challenging me to extend my knowledge.

To Professors Dickson, Arendse for their support and encouragement. To the Head of the School of Accountancy Professor Nirupa Padia, I sincerely appreciate the opportunity I have been given to complete this PHD.

To Dr Petra Gaylard who provided me with statistical support and to David Mcclelland, who so generously shared his knowledge on value relevance research.

Finally, I would like to thank Paula Van de Wouw, for your enthusiastic participation in exploring a new approach to an old problem, for allowing me to use you as a sounding board for my ideas and supporting me throughout this process.

TABLE OF CONTENTS

TABLES

FIGURES

TABLE OF ACRONYMS

AFS	Annual Financial Statements
BD	Burgstahler and Dichev (1997)
BMN	Beaver, McNichols, and Nelson (2007)
BS	Ball and Shivakumar (2006)
DE	Durtschi and Easton (2005)
EM	Earnings Management
GRC	The Global Competitiveness Report (2014)
KDE	Kernel Density Estimation
PPR	Phillips, Pincus, and Rego (2003)
SEC	U.S. Securities Exchange Commission

CHAPTER 1 INTRODUCTION

Healy and Wahlen (1999:368) define earnings management as an event that "occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers." In contrast signalling theory suggests that managers may use the judgment inherent in the accruals process to make financial reports more informative to users (Arya, Glover, and Sunder, 2003; Healy and Palepu, 1993; Stocken and Verrechia, 2004; Subramanyam, 1996). Healy and Wahlen (1999:369) exclude signalling from their definition of earnings management - (Brown, Kin, and Lys, 1999)"decisions to use accounting judgment to make financial statements more informative (Williamson, 1981)to users do not fall within our definition of earnings management." The Healy and Wahlen definition of earnings management includes earnings management achieved by abusing the judgement required in applying accrual accounting principles, by structuring transactions to comply with rules in accounting standards and real earnings management which is defined as actions that change the timing or structuring of transactions Graham, Harvey, and Rajgopal (2005). Unlike accrual manipulation, real earnings management occurs if the manager undertakes transactions that are inefficient from the firm's perspective but generate a desired profit or loss for the current period (Ewert and Wagenhofer, 2005). The fundamental difference between real and accruals management is that real earnings manipulation activities affect cash flows, whereas accruals manipulation does not (Roychowdhury, 2006).

Earnings, which represent the underlying economic performance of a company, are value relevant (Barth, Beaver, and Landsman, 2001; Brown et al, 1999; Chen, Lin, Wong, and Wu, 2010 ; Easton and Sommers, 2003). If investors and lenders are unable to detect earnings management, this will result in inefficient resource allocation. Because of its insidious nature and intent to mislead stakeholders and to influence contractual outcomes, earnings management is a vexing issue for investors, auditors, regulators and standard setting authorities. The crux of the problem lies in the information asymmetry that is present between the preparer and

stakeholders which agency[1] (Jensen and Meckling, 1976) and information asymmetry theory (Richardson, 2000) suggest may cause preparers to report financial information in an opportunistic manner to the detriment of stakeholders. When it is costly for stakeholders to access and comprehend information, investors may rely on heuristic cut off points of zero earnings and zero earnings changes as suggested by transaction cost theory (Burgstahler and Dichev, 1997; Williamson, 1981) and fail to detect earnings management.

The opaque nature of earnings management techniques also affects auditors' efficiency and exposes them to the risk of litigation and reputational damage. Graham et al (2005) report that management may deliberately select real earnings management techniques that are unobservable while Nelson, Elliot, and Tarpley (2002) report that auditors find that the most common accruals management earnings techniques concern revenue manipulation, business combination accounting, the measurement of intangibles, fixed assets, investments, reserves and recognition of leases. Auditors are more likely to require restatements of earnings management efforts if managers are suspected of abusing the interpretation and application of principles in International Financial Reporting Standards (IFRS) rather than by structuring transactions to comply with precise standards. Because regulatory authorities face the same challenges as investors and auditors in identifying earnings manipulation, many cases of earnings manipulation are not identified and the U.S. Securities and Exchange Commission (SEC) relies on the press, analysts and internal whistle-blowers to identify cases of suspected earnings management (Dechow, Ge, Larson, and Sloan, 2011). The dual nature of discretionary accruals, signalling and opportunism, becomes a challenge for standard setters as they need to strike a balance between which accounting policies and recognition and measurement principles are subject to abuse and which add value to accounting information (Healy and Wahlen, 1999).

This thesis examines earnings management in the South African environment which is considered to be an emerging economy characterised as an insider economy with concentrated ownership, strong investor rights but somewhat weaker legal enforcement (Leuz, Nanda, and Wysocki, 2003) and a comparatively smaller but well-regulated stock exchange which, together with its auditing and accounting standards, have been rated among the best in the world (Report,

[1] Nowadays shares are not widely held , shareholders are represented by unit trusts, pension funds and nominee companies which makes the agency relationship more complex (Lemma, Negash, and Mlilo, 2013).

2014). However, South Africa's earnings opacity score, measured on earnings aggressiveness, loss avoidance and earnings smoothing, falls into the fourth highest opacity rank Bhattacharya, Daouk, and Welker (2003) and Enomoto, Kimura, and Yamaguchi (2012) find low evidence of accruals management but evidence of real earnings management in South African financial statements. However, research into earnings management in South Africa is sparse: Watson and Rossouw (2012) find that only 23 firms have been forced to restate their financial statements over an 8 year period and Van de Wouw (2015) identifies the components of deferred tax that are associated with earnings management. Rabin (2005) reports that relevance and reliability but not understandability are important to auditors when assessing information quality and that auditors in South Africa perceive that meeting analysts' and management targets, remuneration maximisation and lack of corporate governance are factors that influence preparers to use earnings manipulation. This thesis examines two fundamental questions. Does earnings management exist in South Africa? Are investors in South Africa misled by earnings management? At the same time the results in this thesis offer insight into whether research methodologies applied to identify earnings management are relevant in an emerging economy, and whether deferred tax is a valid alternative to accruals in detecting earnings management.

1.1 Problem statement

Because of its negative effect on capital markets fundamental questions that challenge academics, investors, auditors and regulators are how best to detect financial statement manipulation (Dechow et al, 2011) and whether the market prices discretionary accruals. In developed markets with sophisticated enforcement bodies, such as the U.S. Securities and Exchange Commission (SEC), it is possible to develop an earnings management prediction model based on a sample of firms that have been subject to SEC enforcement actions. However, a sample of suspected earnings management firms, based on earnings restatements is not readily available in South Africa and other developing markets where oversight bodies are not as advanced and compliance with International Financial Reporting Standards is not examined on a regular basis. Consequently, in emerging markets, identifying a sample of suspected earnings management firms is the first step in earnings management research.

This thesis firstly identifies suspected earnings management firms using discontinuities in earnings distributions, secondly examines whether these discontinuities are attributable to earnings management and thirdly tests whether the JSE prices suspected earnings management and non-earnings management firms differently.

The objective of this thesis is to examine whether earnings management exists in South African companies and whether investors price suspected earnings management firms differently from non-earnings management firms. Prior research into identifying earnings management firms was based on either discontinuities in earnings levels or changes distributions (Burgstahler and Dichev, 1997; Coulton, Taylor, and Taylor, 2005; Dechow, Richardson, and Tuna, 2003; Degeorge, Patel, and Zeckhauser, 1999; Glaum, Lichtblau, and Lindemann, 2004; Holland and Ramsay, 2003; Phillips et al, 2003) or discretionary accruals in samples of companies which have incentives to manage earnings (DeAngelo, 1986; Healy, 1985; Jones, 1991).Recently Dechow et al (2011) have assembled a data base of earnings management suspects based on firms that have been forced to change their financial statements by the U.S. Securities and Exchange Commission (SEC). However, in South Africa the data base of suspected earnings management restatements is small Watson and Rossouw (2012) and sample size limitations preclude sample selection based on assumed earnings management in specific settings. Therefore, this thesis uses distribution analysis to identify suspected EM firms. Initially histogram methodology, as pioneered by Burgstahler and Dichev (1997), was applied to identify suspected EM firms however, bin size became an issue. Consequently, kernel density estimation, (Lahr, 2014), which generates bandwidths from the data itself, is used in this thesis to identify discontinuities in earnings distributions. The discontinuities in earnings levels and changes distributions identified using kernel density estimation (hereafter KDE) are validated as evidence of earnings management by comparing discretionary accruals and working capital accruals between suspected EM and non-EM firms. Because discretionary accruals computation is fraught with methodological issues (Dechow, Sloan, and Sweeney, 1995; Guay, Kothari, and Watts, 1996; Young, 1999) deferred taxation is proposed as an alternate to discretionary accruals in detecting earnings management (Phillips et al, 2003). Consequently, the third section of this thesis evaluates whether deferred taxation is a viable alternative to discretionary accruals in identifying earnings management. Finally a value relevance study is conducted to test whether

prices and returns react differently in suspected earnings management and non-earnings management firms listed on the JSE.

The main hypotheses explored in this thesis are:

Whether discontinuities exist in the frequency distributions of earnings levels and changes in companies listed on the JSE.

Whether identified discontinuities in earnings distributions are evidence of earnings management.

Whether deferred tax expense is incrementally useful to accruals based measures in detecting earnings management.

Whether the market prices suspected earnings management and non-earnings management firms differently.

1.2 Research Methodology

This thesis commences by searching for discontinuities around zero earnings and earnings changes in histograms constructed using binwidths applied in prior research and deflating earnings and earnings changes by market value of equity. KDE was substituted as the preferred methodology to identify discontinuities because the above binwidths proved to be an issue. Concurrently, the effect of deflating by number of shares in issue at the end of the financial year, total assets as well as previously used market value of equity is explored. This section of the thesis ends by comparing accruals, cash performance measures and incentives to manipulate earnings between the firms identified as suspected earnings management firms and the non-earnings management firms to confirm that the identified discontinuity is attributable to earnings management. Thereafter deferred tax is tested as a predictor variable for detecting earnings management and the thesis concludes by examining whether the market prices suspected earnings management firms differently from non-earnings management firms.

This research methodology section begins by describing the theory that explains why discontinuities in earnings distributions are associated with earnings management, compares histograms and kernel density estimation and proceeds to discuss concerns raised about the effect

of deflation and taxation. It then proceeds to identify the discretionary accruals models that have been developed in prior research and explains how the identified discontinuity in earnings levels and changes distributions will be validated as evidence of earnings management. Thereafter the conceptual justification for using deferred tax to identify suspected earrings management firms is clarified and the methodology section ends by explaining how investors pricing of suspected earnings management and non-earnings management firms will be tested.

Earnings distributions

Identifying discontinuities in earnings distributions

This thesis uses discontinuities in earnings distributions as pioneered by Burgstahler and Dichev (1997) to identify suspected earnings management firms. The term discontinuity is used in the literature to describe a low frequency of small loss observations and a high frequency of small profit observations relative to those in adjacent intervals in earnings distributions (Beaver et al, 2007). Conceptually Burgstahler and Dichev (1997) rely on transaction- cost theory and prospect theory, Kahneman and Tversky (1979), to underpin their hypothesis that the discontinuity in earnings distributions is caused by earnings management. Burgstahler and Dichev (1997) posit that management will manipulate earnings to beat prior year earnings or to avoid reporting an earnings decline and investigate the distribution of earnings around these pre-determined thresholds. The distributional approach compares the actual number of observations in researcher selected bins in the vicinity of zero earnings or earnings changes to a reference distribution of no earnings management defined as the average number of observations in the bins immediately adjacent to the discontinuity. If the difference between the actual number of observations and the expected number of observations from the reference distribution is significant, this is identified as a discontinuity in the earnings distribution, and is interpreted as evidence of earnings management at that point in the earnings distribution.

However, research subsequent to Burgstahler and Dichev (1997) has challenged their methodology on the grounds that it can misclassify earnings management firms because it allows researchers to choose an appropriate binwidth, assumes a local linearity in the distribution of earnings, assumes that manipulation will only occur in the vicinity around zero and is unable to detect the exact location of the discontinuity in the earnings distribution (Bollen and Pool, 2009; Brown et al, 1999; Chen et al, 2010 ; Lahr, 2014). Instead of using the histogram methodology

applied by Burgstahler and Dichev (1997) to identify discontinuities in earnings distributions, (Lahr, 2014)[2] advocates a bootstrap procedure to endogenise the selection of a suitable bandwidth that will result in a reference kernel density of no earnings management that cannot be distinguished from the empirical distribution of earnings and earnings changes. The resulting density estimate replaces Burgstahler and Dichev's (1997) reference distribution, the number of observations in adjacent bins, with a nonparametric reference distribution and substitutes researcher selected binwidths with bandwidths that are derived from the empirical data itself. Once the reference distribution, kernel density estimate, is fitted to the empirical data, a local test for a discontinuity is performed by comparing the expected number of observations from the kernel density estimate to the actual data. Primarily, the strength of KDE lies in the fact that the construction of the reference distribution from the empirical data reduces the researcher's degrees of freedom when selecting binwidths and constructs a reference distribution that is not distinguishable from the data itself, is able to identify the exact location of discontinuities in the earnings distribution and offers a procedure to test for the existence of a local discontinuity (Lahr, 2014).

Exploring the effect of deflation and taxation

In addition to the binwidth and reference distribution issues raised above the deflator and definition of earnings used by Burgstahler and Dichev (1997) have been criticised. Durtschi and Easton (2005) and Durtschi and Easton (2009) assert that deflating earnings by market capitalisation or total assets that differ in magnitude between profit or loss firms can cause a discontinuity in the earnings distribution. On the other hand, Beaver et al (2007) find that (Beneish, 1999) taxation can explain some of the discontinuity in the distribution of earnings. Beaver et al (2007); (Beneish, 1999); Durtschi and Easton (2005) and Durtschi and Easton (2009:1253) warn researchers that the observed shapes of earnings distributions around zero are not "ipso facto evidence of earnings management; before one can draw conclusions regarding the presence/absence of earnings management, evidence beyond the mere shapes of these earnings distributions must be brought to bear".

[2] The Lahr procedure will be referred to as bootstrap kernel density estimation or alternately kernel density estimation

The effect of deflation and taxation on the earnings levels and distributions will be examined by exploring unscaled earnings and earnings changes distributions and the pre and after tax distributions of earnings levels and earnings changes scaled by alternatively, the number of shares at the end of the reporting period, market value and total assets. This thesis thus tests the application of KDE to ascertain whether earnings management exists in listed South African firms and develops the literature that explores the effect of deflation and taxation on discontinuities in earnings levels and changes distributions.

Testing the discontinuity for evidence of earnings management

This thesis recognises the concern raised by Durtschi and Easton (2005) and Durtschi and Easton (2009) that the existence of a discontinuity in the frequency distribution of earnings alone is not sufficient evidence of earnings management. Therefore, the second objective of this thesis is to investigate whether the observed jumps in the earnings density functions are attributable to earnings management, whether the basic cash performance of the suspected EM (earnings management) and non-EM firms differ, and whether high market valuations and/or leverage motivate misstating managers. The focus is to investigate whether accruals management causes the jump in the earnings density function and specifically examines whether accruals metrics are higher in suspected EM relative to non-EM firms by comparing mean and median accruals metrics using clustered t-tests and the Sommers D t- test. As real earnings management cannot be detected using accruals metrics, it is not considered in this research. However, it is acknowledged that manipulating transactions as opposed to accruals may well be an added explanation of discontinuities in earnings management. Evidence of real earnings management as an explanation for the kink in distributions and as a further validation of distribution based methodology is left to future research.

Several accruals measures are investigated, beginning with measures that are readily observable in financial statements. Total accruals are compared as they are found to be superior to unexpected accruals in identifying accounting misstatements (Bayley and Taylor, 2007). Change in working capital accruals are examined because this measure does not contain depreciation and amortisations (Dechow et al, 2011) and changes in accounts receivable are investigated as Beneish (1999) finds that manipulating firms overstated earnings by recording fictitious or unearned sales.

Thereafter discretionary accruals, the earnings management component of total accruals, are estimated and compared between suspected EM and non-EM firms. Models of discretionary accruals attempt separate total accruals into their non-earnings management component by regressing total accruals on proxies for normal accruals such as changes in revenue adjusted for changes in accounts receivable and gross fixed assets. Discretionary accruals are then calculated as the difference between total accruals and non-discretionary accruals. The most efficient and most commonly used model is the modified Jones model (Dechow et al, 1995) although (Dechow et al, 1995; Guay et al, 1996; Young, 1999) all report that discretionary accrual models tend to be inefficient in extracting non-discretionary accruals. More recently Ball and Shivakumar (2006) hypothesise that timing differences in the recognition of gains and losses introduces asymmetry in the relationship between accruals and cash flows. This implies that the positive correlation between cash flows and accruals, due to the timely recognition role of accruals, is greater in periods with losses than those with gains. As a result they suggest that models that estimate discretionary accruals that are linear in cash flows are misspecified and suggest that a piecewise linear regression model incorporating the asymmetry be used in the estimation of discretionary accruals. Therefore, the two models of discretionary accruals that will be compared between suspected earnings management and non-earnings management firms are the modified Jones discretionary accruals and the asymmetric Ball and Shivakumar models.[3]

Theoretically, transaction cost and prospect theory suggest that suspected EM firms are loss making firms whose results have been manipulated into profits using earnings management techniques. Hence, if all the suspected EM firms identified using KDE are indeed actual earnings upwards management firms, it can be anticipated that basic cash performance measures, that are not affected by earnings management would be similar between non-EM and suspected EM firms. In this context and following Healy (1985) cash flows and changes in cash flows are used as a proxy for earnings without manipulation. In addition changes in cash sales as suggested by Dechow et al (2011) are included as a measure of pre-managed performance, based on the assumption that misstating firms will manipulate credit sales in periods of decreasing

[3] Jansen, Ramnath, and Yohn (2012) suggest an alternate diagnostic, asset turnover and profit margin, as an alternate diagnostic for earnings management. Asset turnover is defined as the ratio of sales to net operating assets. This diagnostic was not used in this research because Harebottle (2015) reports that in the South African context, delta asset turnover and profit margin display the expected inverse relationship in suspected EM firms but are not significantly larger in suspected EM firms.

performance to hide decreases in cash sales. Therefore, to evaluate whether pre-managed cash performance is similar in suspected EM and non-EM firms, mean and median performance metrics are compared using clustered t-tests and the Sommers D t- test.

Managers may have incentives to manage earnings to maintain high stock prices and influence short-term price performance or to meet loan covenants (Healy and Wahlen, 1999). To explore whether incentives to manipulate earnings are different between suspected EM and non-EM firms mean and median book to market and leverage ratios are compared to test whether these are higher in suspected EM and non-EM firms.

Is the deferred tax expense incrementally useful to accruals based measures in detecting earnings management?

After investigating whether the identified discontinuities in earnings distributions can be attributed to accruals management, the next chapter of the thesis tests whether deferred tax expense is incrementally useful to accrual measures in detecting earnings management to avoid an earnings decline or loss, using pooled cross-sectional model and probit regression.

Because earnings management is not observable and discretionary accruals metrics are difficult to calculate Phillips et al (2003) propose that the deferred tax expense may capture the effect of earnings management and, therefore, act as a replacement for discretionary accruals in detecting earnings management firms. Deferred tax arises when revenue or expenses are recognised in different periods for accounting and for tax purposes. The tax consequence of this mismatch is recognised as a deferred tax asset or liability in the statement of financial position. Upward (downward) manipulation can result in larger (smaller) accounting income relative to taxable income which will result in an increased (decreased) tax expense in suspected EM firms.Except where changes in the net deferred tax liability for a period relate to mergers or acquisitions or to income or loss items that are deferred through comprehensive income in equity, the recognition or change in the net deferred tax liability account will be recognised as deferred tax expense or income in the statement of comprehensive income. However, the deferred tax figure itself may be subject to manipulation because Generally Accepted Accounting Practice (GAAP) stipulates that a deferred tax asset can only be recognised to the extent that it is probable that deferred tax liabilities or future profits will exist, against which the deferred tax asset can be utilised. This is most likely to occur when the firm is in a loss situation. Preparers can, therefore, incorrectly

recognise a deferred tax asset when there is no probability that the asset will be recovered; this will lead to the reduction of taxation in the statement of comprehensive income. Schrand and Wong (2003) and Phillips, Pincus, Rego, and Wan (2004) attempt to identify whether the recognition and measurement of the deferred tax asset account is used to manipulate earnings but their research has led to inconclusive and contradictory results.

Does the market price suspected earnings management and non-earnings management firms differently?

To conclude this thesis examines whether earnings management affects investors' resource allocation decisions. Value relevance research tests whether accounting variables explain variation in share prices and examines the association between accounting amounts and share prices (Barth et al, 2001). Specifically, this research investigates whether there is a difference in the price levels and cumulative abnormal returns in suspected EM and non-EM firms 1,3,10 and 30 days after the date on which the annual financial statements are issued. A short window design is used because this research intends to study investors' reaction to the release of annual financial statements. The release of annual financial statements is chosen as the event date rather than the earnings announcement date as investors need both income statement and balance sheet information to identify the discretionary component of total accruals. Balsam et al (2002) investigate price reaction to the release of both the earnings announcement and the subsequent release of a full set of financial statements. They report that neither sophisticated nor unsophisticated investors react to evidence of earnings management at the date of the earnings announcement but that sophisticated investors react negatively to unexpected discretionary accruals in the period commencing 10 days after the earnings announcement date and ending two days before the release of the full set of financial statements. In contrast, unsophisticated investors react negatively to unexpected discretionary accruals only after the release of the full set of financial statements. Baber et al (2006) find that investors react negatively to evidence of earnings management in earnings announcements only when these are accompanied by balance sheet and or cash flow information. Gavious (2007) also investigates investors' reaction to the release of a full set of financial statements and reports that investors do not price discretionary accruals until analysts have released revised forecasts 30 days after the release date.

Using both price and return analysis, this research evaluates whether there is a difference in the value relevance of earnings, book value, dividends and interest bearing liabilities in suspected earnings management firms and non-earnings management firms. Regression analysis is based on the Ohlson (1995) model as applied by amongst others Barth and Clinch (1998);Brown et al (1999);Collins, Maydew, and Weiss (1997) and Easton and Sommers (2003) and takes into account deflation concerns raised by Barth and Kallapur (1996);Brown et al, (1999);Easton (1999) and Easton, Eddey, and Harris (1993).

1.3 Importance of the study

Distribution based methodologies for identifying suspected earnings management firms are relevant in emerging markets where specific data bases of suspected earnings manipulators may not be available. However, most research into earnings management is conducted in developed markets where stock markets are larger and more sophisticated and where governance and law enforcement are more advanced and incentives to manipulate earnings may be different. Therefore the results of this thesis are of interest to researchers in developing markets as they provide a context against which the appropriateness of methods used in developed markets can be evaluated. Recently Donelson, Mcinnis, and Mergenthaler (2013) validate the use of distribution analysis as a tool to identify the location of suspected earnings management firms and report that evidence of earnings management in earnings levels extends into bins two and four to the right of zero. This study is the first, known to this researcher, that attempts to identify suspected EM firms by identifying discontinuities in the frequency distributions of earnings levels and changes in companies listed on the JSE.

Ultimately the outcome of this research may be of interest to investors, analysts, auditors and regulators as it may indicate the thresholds around which earnings management takes place and which accruals are predominantly subject to manipulation. In addition, if deferred tax is incrementally useful to accruals measures in detecting earnings management, this provides a readily accessible figure in the financial statements with which to start exploring specific accruals made during the year.

For researchers interested in earnings management in emerging economies this thesis is important as initial research revealed that a discontinuity in earnings distributions, in firms listed

on the JSE, was not evident in histograms with binwidths used in research in developed markets and are consequently inappropriate in the South African environment. Therefore, this thesis will use kernel density estimation to endogenise the selection of bandwidths and pinpoint discontinuities in earnings levels and changes distributions. Simultaneously the effect of deflation and taxation on the location of discontinuities will be explored. Because KDE explores the entire earnings distribution instead of just the intervals around zero it is anticipated that testing various deflators will extend researchers understanding of the effect of scaling, in both developing and developed economies. Validation that discontinuities in earnings distributions are evidence of earnings manipulation will provide future researchers with a data base of suspected earnings management companies. This base could be used for example, to develop and test country specific earnings prediction models that will be similar to the *F*-score developed by (Dechow et al, 2011) and to explore the association between corporate governance and earnings management.

Testing whether investors price suspected earnings management firms differently from non-earnings management firms will provide investors in shares listed on the JSE with an indication of whether they are able to detect earnings management and whether it has an effect on share prices. The result of this section of the thesis will also add to the body of research that tests the efficiency of the JSE.

1.3 Delimitations

This work is limited in that it explores only earnings manipulation achieved through accruals and does not consider real earnings management actions which affect the timing and structure of transactions and may alter cash flows. However, it is acknowledged that both real earnings and accruals management may be used to move companies from small losses to small profits and thus affect discontinuities in earnings distributions. Prior research analyses distributions of analyst forecast errors, as well as earnings levels and changes for discontinuities but this research excludes analysts forecast errors. Although it is acknowledged that meeting or beatings analysts forecast is a motivation for earnings manipulation Matsumoto (2002), the focus of the validation section of this thesis is accruals manipulation. Although it is acknowledged that signaling of

private information may motivate preparers to manipulate earnings, this thesis adopts Healy and Wahlen's view that earnings management is intended to mislead and not to inform users.

Although the characteristics of the South African economic reporting environment is discussed as a context for this research in Chapter 2, no attempt is made to verify the classification of South Africa as an emerging/developing economy.

Prior research links earnings management to individual firm characteristics such as the effectiveness of its corporate governance structure, the composition of its board of directors, and ownership structure: this research does not consider these factors when testing price reaction.

Sample selection and survivorship bias could induce discontinuities in earnings distributions. Firstly, because of prelisting requirements that give preference to profit making firms, there are likely to be more profit making than loss making firms listed on stock exchanges (Christodoulou and Mcleay, 2009; Dechow et al, 2003). Secondly, as pointed out by Durtschi and Easton (2005), sample selection bias exists in distribution studies where the scalar is market value of equity because a greater proportion of loss observations rather than profit observations are deleted from the sample. Dechow et al (2003) report that the discontinuity in earnings distributions is larger for newly listed firms and smaller for firms that have been listed for over 20 years. Survivorship bias could result in a sample of larger firms with a history of profits rather than losses which could mean that the sample has more firms with incentives to manage earnings to maintain market value. However, Dechow et al (2011) suggest that selection bias is of general concern in analysing determinants of earnings manipulation and can also be found in studies that base sample selection on external sources: the effect of the bias is to limit the generalisability of the results to other settings.

1.4 Data

This research is based on all the available observations of all firms listed on the JSE for the years 1998-2010 (2631 observations).The information required was extracted from the McGregor BFA data base. The year 1998 was chosen as the starting point in the distribution because IAS 12 Income Taxes became effective for all financial years beginning on or after 1 January 1998. Where scaling is used based on changes in net market value, total assets or number of shares in issue the sample will only include the years 1999-2010 because both the numerator and

denominator require prior period observations. In line with Burgstahler and Dichev (1997) (hereafter BD) banks, financial institutions and regulated industries are eliminated as incentives to use earnings management techniques in these sectors may differ.

The rest of this thesis proceeds as follows.

Chapter 2 establishes a context for this thesis and specifically discusses earnings management achieved through manipulating the accruals process and discusses prospect and transaction cost theory as the concept that explains Burgstahler and Dichev's (1997) assumption that preparers will manipulate earnings to avoid reporting a loss or decrease in year-on-year earnings. Thereafter distribution analysis as a tool for identifying suspected earnings management firms is introduced. Both BD's histogram methodology and kernel density estimation are introduced. Finally, the information environment in emerging markets and the South African reporting environment are considered.

Chapter 3 begins by explaining distribution analysis and considers the methodological issues raised in subsequent research. These include researcher selected binwidths, Burgstahler and Dichev's (1997) use of the number of observations in adjacent bins as the reference distribution of no earnings management and the impact of deflation and taxation on earnings distributions. The chapter closes by testing whether discontinuities in the frequency distributions of earnings levels and changes of South African companies listed on the JSE can be identified using Burgstahler and Dichev's (1997) histogram methodology.

Chapter 4 describes Lahr's (2014) kernel density estimation methodology and its accompanying bootstrapping procedure, to identify discontinuities in earnings and earnings changes distributions. The primary objective of this chapter is to establish whether KDE identifies discontinuities in the frequency distributions of earnings levels and changes of South African companies listed on the JSE. The analysis commences by identifying discontinuities in unscaled earnings levels and changes distributions before and after taxation. Thereafter, the distributions of earnings and earnings changes before and after tax, deflated by number of shares, market value of equity and total assets are analysed for discontinuities using kernel density estimation. The result of this analysis identifies the exact locality of discontinuities in the distributions and

also illustrates how scalars can shift the location of the discontinuity away from zero earnings and earnings changes.

Chapter 5 the objective of Chapter 5 is to investigate, firstly, whether identified discontinuities in the earnings density functions, using kernel density estimation, are attributable to earnings management by comparing accruals metrics between suspected earnings management and non-earnings management firms. Secondly, unmanaged performance in suspected EM and non-EM firms is compared and, thirdly, the book-to-market and debt equity ratios are analysed to investigate whether high market valuations or leverage motivate misstating managers. The following hypotheses are tested;

Accruals metrics are higher in suspected EM relative to non-EM firms.

Unmanaged performance metrics are the same in suspected EM and non-EM firms.

Leverage and book-to-market ratios are higher in suspected EM and non-EM firms.

The earnings management metrics compared are total assets, modified Jones and Ball and Shivakumar discretionary accruals, deferred tax, changes in working capital and changes in accounts receivable. Unmanaged performance is assessed on changes in cash sales and cash flows and current cash flows from operations.

Chapter 6 evaluates the feasibility of using deferred tax as an alternate instrument for detecting earnings management by investigating the incremental usefulness of the deferred tax expense to accrual measures in detecting earnings management in firms to avoid an earnings decline or a loss. Specifically the following hypotheses will be tested:

Deferred tax expense is incrementally useful to accrual measures in detecting earnings management *to avoid an earnings decline*.

Deferred tax expense is incrementally useful to accrual measures in detecting earnings management *to avoid a loss*.

The accruals measures included in the regressions are total accruals, modified Jones discretionary accruals and Ball and Shivakumar asymmetric discretionary accruals.

Chapter 7 concludes this thesis by assessing whether there is a difference in the price levels and cumulative abnormal returns of suspected EM and non-EM firms around the date that the annual financial statements are released.

Specifically the following hypotheses will be tested:

> There is no difference in the price levels of suspected EM and non-EM firms around the date on which the annual financial statements are released.
>
> There is no difference in cumulative abnormal returns (CARS) of suspected EM and non-EM firms around the date on which the annual financial statements are released.

Chapter 8 synthesises the results of the thesis and highlights areas for future research.

CHAPTER 2 IDENTIFYING EARNINGS MANAGEMENT IN SOUTH AFRICA AND EMERGING ECONOMIES

Market reaction to sustained gains or, in contrast, negative returns is the fundamental reason why preparers manipulate earnings. Market reaction to earnings news is explained by transaction cost and prospect theory which are the conceptual basis that BD rely on to justify why discontinuities in the distribution of earnings changes and levels are evidence of earnings management.

The objective of this chapter is to provide the context for research into earnings management and the South African reporting environment. The chapter commences by discussing managements' incentives for managing earnings and moves on to discuss prospect and transaction theories as the conceptual basis for identifying suspected earnings management firms at discontinuities in distributions. Thereafter the nature of earnings management is explained and then the characteristics of emerging markets are considered focussing specifically on earnings management and share valuation in developing economies. The chapter concludes by discussing prior research into earnings management in the South Africa.

2.1 Incentives for managing earnings

Information asymmetry (Richardson, 2000; Yet and Imm, 2010) and agency theory (Jensen and Meckling, 1976) on the one hand and signalling theory (Arya et al, 2003; Healy and Palepu, 1993; Holthausen, 1990; Stocken and Verrechia, 2004; Subramanyam, 1996) offer contrasting explanations for managers' accounting judgement choices. Whereas information asymmetry and agency theory suggest that managers use accruals to obfuscate financial results, signalling theory advocates that managers can use accounting judgement to make financial reports more meaningful.

The theory of information asymmetry is based on the idea that managers possess private information about the firm that external users are not privy to. Because stakeholders lack resources and incentives, they do not have the information that they need to monitor managements' actions which affords managers with the opportunity to manipulate earnings (Richardson, 2000; Yet and Imm, 2010). Agency theory (Jensen and Meckling, 1976) proposes

that where information asymmetry exists between agents and principals and their goals are in conflict it is problematic and costly for the principal to supervise and scrutinize the agents' actions. This affords the agent with the opportunity to act in his own interests to the detriment of external stakeholders. Even though bonding contracts and incentives may deter agents' actions (Jensen and Meckling, 1976) transaction cost theory (Williamson, 1981) suggests that thresholds within these agreements may in themselves provide managers with incentives to manipulate earnings and that this can be either income increasing or decreasing.

Signalling theory suggests that managers could use the accruals process to communicate inside information about future prospects to users (Arya et al, 2003; Healy and Palepu, 1993; Holthausen, 1990; Subramanyam, 1996). Stocken and Verrechia (2004) find that where firms' financial reporting systems do not recognise all value-relevant information, managers may manipulate financial reports to provide information to users that they may not otherwise convey. Here managers' intention is not to mislead but to improve the informativeness of earnings. Thus signalling can be used to explain both upwards and downwards earnings management. If the manager has inside information about better future prospects he may choose to signal this by increasing earnings. If, on the other hand, the manager is of the opinion that current profits are not sustainable, he may choose to decrease earnings by overproviding for expenses or by deferring earnings to future periods. Nevertheless, agency theory suggests that where bonus bounds are exceeded managers may postpone the recognition of profits to the next reporting period (Healy, 1985).Arya et al (2003) are of the opinion that managers can effectively use accruals to signal permanent income which can be a smoothed out series of raw income numbers. For example, managers' estimation of the credit loss allowance recognised on accounts receivable may be a credible estimation of losses to future cash flows and may not be an attempt to underestimate existing losses. Because this thesis supposes that managers' intention is to mislead, signalling motivations are not included when incentives to manipulate earnings are considered.

Prior research provides insights into managers' incentives to both increase and decrease earnings. Because investors reward steadily increasing earnings with higher price earnings multiples and downgrade firms that experience negative returns managers attempt to meet earnings benchmarks and maintain stock prices (Barth, Elliot, and Finn, 1999; Kasznik, 1999).

This motivation intensifies if management hold shares or options or their jobs are in jeopardy (Brown and Caylor, 2005). Graham et al (2005) and Dichev, Graham, Harvey, and Rajgopal (2013) present incentives to indulge in earnings management from the view point of preparers. The primary motives are to meet or beat earnings benchmarks in order to influence share prices and to safeguard preparers' own welfare and reputation: employee bonuses, credit ratings and loan covenants are a secondary consideration. In contrast, managers are incentivised to reduce earnings before initial public offerings (Gong, Louis, and Sun, 2008; Teoh, Welch, and Wong, 1998); prior to management buy outs (DeAngelo, 1986); prior to stock repurchases and to reduce political costs (Watts and Zimmerman, 1978). Healy (1985) and Levitt (1998) posit that where bonuses are near their maximum this may be an incentive to reduce current period profits and to move them to the next reporting period.

Indeed discontinuities in earnings distributions may be explained by both upwards and downwards earnings manipulation.

2.2 Theory explaining why earnings management creates discontinuities in earnings distributions

BD rely on transaction cost and prospect theory, which hypothesises distrust of absolute and relative losses, to provide the theoretical foundation for a discontinuity, at zero, in the distribution of earnings levels and changes. Transaction cost theory is founded in the study of organisations and applies to both the positioning of efficient boundaries between firms and markets and to the structuring of internal transactions (Williamson, 1981). Transaction cost theory is based on the behavioral assumption that "organization man" experiences limits in formulating and solving complex problems and in processing information (Williamson, 1981:553).This results in incomplete contracting when the parties to a contract find it impossible to deal with the complexity in all the relevant aspects of a contract. In the context of earnings management transaction cost theory relies on two assumptions (BD: 122): firstly that information about earnings affects the terms of transactions between the firm and its stakeholders and that terms of transactions are generally more favourable for firms with higher earnings. Secondly, high costs of accessing and analysing information or limited financial accounting understanding, Glaum et al. (2004), cause some stakeholders to use heuristic cut-offs at zero earnings levels or zero changes in earnings to determine contract terms. Consequently preparers have incentives to

manipulate small losses into small gains and zero increases into small increases because they are aware that when investors' evaluation of a firm's financial performance is constrained, they will rely on heuristic cut off points of zero earnings or zero earning changes to evaluate firm performance. Stakeholders may rely on thresholds or heuristics, for example, banks may only grant loans to companies that report positive earnings, achieving thresholds may influence analysts' recommendations and crossing thresholds may simplify executive's relations with shareholders and boards of directors (Degeorge et al, 1999).

Prospect theory, Kahneman and Tversky (1979), is based on the theory that investors and lenders value their claims on an entity's net resources with reference to accounting earnings and regard small profits as being more value relevant than small losses. Therefore if executives, the boards that they report to or investors who invest in an entity's shares behave in accordance with prospect theory they evaluate firm's profitability as changes from a reference point and executives will manage reported earnings in response to this behaviour (Degeorge et al, 1999). Interviews with managers confirm that they are prepared to incur significant costs and are willing to take actions to meet these benchmarks (Dichev et al, 2013; Graham et al, 2005). Furthermore, managers strive to meet earnings benchmarks to maintain stock prices especially if they hold shares or options or their jobs are in jeopardy Brown and Caylor (2005).

Thus based on transaction cost and prospect theory BD test specifically for a discontinuity at zero earnings or zero year-on-year earnings changes and assume a linear relationship between the number of observations in a histogram bin and its adjacent bins (Lahr, 2014). In other words BD's reference distribution of no earnings management is the number of observations in the bins adjacent to zero earnings and earnings changes.

Despite concentrating their research on the distribution of earnings and earnings changes around zero, BD observe evidence of earnings management in intervals other than the two intervals (Chen, Hope, Li, and Wang, 2011) immediately adjacent to zero. These additional discontinuities, in locations other than zero, can be explained by Badertscher, Phillips, Pincus, and Rego (2009) who hypothesise and find that firms whose unmanaged earnings exceed target earnings engage in downward earnings management to create "cookie jar " reserves that can be used in future periods to smooth earnings. Moreover, Levitt (1998) observes that in good times managers use unrealistic assumptions to estimate liabilities for sales returns, bad debts, loan loss

reserves and warranty costs to manage earnings downwards and that firms that report unexpected losses use "big bath " accounting overestimating restructuring costs that can be reversed in future periods to boost earnings. A further rationale for the use of downward earnings management is provided by Healy (1985) who shows that where bonuses are near their maximum this may be an incentive to management to reduce current period profits and to move them to the next reporting period.

2.3 The nature of earnings management

Accruals and professional judgement

Professional judgement, a fundamental characteristic of accounting, is exercised when managers apply accrual accounting. The accrual basis of accounting is an underlying assumption that underpins the preparation of financial statements IAS 1: Par 27 (IASB, 2001).Under this basis of accounting, the effects of transactions and other events are recognised in the financial statements in the period in which they occur and not as cash is received or paid. Financial transactions are, as a result, recognised in income in the period to which they relate and provide a more timely and reliable measure of firm performance than cash flows Guay et al (1996). Judgement is required to estimate many amounts in financial statements, for example, the expected life and realisable value on non-current assets, asset impairments, revenue, provisions, pension liabilities and employee share options. Managers can make financial report more useful by selecting accounting policies and estimating future cash flows that match or misrepresent the economic reality of the firm, (Dechow and Skinner, 2000; Healy and Palepu, 1993; Subramanyam, 1996). The key points to consider are intent to mislead (Nelson et al, 2002) and when managers' accrual decisions move from signalling information about future cash flows to earnings management. Dechow et al (2011) analyse SEC forced financial statement restatements and identify misstated revenue and capitalising costs as assets as the major categories of accruals abuse, followed by misstating of expenses and inventory.

Dechow and Skinner (2000) present three categories of earnings management: those that violate general accepted accounting practice and constitute fraud, those described as real earnings management which involves the timing or structuring of transactions which can have an effect on a firm's cash flows and those that comprise aggressive application of accrual accounting choices.

Examples of fraudulent accounting are recognising sales before they are realisable, fraudulently backdating debtors' invoices and overstating inventory by incorrectly estimating manufacturing costs or ignoring reductions in net realisable value. Fraudulent accounting is clearly a violation of accounting principles and is scoped out of this dissertation. Manipulation achieved by structuring transactions is compared to earnings manipulation below. However, because structuring transactions is achieved without violating accounting principles, it is also outside the scope of this report. Therefore, the focus of this thesis is earnings management (EM) achieved by the aggressive application of accrual accounting principles.

Management intent to mislead users distinguishes accruals that signal managers' inside information about future cash flows from earnings management (Dechow and Skinner, 2000; Parfet, 2000). However, management intent, the deliberate obfuscation of true economic performance, is unobservable and difficult for researchers to isolate. Ultimately, the distinction is between acceptable income smoothing and manipulation, and depends on whether the application of the accruals process is neutral or aggressive. Aggressive application of the accruals process can be income-decreasing or-increasing and involves, inter alia, the recognition and measurement of provisions, inventory, accounts receivable and non-current assets.

Real earnings management

Ewert and Wagenhofer (2005) state that real earnings management affects the timing or structuring of transactions: it occurs if the manager undertakes transactions that are inefficient from the firm's perspective but generate a desired profit or loss for the current period. Real earnings management imposes costs on the firm and changes firm value. Graham et al (2005) conduct a survey that asks chief financial officers (CFO's) to describe their accounting policy and measurement choices. From their perspective CFO's do not view real earnings management as a violation of accounting principles or as committing fraud. They regard real earnings management as conducting business transactions to produce smooth achievable earnings every year; this entails decreasing or postponing discretionary spending or investment projects. Specific examples of real earnings management are decreasing research and development, advertising and maintenance expenditure, delaying the start of a capital project, even if this means a small sacrifice in value, incentivising customers to buy more at the end of the financial

year and prior to changes in financial instrument accounting, selling assets or investments that are not carried at fair value.

Indeed Healy and Wahlen (1999) include structuring of transactions in their definition of earnings management. However, as Graham et al (2005) observe, auditors cannot challenge economic decisions undertaken to meet earnings targets in the normal course of business, but they can challenge measurement and accounting policy choices. By definition, real earnings management is not achieved through manipulation of accruals: models to detect discretionary accruals are not designed to identify real earnings management. Consequently, real earnings management is scoped out of this dissertation.

2.4 Detecting earnings management and share valuations in emerging markets

This thesis investigates identification of and price reaction in suspected earnings management firms in South Africa which has been identified as an emerging market (Klapper and Love, 2002; Lee and Ng, 2004; Patel, Balic, and Bwakira, 2002). This categorisation is pertinent to this research because earnings management is found to be more pervasive in countries that have markedly smaller stock markets and insider economies (Leuz et al, 2003).

Information asymmetry problems and poor disclosure are more serious in emerging markets Lin and Sheng-Fu (2014) but can be alleviated by strong enforcement and improving the quality of accounting information Chen et al (2011). In emerging economies ownership structures, predominantly non-independent boards and insider and family ownership (Al-Fayoumi, Abuzayed, and Alexander, 2010; Jaggi, Leung, and Gul, 2009; Jiang, Habib, and Smallman, 2009; Waweru and Riro, 2013) and weaker corporate governance (Leuz et al, 2003; Rahman and Mohamed-Ali, 2006; Y. Wang and Campbell, 2012; Waweru and Riro, 2013) are associated with earnings manipulation.

Detecting earnings management

Most of the studies that use histograms to explore earnings distributions for discontinuities have taken place in developed economies (Burgstahler and Dichev, 1997; Coulton et al, 2005; Dechow et al, 2003; Degeorge et al, 1999; Glaum et al, 2004; Holland and Ramsay, 2003;

Phillips et al, 2003). Coppens and Peek (2005) used kernel density estimation to compare the distribution of earnings levels and changes in Belgium and Italy and calculated the relevant bandwidth using the rule of thumb method proposed by Silverman (1986). Distribution studies in developing markets appear to be limited, Amar and Abaoub (2010) and Charoenwong and Jiraporn (2009) have respectively identified discontinuities in earnings levels and changes distributions in Tunisia and Singapore and Thailand using histograms.

Research into earnings management in emerging economies focusses mainly on the relationship between evidence of earnings management, measured as discretionary accruals, and ownership and corporate governance. This association is researched in China (Y. Wang and Campbell, 2012) and in Hong Kong (Jaggi et al, 2009). Earnings management in state owned vs privately owned companies is investigated by L. Wang and Yung (2011) in China, by Arnedo, Lizarraga, and Sanchez (2007) in Spain and by Al-Fayoumi et al (2010) in Jordan. In Kenya, Waweru and Riro (2013) research corporate governanance and firm characteristics and Tsipouridou and Spathis (2012) investigate the relationship between earnings management and audit firms and audit report qualifications in Greece and Memis and Cetenak (2012) explore the relationship between earnings management and audit firm and the legal system in eight emerging economies[4]. Rahman and Mohamed-Ali (2006) consider audit committee effectiveness in the presence of concentrated ownership in Malaysia and Pelucio-Grecco, Geron, Grecco, and Lima (2014) research the effect of IFRS adoption and earnings management in Brazil and the association between business ethics and discretionary accruals in Korea is investigated by Hee Choi and Pae (2011). Discretionary accruals estimated in the above studies using modified - Jones or performance adjusted modified- Jones models are presented in Tables 10-13 in Chapter 5.

Share valuations in emerging markets

Market efficiency differs between developed and emerging economies. There is disagreement about fundamental issues such as estimating the cost of capital in emerging markets (Bruner, Conroy, Estrada, Kritzman, and Wei, 2002). Emerging markets grow at real rates that are two or three times higher than developed countries and capital inflows into these markets exceeds that

[4]The countries included in this study are Brazil, Greece, Israel, South Korea, Mexico, Poland, Russia, and Turkey.

into developed markets (Bruner et al, 2002). Stock markets in developing countries suffer from poor and asymmetric information, poor supervision, inadequate disclosure, price volatility and insider trading (Singh and Weisse, 1998). In this respect, the JSE is dissimilar to other emerging markets; the Global Competitiveness Report (Report, 2014) (hereafter GCR) rates the regulation of the JSE as first of the 139 countries surveyed.

Emerging markets tend to price assets at a discount to comparable assets in a developed market because of weaker investor protection rights, weaker corporate governance institutions and a more corrupt environment (Bruner et al, 2002). Klapper and Love (2002) find that good governance is positively related with market valuation and operating performance and that this relationship is stronger in countries with weaker legal systems. From a different perspective, controlling shareholders in an emerging market place a higher value on the benefits of control compared to those in developed markets because in an emerging market, controlling shareholders can expect to receive more private benefits. (Bruner et al, 2002).

As this thesis is the first in South Africa to investigate whether there is a difference in the price levels and cumulative abnormal returns of suspected EM and non-EM firms around the date that the annual financial statements are released, market reaction to earnings accruals is an empirical matter.

2.5 The South African reporting environment

South Africa is an emerging economy and a common law country, which has been classified as an insider economy which tends to have a comparatively smaller but well-regulated stock exchange, concentrated ownership, strong investor rights but somewhat weaker legal enforcement and a satisfactory level of accounting transparency and disclosure (Leuz et al, 2003). South Africa is considered to have strong auditing and accounting standards and a well-regulated stock exchange, all of which were placed first by the GRC. Until 2011 compliance with IFRS in South Africa was enforced by a responsive body, the GAAP Monitoring Panel, which served as an oversight body that investigated and advised the JSE on compliance issues. Since 2011, a proactive process has been put in place which will scrutinise financial statements of all listed companies every five years.

South Africa is ranked as the 5th lowest earnings management country by (Leuz et al, 2003). However in more recent studies South Africa's rating as a non-earnings management environment appears to have deteriorated. Lemma et al (2013), in a study, spanning the period 1996-2012, compute the median accrual management score for South Africa to be -0.09 compared to the overall median of -0.16 for the 44 countries analysed. Gaio (2010) measures South Africa's median earnings quality score as 49.3 compared to that of 49.11 for all the countries surveyed. This earnings management score can be associated with corporate governance and governance infrastructure in South Africa. In agreement with Leuz et al (2003), Lemma et al (2013) find that 55.47% of South African companies have block shareholders and that only 7% of board chairmen are independent and 21% of board members are non-executive directors. These statistics in tandem with South Africa's status as a common law country can be positively associated with the likelihood that South African managers engage in earning management activities. Despite the fact that the GRC rates the strength of South African auditing and accounting standards as 1st out of 144 countries surveyed this does not necessarily translate into quality financial reporting (Ball, Robin, and Shuang Wu, 2003), because South Africa's governance index (Lemma et al, 2013), rule of law (Klapper and Love, 2002) and judicial independence are relatively weaker GRC.

In addition, two professional auditing firm surveys offer direct insight into the incidence of financial statement fraud and executives' willingness to justify such actions. PWC report that South African organisations suffer significantly more procurement, human resources, bribery and financial statement fraud than organisations globally; 35% of South African respondents, compared to 22% globally, report having experienced financial statement fraud.[5] Ernest & Young find that in South Africa 10% (globally 6%) of executives surveyed are willing to justify misstating company financial performance and that chief financial officers are more likely than other executives to justify changes to assumptions relating to valuations and reserves, whereas sales and marketing executives are more likely than other executives to justify introducing flexible return policies.[6]

[5] PWC Global Economic Crime Survey: Confronting the Changing Face of Economic Crime, SA Edition No 4, Feb. 2014 available at www.pwc.co.za/crime survey.
[6] Ernest and Young 13th Global Fraud Survey, 2014, available at www.ey.com.

The Public Inspection Report issued by IRBA (IRBA, 2014/2015) identifies that revenue, financial instruments, property, plant and equipment, investment property, intangible assets, goodwill , inventory and provisions are the most prevalent items in the financial statements that may be subject to recognition and/or measurement problems.

Altogether South Africa's accrual scores taken together with board composition and somewhat weaker governance, rule of law and judicial independence and the results of professional surveys indicate that earnings management might be anticipated. Therefore the relationship between these factors and earnings management in South Africa is explored further in the next section.

2.6 The interaction between earnings management, corporate governance, the legal environment and accounting standards in South Africa.

Corporate governance,(Dechow, Sloan, and Sweeney, 1996; Denis and Mcconnell, 2003) the legal environment (Eleswarapu and Venkataraman, 2006; La Porta, Lopez-de-Silanes, and Vishny, 2000; Leuz et al, 2003; Memis and Cetenak, 2012; Shleifer and Vishney, 1997) and quality of accounting standards (Healy and Palepu, 1993) form the cornerstones of the regulatory environment developed to ensure the quality of financial reporting and to constrain earnings manipulation. At firm level agency theory postulates that ownership structure (Fakhfakh, 2011 ; Jaggi et al, 2009; Jiang et al, 2009; Leuz et al, 2003; Rahman and Mohamed-Ali, 2006; Shleifer and Vishney, 1997) and board independence (Dechow et al, 1996; Fakhfakh, 2011 ; Jaggi et al, 2009; Rahman and Mohamed-Ali, 2006; Waweru and Riro, 2013) should act as constraints to earnings manipulation. Research into corporate governance, ownership structure and discretionary accruals in emerging markets report that investor protection and the quality of law enforcement create an environment in which information asymmetry is reduced, thus managers are less likely to manipulate earnings (Ball, Kothari, and Robin, 2000; Eleswarapu and Venkataraman, 2006; Gaio, 2010; Leuz et al, 2003; Memis and Cetenak, 2012). A high quality legal system supports demands for good quality financial accounting information (Gaio, 2010) and the quality of accounting standards have a significant bearing on information asymmetry between insider and outsider stakeholders (Eleswarapu and Venkataraman, 2006). In themselves South Africa's quality accounting standards and strong investor rights (Leuz et al, 2003) may not lead to higher quality earnings as they are not sustained by strong legal enforcement.

Ownership structure, board independence and earnings management

Agency theory advocates that independent boards of directors are an effective governance mechanism to monitor agents' behaviour and prevent them from engaging in opportunistic behaviour (Subramaniam, Mcmanus, and Zhang, 2009). Board independence is gauged on the independence of the board chairman and dominance of non-executive directors. Ownership structure of a firm is a key variable that is a significant determinant of both earnings management activity (Leuz et al, 2003; Reverte, 2008) and the market value of controlling and non-controlling interests (Bruner et al, 2002). On the one hand, agency theory (Jensen and Meckling, 1976) advocates that large block shareholders have more incentives and greater fiduciary duties to curb managements' power because the expected benefits resulting from their ownership interests exceed monitoring costs (Jiang et al, 2009). The opposite view holds that block shareholders can pressurise managers to report more favourable performance and that where conflicts of interests arise between majority and minority interests block shareholders may find it advantageous to work with management instead of monitoring them which can result in a misappropriation of minority shareholder rights (Jiang et al, 2009). Fan and Wong (2002) find that agency conflicts between controlling owners and outside investors are associated with pyramid and cross-holding structures. Controlling owners can use their authority to increase their benefits at the expense of those of non-controlling shareholders: for example, manipulating their employment benefits or transferring assets to other businesses owned by the controlling shareholders or related parties. These benefits are concealed from non-controlling shareholders because if they are discovered, the non-controlling interest is likely to sue the controlling shareholders (La Porta et al, 2000). In this setting, from an earnings management perspective, controlling shareholders are perceived to influence management to report accounting earnings for self-interest purposes and to hide proprietary information which reduces earnings reliability. Leuz et al (2003) and Dyck and Zingales (2002) suggest that strong and well-enforced outside shareholder rights limit insiders' acquisition of private control. Lemma et al (2013) report, that where block shareholders are considered independently, they do not appear to have incentives to monitor management. However, when block shareholders' incentives to monitor management activities is linked to country specific legal systems, firms in common law countries with block shareholders are more likely to manipulate earnings.

Prior research into the relationship between earnings management and ownership structure in emerging economies highlights that board independence is influenced by ownership structures. Jaggi et al (2009) report that in Hong Kong independent boards of directors are effective only in non-family controlled firms whereas in China, Y. Wang and Campbell (2012) find that increasing non-state ownership and the number of independent directors discourages earnings management but that there is more evidence of earnings manipulation in private versus state owned entities in China (L. Wang and Yung, 2011). Al-Fayoumi et al (2010) observe that in Jordan insider ownership is positively associated with earnings management likewise, in Kenya Waweru and Riro (2013) report that financial disclosures are more reliable in firms with dispersed ownership. Considering corporate governance issues Waweru and Riro (2013) find that in Kenya firms with more independent directors are less inclined to engage in earnings manipulation and Rahman and Mohamed-Ali (2006) determine that in Malaysia the relationship between board composition and discretionary accruals is significant and positive and that larger boards appear to be ineffective in curbing earnings management.

Evidence of board independence and effectiveness in South Africa is somewhat contradictory. Klapper and Love (2002) rate South Africa's governance index at firm level as 66.53%, which is the highest rating of the developing countries in the sample and the GCR rank the efficacy of corporate boards in South Africa as 2nd out of 139 for 2013 and 3rd out of 144 for 2014. However, in a more recent study,Lemma et al (2013) report, that in South Africa, only 7% of board chairmen are independent and that 21% of board members are non-executive directors.

Investor protection and rule of law

Institutional factors are crucial in underpinning investors' confidence in financial markets (De Fond, Hung, and Trezevant, 2007; Reverte, 2008). Specifically, investor protection is important because the returns expected by minority shareholders may never materialise if the controlling managers or shareholders expropriate the rights of other stakeholders (La Porta et al, 2000). Earnings management, an attribute of earnings quality, is influenced by a country's laws and regulations and law enforcement (Ball et al, 2000; Leuz et al, 2003). Leuz et al (2003) report that countries with stronger legal rights for minority shareholders and legal enforcement (measured as the efficiency of the judicial system, an assessment of the rule of law and the corruption index) exhibit lower earnings manipulation than countries with fewer legal rights and weaker legal

enforcement. Similar results are reported by Reverte (2008) who observes that earnings management is significantly lower in European economies characterised by better legal enforcement, stricter securities regulation, less concentrated ownership and stronger investor protection. Shen and Chih (2007) find that in emerging economies in Asia, firms with decent corporate governance standards conduct less earnings management, that good corporate governance mitigates earnings smoothing in large and high growth firms and that firms with high leverage and poor corporate governance find it difficult to fool the market through earnings management. Two studies explore the effect of culture on earnings management. Doupnik (2008) claims that when investor protection and an individual's culture are considered together as explanations for cross-country variation in earnings management, enforcement of legal rights loses its power to explain earnings smoothing. Han, Kang, Salter, and Yoo (2010) provide evidence that national individualism and national uncertainty avoidance together with legal institutions have explanatory power for earnings management around the world.

Eleswarapu and Venkataraman (2006) link rule of law to a strong independent judicial system which in turn, is moulded by a country's corruption index and political system. Ng (2006:823) defines corruption as the misuse of public office for private gains whereas Mauro (1995) measures corruption as the degree to which business transactions involve corruption or questionable transactions. Mauro (1995) determines that corruption lowers private investment thereby reducing economic growth. Based on the period 1980-1983, Mauro (1995) finds that South Africa's racial tensions and active trade unions are in sharp contrast with its bureaucratic efficiency measured as a composite of judiciary system, red tape and corruption. On a scale which ranks a high index as "good" institutions South Africa's bureaucratic efficiency score lies between 6.5 and 7.5 out of a possible ten. However, by 2003, based on the Transparency International Survey, Ng (2006) ranks South Africa's level of corruption at 48th out of 133 countries surveyed. South Africa's governance infrastructure index is 2.7 whereas that of the sample of all countries surveyed is 16.1[7] (Lemma et al, 2013).

[7] The governance infrastructure index is calculated as the composite of government effectiveness, political stability, rule of law, voice and accountability, control of corruption, disclosure and regulatory quality.

Quality of accounting standards

Quality of financial reporting is associated with the financial standards underpinning the preparation of financial statements (Barth, Landsman, and Lang, 2008; Daske, Hail, Leuz, and Verdi, 2008; Jeanjean, 2012) and whether these financial standards are rules or principles based (Barth, 2008; Nelson et al, 2002).

Recent research suggests that high quality information is associated with the interaction between accounting standards, strong institutions and whether a country's legal system is founded on common or code law (Ball et al, 2000).Research into the application of IFRS standards associates high quality financial information with strong institutions (Ball et al, 2003). Barth et al (2008) find that voluntary adoption of IFRS standards in Europe results in increased quality but, Daske et al (2008), report that these benefits are limited to those firms that will benefit from transparent disclosures and Ding, Hope, Jeanjean, and Stoloway (2007) state that high quality institutions and not the change from local to IFRS standards affect earnings quality. Furthermore, mandatory compliance with standards does not ensure uniform accounting treatment of transaction because differences in countries' history and culture will result different interpretations of accounting standards (Barth, 2008; Doupnik, 2008; Han et al, 2010).

Related to the discussion about quality standards is the debate surrounding principles versus rules-based standards. One opinion is that principles-based standards are less precise than rules based standards and that principles based standards permit opportunistic accruals. The opposing view holds that principles are more difficult to manipulate and thus result in higher quality financial statements (Barth, 2008). However, the distinction between rules-based and principles based standards is not clear-cut because FASB standards, considered to be rules-based, are grounded on principles in the conceptual framework and IASB standards, which are considered to be principles based, contain application guidance (Barth, 2008). The effect on earnings manipulation is that auditors are likely to require restatements of attempted earnings manipulation if managers are suspected of manipulating the interpretation and application of principles in IFRS rather than by structuring transactions to comply with precise standards (Nelson et al, 2002).

All in all despite the fact that South Africa has high quality reporting and auditing standards as Ball et al (2003) posit this may not automatically ensure the integrity of financial reports because of the relatively weaker institutional environment in South Africa.

2.7 Research into EM in SA

Research into earnings management in South Africa has been restricted to research that has ranked South Africa's firm level governance, country level legality, shareholder rights, judicial efficiency, accounting transparency and disclosure, propensity for earnings management,market reaction to forced financial restatements (Watson and Rossouw, 2012) and auditors' perceptions of earnings management (Rabin, 2005). Van de Wouw (2015) identifies the components of deferred tax that are associated with earnings management.

Earnings management exists in both developed and emerging economies. South Africa is a unique research environment: which has been classified as an emerging economy but has the characteristics of more developed economies. On the one hand it has strong investor rights, but a somewhat weaker legal enforcement system, and its reporting and auditing standards and stock exchange regulation have been ranked amongst the best in the world. On the other hand, the South African environment has characteristics associated with earnings management activity: for example, an insider economy, smaller stock exchange, concentrated ownership and dependent boards' of directors. It is therefore important for investors, lenders, auditors and banks to be aware of the extent of earnings management in firms trading on the JSE.

The main objective of this research report is to establish the extent of earnings management in South Africa and to examine the pricing of suspected earnings management. The next chapter of the thesis examines earnings levels and changes distributions for discontinuities using histograms and binwidths used in prior research.

CHAPTER 3 DISTRIBUTION ANALYSIS TO IDENTIFY SUSPECTED EARNINGS MANAGEMENT FIRMS ON THE JSE

Earnings is a fundamental driver of firm value. Therefore, understandng earnings quality,which includes an assessment of earnings management (Gaio, 2010; Leuz et al, 2003), is critically important for the efficient functioning of capital markets. How best to detect earnings misstateements is an essential issue for investors, analysts, auditors and regulators (Dechow et al, 2011). Because earnings management is by intent unobservable and therefore not directly quantifiable, models have been developed to decompose total accruals into discretionary accruals (managed accruals) and nondiscretionary accruals (accruals that result from the level of business activity). The primary models that have been developed to measure discretionary accruals are the Healy (1985), DeAngelo (1986), Jones (1991), and the modified Jones model developed by Dechow, Sloan and Sweeny (1995). An alternate method is to locate suspected earnings management firms at discontinuities in earnings distributions. More recently Dechow et al (2011) have developed an earnings misstatement model based on financial misstatements identified from firms subject to forced SEC restatement. In circumstances where a data set of suspected earnings management firms is not readily available, suspected earnings management firms are, by necessity, identified using discontinuities in earnings distributions.

The purpose of this chapter is to establish whether there is evidence of earnings management in firms listed on the JSE by examining earnings distributions for a discontinuity around zero earnings or zero earnings changes benchmarks using histograms. Intervals are based on those applied in prior research (see Table 2). This research is based on all the available observations of all firms listed on the JSE for the years 1998-2010 (2631 observations). In line with BD banks, financial institutions and regulated industries are eliminated as incentives to use earnings management techniques in these sectors may differ.

To address the deflation issues raised by Durtschi and Easton (2005) (DE) and Durtschi and Easton (2009) and the asymmetric taxation concerns raised by Beaver et al (2007) BMN the distributions of earnings levels and earnings changes before and after taxation are deflated by number of shares in issue at the end of the reporting period, market value of equity and total assets.

The remainder of this chapter proceeds as follows. Section 1 explains the BD histogram methodology to identify the location of suspected earnings management in earnings distributions and the problems, identified in subsequent research, in applying the BD methodology are discussed in section 2; the effect of deflation, sample selection and taxation on earnings distributions is evaluated in section 3; the research problem, methodology and results are presented in section 4; the results are discussed in section 5 and conclusions are reached in Section 6.

3.1 Burgstahler and Dichev distribution methodology

BD use transaction and prospect theory and managers' incentives to manipulate earnings to meet thresholds to justify their hypotheses that the frequency of small losses and small earnings decreases is abnormally low in the interval just below zero, while the number of firms reporting small positive earnings and small earnings increases are abnormally high in the interval just above zero.

The BD methodology is based on graphical evidence in the form of histograms; this examines the cross-sectional distribution of earnings changes and earnings levels scaled by the market value of equity. Earnings management is assumed to take place at zero earnings or earnings changes. This manifests in a discontinuity in the distribution of earnings around zero. The earnings variable used is net income after taxation scaled by the market value of equity at the beginning of the current financial year t ; changes in earnings is defined as the change in net income after taxation between years t -1 and t scaled by the market value of equity at the beginning of year t -1. The reason provided by BD for scaling the earnings variable is that since these observations are drawn from a wide range of firm sizes, a lagged measure is used to mitigate any autocorrelation problems. To investigate the existence of earnings management to avoid reporting negative earnings, BD draw a histogram of earnings scaled by market value of equity with interval widths of 0.005 for scaled earnings ranging from -0.25 to +0.35. The histogram of scaled earnings changes is drawn with histogram interval widths of 0.0025 for the range -0.15 to +0.15. BD do not provide an explanation for the histogram widths used in their research. Both the histograms of earnings levels and earnings changes show a single-peaked bell shaped distribution with irregularities near zero, which BD interpret as evidence of earnings management given the smoothness of the remaining distribution.

To test the statistical significance of the identified discontinuity at zero, BD:103 perform a statistical test the only assumption of which is that, under the null hypothesis of no earnings management, the cross-sectional distributions of earnings and earnings changes are relatively smooth. The definition of smoothness used by BD is that the expected number of observations in a given interval of the distribution is the average of observations in the two immediately adjacent intervals. The test statistic used by (BD:103) to test the null hypothesis that the distribution is smooth is the difference between the actual number of observations in an interval and the expected number of observations in the interval, divided by the estimated standard deviation of the difference.[8] Under the null hypothesis of no earnings management, the standard differences will be distributed approximately normal with mean 0 and standard deviation of 1. BD report that the test statistic confirms the existence of an irregularity around zero for both earnings levels and earnings changes and that the kink in the distribution of earnings levels is more pronounced than that identified for earnings changes. Furthermore, BD also find evidence that earnings management affects intervals other than the interval immediately adjacent to zero but they offer no explanation for this finding. Later research, Badertscher et al (2009), provide evidence that fewer than expected observations in bins to the right of zero earnings or earnings changes are attributable to downwards earnings management.

In order to prove that the identified distribution discontinuities are evidence of earnings management, BD provide evidence of an increase in the levels of cash flow and a small increase in the median change in working capital around zero. However, (Dechow et al, 2003) reject the levels of cash flows as evidence of earnings management because the positive relationship between earnings and cash flows and between earnings and working capital accruals could induce the discontinuity. In other words positive cash flows would be expected in firms that display a slight profit or increase in prior period's earnings.

3.2 Problems with applying the BD methodology

Researchers applying the BD methodology have identified problems associated with the choice of interval widths used in the construction of the histograms, with the statistical tests used to

[8] BD:103 denote N as the total number of observations and the probability that an observation will fall into the interval i by p_i, the variance of the difference between the observed and expected number of observations for interval i is
$Npi\,(1 - p_i) + (1/4)\,N\,(pi_{-1} + p_{i+1})\,(1 - p_{i-1} - p_{i+1})$.

test the significance of the distribution discontinuity and with BD's assumption that the remaining distribution of the earnings metric is smooth (Bollen and Pool, 2009; Christodoulou and Mcleay, 2009; Coulton et al, 2005; Degeorge et al, 1999; Glaum et al, 2004; Holland and Ramsay, 2003). Holland and Ramsay (2003) find that the distribution of reported earnings for Australian firms is significantly skewed, contravening BD's assumption of smoothness in the distribution other than in the intervals to the left and right of zero.

Identifying interval widths

The binwidth is the most important parameter that determines the statistical properties of a histogram (Bollen and Pool, 2009). When a binwidth is too small, a histogram can feature discontinuities where none exist; when it is too large, the histogram may appear continuous even if the underlying distribution exhibits discontinuities. Bollen and Pool (2009) provide graphical evidence of this problem. Selecting an appropriate interval width is important because the results for narrow interval widths can differ from wide interval widths and this can affect the conclusions of a study that depends on histograms to identify earnings management firms (Glaum et al, 2004). Indeed, Glaum et al. (2004) replicate the research of Leuz et al (2003) who report that the frequency of small profits to losses is lower for U.S. firms than for firms in all other countries surveyed, including Germany. Leuz et al (2003) scale earnings by lagged total assets and use an interval width of 0.01. Glaum et al. (2004) use smaller interval widths, 0.001 and 0.0005, and find that Leuz et al's (2003) results are reversed; the frequency of small profit to small loss firms is actually higher in the U.S. than in Germany.

Glaum et al (2004) use a pragmatic approach to establish interval widths. They tabulate the number of observations in the intervals to the left and right of the zero earnings and earnings changes for different interval widths and use the width that yields the most pronounced earnings management effect. They repeat their tests for a variety of interval widths and report highly significant irregularities around earnings thresholds. However, when they compare the extent of earnings management to beat thresholds across the distributions for German, as compared to U.S. firms, the choice of interval does matter.

As discussed by Bollen and Pool (2009), the interval width used to construct a histogram is one of the most important parameters that affects its statistical properties. Researchers use either

calculations or a rule of thumb approach to establish binwidths. BD do not provide a justification for the interval width that they use to construct their histograms. Subsequent researchers, who replicate the work of BD, use the BD interval widths without question, for example, DE (2005) , BMN and Dechow et al. (2003) and do not consider that the choice of interval widths may have affected their identification of a kink in the frequency distribution of earnings.

Degeorge et al (1999), Beatty, Bin Ke, and Petroni (2002) and Bollen and Pool (2009) use the binwidth calculation recommended by Silverman (1986) and Scott (1992). They recommended a binwidth of $2IQRn^{-1/3}$, where IQR is the sample interquartile range of the variable and n is the number of available observations. Holland and Ramsay (2003) who investigate earnings levels and changes scaled by total assets in an Australian setting use this formula to calculate binwidths, decided against using the above binwidth calculations because the widths identified were larger than those used by BD and choose binwidths using visual inspection. Holland and Ramsay (2003) report their results using an interval width of 0.01 for scaled earnings levels and 0.005 for scaled earnings changes. However, Holland and Ramsay (2003) fail to appreciate that their metric, earnings scaled by total assets, differs from BD who use market value as a deflator. Coulton et al. (2005), in research also conducted in Australia, acknowledge the effect of researcher- selected interval widths but use a 1% interval width for their metric of earnings and earnings changes scaled by total assets and lagged total assets without question. In emerging market settings, Charoenwong and Jiraporn (2009) use the binwidth calculation recommended by Silverman (1986) and Scott (1992) to calculate binwidths in their research into earnings management in Singapore and Thailand. An interval binwidth of 2 cents is calculated for Singapore and 1 baht in Thailand and is applied to construct histograms for both earnings levels and changes deflated by number of shares in issue. Ben Amar and Abaoub (2010) in research conducted in Tunisia, analyse the distribution of earnings and earnings changes scaled by total assets. They use a binwidth of 0.03 and 0.01 in constructing histograms of earnings and earnings changes respectively without justification. Neither Charoenwong and Jiraporn (2009) nor Ben Amar and Abaoub (2010) offer evidence that the identified discontinuities are associated with earnings management.

The BD test statistic

Holland and Ramsay (2003) question the use of the BD test statistic because of its assumption of smoothness and they deem it inappropriate to use the number of observations in the two adjacent intervals to calculate the expected number of observations as the first adjacent interval will contain less than the expected number of observations because losses will have been manipulated out of this interval. Holland and Ramsey (2003) do not support BD's suggested remedy, to use the average observations in the next to adjacent intervals or the average in the four adjacent intervals as this compounds the problems associated with the linearity assumption because it extends the number of intervals required for the BD test.

Furthermore, Coulton et al (2005) point out that where the peak of the distribution lies adjacent to the benchmark interval, it is to be expected that the BD test will give a significant result because the reference distribution in the adjacent binwidths is not smooth. Even in the absence of earnings management, it is more probable that an observation will be observed in the peak of the distribution than in the adjacent interval width. Burgstahler and Chuck (2013) mention that in the circumstance where the earnings threshold falls close to the peak of the distribution, evidence of earnings management is inconclusive because the pre-managed distribution is unknown. However, where the reference distribution is drawn from the empirical data itself using bootstrap KDE, by design the reference distribution is continuous at zero (Lahr, 2014) and the risk of spurious results is avoided.

The significance test used by BD assumes that, in the absence of earnings management, the earnings distribution is relatively smooth. However, Holland and Ramsay (2003) and Coulton et al. (2005) note that the distribution of earnings for Australian firms is significantly skewed. Therefore, Holland and Ramsay (2003) are unable to replicate the BD tests to measure the prevalence of earnings management using Australian data and use total assets as a deflator and their own interval widths.

Table 3 in Section 3.4 of this chapter shows no discontinuities in BD histograms in South African earnings distributions. This result is probably attributable to BD binwidths being unsuitable for emerging markets data (Ben Amar and Abaoub, 2010 ; Charoenwong and

Jiraporn, 2009) and the concerns raised by Coulton et al (2005) and Holland and Ramsay (2003) about skewed data where the peak of the distribution lies adjacent to zero.

To mitigate these problems in applying the BD test procedure, Lahr (2014) proposes the use of kernel density estimation, which like a histogram is a nonparametric tool, to explore the distribution of scaled earnings and earnings changes.

3.3 The impact that deflators, taxation and sample selection on discontinuities in earnings levels and changes

Section 3.2 of this chapter discusses the problems associated with drawing BD's earnings distribution histograms and applying their statistical tests. This section discusses the debate surrounding deflation and the effect that sample selection can have on the distribution of earnings metrics to the left and right of zero and BMN's suggestion that taxation can impact on the discontinuity in the earnings distribution.

Deflation

BD analyse the distribution of earnings and earnings changes and use market value of equity as a deflator. Deflation is necessary to homogenise firm observations (Degeorge et al, 1999) because the earnings observations are drawn from a broad range of firm sizes. BD are aware that deflation may influence the earnings distribution, and repeat their tests scaling by book value of equity, total assets and net sales and report qualitatively similar results.

Degeorge et al (1999) and Dechow et al (2003) suggest that the discontinuity in earnings levels and changes reported by BD are due to the fact that market value is used as a deflator. They hypothesise that investors value small profit firms differently from small loss firms: these differences may be an alternate explanation to earnings management for the kink in the distribution of earnings DE (2005). Dechow et al (2003) explore the distribution of undeflated earnings, earnings deflated by market value and earnings per share and conclude that scaling by market value of equity changes the shape of the earnings distribution. When the distribution of undeflated earnings is analysed, the proportion of small profit (all firm years where net income is greater or equal to zero but less than 0.005) to small loss firms (all firm years where losses are greater than zero but greater than a loss of 0.005) is 1.81. The ratio of earnings divided by market

value of shares for small profit to small loss firms using the same bandwidths is 2.30. This declines to 1.11 when they explore the distribution of earnings per share. In addition, larger kinks in the distribution of earnings per share at other points such as 39 versus 40 cents, 79 versus 80 cents and 99 cents versus $1 are identified but these cannot be attributes to loss avoidance.

DE (2005) replicate BD's analysis of the distribution of earnings scaled by market value of equity and then compare this to the frequency distribution of reported diluted earnings per share. Consistent with BD, DE (2005) report a discontinuity in the distribution of market deflated earnings at zero: the interval immediately to the left of zero contains 748 observations while that immediately to the right of zero contains 1588 observations, a finding that was previously interpreted by researchers as evidence of earnings management. In contrast, DE (2005) inspect the distribution of reported diluted EPS for each one cent interval in the segment of the distribution between -$1 and +$1. They report no evidence of a discontinuity at zero: in fact there are significantly (t = 2.72) more observations (1850) with a small one cent loss than observations (1561) with a small one cent profit. Because the only difference between DE's (2005) two distributions is the deflator, they attribute the difference between the shapes to deflation. Burgstahler & Chuk (2013) disagree with this finding which they attribute to DE's (2005) inappropriate research design which focuses on small EPS and small undeflated earnings, and they do not recognise that the rate of earnings management differs across all segments of the population. Burgstahler and Chuk (op cit) demonstrate that the DE (2005) methodology fails to take the effect of size as a covariate into account and that it also does not recognise the theoretical prediction that earnings will be managed more frequently when the level of accruals needed to meet an earnings threshold is smaller.

In addition to previously discussed concerns raised by (Burgstahler and Chuck 2013), it must be noted that the numerator used by DE (2005) in the replicated BD analysis is earnings, whereas reported diluted EPS is a figure that is calculated in terms of GAAP. Diluted earnings consists of earnings as used in the BD definition adjusted for earnings attributable to outside shareholders and preference shareholders; a further deduction is made for the reversal of any after tax amounts included in the income figure that will reverse when potentially dilutive instruments are converted. To conclude that the only differences in the two distributions are the deflator is spurious.

In contrast to earnings distributions, when DE (2005) examine the distributions of change in net income deflated by market price and changes in diluted earnings per share, the BD replication shows that the interval from 0.00 to -0.0025 contains 1301 observations while the interval from 0.00 to +0.0025 contains 1746 observations. However, in contrast to the distribution of reported diluted EPS, DE (2005) report that there is asymmetry of the distribution of the change in diluted EPS around zero. There are more observations (2166) with a positive change in EPS of +$0.01 than observations (1634) with a negative change in EPS of -$0.01: this difference is significant at the 0.01 level, t =14.15. DE (2005) report that when all their analysis is repeated for EPS as compared to diluted EPS, the results are very similar and the conclusions are the same. Commenting on the DE (2005) finding that a discontinuity exists in the earnings changes distribution, Burgstahler & Chuk (2013) observe that this result is not surprising as deflating by price can explain discontinuities in scaled earnings in a restricted zone around zero but that there is no evidence in the literature that suggests that beginning of year prices differ for small earnings decreases versus small earnings increases.

To mitigate any concern that the number of shares issued, the denominator in the earnings per share calculation, may differ between loss and profit firms, DE (2005) analyse the number of shares outstanding for very small profit and for very small loss firms and report that there is no significant difference between them. By comparison, all other deflators, market value of equity, total assets and sales revenue are lower for small loss firms than for small profit firms, lower market values are lower for small loss firms in the ranges between -1c and 1c per share and losses and profits between -$100 000 and + $100 000. This finding leads DE (2005) to conclude that whenever a deflator is valued differently between profit and loss observations, the very act of deflation will contribute to the discontinuity of the frequency distribution around zero. However, as pointed out by Burgstahler and Chuck (2013), this result is relevant for only one segment of the population.

BMN repudiate DE's (2005) contention that shares outstanding are unlikely to induce a false discontinuity as they do not differ systematically between loss and profit observations. In contrast to DE (2005) who examine the distribution of the number of shares outstanding across a narrow distribution of earnings per share, BMN examine the behaviour of the number of shares outstanding across the entire distribution of undeflated net income partitioned into interval

widths of $100 000. They find a larger number of shares outstanding for loss observations which declines in the region around zero and that this pattern reduces the discontinuity in the share deflated distribution of earnings. Moreover, BMN report that the distribution of the market value of equity, and other deflators such as assets and sales, is stable around zero and that deflating by market value of equity, total assets or sales should not induce the location of profit and loss observations to shift. BMN attribute this disparity between the two studies to the fact that DE (2005) base their research on an examination of deflators across the distribution of earnings per share which itself incorporates the effects of share deflation while BMN analyse deflators across unscaled net income. In addition, BMN point out that DE (2005) anticipate that the distribution is flat in the region immediately around zero which is different from BD's assumption that the distribution is smooth in the region immediately around zero.

Durtschi and Easton (2009) analyse the differences between all potential deflators for loss observations and profit observations: this methodology contrasts with their earlier study in which price per share and total assets were compared based on earnings per share intervals. The 2009 study reports that market capitalisation, net operating assets, net sales, number of employees, total assets and shareholders' equity are statistically significantly smaller for loss intervals than for profit intervals of the same size.

Donelson et al (2013) apply a unique method to explore the influence of earnings management on discontinuities in earnings distributions and demonstrate that earning levels but not earnings changes are sensitive to deflation. Donelson et al (op cit) quantify the amount of earnings management by comparing reported earnings and earnings restated as a consequence of settled accounting-related class action lawsuits and then compare the distributions of restated (unmanaged) earnings to the originally reported (managed) earnings. They report that earnings management explains the difference in the distribution of earnings levels when scaling by market value of equity. Deflating by total assets in the zero profit distributions induces evidence of earnings management in both the pre and post managed earnings distributions but discontinuities are smaller in the pre-managed distributions: signalling that factors other than earnings management contribute to the discontinuity in earnings levels distributions.

In brief, Donelson et al (2013) provide evidence that scaling effects the distribution of earnings levels more than the distribution of earnings changes. It is difficult to compare the results of DE

(2005) and other studies because they concentrate on a small segment of the population and analyse diluted EPS. Despite these methodological differences, the above-mentioned authors have opened the debate that discontinuities in the distribution of earnings may be caused by factors other than earnings manipulation. As Durtschi and Easton (2009) conclude additional evidence other than the shape of the distribution of earnings must be brought to bear as evidence of earnings manipulation.

Sample selection bias

DE (2005) contend that both deflation and sample selection criteria contribute to the discontinuity in the distribution of earnings around zero and suggest that deflating by lagged share price reduces the sample size.

When DE (2005) analyse the distribution of EPS for entity's where beginning of year share price is not available, there are significantly more missing observations with a one-cent loss than a one-cent profit, which results in the removal of a larger number of loss observations than profit observations from the sample. In the same vein, DE (2005) suggest that the discontinuity in the distribution of undeflated net income found by Dechow et al. (2003) is caused because lagged share price is a sample selection criteria. Burgstahler and Chuck (2013) attribute DE's (2005) results to their research design which concentrates on the segment with missing price data and they observe that the effect of sample selection in that isolated segment of the data cannot explain discontinuities in the remaining segments which do not contain missing data.

Again Durtschi and Easton (2009) analyse the distribution of annual reported net income and find no discontinuity. However, when the sample selection criteria that observations must have four consecutive quarters of observations and beginning of year market capitalisation, used by Jacob and and Jorgensen (2007) are imposed, a break in the distribution at zero is induced. Similarly, when BMN select firms with positive sales, positive assets and beginning of year market capitalisation, they find that more observations in the intervals immediately to the left of zero than to the right of zero are eliminated.

Effects of taxation

DE (2005) and Durtschi and Easton (2009) focus on the effect that deflation and sample selection have on earnings distributions. In contrast BMN suggest that even in the absence of earnings management asymmetric recognition of taxation for profit and for loss firms causes a discontinuity in the earnings distribution. This has implications for using the average number of observations in the bins adjoining the discontinuity as a reference distribution of non- managed earnings because taxes that are recognised asymmetrically in profit and loss firms will in themselves cause a discontinuity in the distribution of earnings after tax in the vicinity of zero. Christodoulou and Mcleay (2009) report that the asymmetric distribution of bounded earnings around zero may be caused by the effect of taxation on earnings. The effect of adding back taxation to earnings levels and changes distributions is an empirical issue.

Current income is taxable immediately and is recognised for accounting purposes as an expense in the period that profit is reported. In contrast the taxation effect of accounting losses is only recognised in the period in which these arise if it is probable that future taxable profit will be available against which the unused tax credits can be deducted IAS 12 Income Taxes (International Accounting Standards Board, 2008). The practical effect of this accounting treatment is that taxation on profits is always recognised but the tax saving on losses is not necessarily recognised. As a result, effective tax rates are higher for profit than for loss firms and this has the effect of drawing profit observations towards zero. This contributes to the discontinuity at zero but as BMN note, the asymmetry in taxation recognition cannot change small losses into small profits. Unlike the asymmetry caused by taxation BMN find that depreciation and interest expense and interest and non-operating income do not appear to affect earnings distributions around zero.

3.4 Methodology and results

The purpose of this chapter is to establish whether there is evidence of earnings management in firms listed on the JSE using histograms and BD's statistical test for a difference in the number of observations to the left and right of zero profits and changes benchmarks.

The following hypotheses are tested:

H1: Earnings are managed to avoid reporting losses.

H2: Earnings are managed to avoid reporting earnings decreases.

To take account of DE's (2005) concerns about the deflator used by BD and the effect that taxes may have on the frequency distribution raised by BMN, earnings levels and changes before and after taxation will be deflated alternately by the number of shares in issue at the end of the reporting period (number of shares), lagged market value of equity and total assets. The data used in this thesis is described in Chapter 1.4. As mentioned by DE (2005) sample selection bias may be present where market value of equity is the deflator, however this bias is not relevant where total assets and number of shares in issue are the deflators because this information is available from the company financial statements listed in the McGregor's data base.

Degeorge et al (1999), Dechow et al. (2003) and DE (2005) analyse the distribution of EPS. In this thesis, net income and net income changes before and after tax are deflated by the number of shares instead of using EPS. There are primarily two reasons for this decision. Firstly, when EPS is calculated, the profits attributable to non-controlling interest and profits attributable to preference shares are deducted from the current period's profits and the remaining figure is divided by the weighted average number of shares in issue in the reporting period. Therefore, if EPS is used, the results are not comparable to prior research which explores net income after tax deflated by market value of equity or total assets because the same numerator is not being compared. In EPS the numerator is profit attributable to controlling shareholders, while in the other distributions the numerator is the total income of the entity after tax. Secondly, this thesis will be comparing the distribution of profits before and after tax. If EPS is selected as the earnings metric taxation cannot be added back to EPS without first calculating tax per ordinary share. The result of this decision is that the distribution of earnings levels and changes divided by the number of shares in issue is not directly comparable to previous studies that report the results of analysing the distribution of EPS.

Table 1 contains the definitions of variables used to describe the deflated earnings levels and changes distributions used in this thesis.

The bindwidths used in prior research to construct histograms in prior research are presented in Table 2.[9] The results of the BD statistical tests for differences between the actual number of observations in the intervals at zero and the expected number of observations are presented in Table 3. Where the deflator used in this research is the number of shares in issue at the end of the reporting period the binwidth is not directly comparable with the prior research quoted which all analyse the distribution of EPS.

Table 3 Panel A shows the number of observations to the left and right of zero when earnings levels before and after tax, scaled by number of shares, lagged market value of equity and lagged total assets are analysed for discontinuities using histograms and binwidths used in prior research. Panel B reports the number of observations to the left and right of zero for earnings changes between t and t_{-1} deflated by market value and total assets at t_{-2} and the number of shares at the end of each reporting period. The BD test statistic reported is the difference between the actual number of observations in an interval and the expected number of observations in the interval divided by the standard deviation of the difference. In the presence of no earnings management these standardised differences will be distributed approximately Normal with mean 0 and standard deviation 1 (BD: 103). Because the distribution is not expected to be smooth around zero in the presence of earnings management, the standardised differences for the interval immediately to the left of zero and immediately to the right of zero are affected by earnings management and are not independent of each other.

[9] The term "binwidths" is used to describe preselected binwidths used to construct histograms whereas the term "bandwidths" is the bootstrapped Lahr (2014) bandwidth derived from the data itself.

Table 1 Variable definitions

Variable	Description
NIAT t/No of shares $_{t}$	Net income after tax at time t deflated by number of shares in issue at time t
NIAT $_{t}$/Market value of shares at $_{t}$ $_{-1}$	Net income after tax at time t deflated by market value of equity at time t-1
NIAT $_{t}$/Total assets $_{t-1}$	Net income after tax at time t deflated by total assets at time t-1
NIBT $_{t}$/No of shares $_{t}$	Net income before tax at time t deflated by number of shares in issue at time t
NIBT t/Market value of shares t -1	Net income before tax at time t deflated by market value of equity at time t-1
NIBT t/ Total assets t-1	Net income before tax at time t deflated by total assets at time t-1
(NIAT $_{t}$/No of shares $_{t)}$ -(NIAT $_{t-1}$/No of shares $_{t-1)}$	Net income after tax at time t deflated by number of shares in issue at time t minus net income after tax at time t-1 deflated by number of shares in issue at time t-1
(NIAT $_{t}$-NIAT $_{t-1}$)/ Market value of shares $_{t-2}$	Net income after tax at time t minus net income after tax at time t-1 deflated by market value of equity at time t-2
(NIAT $_{t}$-NIAT $_{t-1}$)/ Total assets $_{t-2}$	Net income after tax at time t minus net income after tax at time t-1 deflated by total assets at time t-2
(NIBT $_{t)}$/No of shares $_{t)}$-(NIBT $_{t-1}$)/ No of shares $_{t-1)}$	Net income before tax at time t deflated by number of shares in issue at time t minus net income before tax at time t-1 deflated by number of shares in issue at time t-1
(NIBT $_{t}$-NIBT $_{t-1}$)/ Market value of shares $_{t-2}$	Net income before tax at time t minus net income before tax at time t-1 deflated by market value of equity at time t-2
(NIBT $_{t}$-NIBT $_{t-1}$)/ Total assets $_{t-2}$	Net income before tax at time t minus net income before tax at time t-1 deflated by total assets at time t-2

Table 2 Binwidths used to draw histograms in this and prior research

Definition of earnings distribution	Earnings levels/earnings changes	Binwidth used in this research	Prior research
NIAT t/No of shares $_t$	Earnings levels	0.01	Degeorge at al (1999) 0.01c
			0.02 Singaporean cents and 1 Taiwanese baht Charoenwong and Jiraporn
	Earnings changes		0.02 Singaporean cents and 1 Taiwanese baht Charoenwong and Jiraporn
NIAT $_t$/Market value of shares at $_{t\ -1}$	Earning levels	0.02	PPR 0.02
			BD 0.005
	Earnings changes	0.01	PPR 0.01
			BD 0.0025
NIAT $_t$/Total assets $_{t-1}$	Earnings levels	0.01	Holland and Ramsay (2003) and Coulton et al. (2005) 0.01
			0.03 Ben Amar and Abaoub
	Earnings changes	0.005	Holland and Ramsay (2003) 0.005
			Coulton et al. (2005) 0.001
			0.01 Ben Amar and Abaoub
NIBT $_t$/No of shares $_t$	Earnings changes	0.005	Holland and Ramsay (2003) 0.005
	Earnings levels	0.01	
NIBT t/Market value of shares t -1	Earnings changes	0.01	
	Earnings levels	0.02	BMN 0.005

	Earnings changes	0.01	
NIBT t/ Total assets t-1	Earnings levels	0.01	
	Earnings changes	0.005	

Table 3 Results of BD analysis at zero for earnings levels and changes

Panel A Earnings levels observations around zero

Earnings levels	Intervals	Actual number of observations	Expected number of observations	Difference	BD statistic	p-value
$NIAT_t$/no of shares $_t$	0,0.01	61	38	23	2.362398668	0.0091***
	-0.01,0	41	43	-2	-0.22205681	0.5879
NIATt/Market value of shares t -1	0,0.02	80	51	29	2.539866961	0.0055***
	-0.02,0	36	49	-13	-1.4293665	0.9236
NIATt/Total assets t-1	0,0.01	30	36	-6	-0.74587556	0.7721
	-0.01,0	30	21	9	1.347222379	0.0889*
NIBTt/No of shares t	0,0.01	66	32	34	3.497802503	0.0002***
	-0.01,0	41	45	-4	-0.38392385	0.6495
NIBTt/Market value of shares t -1	0,0.02	71	38	33	3.277461352	0.0005***
	-0.02,0	30	43	-13	-1.4854586	0.9313
NIBTt/ Total assets t-1	0,0.01	34	26	8	1.112014952	0.1331
	-0.01,0	24	23	1	0.146894003	0.4416

Panel B Earnings changes observations around zero						
Earnings changes	**Intervals**	**Actual number of observations**	**Expected number of observations**	**Difference**	**BD statistic**	**p-value**
($NIAT_t$/No of shares $_{t)}$ - ($NIAT_{t-1}$/No of shares $_{t-1)}$	0,0.01	71	45	26	2.521579348	0.0058***
	-0.01,0	50	56	-6	-0.54596779	0.7075
($NIAT_t$-$NIAT_{t-1}$)/ Market value of shares $_{t-2}$	0,0.01	120	100	20	1.404865589	0.0800*
	-0.01,0	87	82	5	0.396714562	0.3458
($NIAT_t$-$NIAT_{t-1}$)/ Total assets $_{t-2}$	0,0.005	51	58	-7	-0.68327345	0.7528
	-0.005,0	49	40	9	0.968877059	0.1663
($NIBT_{t)}$/No of shares $_{t)}$- ($NIBT_{t-1}$)/ No of shares $_{t-1)}$	0,0.01	68	38	30	2.978867932	0.0014***
	-0.01,0	41	51	-10	-1.01093002	0.844
($NIBT_t$-$NIBT_{t-1}$)/ Market value of shares $_{t-2}$	0,0.01	98	86	12	0.915651351	0.1799
	-0.01,0	74	66	8	0.738533715	0.2301
($NIBT_t$-$NIBT_{t-1}$)/ Total assets $_{t-2}$	0,0.005	46	40	6	0.65682993	0.2556
	-0.005,0	39	37	2	0.291531254	0.3853

The BD statistic, as corrected by BMN, is calculated as follows;

$Npi\,(1 - p_i) + (1/4)\,N\,(pi_{-1} + p_{i+1})\,(2 - p_{i-1} - p_{i+1})$.

***the BD test statistic is significant at the p <.0001 significance level,** at the < .05 significance level, * at the <0.10 significance level

Table 3 Panel A and B reveal a small number of observations in the intervals to the left and right of zero in earnings levels and changes across all the deflators. There are significantly more observations than expected in the interval to the right of zero in the distributions of earnings levels after taxation deflated by the number of shares and market value of equity: however, the difference between the observed and expected number of observations to the left of zero is not significant. Deflating by total assets in the South African environment appears to distort the distribution of earnings levels after taxation; there are insignificantly fewer than the expected number of observations in the interval to the right of zero and significantly more observations in the interval to the left of zero. Adding back taxation to earnings levels does not change the pattern when scaling by number of shares and market value of equity. The distribution of net income before tax scaled by total assets shows insignificantly more than the expected number of observations both to the left and right of zero.

Only the distribution of earnings changes scaled by number of shares shows significantly more observations to the right of zero but insignificantly fewer than expected observations to the left of zero. Deflating earnings changes before and after taxation by market value of equity induces insignificantly more than the expected number of observations to the left of zero. There are still insignificantly fewer than the expected number of observations to the right of zero when earnings changes after tax are analysed: adding back taxation to this distribution causes insignificantly fewer observations on both sides of zero.

When BD analyse the distribution of earnings deflated by market value of equity, they report significantly more (less) than the expected number of observations to the right (left) of zero. The standardised difference in the interval immediately to the left of zero is -13.16 and the standardised difference for the interval immediately to the right of zero is 8.92 which means that there were significantly fewer observations than expected in the interval immediately to the left of zero and significantly more than the expected observations than anticipated in the interval immediately to the right of zero. This result is interpreted as evidence that firms with small losses have manipulated small losses into small gains. Where earnings change distributions are analysed BD report a standardised difference for the interval immediately to the left of zero of -8.0 and the difference for the interval to the right of zero earnings changes as 5.88. BD's sample

of firms is 64 466 where earnings changes are analysed and 75 999 where earnings levels are analysed and their research period extends between 1 977 and 1 994.

The result of the standardised differences in the distributions of earnings levels and changes reported in Table 3 Panel A and B is not directly comparable to BD's results as intervals larger than those used by BD, as suggested by Phillips et al (2003), were used. Analysing the distribution of earnings levels scaled by market value of equity Phillips et al (2003) identify 1 794 suspected earnings management firm observations whose earnings equal 0.02 of market value of equity, and 991 non- earnings management firms with small losses equal to -0.02 of market value of equity. The equivalent number when earnings changes are scaled by market value of equity using a bandwidth of 0.01 is 2 495 suspected earnings management and 1 644 non-earnings management firms. Phillips et al (2003) do not report standardised differences in their results. Degeorge et al (1999) adopt a somewhat different approach and analyse earnings per share and changes in earnings per share and report that there appears to be a deficit of observations in the negative region and a considerable jump in observations between 0 and 1c. A similar pattern is reported where the distribution of quarterly changes in EPS is examined. In an emerging economy Charoenwong and Jiraporn (2009) examine discontinuities in earnings levels and changes deflated by number of shares in issue in Singapore and Thailand and use the binwidth calculation recommended by Silverman (1986) and Scott (1992).They report a significant increase in observations from bins -1 to 0 in both economies in the earnings levels distributions but no evidence of a significant discontinuity in earnings changes distributions in either Singapore or Thailand.

Holland and Ramsay (2003) fail to locate discontinuities in Australian earnings data deflated by market value of equity and consequently scale by total assets, for the period 1998 -2000. Their sample consists of 5 030 observations. They report significant discontinuities in earnings levels: the standardised difference for the interval immediately to the left of zero is -2.83 and that for the interval immediately to the right of zero is 3.85. The evidence in the distribution of earnings changes is weaker, the standardised difference for the interval immediately to the left of zero is -2.35 (significant at the 1% level) but that to the right of zero is 1.68 which is only significant at the 5% level. Based on Australian data for the period 1993-2002 and a sample of 6 436 firm years Coulton et al (2005) identify 260 firms that just report small profits and 157 firms that

report small losses. Ben Amar and Abaoub (2010) analyse earnings levels and changes distributions deflated by total assets in Tunisia, an emerging economy, using binwidths equal to 0.03 (0.01) for earnings levels (changes) and report fewer than the expected number of observations to the left of zero.

To examine their hypothesis that taxation exacerbates discontinuities in earnings distributions, BMN analyse before tax earnings levels distributions. They find a significant difference between the expected and observed number of observation to the left and right of zero, but the discontinuity is not as pronounced as that identified in the after tax distribution. For the period 1976-2001 and based on 114 177 firm-year observations they report a positive standardised difference of 6.02 for the interval to the right of zero in the pre-tax distribution and 9.07 for the comparable interval in the after tax distribution.

3.5 Conclusion

The results of the BD test for standardised differences between observations in the intervals to the left and right of zero applied to earnings data from firms listed on the JSE does not show the discontinuities found in research on data in developed economies such as America and Australia data or in emerging economies such as Singapore, Thailand or Tunisia. This thesis identifies only a very small number of suspected EM firms in South African data and no shortfall of observations in the interval below zero. Deflating by alternate scalers or adjusting for taxation does not have an effect on these results. The small South African sample size may be one explanation for this result. A further explanation may be that researcher selected binwidths used in more developed environments are not appropriate for small sample sizes or in emerging markets. To overcome the binwidth problem identified in this chapter of the thesis, kernel density estimation and the bootstrapping test advocated by (Lahr, 2014) will be used in Chapter 4 to identify a suitable bandwidth that can be used to construct a reference distribution of no earnings management.

CHAPTER 4 KERNEL DENSITY ESTIMATION TO IDENTIFY SUSPECTED EARNINGS MANAGEMENT FIRMS ON THE JSE

The objective of this thesis is to explore whether earnings management is prevalent in firms listed on the JSE so that future research can develop a model that can identify manipulating firms in South Africa and emerging economies. No evidence of discontinuities in earnings levels and changes distributions was found using South African data, traditional methodologies and binwidths.

In this chapter kernel density estimation, Lahr (2014), is applied as an alternate to constructing histograms to identify discontinuities in earnings distributions. This method uses a bootstrap test to endogenise the selection of an appropriate bandwidth[10] to draw a reference distribution of no earnings management. This reference distribution, the kernel density estimate is fitted to the empirical data and discontinuities are identified at the points of maximum difference. There are two primary advantages of this method. Firstly binwidth selection is not an option; appropriate intervals are generated from the data itself and are verified by a bootstrapping procedure. Secondly this method identifies discontinuities in the entire distribution and does not limit the search to the intervals around zero. This is an important issue because Donelson et al (2013) prove that manipulation is not limited to the first interval to the right of zero and Badertscher et al (2009) show that downwards earnings management explains the deficit in the expected number of observations to the right of suspected earnings management bands. Indeed, in levels analysis, in this thesis, manipulation is found to occur from bins negative one and two to bins one through to three to the right of zero. In earnings changes distributions there is a decrease in observations in bins zero through to negative three and an increase in observations in bins positive one, two and four. The purpose of this chapter is to establish whether there is evidence of earnings management in firms listed on the JSE by examining earnings distributions for discontinuities using kernel density estimation.

[10] In this thesis the terminology binwidth is used to describe researcher selected binwidths used in BD's approach to analysing earnings distributions. Bandwidths are used to describe the intervals derived for the data itself as recommended in Lahr (2014).

This chapter proceeds as follows. Section one describes kernel density estimation, the research methodology is described in section 2, the results are presented in section 3 and the chapter is concluded in section 4.

4.1 Kernel Density Estimation

Despite the fact that the BD methodology has been used by many studies, Lahr (2014) and Bollen and Pool (2009) observe that the main disadvantages of the BD methodology are its assumption that manipulation occurs in the vicinity of zero earnings levels and changes, its inability to detect the exact location of a discontinuity and that the use of preselected bandwidths may not be plausible. The BD test statistic is also questioned as it assumes that the manipulation free reference distribution is smooth and that the shape of the underlying reference distribution is approximately linear in the vicinity of the discontinuity which Lahr (2014) suggests is overly restrictive when applied to earnings distributions which may be multimodal and have a skewed density. Lahr (2014), therefore, suggests using bootstrap kernel density estimation to test for earnings management. The objective of this approach is to reduce researchers' subjectivity in selecting bandwidths and to propose a methodology that derives the manipulation free reference distribution from the data itself.

Instead of using BD's assumption of linearity around zero, in the distribution of fund returns, as a reference distribution of hedge fund returns without manipulation, Bollen & Pool (2009) fit a reference distribution to the whole data distribution using nonparametric kernel densities using a Gaussian kernel and preselected bandwidths. Because Bollen & Poole's (op cit) approach does not overcome the problem of preselected bandwidths, Lahr (op cit)[11] advocates a bootstrap procedure to endogenise the selection of a suitable bandwidth that will result in a reference kernel density that cannot be distinguished from the empirical distribution of earnings and earnings changes. The resulting density estimate replaces BD's reference distribution, the number of observations in adjacent bins, with a nonparametric reference distribution and substitutes researcher selected binwidths with bandwidths that are constructed from the empirical data. Once the reference distribution, kernel density estimate, is fitted to the empirical data, a

[11] The Lahr procedure will be referred to as bootstrap kernel density estimation hereafter, bootstrap (KDE) or (KDE).

local test for a discontinuity is performed by comparing the expected number of observations from the kernel density estimates to the actual data. In other words, Lahr (2014) bases the construction of the reference distribution of earnings prior to manipulation on all the empirical earnings levels and changes observations and then analyses the entire distribution for discontinuities instead of only establishing discontinuities at zero earnings levels and changes. The Lahr (2014) methodology thus acknowledges that transaction and prospect theory can explain both upwards and downwards earnings management because managers may be incentivised to manage earnings either upwards or downwards to meet contracting boundaries and that discontinuities may occur at other points of maximum difference between the empirical and the kernel density distributions. Primarily, the strength of kernel density estimation (KDE) lies in the fact that the construction of the reference distribution from the empirical data reduces the researcher's freedom to select bandwidths and constructs a reference distribution that is not distinguishable from the data itself, is able to identify the precise location of discontinuities in the earnings distribution and offers a procedure to test for the existence of a local discontinuity.

The Lahr (2014) test for earnings management using kernel density estimation

The primary objective underpinning the bootstrap KDE (Lahr, 2014) is to ensure that the kernel density estimate generally fits the empirical earnings distribution. To achieve this Lahr (2014) uses bootstrapping (resampling from the original data) to ensure that the kernel density estimate meets pre-constructed confidence bands. These confidence bands are then plotted around the empirical earnings distribution. The distance between the constructed confidence bands and the KDE can be adjusted to yield a kernel density estimate (the reference distribution) that matches the confidence level selected by the researcher. This procedure replaces researcher selected binwidths, that may be appropriate for the earnings data, with a bandwidth that is appropriate at a pre-set confidence level. In contrast to BD who test for a significant discontinuity in the histogram of scaled earnings and earnings changes at zero, discontinuities can be identified at the location of the maximum difference between the empirical earnings data and the kernel density estimate.

The following is the test procedure to identify evidence of earnings management in distributions of earnings levels and changes as presented in Lahr (2014).

1. As a starting point to construct the reference kernel an initial kernel bandwidth *h* is calculated for the data using Silverman's (1986) rule of thumb.
2. Next a kernel function, for example, the Epanechnikov, Gaussian or uniform kernel is selected to construct a kernel density estimate. The maximum difference between the empirical density distribution and the constructed kernel (the integrated kernel density) is calculated and denoted as *d max.*
3. Then the bootstrapping procedure is used to construct a confidence interval for the empirical distribution at *d max*.
4. If the integrated kernel density at *d max* is outside the constructed confidence interval, the bandwidth *h* is reduced and the procedure starts again from step 2. If the empirical cumulative distribution function (ECDF) is located inside the confidence interval, *h* must be increased. Step 2 is repeated until the ECDF meets the confidence band.
5. Finally a binomial test or z-test is used to determine the discontinuity's statistical significance[12] by testing the expected number of observations within the intervals $(d_{max} - h, d_{max}]$ and $(d_{max}, d_{max} + h]$ simultaneously against the observed number of observations.

Explaining the steps in the test procedure

Estimating the kernel bandwidth

The choice of bandwidth (*h)* is the first and most crucial step in the process to construct the reference distribution using kernel density estimation. A small h results in an estimator with a small bias and large variance, but a large *h* causes lower variance that conceals discontinuities that may be present in the data (Lahr, 2014).

Because the South African earnings data is skewed and shows excess kurtosis, this thesis will follow the approach used by Lahr (2014) and apply a variation of Silverman (1986)'s rule of thumb to calculate the bandwidth:

[12] $(d_{max} - h, d_{max}]$ represents the expected number of observations to the left of the identified discontinuity; $(d_{max}, d_{max} + h]$ the expected number of observations to the right of the discontinuity.

h opt = 0.9σn-1/5 where

$$\sigma = \min\left(\sqrt{\hat{\sigma}_X},\ \frac{Qx}{1.349}\right),$$

w(Jacob and and Jorgensen, 2007)here $\hat{\sigma}_X$ is the sample standard deviation and *Qx* is the sample interquartile range.

Choosing a kernel function and constructing a kernel density estimate

Apart from the selection of the bandwidth, the only other degree of freedom allowed to the researcher is the kernel function used to construct the reference distribution. Lahr (op cit) demonstrates that it is the selection of the correct bandwidth for the construction of the kernel, rather than the kernel function which is a source of errors in significance tests.

Lahr (2014) uses three kernel functions, the Epanechnikov kernel, Gaussian kernel and uniform kernel to construct the reference density function. The Gaussian kernel, applied by Bollen and Pool (2009) takes all the sample observations into account, whereas both the Epanechnikov and uniform kernels have bounded support and consider only observations within the interval + *h* from the point of the discontinuity (Lahr op cit). When the bandwidth is selected using rule of thumb, as compared to bootstrap KDE in conjunction with a Gaussian kernel, as in Bollen and Pool (2009), bandwidths are three to four times as big for rule of thumb kernels, which leads to overstated test statistics (Lahr, 2014). Lahr (2014) reports that bandwidth selection using the rule of thumb method suggested by Silverman (1986) also results in inflated test statistics for the Epanechnikov and uniform kernels but is less severe and attributes this to the fact that Gaussian kernels place weight on all observations and not only on the observations around in the intervals immediately surrounding the discontinuity. Therefore Lahr (2014) suggests that when a researcher is searching for discontinuities in the neighbourhood of some point, the uniform and Epanechnikov kernels are more appropriate.[13]

[13](Christodoulou and Mcleay, 2009) limit asymmetry in earnings variables by scaling earnings by the magnitude of its own components and construct a reference distribution of no earnings management using kernel density estimation and a generalised bounded distributional function.

The bootstrapping procedure to estimate bandwidths

The BD methodology uses the average number of observations in the two intervals adjacent to the discontinuity at zero as a reference distribution of no earnings management whereas Bollen and Pool (2009) construct a Gaussian kernel as a reference distribution based on preselected bandwidths using Spearman's (1986) rule of thumb. Bollen and Pool (2009) use a smoothed bootstrap test as part of a discontinuity test after assuming a reference distribution. This differs (Bollen and Pool, 2009)from Lahr (2014) who uses bootstrapping to construct a credible reference distribution. The objective of Lahr's (2014) research is to use kernel density estimation to construct the bandwidth needed for the kernel density estimation endogenously from the data itself using a bootstrap test rather than to use a bandwidth that is assumed to be correct. Bootstrapping is used to test whether the unobserved earnings distribution may have generated the kernel density function which represents the earnings distribution prior to the earnings management process. In other words, bootstrapping validates whether the kernel density function is a plausible reference distribution that represents the empirical data.

To apply the Lahr bootstrapping procedure, a large number of samples with size equal to the original sample are drawn with replacement from the data. Confidence bands for the empirical distribution at a predetermined confidence level are constructed from these samples. It is questionable that the density estimate derived for the original data describes the underlying earnings distribution if the integrated kernel density estimate for some bandwidth lies outside the confidence interval. The bandwidth must be adjusted until the integrated kernel density estimate exactly meets the confidence interval. If the point of maximum difference between the integrated kernel density and the empirical distribution is different from the one at which the procedure started, the estimation process is repeated at the new point of maximum difference. The final bandwidth used will be the smallest bandwidth obtained from iterations at all points of maximum difference (Lahr, 2014).

Testing the discontinuity

The principle underpinning KDE is that a discontinuity in a distribution is located at the point of maximum difference between the integrated density estimate and the empirical cumulative earnings distribution function. The expected number of observations under the null hypothesis of

no earnings management is represented by the kernel density estimate: this number is compared to the actual number of observations in the empirical cumulative earnings function on both sides of the discontinuity. Because the number of observations that fall within a specific interval follows a binomial distribution, Lahr (2014) uses the following test statistic:

$$z = \frac{p - \hat{p}}{\sqrt{\hat{p}(1 - \hat{p})}}\sqrt{N},$$

In the above equation the empirical probability p is the actual number of observations in the interval divided by sample size *N*. For small *pN*, the binomial distribution should be used instead of the normal distribution.

The expected number of observations in terms of the integrated density estimate $\hat{F}h$ over the interval of interest is:

$$\hat{p} = \hat{F}_h(d_{\max}) - \hat{F}_h(d_{\max} - h)$$

for the interval to the left of the discontinuity and

$$\hat{p} = \hat{F}_h(d_{\max} + h) - \hat{F}_h(d_{\max})$$

for the interval to the right of the discontinuity.

Lahr (2014) adjusts the test's rejection region using the Bonferroni correction because two hypotheses are tested simultaneously. If the empirical density shows a positive jump at the discontinuity, the test statistic is negative to the left and positive to the right of the kink.

4.2 Research Methodology

The purpose of this chapter is to establish whether there is evidence of earnings management in firms listed on the JSE by examining earnings distributions for discontinuities using kernel density estimation. To answer the research problem the frequency distributions of earnings levels and changes, before and after taxation, deflated by number of shares, lagged market value of

equity and lagged total assets will be explored using Lahr (2014) bootstrap kernel density estimation.[14]

Data

This research is based on all the available observations of all firms listed on the Johannesburg Securities Exchange (JSE) for the years 1998-2010 (2631 observations).The information required was extracted from the McGregor BFA data base. The year 1998 was chosen as the starting point in the distribution because IAS 12 Income Taxes became effective for all financial years beginning on or after 1 January 1998. Where scaling is used based on changes in net market value, total assets or number of shares in issue, the sample will only include the years 1999-2010 because both the numerator and denominator require prior period observations. In line with BD banks, financial institutions and regulated industries are eliminated as incentives to use earnings management techniques in these sectors may differ. To deal with outliers, the upper and lower 1% of observations is eliminated. This results in a sample of 108 firms in 1998 which slowly increases to 211 firms in 2010. The maximum sample size consists of 2024 firm years. Because reporting in terms of IASB standards became mandatory in South Africa in 2005 and because of the global financial crises that began in 2007/2008 the Chow test was used to explore whether there was a structural break in the distribution of net income after tax regressed on net assets, for the period 2005 to 2010 and for the period 1998-2004. The results fail to find a structural break, $p>0.8066$.

Method

Because significant differences between deflators may contribute to a discontinuity in the distribution of deflated earnings levels and changes the research commences by comparing deflators between loss and profit firms to establish whether these are significantly different from each other. The results of this comparison are presented in Table 4. Next undeflated net income levels are analysed for discontinuities using KDE. Figure 1.1 in Appendix A to this chapter of the thesis is a graph showing the empirical distribution of undeflated earnings and earnings changes and the bootstrapped kernel density estimate. The location of discontinuities in the

[14] The terms bootstrap kernel density estimation and kernel density estimation are used interchangeably in this report and are often described as KDE

undeflated earnings levels and changes distributions are presented in Table 5. Thereafter KDE is used to identify discontinuities in earnings levels and changes distributions before and after tax deflated by number of shares issued, market value of equity and total assets. KDE is applied using the procedure described in section 4.1. An Epanechnikov kernel is used because Lahr (2014) finds that the Epanechnikov kernel is better suited to analysing abnormally distributed data whereas a Gaussian kernel is more appropriate for normally distributed data. The Epanechnikov kernel has bounded support which is more appropriate for abnormally distributed data than the Gaussian kernel which takes all the observations in the data into account. Lahr (2014) reports inflated test statistics when smoothing abnormal distributions with a Gaussian kernel. The KDE graphs are presented in Appendix A of this chapter and the location of discontinuities and associated bootstrapped binwidths in the distributions of deflated net income and changes before and after taxation are presented in Table 6 and 7 respectively.

In this research a bootstrap KDE Lahr (2014) is used to construct 95% confidence intervals to construct the kernel density reference distribution which estimation which will be compared to empirical distributions of scaled earnings and earnings changes. The kernel bandwidth h for the bootstrap KDE is estimated by replicating Lahr's procedure described above using 1000 bootstrap samples drawn from the original data and a two-sided confidence interval of 0.05 when fitting the bandwidth to the data. The "asciker" and "bsciker" programs (for asymptotic and bootstrap confidence intervals respectively) are available in Stata statistical software and are used in these estimations.

4.3 Results

Comparison deflators between loss and profit firms

Table 4 shows the results of comparing deflators between profit and loss observations. Means are compared using a clustered t-test because the data includes numerous observations from the same firms; medians are compared using the Sommers D' test which is the non-parametric equivalent of the clustered t-test for abnormally distributed data. Both the mean and median market value of equity and total assets are significantly different from each other which indicates that it may be inappropriate to use these deflators when testing the distribution of earnings for a discontinuity. However, the number of shares in issue is not significantly different between profit

and loss firms and this justifies the use of this metric as a deflator. This finding differs from that reported by BMN when analysing data from companies listed on the NYSE, who find that number of shares issued across the entire distribution of undeflated earnings is systematically larger for loss observations and declines in the region around zero earnings and that market value and assets are relatively symmetric around zero. Concentrated ownership in firms listed on the JSE may explain the insignificant difference in number of shares between profit and loss companies.

Table 4 Comparison deflators across profit and loss firms

	Profit firms			Loss firms			clustered t-test		Somers'D t-test	
	No	Mean	Median	No	Mean	Median	t-stat	p-value	t-stat	p-value
Number of shares	1708	270771	144983	318	264982.4	143516.5	0.15	0.885	-0.91	0.363
Market value of equity	1708	5645662	586806	318	1421064	64052.92	3.32	0.001	9.45	0
Total Assets	1708	4387993	637919.5	318	1247651	158970.5	3.8	0	7.71	0

Identifying discontinuities in the distributions of undeflated earnings levels and changes

The distribution of undeflated earnings levels is tested for a discontinuity using kernel density estimation to establish whether a discontinuity exists between empirical data and the reference kernel density estimate. The discontinuity between undeflated earnings and the bootstrapped kernel density estimate is displayed graphically in the Appendix Figure 1.1 and the location of discontinuities in both undeflated earnings levels and changes distributions using bootstrapped KDE bandwidths is presented in Table 5[15]. In Figure 1.1 an irregularity in the distribution around zero is evident. In the NIAT distribution referred to Table 5 in the interval 0, 29429.92 to the

[15] The intervals in the distribution of earnings levels and changes to the right of zero which display an excess of empirical observations over the expected KDE number of observations (suspected EM firms) are shaded in dark grey while those to the left of zero, where fewer than the expected number of observations are observed (non-EM firms), are shaded in lighter grey. Intervals to the right of the suspected earnings managed firms that display additional non-EM firms (evidence that some firms may have manipulated earnings downwards) are unshaded.

right of zero, there are significantly more observations than expected, 575 observations in the empirical data, while the reference kernel density estimate expects 284 observations. There are significantly fewer than the expected number of observations in the three intervals to the left of zero. In the first interval -29448.92,-19 the empirical number of observations is 190, while the kernel density estimate expects 284 observations; in the second interval -58878.84,-29448.92 there are 39 actual observations as compared to 203 expected observations and in the third interval to the left of zero -88308.75,-58878.84 there are 16 observations as opposed to the kernel density expectation of 61. Lahr (2010) in data deflated by market value of equity reports that evidence of no earnings management extends to the three intervals to the left of zero. These results are consistent with Lahr (2014) who reports a significant discontinuity in the distribution of unscaled earnings and contradicts DE (2005) who report an absence of discontinuity when analysing the distribution of undeflated earnings using interval widths of $100 000.

In addition to the identified jump in the distribution around zero there are fewer observations than expected in the second interval to the right of zero 29429.92, 58859.84, that is 210 empirical observations as compared to 271 expected in the reference KDE. The shortfall of observations in the interval to the right of the suspected EM band can be interpreted as evidence that firms may have managed earnings downwards as demonstrated by (Badertscher et al, 2009). The discovered shortfall in the number of observations to the right of the discontinuity is significant as this suggests that the suspected EM band could consist of companies that have genuinely earned profits and companies whose profits have been manipulated upwards and downwards. This second break in the distribution of earnings is not wholly unexpected as BD and Degeorge et al (1999) report additional discontinuities in the distribution of earnings to those identified at zero and Donelson et al (2013) who present evidence that earnings management activity extends into the third and fourth intervals to the right of zero.

Table 5 Discontinuities identified using kernel density estimation: undeflated data

	Suspected earnings management firms: bandwidths to right of zero								Non-earnings management firms									
									Bandwidths to left of zero						Bandwidths to the right of zero			
	First interval		Second interval		Third Interval		Fourth Interval		First interval		Second interval		Third interval		Second interval		Third interval	
	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE
LEVELS																		
NIAT	0, 29429.92								-29448.92, -19		-58878.84, -29448.92		-88308.75, -58878.84		29429.92, 58859.84			
	575	284							190	284	39	203	16	61	210	271		
NIBT	0, 42140.16								-42169.16, -29		-84309.33, -42169.16		-126449.5, -84309.33		42140.16, 84280.33		84280.33, 126420.5	
	595	288							190	288	29	204	19	59	218	275	123	150
CHANGE																		
$NIAT_t - NIAT_{t-2}$	0, 7871.015										-15744.03, -7873.015		-23615.04, -15744.03		7871.015, 15742.03			
	307	212									77	163	41	72	149	197		
$NIBT_t - NIBT_{t-2}$	0, 9464.692										-18982.38, -9517.692		-28447.08, -18982.38		9464.692, 18929.38			
	298	208									67	158	44	67	38	197		

This table presents discontinuities in unscaled earnings levels and changes distributions identified using kernel density estimation. Bandwidth estimates using the bootstrapping test are presented together with the empirical number of observations and the estimated number of observations predicted by the reference distribution of pre-managed earnings drawn using these bandwidths.

Turning to undeflated net income before taxation (NIBT) (Table 5), the same distribution pattern exists: there are more than the expected numbers of observations in the bandwidth to the right of zero (actual 595 observations compared to expected 288 observations) and fewer than the expected number of observations in the three intervals to the left of zero. In total there are 238 non-EM observations compared to the expected 548 observations. However, in the distribution of NIBT there is evidence of downwards earnings management in both the second and third intervals to the right of the suspected earnings management interval. The bootstrapped KDE bandwidth for the NIBT distribution is ZAR 42140.16 million. The increased bandwidth is attributable to the fact that earnings before taxation is larger than earnings after taxation.

When changes in the distribution of both net income before and after taxation are analysed (Table 5), there are still more than the expected number of observations in the first interval to the right of zero, but the deficit in the expected number of observations only appears in the second interval to the left of zero. Evidence of downwards earnings management still exists in the interval to the right of the suspected EM band. The KDE bandwidth for the distribution in changes in income after tax is ZAR 7871.015m as compared to ZAR 9464.692m for that of changes in net income before tax.

Distributions of deflated earnings levels (earnings management to report positive profits)

In this section, the distribution of earnings levels after and before taxation, deflated by number of shares in issue at the end of the reporting period, lagged market value of equity and total assets, are analysed using KDE to identify discontinuities. Table 6 depicts the results of the KDE analysis identifying the bootstrapped bandwidths, the intervals in which discontinuities have been identified and the location of the discontinuities in before and after tax distributions respectively. Graphs displaying KDE discontinuities and the bandwidths where significant differences between the empirical distributions and the kernel density estimate are identified are presented in Figures 1.2-1.13 in Appendix A.

When deflating net income after tax by number of shares (see Table 6) the location of the discontinuities in the distribution are consistent with those revealed where undeflated earnings

were analysed as reported in Table 5. The bootstrapped bandwidth is .2173092 cents . There are significantly more than the expected number of observations in the interval immediately to the right of zero[16] and significantly less than the expected number of observations in the three intervals to the left of zero[17]. Agency, prospect theory and transaction theory explain discontinuities at zero. Managerial compensation Dichev et al (2013) and downwards earnings management Badertscher et al (2009) explain discontinuities in intervals further away from zero. As shown in the distribution of undeflated earnings levels, there is evidence that earnings may have been manipulated downwards in the first interval to the right of the suspected EM band, the number of observations predicted by the kernel density estimate is 262 were the actual number of observations is 206 firm years. As explained in Lahr (2014) the expected number of loss and profit observations is the same in the loss and profit intervals where the jump is identified at zero because by design the KDE reference distribution is continuous at zero.

Deflating by number of shares at the end of the year does not significantly alter the number of EM firms predicted by KDE in the undeflated data. The Kernel density estimated 284 observations in the first interval to the right of zero in the undeflated distribution while the deflated distribution estimate was 272. The empirical number of profit firm year observations in the interval immediately to the right of zero in the undeflated distribution was 575 while that in the deflated distribution was 525. The total number of actual firm year observations across all three intervals to the left of zero was 245 in the undeflated distribution and 248 in the deflated distribution of earnings.

A similar pattern emerges when the distribution of net income before tax (NIBT), is analysed. The only difference is that deflation by number of shares at the end of the reporting period eliminates the discontinuity in the third interval to the right of zero observed in the undeflated distribution of NIBT. That is there is no longer evidence of downward earnings management. It is interesting to note that the raw number of loss observations in the first interval to the left of zero does not change when taxation is added back to income which supports BMN's contention

[16] The actual number of profit firm years is 525 as compared to the kernel density estimate of 272.
[17] The actual number of firm years reporting losses in the first interval to the left of zero is 190 compared to the kernel density estimate of 272, in the second interval the observed number of loss firm years is 48 as opposed to the expected number of 193 and in the third interval the actual number of loss observations is 10 as compared to the predicted number of 58.

that there is asymmetric recognition of taxation between loss and profit firms: that is, taxation effects are not always recognised in loss firms.

When NIAT is deflated by both market value of equity and total assets, there are no longer more than the expected number of observations in the first interval to the right of zero; instead the anomaly now appears in the second and third intervals to the right of zero. However, there is now less than the predicted number of observations in only the first two intervals to the left of zero where the deficit in observations extended over three intervals where number of shares was used as the deflator. The total number of suspected EM firms is 761 when scaling by market value of equity and 698 when total assets is the deflator; the total number of non-EM firms reduces to 93 and 120 respectively. When the distribution of NIBT scaled by market value and total assets, is analysed there are more than the expected number of observations in the third and fourth intervals to the right of zero, and this confirms BMN's finding that taxation will push the distribution of earnings towards zero.

The shift in the location of the discontinuity in the distribution of earnings levels where market value of equity and total assets are the deflators is, in all probability, attributable to the fact that there is a significant difference between the value of market equity and total assets in profit and loss firms. Donelson et al (2013) provide evidence that total assets affect the distribution of earnings. When total assets are used as the scalar rather than market value of equity there is a decrease in the proportion of observations in the first bin to the left of zero and an increase in the proportion of observations in bins two to four to the right of zero. In contrast and, importantly, where number of shares is the deflator, the location of the discontinuity in the distribution of net income before and after taxation in the unscaled distributions and deflated distributions is located at zero earnings.

The finding that there is no evidence of a kink in the distribution NIAT deflated by total assets in the first interval to the right of zero can be contrasted to that of Holland and Ramsay (2003) and Coulton et al. (2005) who in research into Australian data, report an abnormal distribution at zero of earnings after taxation scaled by total assets. Both Holland and Ramsay (2003) and Coulton et al. (2005) use an interval 0.01 chosen by inspection when their calculation of binwidth using the calculations outlined by Silverman (1986) and Scott (1992) proved to be larger than 0.005 used by BD. In this research KDE identifies a bandwidth of .045 in the earnings levels scaled by total

assets distributions. However, a direct comparison cannot be made between BD and the Australian studies because their earnings metric is NIAT scaled by total assets, whereas BD deflate by market value of equity. In a U.K. study Gore, Pope, and Singh (2007) use an interval width of 0.01 to draw their histograms of NIAT scaled by total assets and report a distinct discontinuity at zero.

In conclusion, it appears that scaling earnings levels by market value of equity and total assets where these values are significantly different between profit making as compared to loss firms does affect the distribution of earnings levels as claimed by DE (2005). In sharp contrast, number of shares is the preferred scaler as it does not affect the distribution which is probably due to this scaler being insignificantly different between profit and loss firms.

Distribution of deflated earnings changes (earnings management to maintain previously reported earnings)

The distribution of both undeflated and all deflated earnings changes before and after taxation reveal more than the expected number of observations in the first interval to the right of zero and less than the expected number of observations in the second and third interval to the left of zero. The only exception is earnings changes before tax deflated by total assets where there is less than the expected number of observations in the first three intervals to the left of zero. In all the distributions except for changes in net income after tax scaled by number of shares, there is evidence of downwards earnings management in the intervals to the right of the expected earnings management zone but an erratic pattern emerges as the deficit in observations appears across both the second and third intervals to the right of the suspected earnings management interval.

All in all the results of the earnings distribution exploration finds that deflation matters in earnings levels distributions but not in earnings changes distributions. In levels distributions undeflated profits exhibit a discontinuity at zero as does the distribution when number of shares in issue is the deflator. Deflating by both market values of equity and total assets shifts the discontinuity in the distribution away from zero to the second interval to the right of zero. In the South African environment this finding is explained by the insignificant difference between the numbers of shares in issue in loss versus profit companies. In undeflated and deflated earnings changes distributions there are more than the expected number of observations in the first

interval to the right of zero, but fewer than the expected number of observations in the second and third intervals to the left of zero. This finding is valuable as it demonstrates that using KDE allows researchers to demonstrate the effect that deflators, that differ between profit and loss firms, have on the position of discontinuities in earnings distributions.

Table 6 Discontinuities identified using kernel density estimation: earnings levels distributions

	Suspected earnings management firms: bandwidths to right of zero								Non-earnings management firms									
									Bandwidths to left of zero						Bandwidths to the right of zero			
	First interval		Second interval		Third Interval		Fourth Interval		First interval		Second interval		Third interval		Second interval		Third interval	
	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE
NIAT t/No of shares $_t$	0, 0.2173092								-.2173593, -0.0000501		-.4346686, -0.2173593		-.6519778, -0.4346686		.2173092, 0.4346185			
	525	272							190	272	48	193	10	58	206	262		
NIAT $_t$/Market value of shares at $_{t-1}$			.0505496, 0.1010993		.1010993, 0.1516489				-.0506253, -0.0000757		-.101175, -0.0506253							
			383	276	378	272			62	196	31	99						
NIAT $_t$/Total assets $_{t-1}$			.0450656, 0.0901312		.0901312, 0.1351968				-.0450766, -0.000011		-.0901421, -0.0450766							
			341	276	357	267			86	205	34	113						
NIBT $_t$/No of shares $_t$	0, 0.3131137								-.3132571, -0.0001434		-.6263708, -0.3132571		-.9394845, -0.6263708		.3131137, 0.6262274			
	568	279							190	279	35	199	20	57	202	267		
NIBT $_t$/Market value of shares at $_{t-1}$					.1105067, 0.1657601		.1657601, 0.221013		-.0553853, -0.000132		-.1106387 0.0553853							
					358	254	270	230	47	149	33	80						
NIBT t/ Total assets t-1					.0965444, 0.1448166		.1448166, 0.1930888		.0485193, -0.0002471		-.0967915, -0.0485193							
					280	234	255	213	62	163	37	93						

This table presents discontinuities in scaled earnings levels and changes distributions identified using kernel density estimation. Bandwidth estimates using the bootstrapping test are presented together with the empirical number of observations and the estimated number of observations predicted by the reference distribution of pre-managed earning drawn using these bandwidths.

Table 7 Discontinuities identified using kernel density estimation: earnings changes distributions

	Suspected earnings management firms: bandwidths to right of zero								Non-earnings management firms									
									Bandwidths to left of zero						Bandwidths to the right of zero			
	First interval		Second interval		Third Interval		Fourth Interval		First interval		Second interval		Third interval		Second interval		Third interval	
	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE	Raw	KDE
(NIAT $_t$/No of shares $_{t)}$ -(NIAT $_{t-1}$/No of shares $_{t-1)}$	0, 0.0588355										-.117679, -0.0588435		-.1765145, -0.117679					
	285	196									61	154	47	68				
(NIAT $_t$-NIAT $_{t-1}$)/ Market value of shares $_{t-2}$	0, 0.0765076										-.1530312, -0.0765237		-.2295388, -0.1530312				.1530151, 0.2295227	
	607	301									74	238	42	83			64	107
(NIAT $_t$-NIAT $_{t-1}$)/ Total assets $_{t-2}$	0, 0.0672279										-.1345039, -0.067276		-.2017319, -0.1345039		.0672279, 0.1344559		.1344559, 0.2016838	
	637	321									98	251	41	89	176	275	74	117
(NIBT t)/No of shares t)-(NIBT t-1)/ No of shares t-1)	0, 0.0737507										-.1476887, -0.073938		-.2214394, -0.1476887		0737507, 0.1475014			
	292	198									74	154	38	68	132	181		
(NIBT $_t$-NIBT $_{t-1}$)/ Market value of shares $_{t-2}$	0, 0.0836156										-.1673238, -0.0837083		-.2509394, -0.1673238		.0836156, 0.1672311		.1672311, 0.2508467	
	584	294									87	229	48	83	172	254	69	113
(NIBT $_t$-NIBT $_{t-1}$)/ Total assets $_{t-2}$	0 ,.0731649								-.0732794, -0.0001145		-.1464443, -0.0732794		-.2196091, -0.1464443		.0731649, 0.1463297		.1463297, 0.2194946	
	596	315							276	315	112	241	52	90	236	275	83	127

This table presents discontinuities in scaled earnings levels and changes distributions identified using kernel density estimation. Bandwidth estimates using the bootstrapping test are presented together with the empirical number of observations and the estimated number of observations predicted by the reference distribution of pre-managed earning drawn using these bandwidths.

Table 8 Comparison of KDE bandwidths to pre-selected researcher binwidths applied in previous research			
Definition of earnings distribution	**Earnings levels/earnings changes**	**KDE**	**Prior research**
NIAT t/No of shares t	Earnings levels Earnings changes	21 c per share 5.883 c change per share	1 c per share Degeorge at al (1999)
NIAT t/Market value of shares at t -1	Earning levels Earnings changes	0.05 0.076	PPR 0.02 BD 0.005 PPR 0.01 BD 0.0025
NIAT t/Total assets t-1	Earnings levels Earnings changes	0.045 0.067	0.01 Holland and Ramsay (2003) and Coulton et al. (2005) 0.005 Holland and Ramsay (2003) 0.01 Coulton et al. (2005)
NIBT t/No of shares t	Earnings levels Earnings changes	31 c per share 7.375 c change per share	
NIBT t/Market value of shares t -1	Earnings levels Earnings changes	0.055 0.083	BMN 0.005
NIBT t/ Total assets t-1	Earnings levels Earnings changes	0.048 0.073	

Comparison of KDE bandwidths to binwidths in prior research

Table 8 compares the binwidths used in prior research into earnings discontinuities to the bandwidths generated using KDE. The primary difference in methodology is that bootstrapped KDE limits researcher discretion in setting binwidths.

Applying bootstrapped kernel density procedure Lahr (2014), yields consistently larger bandwidths than the researcher selected binwidths applied in prior research. The bootstrapping test when applied to earnings deflated by number of shares produces a reference kernel based on

intervals of 21c. Degeorge et al. (1999), analyse the distribution of EPS, which is not directly comparable to earnings deflated by number of shares, to report a jump in the distribution between zero and 1 cent per share. Dechow et al (2003) report results which show more observations of +1 cent (762) than -1 cent (682) and also identifies discontinuities at 39 versus 40 cents, 79 versus 80 cents, and 99 cents versus $1. The findings by Dechow et al (2003) of additional discontinuities higher up in the earnings distribution, is also found in the KDE analysis. In addition, it is debateable whether investors would be satisfied with profits of 1c per share; so it is questionable whether preparers would view this as a sufficiently large threshold when manipulating earnings. Similar to BD,(Phillips et al, 2003) (PPR), Holland and Ramsay (2003) and Coulton et al (2005) who use smaller binwidths to construct earnings changes histograms than those used in earnings levels distributions, smaller KDE bandwidths (5 c per share) are identified when the distribution of changes in earnings deflated by number of shares is analysed. When the distribution of earnings levels before taxation is explored, the bootstrapped KDE interval is 31 cents per share which is feasible because reversing taxation increases the profit figure. The binwidth for earnings changes before taxation is as expected considerably smaller for earnings changes.

In all the other distributions analysed the bootstrapped KDE estimates are higher than the researcher selected binwidths used in prior research. The reason may be attributable to deflators that are significantly different between profit and loss firms and display skewness and substantial kurtosis[18] and the small South African sample.

4.4 Conclusion

The objective of this chapter was to establish whether there is evidence of earnings management in companies listed on the JSE by applying kernel density estimation (KDE) to identify discontinuities in the frequency distributions of earnings levels and earnings changes. The most important result of the analysis is that in earnings levels scaling by market value of equity and total assets, but not by number of shares, affects the location of discontinuities whereas scaling has no effect the position of discontinuities in earnings changes distributions. This is attributable

[18] Skewness 15.76748 and Kurtosis 268.5432 in total assets in loss firms and that in profit firms is Skewness 6.562681 and Kurtosis 60.35942. Skewness 16.06 and Kurtosis 272.2238 in market value of equity in loss firms and Skewness 7.934915 and Kurtosis 79.33406 in profit firms.

to the fact there is a significant difference between market value of equity and total assets but not in number of shares in profit versus loss firms. In earnings levels distributions there is convincing evidence that earnings manipulation takes place around zero where the scalar is number of shares. Furthermore, there is evidence of downwards earnings management in the second interval to the right of the suspected earnings management interval. Deflating by market value of equity and total assets shifts the location of the excess number of observations to the second and third intervals to the right of zero and eliminates the evidence of downwards earnings management. Adding back taxation does not affect the discontinuity pattern where number of shares is the scalar but shifts the location of the excess observations to the third and fourth intervals to the right of zero where the other deflators are used. Where earnings changes are analysed deflation is not an issue. There is evidence of earnings management in the form of more than the expected number of observations in the first interval to the right of zero in all earnings changes distributions, however it does not appear that the excess observations are drawn from the first interval of losses to the left of zero because a deficit in observations emerges only in the second and third intervals to the left of zero, evidence of downward earnings management persists to the right of the earnings management band of observations.

The evidence of downwards earnings management to the right of the suspected earnings management firms is a significant finding. This suggests that the suspected earnings management band is not homogeneous and consists of firms with genuine profits and firms that have manipulated their profits upwards and downwards. This finding may offer an explanation for the results in prior research which fail to find significant differences between accruals metrics in suspected and non-EM firms identified in distribution studies. Exploration of the effect of downwards earnings management on earnings distributions is a matter left for further research.

Evidence of a discontinuity in earnings distributions is an indication of earnings management. However, in itself it does not provide evidence that earnings of the firms appearing in the intervals to the right of zero have been manipulated. Therefore taking cognisance of the warning in DE (2005) Chapter 5 of this thesis will compare accruals metrics between suspected EM and non-EM firms to explore whether the jump in the distribution of earnings levels and changes can be attributed to earnings management.

APPENDIX A

Graphs displaying kde discontinuities in earnings distributions - earnings levels

Earnings levels: net income after taxation

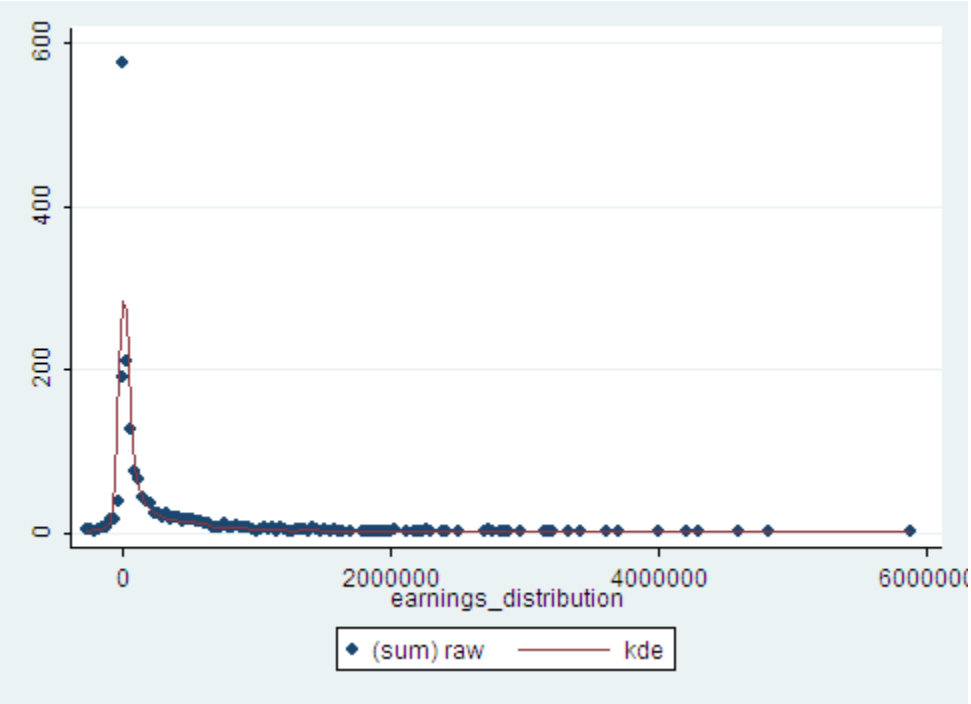

Figure 1.1 Distribution undeflated earnings

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-88308.75,-58878.84	16	61	-45	EM 0
-58878.84,-29448.92	39	203	-164	EM 0
-29448.92,-19	190	284	-94	EM 0
0,29429.92	575	284	+290	EM 1
29429.92,58859.84	210	271	-61	EM 0

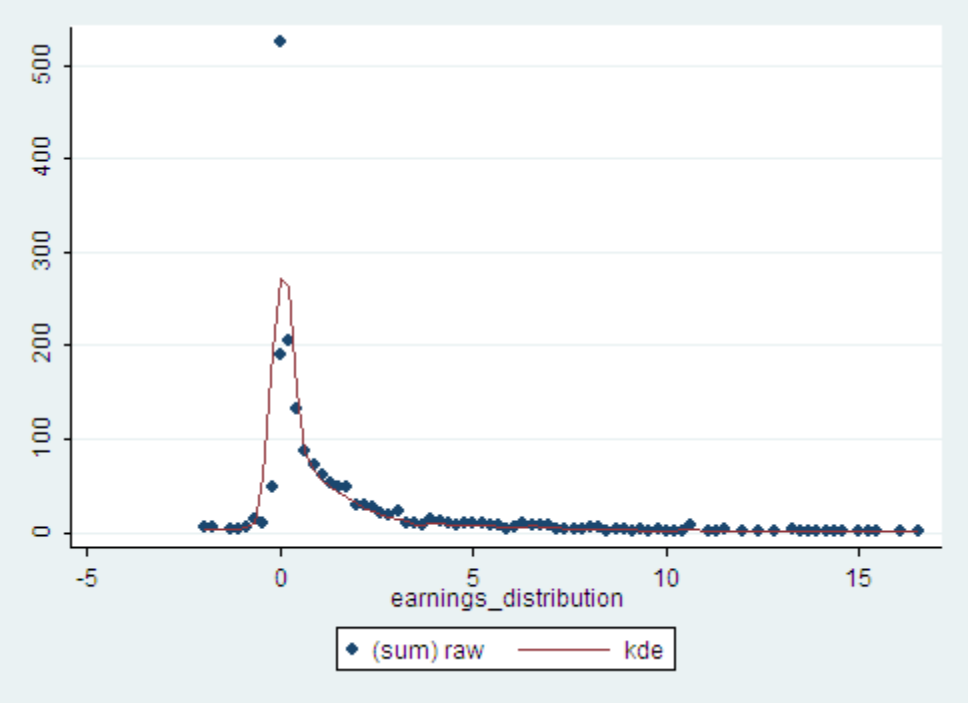

Figure 1.2 Distribution NIAT / no of shares

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.6519778,-.4346686	10	58	-48	EM 0
-.4346686,-.2173593	48	193	-145	EM 0
-.2173593,-.0000501	190	272	-82	EM 0
0,.2173092	525	272	+253	EM 1
.2173092,.4346185	206	262	-56	EM 0

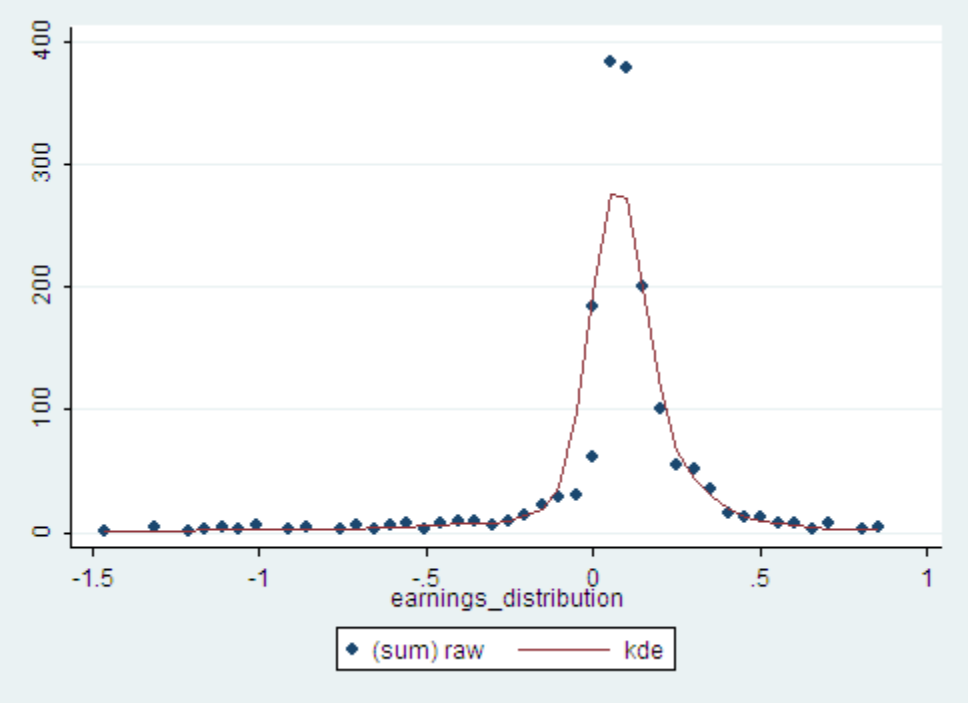

Figure 1.3 Distribution NIAT/market value of equity

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.101175,-.0506253	31	98	- 67	EM 0
-.0506253,-.0000757	62	195	-133	EM 0
0,.0505496	184	195	+11	Nil
.0505496,.1010993	383	276	+107	EM 1
.1010993,.1516489	378	271	+107	EM 1

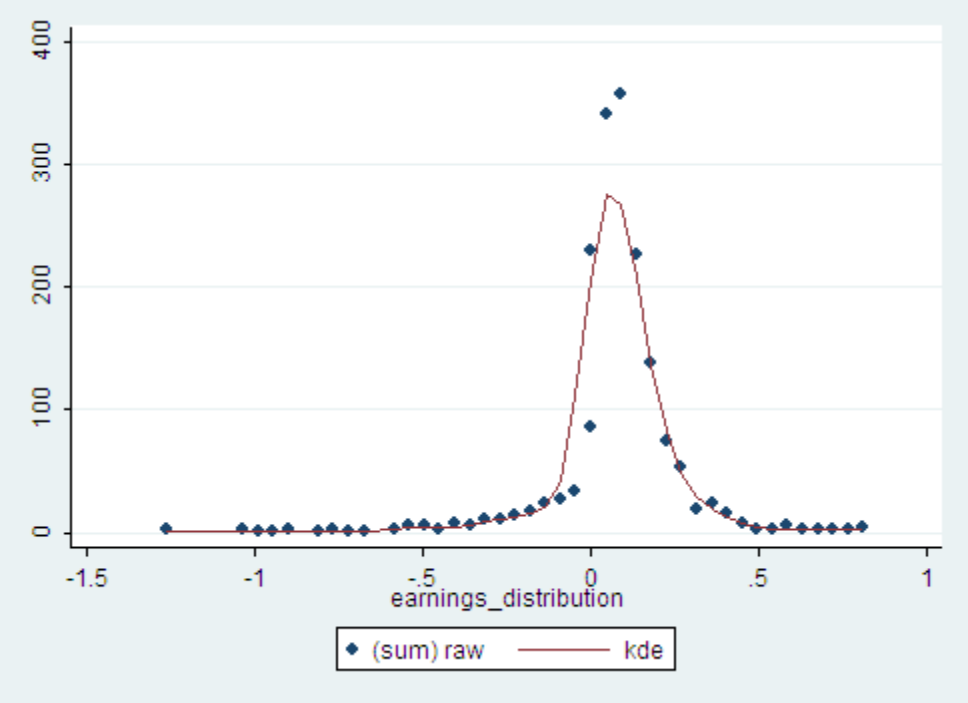

Figure 1.4 Distribution NIAT/ total assets

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.0901421,-.0450766	34	112	- 78	EM 0
-.0450766,-.000011	86	204	-118	EM 0
0,.0450656	230	204	+25	Nil
.0450656,.0901312	341	276	+65	EM 1
.0901312,.1351968	357	267	+90	EM 1

Earnings levels: net income before taxation

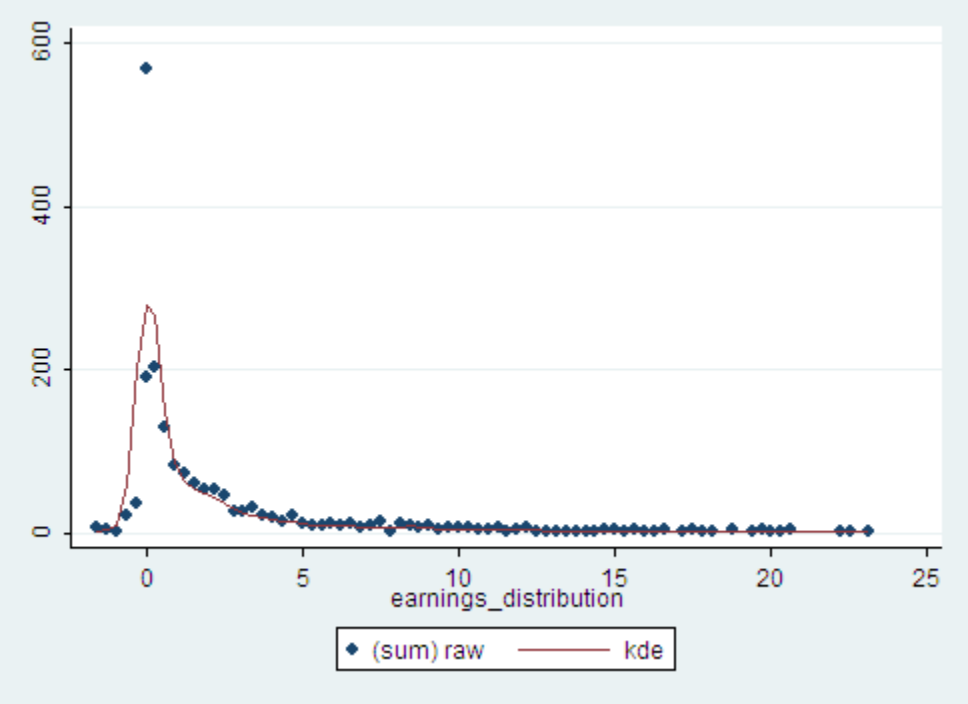

Figure 2.1 Distribution NIBT / no of shares

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.9394845,-.6263708	20	58	-38	EM 0
-.6263708,-.3132571	35	199	-164	EM 0
-.3132571,-.0001434	190	279	-89	EM 0
0,.3131137	568	279	+289	EM 1
.3131137,.6262274	202	267	-65	EM 0

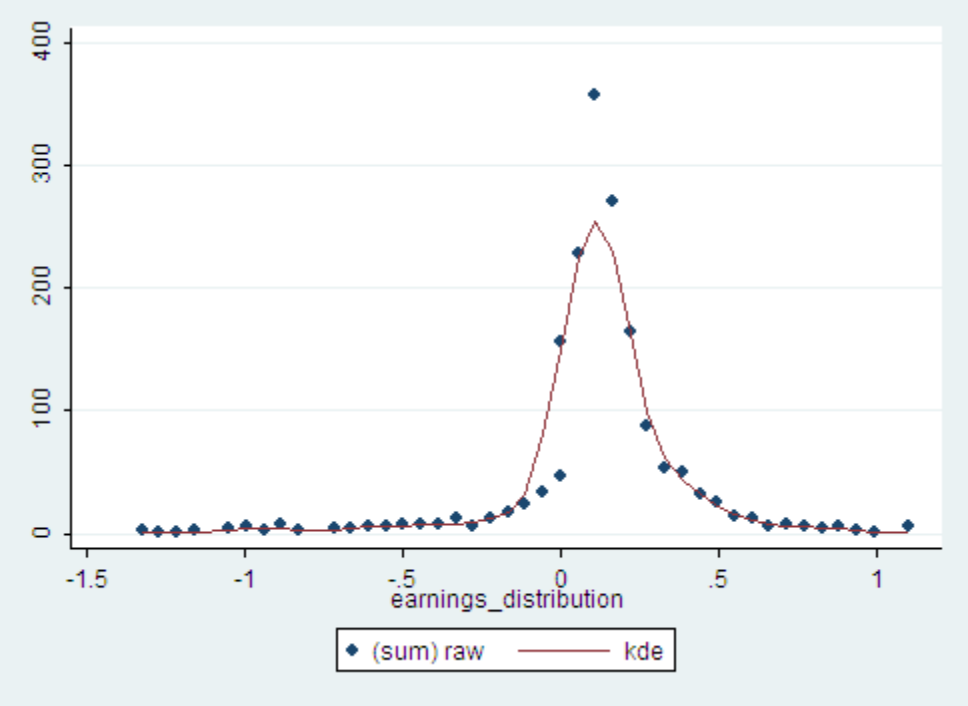

Figure 2.2 Distribution NIBT / market value of equity

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.1106387,-.0553853	33	80	-47	EM 0
-.0553853,-.000132	47	149	-102	EM 0
0,.0552534	156	149	+7	Nil
.0552534,.1105067	228	225	+3	Nil
.1105067,.1657601	358	253	+105	EM 1
.1657601,.2210134	270	230	+40	EM 1

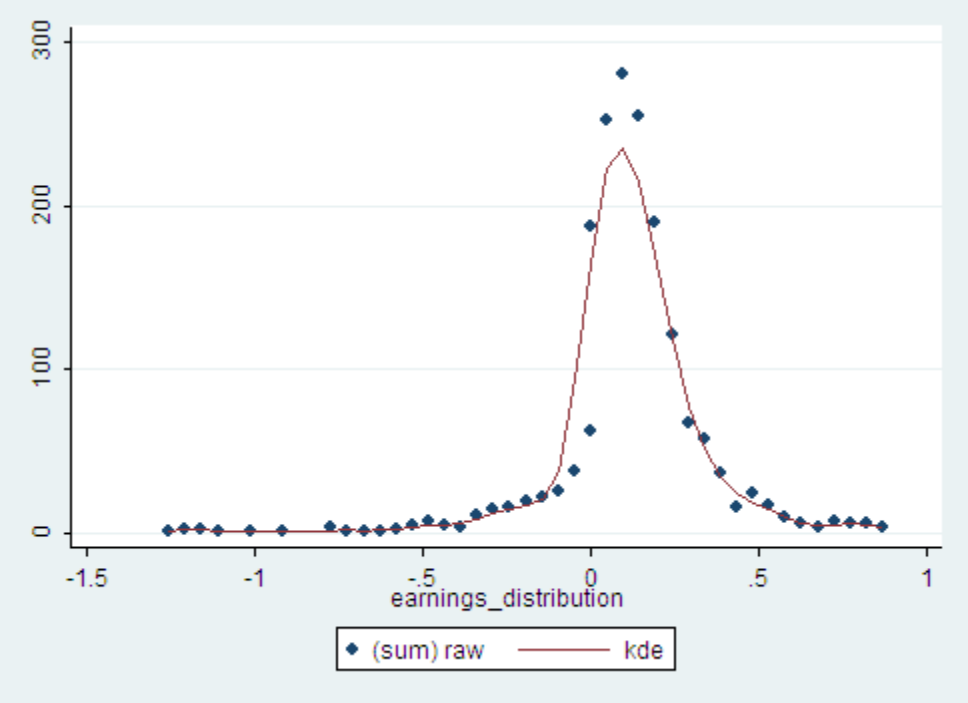

Figure 2.3 Distribution NIBT/ total assets

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.0967915,-.0485193	37	94	-57	EM 0
-.0485193,-.0002471	62	164	-102	EM 0
0,.0482722	187	164	+23	Nil
.0482722,.0965444	252	222	+30	Nil
.0965444,.1448166	280	235	+45	EM 1
.1448166,.1930888	255	214	+41	EM 1

Earnings changes: net income changes after taxation

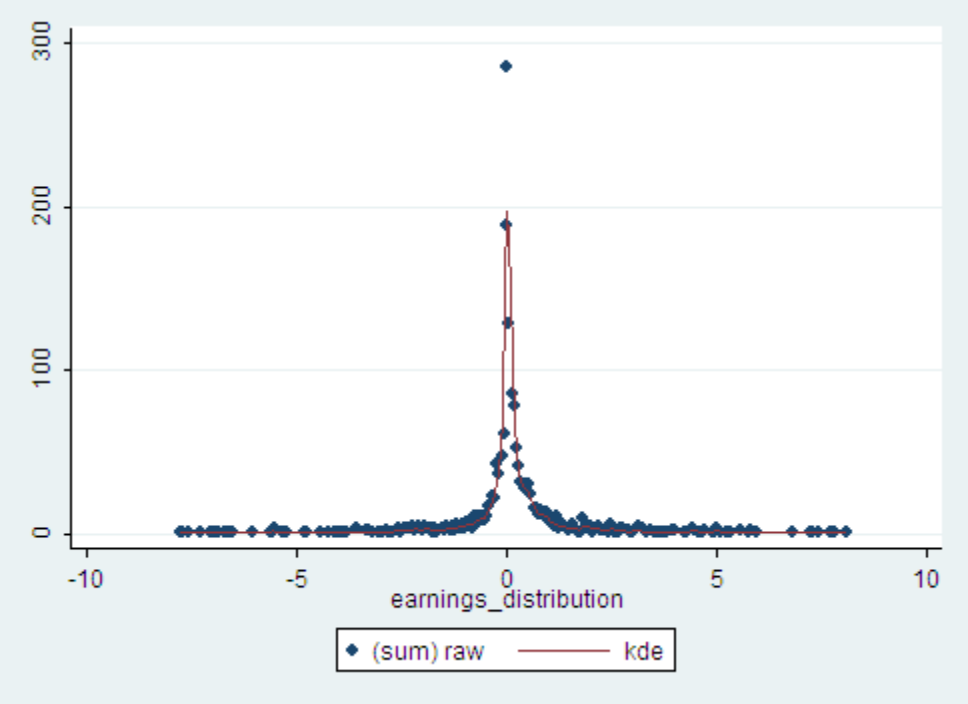

Figure 3.1 Distribution Changes NIAT /no of shares

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.1765145,-.117679	47	68	-21	EM 0
-.117679,-.0588435	61	154	-93	EM 0
-.0588435,-7.93e-06	188	196	-8	Nil
0,.0588355	285	197	+88	EM 1

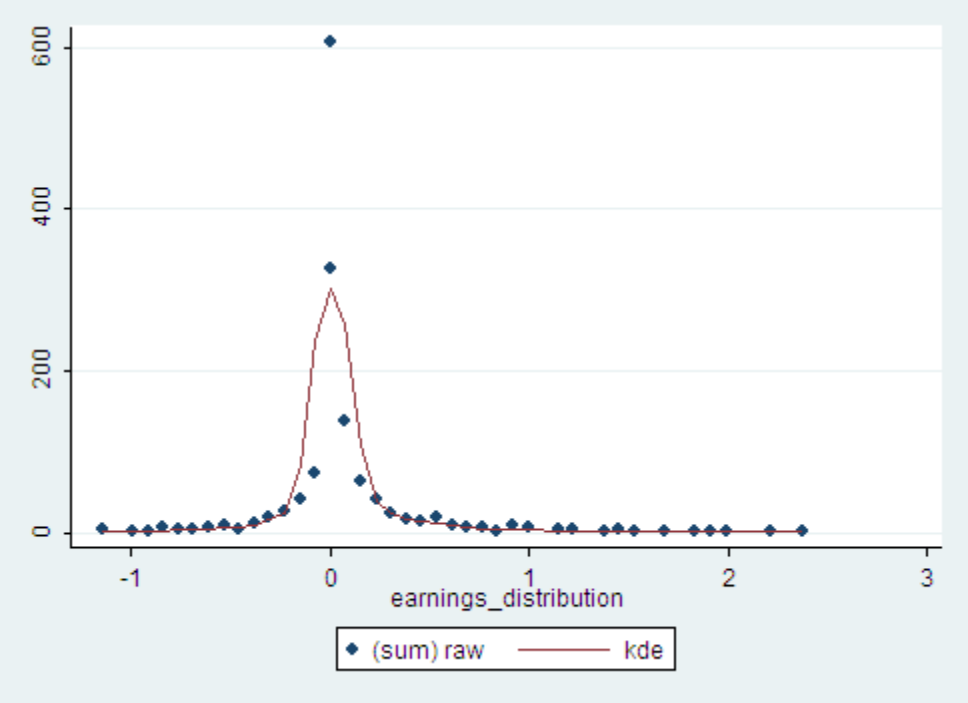

Figure 3.2 Distribution changes NIAT/ market value of equity

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.2509394,-.1673238	48	83	-35	EM 0
-.1673238,-.0837083	87	229	-142	EM 0
-.0837083,-.0000927	279	294	-15	Nll
0,.0836156	584	294	+290	EM 1
.0836156,.1672311	172	254	-82	EM 0
.1672311,.2508467	69	113	-44	EM 0

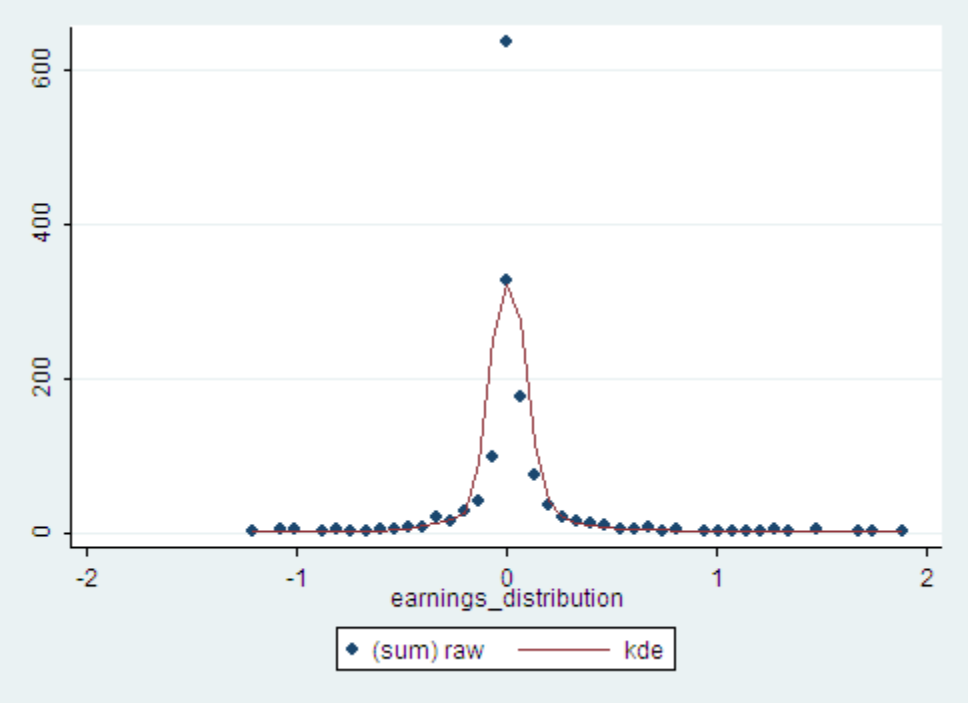

Figure 3.3 Distribution changes NIAT/total assets

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.2017319,-.1345039	41	89	-48	EM 0
-.1345039,-.067276	98	251	-153	EM 0
-.067276,-.0000481	327	322	+5	Nil
0,.0672279	637	322	+315	EM 1
.0672279,.1344559	176	275	-99	EM 0
.1344559,.2016838	74	117	-43	EM 0

Distribution earnings changes: net income changes before taxation

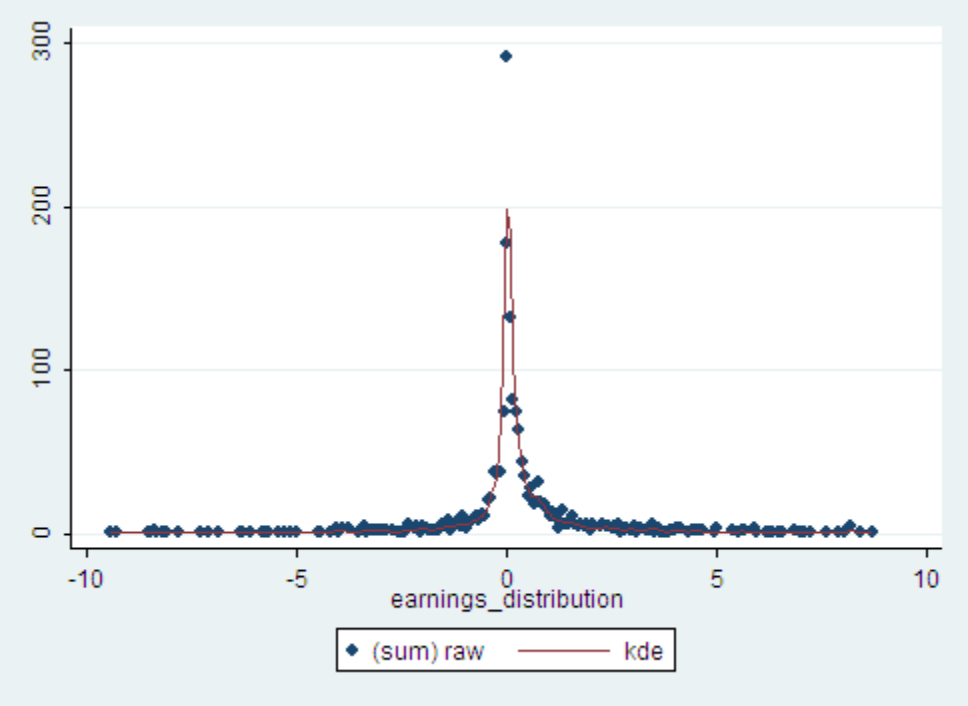

Figure 4.1 Distribution changes NIBT/ no of shares

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.2214394,-.1476887	38	68	-30	EM 0
-.1476887,-.073938	74	154	-80	EM 0
-.073938,-.0001873	177	198	-21	Nil
0,.0737507	292	199	+93	EM 1
.0737507,.1475014	132	181	-49	EM 0

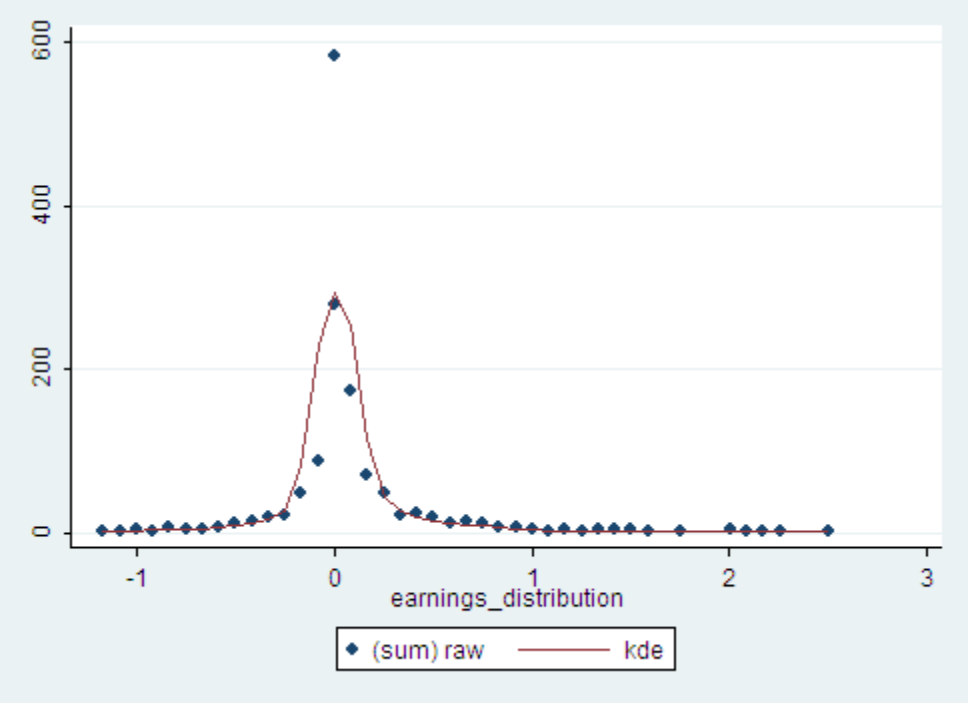

Figure 4.2 Distribution changes NIBT/ market value of equity

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.2509394,-.1673238	48	83	-35	EM 0
-.1673238,-.0837083	87	229	-142	EM 0
-.0837083,-.0000927	279	295	-16	Nil
0,.0836156	584	294	290	EM 1
.0836156,.1672311	172	254	-82	EM 0
.1672311,.2508467	69	113	-44	EM 0

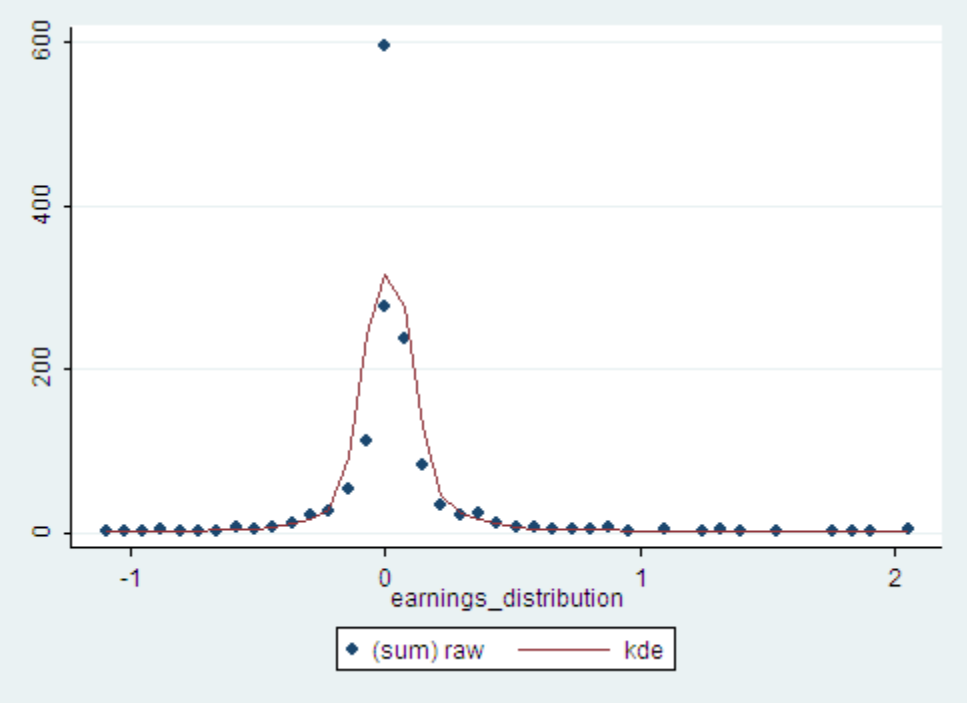

Figure 4.3 Distribution changes NIBT/ total assets

Intervals displaying significant differences between expected and number of observations between empirical distribution and theoretical kernel density estimate				
Interval	**Obs**	**Expected**	**Difference**	**EM0/EM1**
-.2196091,-.1464443	52	90	-38	EM 0
-.1464443,-.0732794	112	241	-129	EM 0
-.0732794,-.0001145	276	315	-39	EM 0
0,.0731649	596	315	+281	EM 1
.0731649,.1463297	236	275	-39	EM 0
.1463297,.2194946	83	127	-44	EM 0

CHAPTERS 5 ARE DISCONTINUITIES IN THE DISTRIBUTION OF EARNINGS EVIDENCE OF EARNINGS MANAGEMENT?

Previous studies into earnings management presuppose that managers will manipulate earnings under specific conditions and then use estimated discretionary accruals or other measures of accruals quality to test for evidence of earnings management.[19]An alternate way to identify suspected earnings management firms is the distributional approach which presumes that earnings management will take place around benchmarks, for example, zero losses or earnings decreases[20]. In contrast, in Chapter 4, kernel density estimation (KDE) (Lahr, 2014) is used to identify the location of discontinuities in scaled[21] earnings levels and changes distributions. A discontinuity is defined as a point at which a density function is discontinuous, jumping from a region of lower density to one of higher density or vice versa (Lahr, 2014). In Chapter 4 earnings levels distributions displayed a discontinuity around zero when earnings were deflated by number of shares. Scaling by market value of equity and total assets moved the discontinuity to the second interval to the right of zero. On the other hand, all the scaled earnings changes distributions displayed more than the expected number of observations in the first interval to the right of zero but the region of lower than anticipated density emerged in the second interval to the left of zero. Furthermore, in both the distributions of unscaled earnings and earnings deflated by number of shares, KDE identified bandwidths with fewer than expected observations to the right of the suspected earnings management band: this may be evidence of downwards earnings management. Consequently, it must be acknowledged that the suspected earnings management band may contain three types of firm years: those that have genuinely earned profits, those whose profits may have been manipulated upwards and those who may have managed their earnings downwards.

[19]Healy (1985) assumes that managers manipulate earnings to meet bonus thresholds, Jones (1991) searches for evidence of earnings management in firms subject to import relief investigations,Dechow et al (2011) identify earnings management firms as those which have been required to restate their financial statements as a consequence enforcement actions by the U.S. Securities Exchange Commission, and numerous studies , for example (Baber et al, 2006; Balsam et al, 2002; Keung, Lin, and Shih, 2010) infer that firms that just meet or beat analysts' forecast have manipulated their earnings .

[20] See for example Burgstahler and Dichev (1997), Degeorge et al (1999), Dechow et al (2003),Holland and Ramsay (2003),Coulton et al (2005) and (Glaum et al, 2004).

[21] The scalars used are number of shares in issue at the end of the reporting period, total assets and market value.

Durtschi and Easton (2005) and (2009) caution that, without verification, a discontinuity in earnings distributions is not proof of earnings management. The objective of this chapter is to investigate, firstly, whether the observed jumps in the earnings density functions are attributable to earnings management; secondly, whether the basic cash performance of the suspected EM (earnings management) and non-EM firms differ, and, thirdly, whether high market valuations or leverage motivate misstating managers.

The focus of this research is to investigate whether accruals management causes the jump in the earnings density function and, specifically to examine whether accruals metrics are higher in suspected EM relative to non-EM firms. As real earnings management cannot be detected using accruals metrics, it is not considered in this research.

Several accruals measures are investigated beginning with measures that are readily observable in financial statements. Total accruals are compared as they are found to be better than various measures of unexpected accruals in identifying accounting misstatements (Bayley and Taylor, 2007). Change in working capital accruals (ΔWC-ACC) are examined because this measure does not contain depreciation and amortisations (Dechow et al, 2011) and changes in accounts receivable are investigated as Beneish (1999) finds that manipulating firms overstate earnings by recording fictitious or unearned sales. Thereafter, discretionary accruals, the earnings management component of total accruals, are estimated and compared between suspected EM and non-EM firms using the modified Jones (DACC-MJ) and the asymmetric Ball and Shivakumar (DACC-BS) models described in section 5.1 of this thesis. Except in the net income before tax deflated by total assets distribution, total accruals are significantly negative in suspected EM and non-EM firms. Where number of shares in issue is the deflator, modified Jones discretionary accruals are significantly income increasing in suspected EM firms and income decreasing in non-EM firms. Where market value of equity is the deflator, modified Jones discretionary accruals become income increasing in non-EM firms and are significantly smaller, whereas in all the distributions asymmetric BS discretionary accruals are significantly income increasing in suspected EM firms and income decreasing in non-EM firms. Finally based on the theory that upward (downward) manipulation increases (decreases) tax expense in suspected EM firms because of larger (smaller) accounting income relative to taxable income

the annual deferred tax expense is examined as an alternate tool to accrual models to identify earnings manipulation (Phillips et al, 2003).

KDE in Chapter 4 of this thesis revealed a discontinuity at zero in earnings levels deflated by number of shares and an excess number of shares in the first interval to the right in earnings changes distributions. Firms whose earnings fall into the band to the right of zero are identified as suspected EM firms whose fundamental performance before manipulation is expected to be similar to that of the non-EM firms. To verify whether this assumption is correct, this thesis examines whether unmanaged performance metrics are the same in suspected EM and non-EM firms. Following Dechow et al (2011), change in cash sales, is analysed to evaluate whether cash sales are declining in suspected earnings management firms. Current period cash flows and changes in cash flows are included as it is a fundamental measure of firm performance which is not contaminated by the accruals process: an increase in operating cash flows indicates improved performance and reduces managers' incentives to manipulate earnings (Phillips et al, 2003). Performance is generally significantly different across the firm classifications. The exceptions are, firstly, in the net income after tax deflated by market value of equity category where mean changes in operating cash flows and changes in cash sales are not significantly different which signifies that pre-managed performance was not different between EM and non-EM firms. However, this is weak evidence that suspected EM firms are loss firms that have been manipulated into profit firms because operating cash flow is significantly higher in suspected EM firms. Secondly, where tax is added back to earnings and the scalar is total assets, the mean changes in cash flows are no longer significant.

Finally, this research considers share and debt incentives to manage earnings (Beneish, 1999; Dechow et al, 2011) and studies whether suspected EM firms have higher market to book values and leverage than non-EM firms. Managers of earnings manipulation firms may be concerned about obtaining finance (Dechow et al, 2011), so higher debt to equity ratios may be expected in suspected EM firms. From the market perspective, highly priced shares signal investors' expectations of future growth which may pressurise managers to manipulate earnings to meet these expectations. Therefore, leverage and book-to-market ratios are compared between suspected EM and non-EM firms. Market prices are significantly larger in EM firms than in non-EM firms but leverage is not an incentive.

The remainder of the chapter is organised as follows. Section 1 evaluates discretionary accruals models, discusses deferred tax as an alternate tool to identifying earnings management and defines the accruals, performance and market related variables. The hypotheses are developed in Section 2 and the methodology is discussed in section 3. The results of the comparison of the accruals, performance and market measures are presented and discussed in Section 4 and Section 5 compares performance variables in a constrained sample of EM firms and Section 6 concludes.

5.1 Models to estimate discretionary accruals

Total accruals include non-discretionary and discretionary accruals, both of which are not directly observable from financial statements. As direct measurement of discretionary accruals is not possible, researchers have developed models to estimate this component of earnings by imposing an expectation model of non-discretionary accruals on total accruals (Young, 1999). Most of the models require at least one parameter to be estimated from a sample or estimation period during which no earnings management is predicted (Dechow et al, 1995).The earliest models (DeAngelo, 1986; Healy, 1985) were unsophisticated in that they failed to recognise the effect of economic conditions on the level of accruals (Jones, 1991). Subsequent models (Dechow et al, 1995; Jones, 1991) rectify this by including changes in revenue and levels of property, plant and equipment in their models. Kothari, Leone, and Wasley (2005) introduce performance-matched discretionary accruals and Ball and Shivakumar (2006) control for asymmetry between accruals and cash flows.

The Healy model

Healy (1985) assumes that cash flows are a proxy for earnings without manipulation, that total accruals represent the managed component of current period earnings and that manipulation occurs in every period. Healy (op cit) suggests that bonus schemes with binding upper or lower bounds induce managers to manipulate earnings downwards, whereas bonus schemes without a binding upper bound motivate managers to increase earnings.

The Healy model tests for earnings management by comparing mean total accruals (scaled by lagged total assets) across three portfolios of company years, those with lower bonus bounds, those with binding upper bonus bounds and those where upper bonus bounds are not binding. Earnings are predicted to be managed upwards in the “no upper bound portfolio” and to be

managed downwards in the other two. This approach is the same as treating the mean total accruals for the portfolio where earnings are managed upwards as the estimation period and the mean total accruals for the portfolio where earnings are expected to be managed downwards as the event period. The mean total accruals from the estimation period are non-discretionary accruals (Dechow et al, 1995).

Therefore, estimated discretionary accruals (EDA) for firm *i* in period *t* are defined as total accruals scaled by lagged total assets:

$$EDA_{it} = TA_{it} / A_{it-1}$$

Where TA equals total accruals and A equals total assets.

Healy (1985) reports that total accruals are lower for company years with binding bonus plan upper bounds than for company years with no upper bound.

The DeAngelo model

DeAngelo (1986) evaluates Healy's approach and concludes it is limited in that total accruals contains both discretionary and nondiscretionary accruals and that total accruals are a poor proxy for discretionary accruals if non-discretionary accruals are large relative to total accruals. To separate discretionary accruals from total accruals, DeAngelo (1986) uses total accruals in the prior period as the estimate of current period non-discretionary accruals. In other words non-discretionary accruals equal prior period total accruals and the first differences in total accruals are discretionary accruals. Both the Healy and DeAngelo models are appropriate only if nondiscretionary accruals are the same over time and mean discretionary accruals are zero in the estimation period. If nondiscretionary accruals change from period to period, then both models will measure nondiscretionary accruals with error (Dechow et al, 1995; Jones, 1991)

The model, therefore, measures discretionary accruals as the first difference in total accruals scaled by lagged total assets:

$$EDA_{it} = (TA_{it} - TA_{it-1}) / A_{it-1}$$

The Jones model

Neither the Healy and DeAngelo models consider that non-discretionary accruals change in response to changes in economic circumstances (Kaplan, 1985). Jones (1991) assumes that firms that would benefit from import relief use earnings management to meet targets. She controls for changes in a firm's economic circumstances on non-discretionary accruals using a firm specific expectations model to estimate nondiscretionary accruals in the estimation period, the period before import relief investigations.

In the Jones model (Jones, 1991) total accruals are first regressed on proxies for the non-discretionary component of total accruals in the estimation period, using the series of data immediately prior to the event period *t.*

The expectation model applied in Jones (1991) to control for changes in the economic circumstances of the firm is:

$$TA_{it} = \alpha + \beta_1 (\Delta REV_{it}) + \beta_2 (PPE_{it)} + \xi_{it} \qquad \text{(a)}$$

where:

TA_{it} = total accruals for firm *i* in period *t;* computed as:
[$\Delta Current\ Assets_t$ - $\Delta Cash_t$] –$\Delta Current\ Liabilities_t$ - $Depreciation_t$ *and Amortisation Expense*$_t$
Change (Δ) is computed between time $_t$ and time $_{t-1.}$

ΔREV_{it} = change in firm *i'*s revenue from period $t-_1$ to *t*;
PPE_{it} = gross property, plant and equipment for firm *i* in period *t*;
ξ_{it} = error term

All the variables are scaled by beginning-of-year total assets. The residual (ξ_{it}) represents the discretionary portion of total accruals.

The ΔREV and PPE terms are designed to control for the non-discretionary component of total accruals associated with changes in operating activity and level of depreciation. Total accruals include changes in working capital accounts, such as accounts receivable, accounts payable and inventory that depend, to some extent, on changes in revenue. The Jones model uses revenue to control for the economic environment based on the assumption that it is an objective measure of the firms' operations before earnings management, Jones (1991). But accounts receivable is not completely exogenous and can be manipulated using real earnings management techniques (Young, 1999). Gross property, plant and equipment are included to control for non-discretionary depreciation expense and is used rather than changes in this account because total depreciation expense is included in total accruals (Jones, 1991).

The parameter estimates of α, β_1 and β_2 from regression (a) in the estimation period are combined with data from the event year t to generate estimated discretionary accruals:

$$DAcc_{it} = TA_{it} - [a_{i} + b_{1i} (\Delta REV_{it}) + b_{2i} (PPE_{it})] \quad \text{(b)}$$

All variable are scaled by total assets at the beginning of the period.

The modified -Jones model

Revenue changes in the Jones model are all assumed to be non-discretionary; the measure of discretionary accruals does not include the impact of revenue manipulation (Dechow et al, 1995). To correct this, Dechow et al.(1995) modify the Jones model by subtracting the change in accounts receivable (ΔREC) from ΔREV. The effect of this adjustment is that credit sales in each period are assumed to be discretionary.

Using coefficient estimates from regressions in the estimation period, discretionary accruals for the modified Jones model are computed as:

$$DAcc_{it} = TA_{it} - [a_{i} + b_{1i} (\Delta REV_{it} - \Delta REC_{it}) + b_{2i} (PPE_{it})]$$

Performance matched discretionary accruals

Dechow et al.(1995) prove that the Jones and modified Jones models are misspecified when applied to samples with extreme performance. Kothari et al. (2005) controls for extreme performance by matching firms on the basis of industry and current year's return on assets. Their results show that, provided the researcher is able to identify an appropriate control sample, discretionary accruals estimated using the performance matched Jones and modified Jones are more efficient.

Forward looking model

The modified Jones model treats increases in inventory made in anticipation of higher sales as a discretionary accrual. To correct for this misclassification, the forward looking model includes future sales growth.

Dechow et al.'s (1995) forward-looking model is estimated as follows:

$$TAcc_{it} = \alpha + \beta_1 (\Delta REV_{it} - (1- k) \Delta REC_{it}) + \beta_2 PPE_{it} + \beta_3 TAcc_{it-1} + \beta_4 GR\_REV_{t+1} + \xi_{it}$$

where:

k	= the slope coefficient from a regression of ΔREC_{it} on ΔREV_{it};
$TAcc_{it-1}$	firm i's total accruals from the prior period scaled by year t-2 total assets;
GR_REV_{t+1}	the change in firm i's sales from year t to t +1, scaled by year t sales;
ξ_{it}	the error term

Ball and Shivakumar's Asymmetric Model

Ball and Shivakumar (2006), hereafter BS, propose two roles for accrual accounting. The noise reduction role where accruals produces an earnings figure that is less noisy than operating cash flows in measuring performance and the timely loss recognition role which is based on the way

that accrual accounting recognises unrealised gains and losses. Where the role of accrual accounting is noise reduction, accruals and cash flow from operations are contemporaneously negatively correlated (Dechow, Kothari, and Watts, 1998) because accruals counteract transitory cash flow movements. On the other hand, under the timely loss recognition role, there is a positive correlation between accruals and current period operating cash flows. The reason for this is that timely recognition of revisions in future cash flows requires accruals which are likely to be positively correlated with the shock to current cash flows (BS).

Based on the premise that revisions to expected future cash flows are made prior to their realisation, the principles of accrual accounting require that gains and losses must be recognised on a timely basis, that is when revisions to expected cash flows are made. BS (2006:208) assert that the relation between accruals and cash flows is not linear because losses are recognised in a more timely fashion than gains.[22]This asymmetry is not recognised in the Jones model which assumes that nondiscretionary working capital accruals are proportional to revenue and that nondiscretionary depreciation is proportional to total investment in property, plant and equipment. Consequently BS (2006:210) hypothesise that conventional discretionary accrual models which do not incorporate loss asymmetry misestimate the discretionary and nondiscretionary component of accruals. BS suggest that a piecewise linear regression model incorporating the asymmetry be used in the estimation of discretionary accruals. Under a variety of proxies for gains or losses BS find that the explanatory power of the Jones model increases when a piecewise linear regression model is used. [23]

[22] Examples of timely recognition of losses but not gains in working capital assets and liabilities are inventory accruals where the lower of cost and net realisable principle requires write downs but does not allow for recognition of increases in realisable value .Examples of timely recognition of unrealised non-current asset losses but not gains are goodwill and non-current asset impairments which are required to be recognised immediately in income.

[23] If the earnings management partitioning variable is correlated with firm performance, Dechow et al (1995) submit that tests for earnings management could be misspecified for all nondiscretionary accruals models and propose that inclusion of firm performance in the earnings regression may correct this problem. As cash flows are a measure of firm performance it is feasible that the improved R^2 values reported by BS in the piecewise linear regression models may be partly attributable to correcting this misspecification.

BS suggest that the following piecewise linear accruals model, that incorporates asymmetric recognition of accrued gains and losses, be used to estimate discretionary accruals.

$ACC_t = \alpha_0 + \alpha_1 \boldsymbol{X}_t + \alpha_2 VAR_t + \alpha_3 DVAR_t + \alpha_4 DVAR_t * VAR_t + v_t$

where:

ACC_t	=accruals in year $_t$;	
X_t	= is the set of independent variables that models use to explain accruals;	
VAR_t	= *a proxy for gain or loss* (defined as cash flow from operations in year $_t$)	In the scenario where levels of earnings are investigated VAR_t is defined as level of cash flow for the current period standardised by total assets at the beginning of the year. Where changes in earnings are evaluated VARt is the changes in cash flow from period $_{t-1}$ to $_t$ scaled by total assets at $_{t-2}$.
$DVAR_t$	= dummy variable that takes on the value of 1 (0) if $CF_t < 0$ ($CF_t > 0$) where levels of earnings are investigated. Where changes in earnings are investigated the dummy variable takes on the value of 1(0) where Δ CF_t between year $_t$ *and* $_{t-1}$ is < 0 (>0).	
v_t	= the error term.	
CF_t	= cash flows time $_t$	

Evaluation of models to detect earnings management

Dechow et al. (1995), Guay et al (1996) and Young (1999) evaluate the specification and power of test statistics across the discretionary accruals models and conclude that none of the accrual models examined generates a reliable measure of the discretionary component of total accruals.

Dechow, Sloan and Sweeney (1995)

Dechow et al (1995) evaluate the Healy, DeAngelo, Jones and their own modified- Jones discretionary accruals models and report that all the models are well specified when applied to the random sample of firm years, but are not powerful when discretionary accruals are significant relative to total accruals and cash flows. Dechow et al (1995) ascribe their finding to the synchronicity between high earnings and accruals and suggest that the nondiscretionary accruals models do not completely extract the higher accruals and caution that if the earnings management partitioning variable is correlated with firm performance, this will lead to potential misspecification of all earnings management tests. To overcome this, Dechow et al (1995) suggest inclusion of a performance variable in the earnings management regression.

Young (1999)

Young (1999) evaluates the extent of predictable measurement error induced by the Healy, DeAngelo, Jones and the modified-Jones discretionary accruals models and suggests controlling for potential variation in propensity for earnings management, a feature not considered by Dechow et al (1995). In a different financial reporting environment (the UK) and using a methodology that differs from Dechow et al (1995) and Guay et al (1996), Young (1999) regresses discretionary accruals, on determinants of the nondiscretionary components of total accruals and propensity for earnings management measured as debt to equity, directors' equity ownership, size and a proxy for income smoothing being the difference between pre-managed earnings and target earnings. The nondiscretionary components of total accruals are cash flow performance, growth rate and fixed asset structure. Cash performance is included based on Dechow et al (1995) who suggest failure to control for cash flows will cause the part of positive nondiscretionary accruals associated with extreme negative (positive) cash flows to be incorrectly attributed to income increasing (decreasing) earnings manipulation activity. That is, discretionary accruals will contain measurement error negatively correlated with cash flow performance. Fixed asset structure, both fixed asset intensity and the useful economic life are included as determinants of nondiscretionary accruals because, in most firms, depreciation explains a significant portion of the difference between reported earnings and operating cash

flows (Young, 1999).Even in the absence of earnings management, firms with a high depreciation charge may appear to be making income decreasing accounting choices.

Young (1999) reports that the nondiscretionary accruals proxies explain a considerable proportion of the variation in discretionary accruals estimated by all the models and that discretionary accruals estimated using the Healy model contain the greatest level of predictable measurement error. There is no significant difference in the explanatory power of the regressions using DeAngelo, Jones and modified Jones discretionary accruals. This is surprising, given that the Jones and modified Jones models are more complex than the first difference approach used in the DeAngelo model. This result suggests that the Jones model is not effective in controlling for nondiscretionary accrual changes associated with revenue and depreciation and that the Dechow et al (1995) modification to the Jones model for discretion over revenue recognition does not improve the accuracy of the latter model. Importantly, like Dechow et al (1995), Young (1999) reports that all the discretionary accruals models induce significant misspecification as a function of cash flow performance.

Young (1999) finds that when discretionary accruals are regressed on the propensity to manage earnings variables, it is evident that discretionary accruals are associated with smooth earnings but there is no relationship between size and the various measures of discretionary accruals. There is a significant positive association between the level of equity ownership and the Healy, Jones and modified-Jones discretionary accruals but a negative association between leverage and all estimates of discretionary accruals.

All in all, Young (1999) reaches a similar conclusion to Dechow et al (1995) that all the accruals models evaluated measure discretionary accruals with considerable error and that operating cash flows are an important source of the measurement error.

Guay, Kothari and Watts (1996)

Guay et al (1996) estimate discretionary accruals in a pooled, cross section sample of 31372 firm year observations of firms listed on the New York and American Stock Exchanges between 1962 and 1993. Using market-based tests, they examine whether return-earnings component regressions produce signs and magnitudes of coefficients consistent with three managerial discretion hypotheses; firm performance, opportunism or noise. They report that only the Jones

and modified-Jones models estimate discretionary accruals related to performance or opportunism. All models are reported to estimate imprecision in estimating discretionary accruals which is especially pronounced in the Healy and DeAngelo models. Guay et al (1996) find a similarity between what is recognised as discretionary and nondiscretionary accruals across all the models. A high degree of correlation is reported between both discretionary accruals estimated using all the models and between discretionary accruals and nondiscretionary earnings (cash flow plus nondiscretionary accruals).This suggests that all the models capture essentially the same underlying earnings component.

Deferred taxes as an alternate tool for identifying earnings management

Discretionary accruals models all tend to be inefficient in extracting non-discretionary accruals from total accruals (Dechow et al, 1995; Guay et al, 1996; Young, 1999). Based on the assumption that managers will not indulge in earnings manipulation that will result in higher current taxation payable to tax authorities, Phillips et al (2003) propose that deferred tax may capture the effect of earnings management and act as an alternate tool to discretionary accruals for identifying earnings management.

Deferred tax arises when revenue or expenses are recognised in different periods for accounting than for tax purposes; the future tax consequence of this mismatch is recognised in financial statements as a part of the deferred tax expense in the statement of comprehensive income and as an asset or liability in the statement of financial position. An increase in deferred tax liabilities is consistent with a firm currently recognising revenue and or deferring an expense for accounting purposes but not for tax purposes. For example, there is discretion over when to recognise revenue for accounting purposes: for tax purposes, however, revenue received in advance must be recognised as revenue as cash is received. Except where changes in the net deferred tax liability for a period relate to mergers or acquisitions (where deferred tax is recognised as part of goodwill) or to income or loss items that are recognised in equity (for example, revaluations), the change in the net deferred tax liability account will affect the deferred tax expense in the income statement. In other words, if revenue is recognised before it is earned or if expenses are deferred to the next accounting period, this will be reflected as an increase in the deferred tax expense account. Similarly, tax allowances for wear and tear that exceed depreciation provided for

accounting purposes will result in an increase in the deferred tax expense. Deferred tax assets increase as firms currently recognise expenses or defer revenue for accounting purposes but not for tax purposes, resulting in a future deductible amount for tax purposes. Temporary differences that arise because firms recognise expenses before they are recognised for tax purposes occur where the accrual principle requires that managers estimate and recognise present obligations for expenditure relating to future events before they are recognised for tax purposes, for example, post-retirement benefits, warranty claims and restructuring costs. Expenses that are recognised before cash is paid, or revenue that is deferred to a future period, results in a negative movement to the deferred tax expense account. A negative movement can also occur where depreciation is written off for accounting purposes but not for tax purposes.

However, deferred tax recognised in the statement of comprehensive income will not always represent the tax consequences of all temporary differences between accounting and taxable income. IAS 12 *Income Taxes* (International Accounting Standards Board, 2008) requires that a deferred tax asset can only be recognised to the extent that it is probable that deferred tax liabilities or future profits will exist, against which the deferred tax asset can be utilised. In this circumstance, deferred tax may not represent the tax consequence of all temporary differences because recognition is restricted. In other words, a company that has incurred losses and does not anticipate returning to a profit making state in the foreseeable future will not be able to recognise all deferred tax assets, while a profit making company can recognise all deferred tax assets. In addition, IAS *12, Income Taxes* requires that a deferred tax asset be recognised for the carry forward of unused tax losses only to the extent that it is probable that future taxable profit will be available against which the unused tax losses can be utilized. In this circumstance, the tax effect of all temporary differences are recognised, but are then reversed when the future tax consequence of assessed losses is recognised. However, when the total tax consequence of unused tax losses cannot be recognised because future taxable profits are not probable, the deferred tax expense in the statement of comprehensive income will not represent the tax consequences of all temporary differences. As suggested by Beaver et al (2007) unrecognized tax losses and deferred tax assets in loss making companies gives rise to asymmetry in taxes between profit and loss companies.

The above restriction on the recognition of tax assets and assessed losses provides preparers with an opportunity to manipulate the deferred tax expense itself: preparers can incorrectly recognise a deferred tax asset when there is no probability that the asset will be recovered; this will lead to the reduction of taxation in the Statement of Comprehensive Income, and a decrease in reported losses. The same effect will be observed if a company making profits recognises a previously unrecognized tax loss, that is, the deferred tax expense will decrease, thus increasing profits. Schrand and Wong (2003) and Phillips et al. (2004) attempt to identify whether the valuation of the deferred tax asset account is used to manipulate earnings but their research has led to inconclusive and contradictory results. Van de Wouw (2015) reports that in the South African context, where recognised tax losses are removed from the deferred tax expense, the previously observed association between deferred tax and earnings management disappears. Therefore, deferred tax may not be a proxy for discretionary accruals and the movement on the deferred tax expense account may not be directly linked to discretionary accruals.

5.2 Hypothesis development

According to BS, accrual accounting is a fundamental accounting concept that improves financial reporting by adjusting cash flows to produce an earnings figure that is less noisy in measuring performance. However, the accrual process provides preparers of financial statements with an opportunity to manipulate earnings. Although models have been developed to identify the manipulated component of accruals (discretionary accruals), these models identify discretionary accruals with error Dechow et al (1995) and Young (1999). In response to this problem, Phillips et al (2003) suggest that deferred tax is an appropriate alternate tool to identify earnings manipulation.

Distributional studies have used the discontinuity in the frequency distribution of earnings levels and changes to identify earnings management firms. However, subsequent debate on the BD histogram methodology of this methodology has advised researchers that the discontinuity in earnings distributions is insufficient evidence of earnings management (Beaver et al, 2007; Durtschi and Easton, 2005). Chapter 4 of this thesis identified suspected EM and non-EM firms using kernel density to analyse the distribution of earnings levels and changes before and after tax deflated by the number of shares in issue, market value of equity and total assets. To validate

that the discontinuity in the distributions presents evidence of earnings management the following null hypothesis will be tested:

H1: accruals metrics are not higher in suspected EM relative to non-EM firms.

Accruals metrics are all expected to be income increasing (decreasing) in suspected earnings management (non-earnings management) firms. Accruals metrics are expected to be decreasing in non-earnings management firms because total accruals are generally expected to be negative (income decreasing) as they include depreciation and amortisation charges.

Theoretically, suspected EM firms are loss making firms whose results have been manipulated into profits using earnings management techniques. Hence, if all the suspected EM firms identified using KDE are indeed actual earnings upwards management firms, it can be anticipated that basic performance measures, which are not affected by earnings management, would be similar between non-EM and suspected EM firms. In this context and following Healy (1985), cash flows are used as a proxy for earnings without manipulation. However, it is entirely possible that firms in the suspected EM interval are not all earnings management firms. Firms that have legitimately earned profits are likely to be included in the suspected earnings management band. In addition, downward earnings management firms may be included in this region because kernel density distributions revealed that, in some cases, there are less than the expected numbers of observations to the right of the suspected earnings management region.[24] Consequently, in order to understand the unmanipulated performance of the suspected EM and non-EM firms performance measures, current cash flows, percentage increase in cash sales and increase in cash flows will be compared across the two firm categories to test the following null hypothesis:

H2: unmanaged performance metrics are not the same in suspected EM and non-EM firms.

Because the companies identified in the suspect region to the right of zero may be genuine profit earners and suspected upward and downward earnings management companies, this comparison is exploratory in nature and there is no a-priori expectation of the direction of these performance

[24] This occurs where levels of NIAT and NIBT are scaled by number of shares and in the earnings before tax change distributions where market value of equity and total assets are the deflators and for all deflators in the before tax earnings changes distributions.

measures and whether they will be significantly different from each other across suspected EM and non-EM firms.

Managers may have incentives to manage earnings to maintain high stock prices or to meet loan covenants, therefore, to explore whether these incentives exist in suspected EM firms but in non-EM firms the following null hypothesis will be tested:

H3: Leverage and book-to-market ratios are not higher in suspected EM than in non-EM firms.

If managers in suspected earnings management firms face higher incentives to manipulate earnings, it is anticipated that leverage and market -to-book ratios will be higher in suspected EM firms.[25]

5.3 Research methodology

The objective of this chapter in the thesis is to investigate whether the observed jumps in the earnings density functions are attributable to earnings management and firm performance and are associated with market related variables. Means and medians on all the variables in the earnings levels and earnings changes, before and after taxation, deflated by number of shares, market value and book value are compared. Means are compared using clustered t- tests and medians are compared using the non-parametric equivalent, the Sommers D' test.

Firstly, accruals variables are compared between suspected EM and non-EM firms to investigate whether there is evidence that accruals management produces the jump in the earnings density function.

Secondly, performance metrics are compared between suspected EM and non-EM firms to assess whether pre-managed performance is similar in these firm categories.

Thirdly, to gauge whether there are differences in incentives to manage earnings between suspected EM and non-EM firms leverage and book-to-market ratios are compared.

The accruals, performance and market related variables are defined below.

[25] Market-to-book ratios and leverage in suspected earnings management firms will be examined in Chapter 7 when market reaction to earning management is examined.

Variable Definitions

The accruals variables, performance variables and market related variables used to test the above hypotheses and their expected direction are discussed in this section. Each variable is defined in Table 9.

Table 9 Variable definitions				
Variable	Abbreviation	Predicted sign	Calculation	Reference
Accruals variables				
Total accruals	TACC	+	Net income after tax in year $_{t}$ – cash flow from operations in year $_{t}$ / total assets at end of year $_{t-1}$	Hribar and Collins (2002)
Modified Jones discretionary accruals	DACC_MJ	+	As defined in section 5.1 / total assets at end of year $_{t-1}$	Dechow et al (1995)
Asymmetric Ball and Shivakumar discretionary accruals	DACC_BS	+	As defined in section 5. / total assets at end of year $_{t-1}$2	Ball and Shivakumar (2006)
Deferred tax expense	DTAX	+	Deferred tax expense for year $_{t}$ / total assets at end of year $_{t-1}$	Phillips et al (2003)
Change in working capital accruals	ΔWC_ACC	+	[(Current assets year $_{t}$ – year $_{t-1}$ minus change in cash year $_{t}$ – year $_{t-1}$) less change in current liabilities year $_{t}$ – year $_{t-1}$] / average total assets	Dechow et al (2011)
Change in accounts receivable	Δ REC	+	Accounts receivable year $_{t}$ – year $_{t-1}$ / average total assets	Dechow et al (2011)
Performance variables				
Percentage change in cash sales	Δ Cash Sales	Not predicted	Turnover in year $_{t}$ - trade debtors in year $_{t}$ / Turnover in year $_{t-1}$- trade debtors in year $_{t-1}$	Dechow et al (2011)

Change in cash flow	Δ Cash Flow	Not predicted	Change in cash flows between year $_{t}$ and $_{t-1}$ / total assets at end of year $_{t-2}$	Phillips et al (2003)
Cash flow	Cash Flow	Not predicted	Cash flow in year $_{t}$ / total assets at end of year $_{t-1}$	Phillips et al (2003)
Market related variables				
Book-to-market	Book-to-market	+	Total equity $_{t}$ / market value of equity $_{t}$	Dechow et al (2011)
Leverage	Leverage	+	Long term debt $_{t}$ / total assets $_{t}$	Dechow et al (2011)

Accruals variables

There is a widely held view (Dechow and Skinner, 2000; Guay et al, 1996; Healy and Wahlen, 1999) that accrual accounting affords preparers the opportunity to manipulate financial statements. Total accruals are easily calculated from the financial statements by subtracting cash flow from operations from net income reported in the statement of comprehensive income. Total accruals are compared as they are found to be superior to unexpected accruals in identifying manipulations (Bayley and Taylor, 2007). If firms are managing earnings upwards to avoid reporting a loss or decline in profits, accruals are expected to be larger in suspected earnings management firms. Total accruals are expected to be negative (income decreasing) as they include depreciation and amortisation charges and are expected to be significantly less negative in suspected EM firms.

Total accruals

Hribar and Collins (2002) define total accruals as earnings from continuing operations minus cash flows from continuing operations. Hribar and Collins (op cit) calculate total accruals as

$TAcc_{it} = EBEI_{it} - (CFO_{it} - EIDO_{it})$

where:

$TAcc_{it}$ = total accruals for firm *i* in period *t;*

$EBEI_{it}$ = firm *i's* income before extraordinary items in year *t*;

CFO_{it} = firm *i's* cash flows from operations in year *t*;

$EIDO_{it}$ = firm *i's* extraordinary items and discontinued operations from the statement of cash flows in year *t.*

However, in this study, certain changes have been made to the calculation of total accruals. The McGregor's database does not separately identify cash flows from discontinued operations because GAAP/IFRS does not require separate disclosure of cash flows from continuing and discontinuing operations. GAAP/IFRS no longer allows the use of extraordinary items. Since discontinued operations and extraordinary items remain in the calculation of income and cash

flows from operations, this is still regarded as an acceptable method of calculating total accruals (Gavious, 2007).

Therefore, in this study total accruals is defined as:

$Tacc_{it}$ = Earnings $_{it} - CFO_{it}$ (1)

Where:

$Tacc_{it}$ = total accruals for firm *i* in period *t;*

Earnings $_{it}$ = firm *i's* income per the income statement in year *t*;

CFO_{it} = firm *i's* cash flows from operations in year *t*;

Discretionary accruals calculated using the modified Jones model

Discretionary accruals, the earnings management component of total accruals, are calculated using the modified Jones (DACC-MJ) and the asymmetric Ball and Shivakumar (DACC-BS) models described below. All accruals measures are predicted to be positive and significantly larger in suspected earnings management firms.

The expectations model for discretionary accruals using the cross sectional modified-Jones model as developed by Dechow et al (1995) is estimated as follows:

$$Tacc_{it} = \alpha + \beta_1 (\Delta REV_{it} - \Delta REC_{it}) + \beta_2 PPE_{it} + \xi_{it} \quad (2)$$

where:

$Tacc_{it}$ = earnings $_{it} - (CFO_{it})$ as defined in (1) above

ΔREV_{it} = change in firm i's sales from period t-1 to t;

ΔREC_{it} = changes in firm i's receivables from year t-1 to t,

PPE_{it} = gross property, plant and equipment for firm i in period t;

ξ_{it} = error term

All the variables are scaled by beginning-of-year total assets.

In the above regression equation $\beta 1$ (Δ $REV_{it} - \Delta$ REC_{it}) and $\beta 2$ PPE_{it} are proxies for non-discretionary accruals and the error term represents discretionary accruals. Modifying the Jones (1991) model by subtracting $\Delta\ REC_{it}$ from $\Delta\ REV_{it}$ changes the Jones model so that credit sales are assumed to be discretionary.

The modified Jones model to estimate discretionary accruals can be explained diagrammatically as follows:

$$Tacc_{it} = \alpha + \beta_1 (\Delta\ REV_{it} - \Delta\ REC_{it}) + \beta_2\ PPE_{it} + \xi_{it}$$

Total Accruals Non-discretionary accruals Discretionary accruals

Following Phillips et al (2003) and Dechow et al. (1995) the parameters in the modified -Jones model (2) above are estimated using the subsample of firm-years in which no earnings management is assumed, that is, all non-EM firms identified using KDE and firms in intervals where the expected and actual number of observations were not significantly different from each other. Therefore, ($\Delta\ REC_{it}$) is excluded from the estimation from the subsample firms as no earnings management is assumed. The estimated parameters calculated from the firms in the interval where no management was found and identified non-earnings management firms are then used to compute estimated discretionary accruals ($DAcc_{it}$) for EM firms as follows:

$$DAcc_{it} = TAcc_{it} - [a_{i} + b_{1i} (\Delta\ REV_{it} - \Delta\ REC_{it}) + b_{2i} (PPE_{it})]$$

Depicted diagrammatically discretionary accruals are calculated as follows:

$$DAcc_{it} = TAcc_{it} - [a_{i} + b_{1i} (\Delta\ REV_{it} - \Delta\ REC_{it}) + b_{2i} (PPE_{it})]$$

Discretionary accruals Total accruals Non –discretionary accruals

Discretionary accruals calculated using the Ball and Shivakumar piecewise linear accruals model

BS hypothesise that because the recognition of gains and losses is asymmetric, the positive correlation between cash flows and accruals is greater in periods with losses than with gains. The effect of this asymmetry is that accrual models that are linear in cash flows are misspecified and misestimate the discretionary and non-discretionary components of accruals.

In this study, the BS model (as explained in 5.1 of this chapter) will be used to re- estimate the parameters for non-discretionary accruals (changes in sales and property, plant and equipment) from the subsample of firms in which no earnings management is assumed. The re-estimated parameters calculated using non-earnings management firms will then be used to compute estimated discretionary accruals in equation 3 below.

$$DAcc_{it} = TAcc_{it} - [a_{i+} b_{1i} (\Delta REV_{it} - \Delta REC_{it}) + b_{2i} (PPE_{it}) + \alpha_2 VAR_t + \alpha_3 DVAR_t + \alpha_4 DVAR_t * VAR_t] + {}_{vt} \quad (3)$$

Changes in working capital accruals (ΔWC-ACC) are compared between suspected EM and non-EM firms to assess working capital accrual quality because this measure does not include depreciation and amortisations and is expected to be positive (income increasing) in suspected EM firms and larger than those in non-EM firms. Changes in accounts receivable are compared across suspected EM and non-EM firms and are predicted to be larger and income increasing in suspected EM firms. Beneish (1999) finds that manipulating firms overstated earnings by recording fictitious or unearned sales and Dechow et al (2011) report that accounts receivable manipulations occur in 19.1 % of misstatements identified by the SEC.

Deferred tax expense is investigated as manipulation can result in higher accounting income than taxable income which will result in a larger deferred tax expense in suspected EM firms.

Performance variables

KDE revealed that there were a smaller number of observations than expected in the bandwidths to the left of zero, in other words firms whose earnings fall in this band are firms which have incurred losses and have not manoeuvred earnings across the threshold into gains. Concomitantly

there were more observations than expected in the interval to the right of zero; firms whose earnings fall in this band are identified as suspected earnings management firms. If firms report small profits as a result of accruals manipulation only, the cash flow from operations is expected to be similar to that of the non-EM firms. Following Dechow et al (2011) performance is evaluated on changes in cash sales as this excludes accruals based sales. Current period cash flows and changes in cash flows are included as a fundamental measure of firm performance as an increase in operating cash flows indicates improved performance and reduces managers' incentives to manipulate earnings (Phillips et al, 2003).

To verify whether this assumption is correct this thesis examines whether unmanaged performance metrics are similar in non-EM relative to suspected EM firms. KDE identified that there were fewer than the expected number of firm years in the band immediately to the right of the suspected earnings management band. This means that the suspected earnings management band most likely contains genuine earnings and suspected upward and downward managed earnings. Given the positive relationship between cash flows and earnings, higher cash flows can be anticipated in small profit firms relative to small loss firms, (Dechow et al, 2003). If the genuine profit making and downward earnings management firms dominate firm years in the suspected EM band the performance metrics may be higher in suspected EM firms relative to non-EM firms. Therefore, the expected direction of the difference in the performance variables is an empirical matter.

Market related incentives

High market prices and borrowings may incentivise managers to manipulate profits to hide poor performance. To evaluate whether motivation is a distinguishing feature between suspected EM and non-EM firms earnings-to-price, book-to-market and leverage are investigated and expected to be higher in suspected EM firms relative to non-EM firms.

5.4 Results

Results of comparing variables in the net income levels after and before tax distributions are presented in Tables 10 and 11 respectively. Net income changes distributions after tax are presented in Table 12, net income changes before tax results are displayed in Table 13. The level

of modified -Jones discretionary accruals identified in prior research in emerging economies is presented in Table 14.

Earnings levels after taxation

Table 10 provides the results of the comparison of accruals, performance and market related variables in suspected EM firms and non-EM firms in the earnings levels distributions. (Dechow et al, 1995)Clustered-*t* and Sommers' D test results that are significant at the 5% level are shaded in grey. Medians and Sommers' D statistics are presented in brackets. The before tax results are displayed in Table 11.

To place the level of modified-Jones discretionary accruals estimated in the South African data, in this thesis in context, the level of modified –Jones discretionary accruals estimated in prior research in developing and developed countries are displayed in Table 14. In this thesis modified –Jones discretionary accruals estimated in suspected earnings manipulation firms in earnings levels deflated by number of shares is lower than that reported in prior research at 0.0298 of total lagged assets. In emerging economies in Kenya and Mexico modified-Jones discretionary accruals are estimated at 0.03, in Malaysia at 0.04, in Greece 0.064 and in South Korea 0.077. In Israel, Turkey, Brazil and Poland modified-Jones discretionary accruals are 9% of total lagged assets and in Russia, China and Hong Kong they exceed 10%. In France modified-Jones discretionary accruals are 5% of total assets and those in Canada are 0.07. In SEC forced restatement firms modified-Jones discretionary accruals are estimated at 5% of lagged total assets while in suspected earnings identified using distribution analysis modified-Jones accruals are considerably lower at 0.0049.

In the earnings levels deflated by number of shares distribution, suspected earnings manipulation firm years are located in the band 0,.217 to the right of zero and non-EM firms are found in the three bands 0,-.217; -.217,-.436 and -.436,-.651 to the left of zero. In addition, there is less than the expected number of observations in the band .217-.434, that is, the first band immediately to the right of the suspected EM band. As discussed earlier this may be evidence of downwards earnings management. Deflating by market value of equity and total assets shifts the location of the suspected earnings management firms from the first interval to the right of zero to the second and third intervals to the right of zero. In other words, the jump in the earnings distribution no

longer occurs in the vicinity around zero. Where market value of equity and total assets are the deflators, the non-EM firms are located in only the first and second intervals to the left of zero and there is no evidence of downwards earnings management. This shift in the location of the excess observations is attributed to market value of equity and total assets are being significantly different between profit and loss firms.

Accruals variables

In both suspected EM firms and non-EM firms, the mean and median on total accruals are, as predicted, negative, because they contain depreciation and amortisation and are less negative in suspected EM firms than in the non-EM firms in all the scaled distributions. Prior distributional research using histograms and deflating earnings by market value of equity (Dechow et al, 2003) and (Phillips et al, 2003) report negative total accruals which are significantly different to each other at the 5% and 10% levels in earnings management and non-earnings management firms.

Where net income after tax is scaled by number of shares and market value, the modified Jones and asymmetric BS discretionary accruals estimates are significantly positive (income increasing) in suspected EM and negative (income decreasing) and non-EM firms. This result is similar to Phillips et al (2003) who report that modified Jones discretionary accruals are insignificantly positive (negative) in EM firms (non-EM firms) but unlike Dechow et al (2003) who report insignificant income increasing lagged and forward looking discretionary accruals in small loss and small profit firms. Both of these studies identify suspected EM firms using histograms and analyse earnings scaled by market value. Dechow et al (2011) find that modified Jones discretionary accruals are significantly income increasing in SEC identified misstatement firms.

When deflating by total assets, both the mean and median modified Jones discretionary accruals are income increasing in the non-EM band of companies and are significantly larger and positive in the EM band. An Australian study (Coulton et al, 2005) reports insignificantly income increasing modified Jones discretionary accruals in benchmark beaters versus just missed firms when earnings levels are scaled by total assets. Ben Amar and Abaoub (2010) and Charoenwong and Jiraporn (2009) do not test whether identified discontinuities in earnings distributions in Tunisia and Thailand and Singapore respectively, can be attributed to earnings management.

The means and medians on asymmetric BS discretionary accruals (DACC-BS) are statistically higher in suspected EM than in non-EM firms and are income increasing in suspected EM firms and income decreasing in non-EM firms in all the deflated distributions. [26] The clustered *t* – statistic and Sommers' D statistic are lower for modified-Jones than for asymmetric BS discretionary accruals. This suggests that the asymmetric BS model may be more efficient than the modified-Jones model in estimating discretionary accruals because it takes pre-managed cash flows into account.

Mean and median changes in working capital accruals are significantly income increasing (decreasing) in EM (non-EM) firms where assets total and number of shares are the deflators but means are not significant where market value is the scalar. A similar result is observable where changes in accounts receivable are analysed but mean accounts receivable is insignificantly positive in non-EM firms where market value is the deflator. This result is comparable to Dechow et al (2011) who report significantly larger working capital accrual changes and changes in accounts receivable in SEC misstating firms versus the rest of the population.

Where number of shares is the deflator, the effect on deferred tax in the Income Statement is negative, which is the correct future tax consequence of negative total accruals but the incorrect tax effect of positive discretionary accruals in suspected EM firms. PPR hypothesize that deferred tax reflects the tax consequence of discretionary accruals, so when discretionary accruals are income increasing an increase in the deferred tax expense would be expected. The observed negative value of deferred tax expense in suspected EM firms is contrary to what one would anticipate if earnings are being managed upwards. In the NIAT/ number of shares distribution the mean deferred tax is -0.000387 for suspected EM firms, which is significantly less negative (that is greater) than the mean of -0.008110 in the non-EM firms. The median is also larger in the EM firms. In contrast, where market value and total assets are the deflators, deferred tax is significantly positive (negative) in suspected EM (non-earnings management) firms. Deferred tax correctly shows the tax consequence of income increasing (decreasing) discretionary accruals, which is the opposite relationship that is observed where number of shares is the deflator. Phillips et al (2003) report that deferred tax is incorrectly negative in their

[26] Mean modified Jones discretionary accruals are 0.029849 of total assets and asymmetric BS discretionary accruals are 0.032416 in suspected EM firms and -0.090642 and -.108160 respectively in non-EM firms where number of shares is the scalar.

sample of suspected earnings management firms where modified-Jones discretionary accruals are reported to be positive

To sum up, applying KDE, number of shares was the only deflator which did not alter the observed position of suspected EM and non-EM firms in the unscaled distribution. In this distribution all accrual variables are significantly larger in suspected EM firms. Where market value of equity is the scalar discretionary accruals are income increasing (decreasing) in EM (non-EM) firms but ΔWCC-ACC and mean changes in accounts receivable are not significantly larger in EM firms. Total assets appear to be an unsuitable deflator because modified Jones discretionary accruals become significantly income increasing in non-EM firms.

Performance variables

In order to understand the fundamental pre-managed performance of suspected EM and non-EM firms, performance variables, increase in cash sales, cash flows and change in cash flows are compared between suspected EM and non-EM firms. In the NIAT/ number of shares distribution all the performance variables are significantly larger in suspected EM firms. As reported by Dechow et al (2011) mean changes in cash sales are also positive in non-EM firms but significantly smaller than those in suspected EM firms, signalling either positive growth in performance across both firm types or real earnings management whereby firms front-load their sales at the end of the financial year (Dechow et al, 2011). In the NIAT/ number of shares distribution, current cash flow and change in cash flows[27] are positive in both classes of firm and the means and medians are significantly different and larger in suspected EM firms. This finding refutes the possibility that unmanaged cash performance in suspected EM and non-EM firms is the same. An explanation for this may be found in the KDE distribution analysis which identified evidence of downwards earnings management in the band of earnings observations to the right of the suspected EM band firms. An implication of this is that firms with larger pre-managed cash

[27] In the distribution of NIAT/no of shares the mean and median current cash flows in suspected EM firms are positive 0.199745 and 0.172497 respectively. Mean and median current cash flows in non-EM firms are considerably smaller, albeit closer to each other in value, being 0.050613 and 0.051524 respectively. Mean and median change in cash flows is also positive in both suspected EM and non-EM firms. Both mean and median change in cash flows increase in suspected EM firms (1.264156 and 1.142318 respectively), in contrast in non-EM firms the median but not the mean shows a decrease in value; mean 1.038624 and median 0.9902330.

flows may be included in the suspected EM band which, in turn, could increase the magnitude of the cash performance variables. Exploration of this explanation is suggested for future research.

When performance is analysed in the distribution of NIAT/market value of equity distribution the mean changes in cash sales and changes in cash are positive for both EM and non-EM firms but are now insignificantly different from each other. When scaling by total assets, mean changes in cash flows are positive and larger in EM and non-EM firms but are no longer significantly different. These results cannot be construed as conclusive evidence that the unmanaged performance of the suspected EM firms is the same as that of the non-EM firms because the medians are not significantly different and the levels of cash flows remain higher and significantly different in EM firms. A possible explanation for the changes in the results where market value and total assets are the deflators may be that the suspected EM band no longer contains downwards managed firms. Downwards managed firms may have had higher pre-managed earnings measured by changes in cash sales and changes in operating cash flows than genuine profit earners or upward managed firms. If these firms are no longer present in the suspected EM band this would have the effect of decreasing the mean on these variables. Taken in isolation, and without considering the fact that levels of operating cash flows were significantly larger in suspected EM firms, the fact that these pre-managed variables are no longer significantly larger in suspected EM firms could erroneously be interpreted as an indication that suspected EM firms may have been loss making firms whose earnings have been managed upwards.

The finding that discretionary accruals, change in working capital and change in accounts receivable are significantly negative indicate that firms to the left of zero may have engaged in downwards earnings management. If the firms that remain in the intervals to the left of the discontinuity are non- earnings management firms one would expect discretionary accruals, working capital changes and changes in accounts receivable to be zero. In addition, there is an inconsistency between the results of the bootstrap KDE results in Table 6. The evidence of downwards earnings management would suggest that the actual number of observations in some of the intervals below the threshold would be larger than that predicted by KDE. However, this is not the case; the results reported in Table 6 show no evidence of excess observations to the left of the no-earnings management intervals. This result may attributed to discretionary accruals

reversing in loss periods which are associated with negative changes in business activity Dechow, Hutton, Kim, and Sloan (2012). However this problem is left unresolved in this thesis and is an area for future research.

Market related variables

Leverage and the book-to-market ratio are compared between suspected EM and non-EM firms to determine whether EM firms have incentives to manage earnings. If managers have incentives to enhance financial performance to satisfy existing debt covenants and raise new finance, leverage is expected to be higher in suspected EM firms (Dechow et al, 2011). The mean leverage is insignificantly larger in non-EM firms across all the deflated distributions so leverage does not appear to be an incentive to enhance performance.

Managers of firms with high share prices relative to fundamentals may have incentives to increase earnings to hide diminishing performance and to enhance compensation tied to share prices (Dechow et al, 2011). The mean and median book-to-market ratio in suspected EM firms is lower than that in non-EM firms across all the deflated distributions indicating that the share price of suspected EM firms is higher[28]. This is an indication that managers of the suspected EM firms may have higher incentives than those in non-EM firms to boost profits to maintain share prices. Market prices of suspected EM firms appear to be lower in the market value and total assets distributions than in the number of shares distributions. Investors might perceive the suspected EM firms in the first two distributions to be more profitable than their counterparts in the number of shares distributions because of the location of suspected EM firms in the KDE distributions. Where market value of equity and total assets were the deflators the suspected EM firms were found in the second and third intervals to the right of zero (that is larger earnings) as compared to the first interval to the right of zero in the number of shares distribution.

Earnings levels before taxation

When tax is added back to the net income deflated by number of shares distribution, the disjoint in the distribution is still situated at zero earnings, the number of suspected EM firms is now 481 compared to 455 in the after tax distribution and the number of non-EM years decreases slightly

[28] In the number of shares deflated distribution, the mean (median) in EM firms is 1.015 (0.734) and in non-EM firms 1.20 (1.04). The prices of the two categories of firms differ significantly at the 5% level,

from 222 to 217 firm years; the KDE bandwidth increases to 0.31. The discontinuity in the distribution of net income before tax deflated by market value and total assets shifts from the second and third intervals to the third and fourth intervals to the right of zero, the number of suspected EM firms decrease from 756 to 623 firm years in the market value deflation distribution and from 697 to 535 firms in the total assets distribution. The KDE bandwidths do not vary much when taxation is added back to the market value and total assets distributions. In both the distributions, the number of non-EM firms remains almost the same which makes sense because of the asymmetric treatment of taxation in profit and loss firms.

Descriptive statistics are presented in Table 11. In the number of shares distribution, the sign and the clustered t-statistic and Sommers D t-statistics results on all the accruals variables and their relationship to one another remain qualitatively the same. Where performance is assessed, the only difference is that the median changes in cash flows are negative in non-EM firms and these remain significantly different from those in suspected EM firms.

When the distribution of net income before taxation/market value is analysed, all the discretionary accruals variables, as well as changes in working capital accruals and accounts receivable, increase in EM and decrease in non-EM firms and are significantly different from each other.

In contrast where net income before taxation is deflated by total assets, modified Jones discretionary accruals are income increasing in the non-EM band but these discretionary accruals and total accruals are no longer significantly different between EM and non-EM firms. Median changes in cash flows decrease in non-EM firms but remain positive in EM firms, and remain significantly different. Mean changes in cash flows are positive and larger in EM and non-EM firms but are no longer significantly different. This in itself cannot be construed as evidence that the unmanaged performance of the suspected EM firms is the same as that of the non-EM firms because the medians are not significantly different and increases in cash sales and the levels of cash flows remain higher and significantly different in EM firms. In all the before tax distributions, book-to-market ratios are significantly higher in suspected EM firms and there is no significant difference in leverage between the two categories of firms, non-EM firms have larger borrowings than EM firms.

All in all, earnings before and after tax deflated by number of shares displays a discontinuity around zero and, accruals measures are significantly larger, level of performance is greater and incentives to manage earnings more pronounced in suspected EM firms. Where market value is the deflator the location of the discontinuity is shifted away from zero, discretionary accruals are significantly income decreasing in non-EM firms and there is very weak evidence, in the after tax distribution, that changes in pre-managed income in suspected EM firms and non-EM firms could have been similar. Where total assets is the scaler, the discontinuity in the distribution is also shifted away from zero; in the after tax distribution, modified Jones discretionary accruals become significantly income increasing in non-EM firms but together with total accruals are no longer significantly larger in the before tax distribution, indicating that deflating by total assets may influence research results. In addition, these results lend only minimal support to BMN's assertion that taxation may be one explanation for the kink in earnings changes deflated by market value and total assets.

Table 10 Descriptive statistics NIAT earnings management versus non-earnings management firms: earnings managed to avoid a loss

	NIAT/no of shares						NIAT/ Market value of shares						NIAT/ Total assets					
	EM Firms		Non-EM Firms				EM Firms		Non-EM Firms				EM Firms		Non-EM Firms			
	No	Mean (Median)	No	Mean (Median)	t-stat	p-value	No	Mean (Median)	No	Mean (Median)	t-stat	p-value	No	Mean (Median)	No	Mean (Median)	t-stat	p-value
Accruals quality variables																		
TACC	455	-0.082655 (-0.076686)	222	-0.20868 (-0.152512)	5.42 (6.12)	0 (0.00)	756	-0.091166 (-0.09040)	88	-0.006027 (-0.000116	3.14 (2.77)	0.002 (0.006)	697	-0.077868 (-0.074542)	120	-0.119583 (-0.112705)	3.59 (3.73)	0 (0.00)
DACC_MJ	429	0.029849 (0.034794)	208	-0.090642 (-0.042551)	5.81 (6.01)	0 (0.00)	749	0.028223 (0.029282)	88	-0.04079 (-0.017651)	3.48 (3.2)	0.001 (0.002)	692	0.047349 (0.050583)	114	0.006202 (0.004729)	3.8 (3.78)	0 (0.00)
DACC_BS	429	0.032416 (0.025490)	208	-0.10816 (-0.069113)	7.14 (7.76)	0 (0.00)	749	0.049878 (0.043348)	88	-0.064105 (-0.042168)	6.95 (8.23)	0 (0.00)	692	0.029567 (0.032104)	114	-0.02328 (-0.027002)	5.7 (6.16)	0 (0.00)
DTAX	444	-0.000387 (0)	218	-0.00811 (-0.000068)	4.23 (3.7)	0 (0.00)	759	0.002077 (0.000976)	92	-0.15432 (-0.123746	3.87 (3.76)	0 (0.00)	696	0.002626 (0.001036)	118	-0.007779 (-0.002017)	6.16 (6.46)	0 (0.00)
ΔWC_ACC	381	0.013264 (0.004059)	191	-0.036905 (-0.026577)	4.19 (4.62)	0 (0.00)	667	0.007283 (0.005610)	83	-0.010373 (-0.007518	1.12 (2.47)	0.266 (0.014)	628	0.010971 (0.006631)	112	-0.020393 (-0.016063)	3.24 (3.51)	0.001 (0.00)
Δ REC	378	0.031379 (0.019510)	188	-0.011865 (-0.004298)	4.18 (5.24)	0 (0.00)	670	0.027542 (0.017417)	82	0.013294 (0)	1.2 (3.08)	0.203 0	626	0.020552 (0.010179)	110	-0.007365 (-0.000330)	4.35 (4.67)	0 (0.00)
Perfor-mance variables																		
Δ Cash Sales	434	1.264156 (1.142318)	215	1.038624 (0.990233)	4.13 (6.23)	0 (0.00)	746	1.20057 (1.142593)	85	1.113674 (1.061481)	1.62 (2.74)	0.107 (0.007)	684	1.168103 (1.130822)	114	1.022476 (1.014797)	3.34 (5.54)	0.001 (0.00)
Δ Cash Flow	447	0.052424 (0.037252)	228	0.015876 (0.008756)	2.55 (3.11)	0.012 (0.00)	756	0.039686 (0.027452)	87	0.014898 (0.007524)	1.63 (2.45)	0.104 (0.015)	693	0.023904 (0.019728)	117	0.014151 (0.014933)	0.9 (1.21)	0.368 (0.229)
Cash Flow	449	0.199745 (0.172497)	220	0.050613 (0.051524)	7.79 (7.82)	0 (0.00)	755	0.231467 (0.214413)	90	0.109757 (0.100479)	6.61 (6.28)	0 (0.00)	696	0.167068 (0.160606)	120	0.0887094 (0.079718)	6.63 6.63	0 (0.00)
Market related variables																		
Leverage	532	0.104434 (0.050346)	248	0.114371 (0.052882)	-0.68 (-0.59)	0.499 (0.553)	761	0.100201 (0.050647)	93	0.101436 (0.037472)	-0.07 (0.08)	0.943 (0.933)	698	0.103652 (0.064502)	120	0.124302 (0.072562)	-1.17 -0.43	0.242 0.667
Book-to-market	489	1.015597 (0.734044)	217	1.209395 (1.041334)	-2.27 (-2.3)	0.024 (0.023)	751	0.714546 (0.517496)	92	1.274971 (1.109564)	-5.16 (-4.24)	0 (0.00)	673	0.896392 (0.729255)	115	1.487924 (1.220263)	-5.47 (-4.93)	0 (0.00)

P values significant at the 5% level highlighted in grey. In this table means and medians (shown in brackets) for accruals, performance and market related variables are calculated and presented for suspected (EM) and non-EM firms where earnings are managed to avoid reporting a loss. The variables are defined in Table 9. Pair wise differences in the means are compared using clustered t-tests and medians are compared using the Sommers D' test.

Table 11 Descriptive statistics NIBT earnings management versus non-earnings management firms: earnings managed to avoid a loss

	NIBT/no of shares						NIBT/ Market value of shares						NIBT/ Total assets					
	EM Firms		Non-EM Firms				EM Firms		Non-EM Firms				EM Firms		Non-EM Firms			
	No	Mean (Median)	No	Mean (Median)	t-stat	p-value	No	Mean (Median)	No	Mean (Median)	t-stat	p-value	No	Mean (Median)	No	Mean (Median)	t-stat	p-value
Accruals quality variables																		
TACC	481	-0.08282 (-0.07669)	217	-0.227485 -(0.157192)	5.9 (6.59)	0 (0.00)	623	-0.096946 (-0.091973)	79	-0.160621 (-0.116228)	2.66 (2.12)	0.009 (0.036)	535	-0.084204 (-0.078857)	99	-0.1114993 (-0.105008)	1.69 2.14	0.093 (0.034)
DACC_MJ	464	0.029112 (0.037313)	203	-0.111635 (-0.048747)	6.2 (6.47)	0 (0.00)	617	0.018691 (0.023028)	74	-0.048545 (-0.015258)	2.82 (2.23)	0.005 (0.027)	534	0.03432 (0.038038)	93	0.0074795	1.77 (2.13)	0.079 (0.035)
DACC_BS	464	0.031527 (0.023000)	203	-0.12575 (-0.079727)	6.99 (7.45)	0 (0.00)	617	0.036792 (0.037514)	74	-0.073839 (-0.038399)	5.33 (6.33)	0 (0.00)	534	0.024609 (0.029097)	93	-0.024156 (-0.025404)	3.67 (4.93)	0 (0.00)
DTAX	477	-0.000555 (0)	216	-0.008884 (-0.000358)	4.58 (4.62)	0 (0.00)	625	0.002564 (0.001296)	77	-0.007043 (-0.002116)	4.1 (4.14)	0 (0.00)	534	0.003399 (0.001403)	98	-0.0091584 (-0.003742)	6.5 7.09	0 (0.00)
WC_ACC	415	0.0205609 (0.006888)	183	-0.051828 (-0.045579)	5.27 (5.76)	0 (0.00)	562	0.007605 (0.008662)	71	-0.035182 (-0.043034)	2.6 (3.62)	0.01 (0.00)	479	0.0158 (0.009395)	91	-0.0367491 (-0.029134)	4.75 (4.62)	0 (0.00)
Δ REC	411	0.031373 (0.019218)	181	-0.024628 (-0.016184)	5.56 (6.17)	0 (0.00)	562	0.02736 (0.020147)	69	-0.007135 (-0.000271)	3.02 (4.74)	0.003 (0.00)	477	0.026025 (0.013156)	90	-0.0141218 (-0.000160)	4.93 (5.24)	0 (0.00)
Perfor-mance variables																		
Δ Cash Sales	470	1.250956 (1.128561)	209	1.039 (0.96963)	4.18 (6.27)	0 (0.00)	624	1.209379 (1.141788)	72	1.010138 (1.02956)	4.32 (4.03)	0 (0.00)	531	1.189952 (1.147394)	91	1.002894 (1.013994)	4.31 (6.23)	0)0.00)
Δ Cash Flow	482	0.049995 (0.037319)	216	0.006149 (-0.00035)	3.19 (4.02)	0.002 (0.00)	622	0.036406 (0.027818)	75	-0.002476 (-0.010599)	1.99 (2.96)	0.048 (0.003)	529	0.034377 (0.024672)	97	0.0115948 (-0.000487)	1.56 (2.61)	0.12 (0.01)
Cash Flow	484	0.1941241 (0.162486)	215	0.03857 (0.040035)	8.02 (8.15)	0 (0.00)	626	0.238699 (0.216676)	77	0.08883 (0.079527)	7.13 (6.14)	0 (0.00)	533	0.18302 (0.179864)	99	0.0738661 (0.0651285)	7.59 (7.49)	0 (0.00)
Market related variables																		
Leverage	568	0.106201 (0.050346)	245	0.122229 (0.054991)	-1.13 (-1.09)	0.261 (0.227)	628	0.104257 (0.05302)	80	0.112899 (0.070769)	-0.42 (-0.11)	0.671 (0.911)	535	0.097454 (0.060046)	99	0.138615 (0.071159)	-1.83 (-0.79)	0.068 (0.432)
Book-to-market	524	1.027332 (0.7519)	211	1.225035 (1.041334)	-2.37 (-2.46)	0.019 (0.015)	619	0.716073 (0.510794)	78	1.376685 (1.209899)	-5.39 (-4.79)	0 (0.00)	521	0.833993 (0.686148)	92	1.61366 (1.312902)	-6.2 (-5.78)	0 (0.00)

P values significant at the 5% level highlighted in grey. In this table means and medians (shown in brackets) for accruals, performance and market related variables are calculated and presented for suspected (EM) and non-EM firms where earnings are managed to avoid reporting a loss The variables are defined in Table 9. Pair wise differences in the means are compared using clustered t-tests and medians are compared using the Sommers D' test.

Earnings changes distributions

In the earnings changes deflated by number of shares distributions, suspected earnings management years are located in the band 0, .058 to the right of zero: there is no evidence of fewer than the expected number of observations in the first band to the left of zero, fewer observations emerge in the bands -.058,-.117 and -.117,-.176 and there is no evidence of downwards manipulation. Evidence of downwards manipulation occurs in earnings changes distributions deflated by market value of equity and total assets.

Changes in net income after tax distributions are easier to interpret than the earnings levels distributions because all the deflators yield a jump in the same location in the earnings distribution; there are more than the predicted number of observations in the first interval to the right of zero and fewer than the number expected in the second and third intervals to the left of zero. There is evidence of downwards earnings management in the market value and total assets changes after tax distributions but not in the number of shares distributions Earnings changes after taxation are displayed in Table 12 and the before tax distributions in Table 13.

In the NIAT and NIBT/no of shares distributions, except for the median modified-Jones discretionary accruals and mean and median changes in accounts receivable which are income increasing in non-EM firms, means and medians on all the accruals variables are positive for suspected EM firms and negative for non-EM firms and are significantly larger in EM firms. As in the levels distributions deferred tax in suspected EM firms is incorrectly negative in EM firms where discretionary accruals are positive in EM firms.

Where earnings changes after tax are deflated by market value of equity, the means and medians on all the accruals variables are significantly larger and income increasing in suspected EM firms and decreasing in non-EM firms. When earnings changes are scaled by total assets, median modified Jones and asymmetric discretionary accruals become positive and remain significantly different in non-EM firms. ΔWCC-ACC means are no longer significantly different from each other across EM and non-EM firms. As in the levels distributions, deferred tax correctly reflects the deferred tax consequences of income increasing discretionary accruals in EM firms.

In related but not directly comparable research in Spain Arnedo et al (2007) report that modified-Jones discretionary accruals are income increasing in firms whose pre-managed

earnings does not equal prior period earnings and income decreasing when excess earnings are reported. Discretionary accruals are not compared between above and below target firms but are reported to be significantly different from zero.

Cash performance, as measured by changes in cash sales and cash flows, are positive in both firm categories and significantly larger in EM firms where number of shares is the deflator. Changes in cash flows decrease in non-EM firms in the market value and total assets distributions.

Where taxation is added back, the results remain qualitatively the same except that in the total assets deflated distributions median modified-Jones discretionary accruals become income decreasing in EM firms and income increasing in non-EM firms. Both mean and median ΔWCC-ACC are no longer significantly different. When number of shares is the deflator deferred tax, for the first time, correctly reflects the future tax consequences of income increasing discretionary accruals in suspected EM firms. Where market incentives to manage earnings are considered in both the before after tax changes distributions, median, but not mean, leverage is lower in suspected EM firms. Mean and median book-to-market ratios are lower, that is, shares are more highly valued, in suspected EM firms.

In brief, the comparison of accrual and performance variable is qualitatively similar across before and after earnings changes distributions which can be attributed to the fact that discontinuities appear in the same locations in all the distributions. However, the inconsistency observed between the KDE results in the intervals to the left of zero and negative discretionary accruals, working capital and accounts receivable also occurs in the earnings changes sample.

Table 12 Descriptive statistics earnings NIAT changes management versus non-earnings management firms

	(NIAT t)/No of shares t)-(NIATt-1)/ No of shares t-1)						(NIATt-NIATt-1)/ Market value of sharest-2						(NIATt-NIATt-1)/ Total assets t-2					
	EM Firms		Non-EM Firms				EM Firms		Non-EM Firms				EM Firms		Non-EM Firms			
Accruals quality variables	**No**	Mean (Median)	**No**	Mean (Median)	**t-stat**	**p-value**	**No**	Mean (Median)	**No**	Mean (Median)	**t-stat**	**p-value**	**No**	Mean (Median)	**No**	Mean (Median)	**t-stat**	**p-value**
TACC	276	-0.0950034 (-0.082998)	104	-0.149638 (-0.098369)	2.44 (2.21)	0.016 (0.029)	605	-0.08705 (-0.083485)	116	-0.154412 (-0.109666)	3.65 (3.21)	0 (0.00)	637	-0.080753 (-0.079782)	139	-0.1327603 (-0.104621)	3.57 (3.43)	0 (0.00)
DACC_MJ	260	0.015688 (0.0290532)	105	-0.029507 (0.022708)	2.28 (2.06)	0.024 (0.041)	599	0.030509 (0.035233)	114	-0.037702 (-0.004611)	3.76 (3.44)	0 (0.00)	631	0.041145 (0.043023)	137	-0.016093 (0.006764)	3.84 (3.82)	0 (0.00)
DACC_BS	260	0.0303024 (0.0316447)	105	-0.040968 (-0.008402)	4.1 (4.7)	0 (0.00)	599	0.051266 (0.046886)	114	-0.061475 (-0.024796)	6.46 (8.28)	0 (0.00)	631	0.036688 (0.037998)	137	-0.027356 (0.002663)	4.7 (5.93)	0 (0.00)
DTAX	275	-0.0000187 (0)	104	-0.006132 (-0.001069)	2.61 (2.28)	0.01 (0.024)	605	0.002166 (0.000742)	115	-0.004989 (-0.001289)	4.52 (3.89)	0 (0.00)	637	0.002208 (0.000784)	136	-0.00562 (-0.002405)	5.19 (4.55)	0 (0.00)
ΔWC_ACC	254	0.007458 (0)	90	-0.040258 (-0.026069)	3.07 (3.52)	0.003 (0.001)	602	0.005821 (0.005953)	115	-0.034078 (-0.022097)	3.37 (3.94)	0.001 (0.00)	634	0.007664 (0.008269)	138	-0.005545 (-0.007974)	1.17 (2.13)	0.244 (0.04)
Δ REC	252	0.041504 (0.0265723)	91	0.00623 (0.006101)	3.1 (3.07)	0.002 (0.003)	604	0.033573 (0.022707)	114	-0.005626 (-0.000544)	4.74 (5.21)	0 (0.00)	632	0.029453 (0.017227)	136	-0.0029318 (0.0037898)	5.03 (4.95)	0 (0.00)
Perfor-mance variables																		
Δ Cash Sales	267	1.281662 (1.169219)	104	1.075399 (1.078992)	3.9 (3.56)	0 (0.001)	592	1.164629 (1.147567)	114	1.067426 (1.055156)	2.21 4.79)	0.028 (0.00)	627	1.148505 (1.142003)	135	0.9983184 (1.03751)	4.96 (5.64)	0 (0.00)
Δ Cash Flow	271	0.066009 (0.049232)	106	0.018344 (0.014019)	2.24 (2.56)	0.027 (0.012)	605	0.035753 (0.033125)	116	-0.01345 (-0.010457)	4.17 (4.43)	0 (0.00)	634	0.025173 (0.028653)	139	-0.007572 (0.002089)	3.37	0
Cash Flow	272	0.211892 (0.184253)	107	0.134957 (0.122316)	3.26 (3.05)	0.001 (0.003)	603	0.228909 (0.211838)	115	0.113873 (0.105100)	7.34 (7.77)	0 (0.00)	637	0.196637 (0.189289)	138	0.1411187 (0.1264355)	4.23 (4.48)	0 (0.00)
Market related variables																		
Leverage	285	0.106885 (0.038041)	108	0.125494 (0.080718)	-0.82 (-2.09)	0.411 (0.038)	607	0.086395 (0.035772)	116	0.108433 (0.069161)	-1.59 (-2.65)	0.114 0.009	637	0.091382 (0.045344)	138	0.108102 (0.055712)	-1.37 (-1.64)	0.174 (0.103)
Book-to-Market	260	0.897425 (0.670703)	98	1.20729 (0.905596)	-3.03 (-2.87)	0.003 (0.005)	594	0.681569 (0.51709)	112	1.382073 (1.196337)	-7.4 -7.74	0 (0.00)	614	0.815289 (0.590709)	136	1.182056 (0.992566)	-4.69 (-4.98)	0 (0.00)

Table 13 Descriptive statistics NIBT changes earnings management versus non-earnings management firms

	NIBT t)/No of shares t)-'(NIBTt-1)/ No of shares t-1)						'(NIBTt-NIBTt-1)/ Market value of sharest-2						NIBTt-NIBTt-1)/ Total assets t-2					
	EM Firms		Non-EM Firms				EM Firms		Non-EM Firms				EM Firms		Non-EM Firms			
Accruals quality variables	No	Mean (Median)	No	Mean (Median)	t-stat	p-value	No	Mean (Median)	No	Mean (Median)	t-stat	p-value	No	Mean (Median)	No	Mean (Median)	t-stat	p-value
TACC	276	-0.095 (-0.083)	107	-0.14964 (-0.09837)	5.9 (2.21)	0..00 0.029)	582	-0.09773 (-0.08743)	135	-0.1381 (-0.0905)	3.05 (2.11)	0.003 (0.036)	596	-0.08233 (-0.08221)	440	-0.10183 (-0.08933)	2.71 (2.02)	0.007 (0.045)
DACC_MJ	283	0.018032 (0.030676)	110	-0.023608 (-0.00039)	2.04 (2.34)	0.04 (0.02)	576	0.024659 (0.029833)	134	-0.026667 (0.006454)	3.36 (2.5)	0.001 (0.014)	587	0.036452 (-0.04007)	434	0.015722 (0.02924)	2.93 (2.55)	0.004 (0.012)
DACC_BS	283	0.03009 (0.032098)	110	-0.032642 (-0.00762)	3.62 (4.44)	0 (0.00)	576	0.047264 (0.044349)	134	-0.052503 (-0.016804)	6.31 (7.93)	0 (0.00)	587	0.028501 (0.030928)	434	-0.000708 (0.010309)	4.9 (5.67)	0 '(0.00)
DTAX	298	0.000219 (0)	109	-0.007079 (-0.00166)	3.43 (2.73)	0 (0.01)	582	0.002603 (0.000848)	135	-0.005428 (-0.000874)	4.92 (4.67)	0 (0.00)	595	0.0017549 (0.000706)	434	-0.002082 (0)	4.55 (4.67)	0 (0.00)
WC_ACC	281	0.008182 (0.004059)	96	-0.028636 (-0.01725)	2.38 (2.66)	0.018 (0.01)	581	0.005425 (0.005201)	133	-0.032335 (-0.022443)	3.46 (4.31)	0.001 (0.00)	594	0.007008 (0.005973)	435	-0.00122 (-0.00141)	1.37 (1.96)	0.172 (0.051)
Δ REC	278	0.034062 (0.020002)	95	0.002719 (0.00267)	2.76 (2.87)	0.01 (0.01)	582	0.032329 (0.021877)	132	-0.001408 (-0.000156)	3.91 (5.25)	0 (0.00)	591	0.027192 (0.017266)	434	0.00121 (0.000679)	5.69 (6.66)	0 (0.00)
Perfor-mance variables																		
Δ Cash Sales	293	1.262357 (1.164085)	107	1.085521 (.006654)	3.41 (4.16)	0 (0.00)	570	1.163518 (1.147567)	133	1.042273 (1.036597)	2.8 (5)	0.006 (0.00)	585	1.139869 (1.139056)	426	1.053569 (1.055665)	4.06 (7.19)	0 (0.00)
Δ Cash Flow	296	0.0554462 (.0422606)	109	0.0066546 (.020892)	3.33 (3.66)	0 (0.00)	582	0.0346 (0.034807)	134	-0.02081 (-0.016117)	4.95 (5.42)	0 (0.00)	594	0.025058 (0.029081)	438	-0.002034 (-0.0 01101)	4.79 (6.24)	0 (0.00)
Cash Flow	297	0.2031407 (.1787724)	110	0.12982 (.135868)	3.67 (3.36)	0 (0.00)	580	0.230337 (0.212366)	134	0.10367 (0.103917)	9.33 (9.99)	0 (0.00)	596	0.190037 (0.18094)	439	0.141851 (0.132420)	6.05 (6.6)	0 (0.00)
Market variables																		
Leverage	310	0.105799 (0.040497)	112	0.117813 (0.08183)	-0.69 -2.56	0.492 0.011	584	0.088983 (0.036298)	134	0.107722 (0.066885)	-1.33 (-2.64)	0.185 (0.009)	596	0.09661 (0.049081)	439	0.110662 (0.060455)	-1.46 (-1.82)	0.147 (0.07)
Book-to-market	285	0.923455 (0.686992)	105	1.182202 (0.86324)	-2.61 (-2.87)	0.01 (0.005)	573	0.675514 (0.517658)	130	1.379408 (1.193321)	-7.81 (-8.18)	0 (0.00)	574	0.815857 (0.608083)	415	1.163277 (0.933548)	-6.51 (-7. 1)	0 (0.00)

Table 14 Discretionary accruals estimated in prior research		
Country	**Discretionary accruals**	**Author**
Emerging economies		
Brazil	0.098	Memis and Cetenak (2012)
China	0.103	L. Wang and Yung (2011)
Greece	0.064	Memis and Cetenak (2012)
Israel	0.095	Memis and Cetenak (2012)
Kenya	0.03*	Waweru and Riro (2013)
Hong Kong	0.117*	Jaggi et al (2009)
Malaysia	0.04	Rahman and Mohamed-Ali (2006)
Mexico	0.037	Memis and Cetenak (2012)
Poland	0.09	Memis and Cetenak (2012)
Russia	0.101	Memis and Cetenak (2012)
South Korea	0.077	Memis and Cetenak (2012)
Turkey	0.091	Memis and Cetenak (2012)
Developed economies		
Canada	0.0704	Fakhfakh (2011)
France	0.0558	Fakhfakh (2011)
USA	0.0049	Phillips et al (2003)
USA	0.057	Dechow et al (2011)
* performance adjusted mean discretionary accruals		

5.5 Pre-managed performance in a constrained sample of earnings management firms identified using positive discretionary accruals

Because the KDE distribution analysis identified evidence of downwards earnings management to the right of the suspected EM band, an attempt is made to isolate a constrained sample of EM firms based on the sign of modified discretionary accruals. Firm years in the suspected EM band are assigned to the new EM sample if their modified Jones discretionary accruals are positive, that is, income increasing. The suspected EM band is obtained from the distribution of earnings deflated by number of shares. The cash performance of these companies is compared to that of the firms in the non-EM band to examine whether unmanaged performance metrics are the same in possible earnings management and non-EM firms. Accrual metrics are not compared because discretionary accruals are used to partition possible EM firms within the suspected EM band.

Incentives to manipulate earnings are evaluated by comparing market related variables. The descriptive statistics are shown in Table 15.

Table 15 Descriptive statistics earnings management firms with positive accruals vs non-earnings management firms, net income after tax deflated by number of shares

NIAT/no of shares										
	Possible EM Firms			Non-EM Firms			clustered t-test		Sommers D' t-test	
	No	Mean	Median	No	Mean	Median	t-stat	p-value	t-stat	p-value
Performance variables										
Δ Cash Sales	101	1.277617	1.190434	215	1.038624	0.990233	2.89	0.005	3.88	0.000
Δ Cash Flow	111	-0.0183299	-0.0292796	228	0.015876	0.008756	-1.43	0.156	-1.87	0.064
Cash Flow	110	0.0606327	0.0268424	220	0.050613	0.051524	0.43	0.665	-0.68	0.500
Market related variables										
Leverage	189	0.1087574	0.049317	248	0.114371	0.052882	-0.28	0.783	-0.36	0.720
Book-to-market	165	0.8238179	0.6152995	217	1.209395	1.041334	-4.56	0.000	-4.45	0.000

P values significant at the 5% level highlighted in grey

The results indicate that changes in cash sales are significantly different and positive in both possible EM firms and non-EM firms. However, as noted by (Dechow et al, 2011) this could be the result of real earnings management. Change in cash flow is negative in possible EM firms and positive in non-EM firms, both the Clustered-*t* and Sommers' D test are now no longer significantly different from each other. Therefore, the pre- managed performance of the possible EM and non-EM firms is similar and there is evidence of negative cash flows in the possible EM sample. Mean levels of cash flow are insignificantly slightly larger in possible EM firms, but the median is insignificantly smaller than that of non-EM firms. These insignificant results lead to the conclusion that the pre-managed cash flow of the possible EM and non-EM firms was similar prior to earnings management. Managers in possible EM firms have incentives to manage earnings to maintain share prices. This finding suggests that a two-step approach may be appropriate when earnings distributions are analysed to identify suspected EM firms. Once the suspected EM firms are located care, should be taken to discriminate suspected upwards earnings management firms based on the sign of discretionary accruals.

In Chapter 6 of this research, the role of deferred taxation as an alternate tool to identify evidence of earnings management is explored by comparing the incremental usefulness of deferred tax vis a vis total accruals, modified Jones discretionary accruals and asymmetric BS accruals

5.6 Conclusion

Two primary research objectives are investigated in this chapter of the thesis. Firstly, accruals metrics are compared between suspected EM and non-EM firms to investigate whether discontinuities in earnings distributions are evidence of earnings management. Secondly, operating cash flows and changes in cash sales and changes in operating cash flows are compared to establish whether pre-managed performance are similar across the firm categories.

Where earnings levels and earnings changes are deflated by number of shares and market value of equity, both modified Jones and asymmetric BS discretionary accruals are significantly income increasing in suspected EM firms and income decreasing in non-EM firms. Scaling by total assets is not a suitable deflator in the South African context as it appears to affect the sign and statistical significance of the accruals metrics: in the earnings levels before and after tax distribution. Furthermore, this research confirms Ball and Shivakumar's (2006) finding that an asymmetric discretionary accruals model is more efficient in estimating discretionary accruals: in all the distributions, irrespective of deflators, asymmetric BS discretionary accruals are income increasing (decreasing) in suspected EM (non-EM) firms and are significantly different to each other. In brief, when both the location of the discontinuity in earnings distributions and accruals metrics are considered concurrently, there are two primary results: discretionary accruals indicate that there is evidence of manipulation in firms listed on the JSE and evidence that the observed discontinuity in earnings distributions may be caused by earnings management is most convincing where the scalar is number of shares.

Pre-managed performance is compared between suspected EM and non-EM firms to investigate whether firms in the suspected EM band were originally loss making firms and to examine indirectly whether reported performance is supported by increases in cash flows. All in all, there is not convincing evidence that pre-performance variables are similar in suspected EM and non-EM firms and so it cannot be concluded that small profit firms were originally small loss firms.

The anomaly between evidence of downwards earnings management in the firms to the left of the discontinuity and the fact that no build-up of observations occurs to the left of the suspected earnings management firms in the KDE distributions may be attributable to the reversal of discretionary accruals in loss making firms. Such a reversal will not result in more than the expected number of observations to the left of the non-earnings management intervals. However, this is an area for future research.

In supplementary analysis, when pre-managed performance was compared between a constrained sample of earnings management firms (identified based on positive modified Jones discretionary accruals) and the original non-earnings management firms, pre-managed performance based on changes in cash flow and cash flow from operations was found to be similar suggesting that these probable EM firms may have originally been small loss firms. This finding may provide evidence that analysing the distribution of earnings for discontinuities is only the first step in identifying suspected earnings management firms. Future research may consider how to separate firms in the suspected earnings management band into genuine profit earning and upwards and downwards earnings manipulation firms. A further avenue for research is to explore the effect of downwards earnings management in earnings distribution studies. As this research did not explore the existence and effect of real earnings management, it is left to future research to explore whether evidence of real earnings management can explain the jump in earnings distributions.

CHAPTER 6 INCREMENTAL USEFULNESS OF DEFERRED TAXES IN DETECTING EARNINGS MANAGEMENT

Apart from fundamental analysis and careful scrutiny of financial statements, earnings management can be identified by estimating the discretionary component of earnings, using complicated models. These models are cumbersome and have been proved to detect discretionary accruals with error (Dechow et al, 1995; Guay et al, 1996; Young, 1999). Phillips et al (2003) suggest that deferred tax is an easily accessible metric of earnings management that is incrementally useful to traditional measures of discretionary accruals in detecting earnings management. This research extends that performed by Phillips et al (2003) by identifying EM firms by exploring the distribution of earnings levels and changes for discontinuities using kernel density estimation (see Chapter 4) instead of Burgstahler and Dichev's (1997) histogram approach and incorporates Ball and Shivakumar's (2006) asymmetric model of estimating discretionary accruals (see Chapter 5 of this report).

Chapter 4 and 5 of this thesis offer evidence that the discontinuity, identified using KDE, in earnings levels distributions scaled by number of shares is not caused by deflation. Accruals metrics that are significantly income increasing (decreasing) in suspected EM (non-EM) firms provide evidence that the discontinuity is triggered by earnings management. The objective of this chapter of the thesis is to assess the usefulness of deferred tax expense over accruals in detecting earnings management in suspected EM firms

The remainder of this chapter is structured as follows: Section 1 discusses why deferred tax is a viable metric for detecting earnings management. The hypotheses are developed in Section 2 and Section 3 establishes the methodology that is used to assess whether deferred tax is incrementally useful to discretionary accruals in detecting earnings management. Section 4 evaluates the results and a conclusion is reached in section 5.

6.1 Deferred taxes as an alternate tool for identifying earnings management

Discretionary accruals models all tend to be inefficient in extracting non-discretionary accruals from total accruals (Dechow et al, 1995; Guay et al, 1996; Young, 1999). Based on the assumption that managers will not indulge in earnings manipulation that will result in higher current taxation payable to tax authorities (Ettredge, Sun, Lee, and Anandarajan, 2008; Mills and

Newberry, 2001; Phillips et al, 2003) propose that deferred tax may capture the effect of earnings management. Consequently deferred tax could be an easily accessible way to identify earnings management. Deferred tax arises when revenue or expenses are recognised in different periods for accounting than for tax purposes; the future tax consequence of this mismatch is recognised in financial statements as deferred tax which is part of the tax expense in the statement of comprehensive income and as an asset or liability in the statement of financial position. Because most earnings management attempts involve working capital accruals that do not affect current taxation payable, deferred tax recognised in the statement of comprehensive income will capture the future tax consequences of these manipulations.

IAS *12, Income Taxes* requires that deferred tax be recognised for all the future tax consequences (deductions and taxes payable) that will materialise when assets and liabilities recognised in the Statement of Financial Position are recovered or settled. The deferred tax figure in the Statement of Financial Position represents the temporary difference between accounting values, which can be manipulated, and tax values that are relatively free from manipulation because they are based on tax law. Because discretionary accounting choices allow for more discretion than tax law, Phillips et al (2003) hypothesize that changes in the deferred tax effect of these temporary differences, that are recognised as part of the tax expense in the Income Statement, represent the tax effect of management manipulations.

An increase in deferred tax liabilities is consistent with a firm currently recognising revenue and/ or deferring an expense for accounting purposes but not for tax purposes, this results in a future taxable amount which is reflected as a deferred tax liability in the Statement of Financial Position and as a deferred tax expense (positive movement) in the income statement. For example, there is discretion over when to recognise revenue for accounting purposes; for tax purposes, however, revenue received in advance must be recognised as revenue as cash is received. Except where changes in the net deferred tax liability for a period relate to mergers or acquisitions (where deferred tax is recognised as part of goodwill) or to income or loss items that are recognised in equity (for example, revaluations), the change in the net deferred tax liability account will affect the deferred tax expense in the income statement. In other words, if revenue is recognised before it is earned or if expenses are deferred to the next accounting period, this will be reflected as a positive movement on the deferred tax expense account. In addition, deferred

tax will increase where tax allowances for wear and tear exceed depreciation provided for accounting purposes.

Deferred tax assets increase as firms recognise expenses or defer revenue for accounting purposes but not for tax purposes, resulting in a future deductible amount for tax purposes. Temporary differences that arise because firms recognise expenses before they are recognised for tax purposes occur where the accrual principle requires that managers estimate and recognise liabilities for present obligations for expenditure relating to future events before they are recognised for tax purposes, for example, post-retirement benefits, warranty claims and restructuring costs. Expenses that are recognised before cash is paid or revenue that is deferred to a future period results in a negative movement to the deferred tax expense account. A negative movement can also occur where depreciation is written off for accounting purposes but not for tax purposes.

However, deferred tax recognised in the statement of comprehensive income will not always represent the tax consequences of all temporary differences between accounting and taxable income. IAS *12, Income Taxes* requires that a deferred tax asset can only be recognised to the extent that it is probable that deferred tax liabilities or future profits will exist against which the deferred tax asset can be utilised. In this circumstance, deferred tax may not represent the tax consequence of all temporary differences because recognition is restricted. In other words, a company that has incurred losses and does not anticipate returning to a profit making state in the foreseeable future will not be able to recognise all deferred tax assets, while a profit making company can recognise all deferred tax assets. In addition IAS *12, Income Taxes* requires that a deferred tax asset be recognised for the carry forward of unused tax losses only to the extent that it is probable that future taxable profit will be available against which the unused tax losses can be utilized. In this circumstance, the tax effect of all temporary differences is recognised, but is then reversed when the future tax consequence of assessed losses is recognised. However, when the total tax consequence of unused tax losses cannot be recognised because future taxable profits are not probable, the deferred tax expense in the statement of comprehensive income will not represent the tax consequences of all temporary differences. As suggested by (Beaver et al, 2007) unrecognized tax losses and deferred tax assets in loss making companies gives rise to asymmetry in taxes between profit and loss companies.

This restriction on the recognition of tax assets and assessed losses provides preparers with an opportunity to manipulate the deferred tax expense itself: preparers can incorrectly recognise a deferred tax asset when there is no probability that the asset will be recovered (Cook, Huston, and Omer, 2008 ; Phillips et al, 2004). This will lead to the reduction of taxation in the Statement of Comprehensive Income and an increase in reported profits or a decrease in reported losses. The same effect will be observed if a company making profits recognises a previously unrecognized tax loss. A number of studies, Schrand and Wong (2003) and Phillips et al. (2004) attempt to identify whether the valuation of the deferred tax asset account is used to manipulate earnings but their research has led to inconclusive and contradictory results. Van de Wouw (2015)reports that, in the South African context, where recognised tax losses are removed from the deferred tax expense, the previously observed association between deferred tax and earnings management disappears. Therefore, deferred tax may not be a proxy for discretionary accruals and the movement on the deferred tax expense account may not be directly linked to the movement on discretionary accruals.

PPR's proposal does have some limitations. Firstly deferred tax recognised in the current period will capture the future tax consequences of all accruals and is not limited to discretionary accruals. Secondly preparers may choose to manipulate earnings upwards by incorrectly recognising deferred tax assets when their probability of recovery is remote (Cook et al, 2008 ; Phillips et al, 2004). Thirdly the deferred tax expense will not include real earnings management practices where managers simultaneously choose to pay tax to conceal the manipulation (Erikson, Hanlon, and Maydew, 2004). Therefore the incremental usefulness of deferred tax in detecting earnings management is an empirical issue that is addressed in this chapter.

6.2 Hypothesis development

It is important that users of financial statements are able to detect earnings management because its existence impairs the quality of earnings. Because models to estimate accruals manipulation are difficult to estimate and are imprecise, PPR suggest that deferred taxation recognised in the statement of comprehensive income is a convenient and alternate earnings management metric. The purpose of this chapter of the research is to evaluate the usefulness of deferred tax as a metric for detecting earnings management by investigating the incremental usefulness of

deferred tax expense to accrual measures in detecting earnings management in firms to avoid an earnings decline or a loss. Specifically the following hypotheses will be tested:

H1: Deferred tax expense is incrementally useful to accrual measures in detecting earnings management *to avoid an earnings decline*.

H2: Deferred tax expense is incrementally useful to accrual measures in detecting earnings management *to avoid a loss*.

This research will be useful to investors, financial analysts, auditors and regulators in providing them with an additional means to identify suspected earnings management activity.

6.3 Research methodology

The objective of this chapter is to assess the incremental usefulness of deferred tax expense, total accruals and discretionary accruals in detecting earnings management to avoid reporting an earnings decline or a loss. PPR use the BD method to identify discontinuities in the frequency distribution of earnings levels and changes deflated by market value of equity to identify suspected EM and non-EM firms. The research design in this thesis differs from that applied by PPR in that EM and non-EM firms are identified using kernel density estimation as described in Chapter 4. The most convincing evidence that the discontinuity in earnings levels distributions can be associated with earnings management is evident in earnings levels both before and after tax deflated by number of shares. Deflating by total assets appears to distort the location of discontinuities in earnings distributions. Evidence of earnings management in earnings changes distributions do not appear to be sensitive to deflation. Adding back taxation as suggested by BMN shifts the location of the non-earnings management firms one interval further to the left of zero, but does not change the conclusion that modified-Jones discretionary accruals are income increasing in EM and non-EM firms when deflating by total assets. Consequently, the incremental usefulness of deferred tax is only tested in EM firms in the after tax distributions. This research uses two models to estimate discretionary accruals. To facilitate comparison to prior research, the first model used is the modified- Jones model. The second model used in this research is the piecewise linear accruals model suggested by BS as described in Chapter 5 of this thesis.

To investigate whether the deferred tax expense is incrementally useful to accruals measures, the following pooled cross-sectional model is estimated using probit regression.

$$EM_{it} = \alpha + \beta_1 DTE_{it} + \beta_2 AC_{it} + \beta_3 \Delta CFO_{it} + \beta_j \sum_j Ind_{it} + \varepsilon_{it}$$

Where:

EM_{it} = 1 are the suspected EM firms identified in the scaled distributions

EM_{it} = 0 are the identified non-earnings management firms in the scaled distributions

DTE_{it} = firm *i's* deferred tax expense in year *t* scaled by total assets at the end of year *t-1*;

AC_{it} = a measure of firm *i's* accruals in year *t;* (see accruals models below)

ΔCFO_{it} = the change in firm i's cash flows from operations from year *t -1* to *t*, scaled by total assets as the end of year *t – 1*;

$\sum_j Ind_{it}$ = 1(0) if firm *i* is (is not) in industry *j* in year *t*

ε_{it} = the error term.

AC_{it} the measure of firm *i's* accruals in year *t* is a calculated amount that cannot be observed directly from the financial statements. Three measures of accruals are used in this study; total accruals, modified- Jones discretionary accruals and the Ball and Shivakumar Piecewise Linear Accruals Model (see Chapter 5 section 5.4)

ΔCFO_{it} is included to control for the effect that a change in cash flows from continuing operations has on a firm's status as an earning management firm. The need to manage earnings to achieve a zero or slightly positive earnings change is reduced when operating cash flows increase.

Industry dummy variables are included to control for possible differences in earnings management tendencies across industries.

6.4 Results

Descriptive Statistics

Table 16 provides the results of the comparison of the means and medians on accruals metrics, deferred tax and changes in cash flows in EM firms and non-EM firms in the earnings levels

distributions. The results of comparing these variables in earnings changes distributions are shown in Table 17. Clustered-t and Sommers' D test results that are significant at the 5% level are shaded in grey. Medians and Somers' D statistics are presented in brackets. The results in Table 16 and 17 have been extracted from Tables 10 and 12 in Chapter 5. The variables are as defined in Table 9 in Chapter 5.

Table 16 Descriptive statistics NIAT earnings management versus non-earnings management firms: earnings managed to avoid a loss

	NIAT/no of shares						NIAT/ Market value of shares						NIAT/ Total assets					
	EM Firms		Non-EM Firms				EM Firms		Non-EM Firms				EM Firms		Non-EM Firms			
	No	Mean (Median)	No	Mean (Median)	t-stat	p-value	No	Mean (Median)	No	Mean (Median)	t-stat	p-value	No	Mean (Median)	No	Mean (Median)	t-stat	p-value
Accruals quality variables																		
TACC	455	-0.082655 (-0.076686)	222	-0.20868 (-0.152512)	5.42 (6.12)	0 (0.00)	756	-0.091166 (-0.09040)	88	-0.006027 (-0.000116	3.14 (2.77)	0.002 (0.006)	697	-0.077868 (-0.074542)	120	-0.119583 (-0.112705)	3.59 (3.73)	0 (0.00)
DACC_MJ	429	0.029849 (0.034794)	208	-0.090642 (-0.042551)	5.81 (6.01)	0 (0.00)	749	0.028223 (0.029282)	88	-0.04079 (-0.017651)	3.48 (3.2)	0.001 (0.002)	692	0.047349 (0.050583)	114	0.006202 (0.004729)	3.8 (3.78)	0 (0.00)
DACC_BS	429	0.032416 (0.025490)	208	-0.10816 (-0.069113)	7.14 (7.76)	0 (0.00)	749	0.049878 (0.043348)	88	-0.064105 (-0.042168	6.95 (8.23)	0 (0.00)	692	0.029567 (0.032104)	114	-0.02328 (-0.027002)	5.7 (6.16)	0 (0.00)
DTAX	444	-0.000387 (0)	218	-0.00811 (-0.000068)	4.23 (3.7)	0 (0.00)	759	0.002077 (0.000976)	92	-0.15432 (-0.123746	3.87 (3.76)	0 (0.00)	696	0.002626 (0.001036)	118	-0.007779 (-0.002017)	6.16 (6.46)	0 (0.00)
ΔWC_ACC	381	0.013264 (0.004059)	191	-0.036905 (-0.026577)	4.19 (4.62)	0 (0.00)	667	0.007283 (0.005610)	83	-0.010373 (-0.007518	1.12 (2.47)	0.266 (0.014)	628	0.010971 (0.006631)	112	-0.020393 (-0.016063)	3.24 (3.51)	0.001 (0.00)
Δ REC	378	0.031379 (0.019510)	188	-0.011865 (-0.004298)	4.18 (5.24)	0 (0.00)	670	0.027542 (0.017417)	82	0.013294 (0)	1.2 (3.08)	0.203 0	626	0.020552 (0.010179)	110	-0.007365 (-0.000330)	4.35 (4.67)	0 (0.00)
Perfor-mance variables																		
Δ Cash Sales	434	1.264156 (1.142318)	215	1.038624 (0.990233)	4.13 (6.23)	0 (0.00)	746	1.20057 (1.142593)	85	1.113674 (1.061481)	1.62 (2.74)	0.107 (0.007)	684	1.168103 (1.130822)	114	1.022476 (1.014797)	3.34 (5.54)	0.001 (0.00)
Δ Cash Flow	447	0.052424 (0.037252)	228	0.015876 (0.008756)	2.55 (3.11)	0.012 (0.00)	756	0.039686 (0.027452)	87	0.014898 (0.007524)	1.63 (2.45)	0.104 (0.015)	693	0.023904 (0.019728)	117	0.014151 (0.014933)	0.9 (1.21)	0.368 (0.229)
Cash Flow	449	0.199745 (0.172497)	220	0.050613 (0.051524)	7.79 (7.82)	0 (0.00)	755	0.231467 (0.214413)	90	0.109757 (0.100479)	6.61 (6.28)	0 (0.00)	696	0.167068 (0.160606)	120	0.0887094 (0.079718)	6.63 6.63	0 (0.00)
Market related variables																		
Leverage	532	0.104434 (0.050346)	248	0.114371 (0.052882)	-0.68 (-0.59)	0.499 (0.553)	761	0.100201 (0.050647)	93	0.101436 (0.037472)	-0.07 (0.08)	0.943 (0.933)	698	0.103652 (0.064502)	120	0.124302 (0.072562)	-1.17 -0.43	0.242 0.667
Book-to-market	489	1.015597 (0.734044)	217	1.209395 (1.041334)	-2.27 (-2.3)	0.024 (0.023)	751	0.714546 (0.517496)	92	1.274971 (1.109564)	-5.16 (-4.24)	0 (0.00)	673	0.896392 (0.729255)	115	1.487924 (1.220263)	-5.47 (-4.93)	0 (0.00)

Table 17 Descriptive statistics earnings NIAT Changes management versus non-earnings management firms

	(NIAT t)/No of shares t)-(NIATt-1)/ No of shares t-1)						(NIATt-NIATt-1)/ Market value of sharest-2						(NIATt-NIATt-1)/ Total assets t-2					
	EM Firms		Non-EM Firms				EM Firms		Non-EM Firms				EM Firms		Non-EM Firms			
Accruals quality variables	**No**	Mean (Median)	**No**	Mean (Median)	**t-stat**	**p-value**	**No**	Mean (Median)	**No**	Mean (Median)	**t-stat**	**p-value**	**No**	Mean (Median)	**No**	Mean (Median)	**t-stat**	**p-value**
TACC	276	-0.0950034 (-0.082998)	104	-0.149638 (-0.098369)	2.44 (2.21)	0.016 (0.029)	605	-0.08705 (-0.083485)	116	-0.154412 (-0.109666)	3.65 (3.21)	0 (0.00)	637	-0.080753 (-0.079782)	139	-0.1327603 (-0.104621)	3.57 (3.43)	0 (0.00)
DACC_MJ	260	0.015688 (0.0290532)	105	-0.029507 (0.022708)	2.28 (2.06)	0.024 (0.041)	599	0.030509 (0.035233)	114	-0.037702 (-0.004611)	3.76 (3.44)	0 (0.00)	631	0.041145 (0.043023)	137	-0.016093 (0.006764)	3.84 (3.82)	0 (0.00)
DACC_BS	260	0.0303024 (0.0316447)	105	-0.040968 (-0.008402)	4.1 (4.7)	0 (0.00)	599	0.051266 (0.046886)	114	-0.061475 (-0.024796)	6.46 (8.28)	0 (0.00)	631	0.036688 (0.037998)	137	-0.027356 (0.002663)	4.7 (5.93)	0 (0.00)
DTAX	275	-0.0000187 (0)	104	-0.006132 (-0.001069)	2.61 (2.28)	0.01 (0.024)	605	0.002166 (0.000742)	115	-0.004989 (-0.001289)	4.52 (3.89)	0 (0.00)	637	0.002208 (0.000784)	136	-0.00562 (-0.002405)	5.19 (4.55)	0 (0.00)
ΔWC_ACC	254	0.007458 (0)	90	-0.040258 (-0.026069)	3.07 (3.52)	0.003 (0.001)	602	0.005821 (0.005953)	115	-0.034078 (-0.022097)	3.37 (3.94)	0.001 (0.00)	634	0.007664 (0.008269)	138	-0.005545 (-0.007974)	1.17 (2.13)	0.244 (0.04)
Δ REC	252	0.041504 (0.0265723)	91	0.00623 (0.006101)	3.1 (3.07)	0.002 (0.003)	604	0.033573 (0.022707)	114	-0.005626 (-0.000544)	4.74 (5.21)	0 (0.00)	632	0.029453 (0.017227)	136	-0.0029318 (0.0037898)	5.03 (4.95)	0 (0.00)
Perfor-mance variables																		
Δ Cash Sales	267	1.281662 (1.169219)	104	1.075399 (1.078992)	3.9 (3.56)	0 (0.001)	592	1.164629 (1.147567)	114	1.067426 (1.055156)	2.21 4.79)	0.028 (0.00)	627	1.148505 (1.142003)	135	0.9983184 (1.03751)	4.96 (5.64)	0 (0.00)
Δ Cash Flow	271	0.066009 (0.049232)	106	0.018344 (0.014019)	2.24 (2.56)	0.027 (0.012)	605	0.035753 (0.033125)	116	-0.01345 (-0.010457)	4.17 (4.43)	0 (0.00)	634	0.025173 (0.028653)	139	-0.007572 (0.002089)	3.37	0
Cash Flow	272	0.211892 (0.184253)	107	0.134957 (0.122316)	3.26 (3.05)	0.001 (0.003)	603	0.228909 (0.211838)	115	0.113873 (0.105100)	7.34 (7.77)	0 (0.00)	637	0.196637 (0.189289)	138	0.1411187 (0.1264355)	4.23 (4.48)	0 (0.00)
Market related variables																		
Leverage	285	0.106885 (0.038041)	108	0.125494 (0.080718)	-0.82 (-2.09)	0.411 (0.038)	607	0.086395 (0.035772)	116	0.108433 (0.069161)	-1.59 (-2.65)	0.114 0.009	637	0.091382 (0.045344)	138	0.108102 (0.055712)	-1.37 (-1.64)	0.174 (0.103)
Book-to-Market	260	0.897425 (0.670703)	98	1.20729 (0.905596)	-3.03 (-2.87)	0.003 (0.005)	594	0.681569 (0.51709)	112	1.382073 (1.196337)	-7.4 -7.74	0 (0.00)	614	0.815289 (0.590709)	136	1.182056 (0.992566)	-4.69 (-4.98)	0 (0.00)

A noteworthy result of scrutinising the relationship between deferred tax and accruals measures in Table 16 and Table 17 is that the movement on deferred tax recognised in the Income Statement does not always match the movement on the accruals metrics. If accruals are income increasing, one would anticipate that current deferred tax expense would be positive because income has been recognised for accounting purposes before it is recognised for tax purposes. In other words, a deferred tax expense should be recognised on assets that have been increased through income increasing manipulation practices and deferred tax income will result from recognised deferred tax assets when accruals decrease cash flow. The anticipated relationship between total accruals and deferred tax is present in the NIAT/number of shares distribution: total accruals are negative and the tax expense decreases in both EM firms and non-EM firms. Contrary to expectations when income is deflated by both market value of equity and total assets, deferred tax expense increases on negative total accruals in suspected EM firms. PPR, who scale by market value of equity, report the correct relationship.

Where the relationship between deferred tax and discretionary accruals is analysed, the correct relationship exists where earnings levels are deflated by market value of equity. In the earnings levels and earnings changes distributions where number of shares is the deflator, mean deferred tax is unexpectedly negative and significant for suspected EM firms despite income increasing discretionary accruals. A deferred tax asset recognised on income increasing discretionary accruals indicates that earnings could have been manipulated both through discretionary accruals and incorrectly recognising a reduction in the tax expense in the suspected EM firms. An incorrect relationship is also reported by PPR who deflate by market value of equity: deferred tax expense increases, instead of decreasing, in earnings management firms in the presence of income decreasing discretionary accruals. On the other hand, in the total assets deflated earnings levels distributions, the deferred tax expense is as anticipated positive in tandem with positive discretionary accruals in EM firms but incorrectly negative in non-EM firms where modified-Jones discretionary accruals are income increasing.

In the results of this thesis, in earnings changes distributions where number of shares is the deflator, the signs on deferred tax and total accruals correspond. A deferred tax liability is incorrectly recognised in both the market value of equity and total assets earnings changes distributions in the presence of negative total accruals in EM firms. In contrast, PPR report

increasing deferred tax liabilities in both EM and non-EM firms in the presence of negative total accruals. Where the signs of modified-Jones discretionary accruals and deferred tax are inspected the correct relationship is reported in this thesis when market value of equity and total assets are the scalars: but, where number of shares is the deflator, a deferred tax asset is recognised on income increasing discretionary accruals in suspected EM firms. Most surprisingly, PPR find that a deferred tax liability is recognised on income decreasing discretionary accruals in both EM and non-EM firms.

The results of the comparison of the relationship between accruals and recognised deferred tax means that deferred taxation may be incorrectly recognised either through an error in applying deferred tax recognition and measurement principles or through the timing of the recognition of deferred tax on assessed losses. This matter remains to be investigated by researchers in the future.

The Pearson correlation coefficients between the independent variables are presented in the correlation matrix presented in Table 18. Total accruals and both measures of discretionary accruals are highly correlated with each other but that is not an issue because probit regressions are estimated separately for each accrual measure. There are no strong correlations ($r>0.75$) between any of the other independent variables. Gujarati (2003:359) suggests that multicollinearity may exist in the presence of high R^2's but few significant *t* ratios. As this indication is not evident in the results of the probit regressions presented in Tables 19-24 multicollinearity does not appear to be an issue.

To further explore which independent variables are related to each other, each independent variable is regressed on the other independent variables (Gujarati, 2003). Multicollinearity may be a problem if the R^2 obtained from the auxiliary regressions is greater than the overall R^2 obtained in the main regressions Gujarati (2003:361). This is only the case where earnings changes are deflated by number of shares and total accruals and modified –Jones discretionary accruals are included in the probit regression. When regressing total accruals on deferred tax and changes in cash flows, $R^2 = 0.1489$. This is higher than $R^2 = 0.1047$ obtained in the main probit regressions, where deferred tax and total accruals are the test variables. When regressing modified-Jones discretionary accruals on deferred tax and changes in cash flows, $R^2 = 0.1362$ as

compared to $R^{2=}$= 0.0902 obtained in the probit regression where deferred tax and modified-Jones discretionary accruals were the test variables. The R^2 on all the other auxiliary regressions are lower than that obtained in the original probit regressions.

Table 18 Correlation matrices

Pearson Correlation Coefficients

This table presents Pearson correlation coefficients between the independent variables. Variables significantly correlated to each other at the 5% level are marked with *
The independent variables are defined as TACC = Total accruals calculated as net income after tax in year t – cash flow from operations in year t / total assets at end of year t-1; DACC-MJ = Modified Jones discretionary accruals; DACC-BS = Asymmetric Ball and Shivakumar discretionary accruals; DTAX= Deferred tax expense for year t / total assets at end of year t-1; Δ Cash Flow = Change in cash flows between year t and t-1 / total assets at end of year t-2.

Correlation matrix NIAT/no of shares EM 1

	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	-0.0134	-0.4979*	0.9951*	0.9382*
DTAX	-0.0134	1	-0.0573	-0.0276	-0.0644
Δ CFO	-0.4979*	-0.0573	1	-0.4822*	-0.4045*
DACC-MJ	0.9951*	-0.0276	-0.4822*	1	0.9385*
DACC-BS	0.9382*	-0.0644	-0.4045*	0.9385*	1

Correlation matrix NIAT/no of shares EM 0

	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	-0.1391*	-0.3587*	0.9971*	0.9567*
DTAX	-0.1391*	1	0.1170*	-0.065	-0.0456
Δ CFO	-0.3587*	0.1170*	1	-0.3785*	-0.2798*
DACC-MJ	0.9971*	-0.065	-0.3785*	1	0.9554*
DACC-BS	0.9567*	-0.0456	-0.2798*	0.9554*	1

Correlation matrix NIAT/market value EM 1

	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	-0.0524	-0.5287*	0.9924*	0.7425*
DTAX	-0.0524	1	0.0213	-0.035	-0.0321
Δ CFO	-0.5287*	0.0213	1	-0.5053*	-0.2584*
DACC-MJ	0.9924*	-0.035	-0.5053*	1	0.7443*
DACC-BS	0.7425*	-0.0321	-0.2584*	0.7443*	1

Correlation matrix NIAT/market value EM 0

	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	-0.3014*	-0.5456*	0.9949*	0.9704*
DTAX	-0.3014*	1	0.2168*	-0.3118*	-0.2857*

Δ CFO	-0.5456*	0.2168*	1	-0.5347*	-0.4905*
DACC-MJ	0.9949*	-0.3118*	-0.5347*	1	0.9668*
DACC-BS	0.9704*	-0.2857*	-0.4905*	0.9668*	1
Correlation matrix NIAT/total assets EM 1					
	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1.0000	-0.0955*	-0.5585*	0.9945*	0.9809*
DTAX	-0.0955*	1	0.0255	-0.0439	-0.0353
Δ CFO	-0.5585*	0.0255	1	-0.5678*	-0.5820*
DACC-MJ	0.9945*	-0.0439	-0.5678*	1	0.9833*
DACC-BS	0.9809*	-0.0353	-0.5820*	0.9833*	1
Correlation matrix NIAT/total assets EM 0					
	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	-0.0453	-0.4618*	0.9915*	0.9773*
DTAX	-0.0453	1	-0.0596	-0.0555	-0.0438
Δ CFO	-0.4618*	-0.0596	1	-0.4638*	-0.4671*
DACC-MJ	0.9915*	-0.0555	-0.4638*	1	0.9739*
DACC-BS	0.9773*	-0.0438	-0.4671*	0.9739*	1
Correlation matrix NIAT/ changes no of shares EM 1					
	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	0.1109	-0.5475*	0.9901*	0.8412*
DTAX	0.1109	1	-0.0877	0.0942	0.0388
Δ CFO	-0.5475*	-0.0877	1	-0.4798*	-0.3232*
DACC-MJ	0.9901*	0.0942	-0.4798*	1	0.8368*
DACC-BS	0.8412*	0.0388	-0.3232*	0.8368*	1.0000
Correlation matrix NIAT/ changes no of shares EM 0					
	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	-0.0888	-0.3583*	0.9912*	0.9395*
DTAX	-0.0888	1	0.1361	-0.0672	-0.0204
Δ CFO	-0.3583*	0.1361	1	-0.4532*	-0.3628*
DACC-MJ	0.9912*	-0.0672	-0.4532*	1	0.9463*
DACC-BS	0.9395*	-0.0204	-0.3628*	0.9463*	1
Correlation matrix NIAT/ changes MV EM 1					
	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	0.0669	-0.5267*	0.9908*	0.6048*
DTAX	0.0669	1	-0.0865*	0.0816*	0.0697
Δ CFO	-0.5267*	-0.0865*	1	-0.5190*	-0.1154*
DACC-MJ	0.9908*	0.0816*	-0.5190*	1	0.6004*
DACC-BS	0.6048*	0.0697	-0.1154*	0.6004*	1
Correlation matrix NIAT/ changes MV EM 0					
	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	0.0807	-0.3956*	0.9936*	0.8643*

DTAX	0.0807	1	-0.0257	0.0514	0.0854
Δ CFO	-0.3956*	-0.0257	1	-0.3553*	-0.1142*
DACC-MJ	0.9936*	0.0514	-0.3553*	1	0.8656*
DACC-BS	0.8643*	0.0854	-0.1142*	0.8656*	1
Correlation matrix NIAT/ changes total assets EM 1					
	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	0.0771	-0.6030*	0.9898*	0.8812*
DTAX	0.0771	1	-0.0808*	0.1262*	0.1262*
Δ CFO	-0.6030*	-0.0808*	1	-0.5968*	-0.5516*
DACC-MJ	0.9898*	0.0973*	-0.5968*	1	0.8945*
DACC-BS	0.8812*	0.1262*	-0.5516*	0.8945*	1
Correlation matrix NIAT/ changes total assets EM 0					
	TACC	DTE	Δ CFO	DACC_MJ	DACC_BS
TACC	1	-0.0773	-0.5356*	0.9938*	0.9005*
DTAX	-0.0773	1	0.1014*	-0.0279	0.0335
Δ CFO	-0.5356*	0.1014*	1	-0.5060*	-0.3583*
DACC-MJ	0.9938*	-0.0279	-0.5060*	1	0.9071*
DACC-BS	0.9005*	0.0335	-0.3583*	0.9071*	1

Probit regressions

The results of the probit regressions comparing the incremental usefulness of deferred tax to total accruals and modified Jones and asymmetric BS discretionary accruals in detecting earnings management to avoid a loss or an earnings decline are presented in Table 19 through to Table 21. Table 19 presents results of probit regressions comparing deferred tax (DTE) with total accruals, Table 20 shows the results of comparing DTE with modified-Jones discretionary accruals (DACC-MJ) and Table 21 displays the results where DTE is compared to asymmetric Ball and Shivakumar (DACC-BS) discretionary accruals. Probit regression results comparing DTE and total accruals in the alternately deflated earnings changes distributions are presented in Table 22, DACC-MJ accruals are substituted for total accruals in Table 23, and DACC-BS accruals take the place of DACC-MJ accruals in Table 24.

Tables 19-21 present the results of probit regressions to test whether deferred tax is incrementally useful to total accruals, modified Jones discretionary accruals and asymmetric Ball and Shivakumar discretionary accruals (all deflated by total assets at the end of year t-1) in detecting earnings management to avoid a loss. The variables are as defined in Table 9 in

Chapter 5 of this thesis. Suspected earnings management firms and non-earnings management firms are identified using KDE as suggested by Lahr (2014) and described in Chapter 4 of this thesis. In the NIAT/ NO OF SHARES distribution a discontinuity was identified in the first interval to the right of zero (suspected EM firms) and in the first three intervals to the left of zero (non-EM firms). The KDE bootstrapped bandwidth was estimated to be .2173092. In the NIAT/MV EQUITY and NIAT/TOTAL ASSETS distributions the break in the discontinuity appears in the second and third intervals to the right of zero and in the first and second intervals to the right of zero. The KDE bootstrapped bandwidths was estimated to be .0505496 in the NIAT/MARKET VALUE OF EQUITY distribution and .0450656 in the NIAT/TOTAL ASSETS distribution.

Table 19 Results of probit regressions for three deflated earnings levels: comparison of deferred tax expense (DTE) to total accruals (TACC)

	NIAT/ NO OF SHARES				NIAT/MV EQUITY				NIAT LEVELS/TOTAL ASSETS			
		Robust				Robust				Robust		
	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|
DTE	17.50514	3.589986	4.88	0	22.93914	4.949676	4.63	0	31.02337	4.965138	6.25	0
TACC	4.000784	0.591122	6.77	0	4.526196	0.972942	4.65	0	4.377189	0.9196	4.76	0
ΔCFO	2.456097	0.46382	5.3	0	3.347051	0.915782	3.65	0	2.573713	0.7579	3.4	0.001
Additio~l	-0.25586	0.523222	-0.49	0.625	-0.437145	0.583362	-0.75	0.454	-0.36485	0.532732	-0.68	0.493
Consum~ds	-0.01847	0.086568	-0.21	0.831	0.2094355	0.116882	1.79	0.073	0.128136	0.092061	1.39	0.164
Consum~es	0.017934	0.07232	0.25	0.804	-0.027576	0.080891	-0.34	0.733	-0.02519	0.073341	-0.34	0.731
Health_~e	-0.137	0.140325	-0.98	0.329	0.1981362	0.172887	1.15	0.252	-0.0851	0.153229	-0.56	0.579
Industr~s	0.001806	0.018741	0.1	0.923	-0.054951	0.025491	-2.16	0.031	-0.02113	0.021735	-0.97	0.331
Oil_Gas	-0.2677	0.260758	-1.03	0.305	-0.426592	0.299384	-1.42	0.154	-0.48752	0.256712	-1.9	0.058
Technol~y	0.031104	0.027632	1.13	0.26	-0.005218	0.03475	-0.15	0.881	-0.005	0.032563	-0.15	0.878
Telecom~s	0.160428	0.192272	0.83	0.404	0.3139401	0.238045	1.32	0.187	0.267302	0.221644	1.21	0.228
Utilities	(omitted)				(omitted)				(omitted)			
_cons	0.52755	1.661769	0.32	0.751	-0.2676	1.724761	-0.16	0.877	0.915852	1.570885	0.58	0.56
	Number of obs = 626				Number of obs = 836				Number of obs = 806			
	Wald chi2(11) = 81.8				Wald chi2(11) = 57.65				Wald chi2(11) = 61.41			
	Prob > chi2 = 0.0000				Prob > chi2 = 0.0000				Prob > chi2 = 0.0000			
	Log pseudolikelihood = -192.44992				Log pseudolikelihood = -227.85775				Log pseudolikelihood = -279.91601			
	Pseudo R2 = 0.1848				Pseudo R2 = 0.1643				Pseudo R2 = 0.1525			

Table 20 Results of probit regression for three deflated earnings levels: comparison of deferred tax expense (DTE) to modified-Jones accruals (DACC-MJ)

	NIAT/NUMBER OF SHARES				NIAT/MV EQUITY				NIAT LEVELS/TOTAL ASSETS			
		Robust				Robust				Robust		
	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|
DTE	18.41112	3.697854	4.98	0	22.32496	4.989692	4.47	0	32.9178	5.192656	6.34	0
DACC-MJ	4.437789	0.668587	6.64	0	4.853723	0.983247	4.94	0	4.390043	0.92061	4.77	0
ΔCFO	2.846423	0.496683	5.73	0	3.26988	0.866059	3.78	0	2.561676	0.742901	3.45	0.001
Additio~l	-0.04823	0.557149	-0.09	0.931	-0.474182	0.585754	-0.81	0.418	-0.39964	0.544136	-0.73	0.463
Consum~ds	0.032448	0.089322	0.36	0.716	0.2133335	0.121011	1.76	0.078	0.116962	0.089943	1.3	0.193
Consum~es	0.013795	0.073317	0.19	0.851	-0.02867	0.081645	-0.35	0.725	-0.03149	0.075136	-0.42	0.675
Health_~e	-0.21182	0.154279	-1.37	0.17	0.1336115	0.172235	0.78	0.438	-0.10375	0.150354	-0.69	0.49
Industr~s	-0.0091	0.019502	-0.47	0.641	-0.056823	0.025754	-2.21	0.027	-0.0243	0.022344	-1.09	0.277
Oil_Gas	-0.28272	0.293341	-0.96	0.335	-0.414783	0.300499	-1.38	0.167	-0.50944	0.255062	-2	0.046
Technol~y	0.036026	0.029578	1.22	0.223	0.0013684	0.036056	0.04	0.97	-0.00224	0.034341	-0.07	0.948
Telecom~s	0.20277	0.199883	1.01	0.31	0.3965339	0.246	1.61	0.107	0.366262	0.231078	1.59	0.113
Utilities	(omitted)				(omitted)				(omitted)			
_cons	-0.29266	1.796525	-0.16	0.871	-0.947818	1.819853	-0.52	0.602	0.721513	1.542682	0.47	0.64
	Number of obs = 602				Number of obs = 828				Number of obs = 798			
	Wald chi2(11) = 81.03				Wald chi2(11) = 59.98				Wald chi2(11) = 64.09			
	Prob > chi2 = 0.0001				Prob > chi2 = 0.0000				Prob > chi2 = 0.0000			
	Log pseudolikelihood = -189.67014				Log pseudolikelihood = -221.38312				Log pseudolikelihood = -270.25626			
	Pseudo R2 = 0.2015				Pseudo R2 = 0.1721				Pseudo R2 = 0.1603			

Table 21 Results of probit regression for three deflated earnings levels: comparison of deferred tax expense (DTE) to asymmetric Ball and Shivakumar accruals (DACC-BS)

	NIAT/NUMBER OF SHARES				NIAT/MV EQUITY				NIAT LEVELS/TOTAL ASSETS			
		Robust				Robust				Robust		
	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|
DTE	19.65248	3.804758	5.17	0	22.30436	4.571583	4.88	0	32.95524	5.548997	5.94	0
DACC-BS	6.085798	1.090459	5.58	0	4.913372	0.894333	5.49	0	8.489222	1.532109	5.54	0
ΔCFO	3.077538	0.554405	5.55	0	4.745711	0.923176	5.14	0	3.666249	0.858311	4.27	0
Additio~l	-0.08604	0.55546	-0.15	0.877	-1.619685	0.786745	-2.06	0.04	-0.33298	0.549874	-0.61	0.545
Consum~ds	0.04487	0.09277	0.48	0.629	0.2492938	0.113712	2.19	0.028	0.134515	0.092415	1.46	0.146
Consum~es	0.003573	0.074714	0.05	0.962	-0.021166	0.072518	-0.29	0.77	-0.03223	0.075323	-0.43	0.669
Health_~e	-0.25082	0.158788	-1.58	0.114	0.1442184	0.186499	0.77	0.439	-0.1444	0.157685	-0.92	0.36
Industr~s	-0.00524	0.020643	-0.25	0.8	-0.000282	0.032594	-0.01	0.993	-0.02299	0.022587	-1.02	0.309
Oil_Gas	-0.20027	0.332427	-0.6	0.547	-0.404228	0.296591	-1.36	0.173	-0.55856	0.258278	-2.16	0.031
Technol~y	0.036627	0.03132	1.17	0.242	-0.032905	0.043609	-0.75	0.451	-0.00126	0.035347	-0.04	0.972
Telecom~s	0.214906	0.205239	1.05	0.295	0.0666037	0.232684	0.29	0.775	0.345349	0.235514	1.47	0.143
Utilities	(omitted)				(omitted)				(omitted)			
_cons	-0.45402	1.843564	-0.25	0.805	-3.503374	1.910559	-1.83	0.067	0.619667	1.614706	0.38	0.701
	Number of obs = 602				Number of obs = 807				Number of obs = 798			
	Wald chi2(11) = 76.12				Wald chi2(12) = 64.60				Wald chi2(11) = 63.25			
	Prob > chi2 = 0.0000				Prob > chi2 = 0.0000				Prob > chi2 = 0.0000			
	Log pseudolikelihood = -182.03974				Log pseudolikelihood = -153.81941				Log pseudolikelihood = -248.78798			
	Pseudo R2 = 0.2650				Pseudo R2 = 0.4102				Pseudo R2 = 0.2270			

Table 22 Results of probit regressions for three deflated earnings changes: comparison of Deferred tax expense (DTE) to total accruals (TACC)

	NIAT CHANGES /NO OF SHARES				NIAT CHANGES/MV EQUITY				NIAT CHANGES/TOTAL ASSETS			
		Robust				Robust				Robust		
	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|
DTE	10.28581	3.894399	2.64	0.008	23.16995	4.534501	5.11	0	25.36507	4.51046	5.62	0
TACC	2.267364	0.611937	3.71	0	4.982449	0.858659	5.8	0	4.405772	1.106633	3.98	0
ΔCFO	1.84901	0.557744	3.32	0.001	4.923611	0.939454	5.24	0	4.360693	0.824243	5.29	0
Additio~l	1.321707	0.788106	1.68	0.094	-1.651396	0.782848	-2.11	0.035	-0.5884	0.581848	-1.01	0.312
Consum~ds	-0.05184	0.168511	-0.31	0.758	0.2627025	0.112936	2.33	0.02	0.384587	0.117296	3.28	0.001
Consum~es	0.254094	0.104744	2.43	0.015	-0.01988	0.07242	-0.27	0.784	-0.02041	0.071377	-0.29	0.775
Health_~e	0.053254	0.231374	0.23	0.818	0.1533927	0.183469	0.84	0.403	-0.20724	0.192137	-1.08	0.281
Industr~s	-0.05091	0.032741	-1.55	0.12	0.0000561	0.032454	0	0.999	-0.05362	0.02702	-1.98	0.047
Oil_Gas	0.217443	0.339927	0.64	0.522	-0.403993	0.295288	-1.37	0.171	0.147071	0.288523	0.51	0.61
Technol~y	-0.02166	0.05028	-0.43	0.667	-0.035491	0.043451	-0.82	0.414	0.022568	0.040207	0.56	0.575
Telecom~s	-0.40404	0.302192	-1.34	0.181	0.0391329	0.23006	0.17	0.865	0.216391	0.230359	0.94	0.348
Utilities	(omitted)				(omitted)				(omitted)			
_cons	-2.54753	2.746075	-0.93	0.354	-3.175717	1.933566	-1.64	0.101	-4.60942	2.003678	-2.3	0.021
	Number of obs = 364 Wald chi2(11) = 43.77 Prob > chi2 = 0.0000 Log pseudolikelihood = -192.44992 Pseudo R2 = 0.1047				Number of obs = 718 Wald chi2(11) = 80.01 Prob > chi2 = 0.0000 Log pseudolikelihood = -248.6681 Pseudo R2 = 0.2128				Number of obs = 770 Wald chi2(11) = 83.09 Prob > chi2 = 0.0000 Log pseudolikelihood = -292.13013 Pseudo R2 = 0.1863			

Table 23 Results of probit regression for three deflated earnings changes: comparison of deferred tax expense (DTE) to modified-Jones accruals (DACC-MJ)

	NIAT CHANGES /NO OF SHARES				NIAT CHANGES/MV EQUITY				NIAT CHANGES/TOTAL ASSETS			
		Robust				Robust				Robust		
	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|
DTE	10.32065	4.081544	2.53	0.011	22.30436	4.571583	4.88	0	24.59556	4.533385	5.43	0
DACC-MJ	1.978646	0.661283	2.99	0.003	4.913372	0.894333	5.49	0	4.662721	1.17562	3.97	0
ΔCFO	1.5255	0.581633	2.62	0.009	4.745711	0.923176	5.14	0	4.345556	0.811973	5.35	0
Additio~l	1.396228	0.815444	1.71	0.087	-1.619685	0.786745	-2.06	0.04	-0.56812	0.584682	-0.97	0.331
Consum~ds	-0.03643	0.166501	-0.22	0.827	0.2492938	0.113712	2.19	0.028	0.368092	0.118082	3.12	0.002
Consum~es	0.250661	0.103378	2.42	0.015	-0.021166	0.072518	-0.29	0.77	-0.01863	0.072351	-0.26	0.797
Health_~e	0.004717	0.242587	0.02	0.984	0.1442184	0.186499	0.77	0.439	-0.21721	0.192704	-1.13	0.26
Industr~s	-0.05402	0.032641	-1.65	0.098	-0.000282	0.032594	-0.01	0.993	-0.05352	0.026992	-1.98	0.047
Oil_Gas	0.257695	0.34613	0.74	0.457	-0.404228	0.296591	-1.36	0.173	0.132359	0.291161	0.45	0.649
Technol~y	-0.01645	0.049194	-0.33	0.738	-0.032905	0.043609	-0.75	0.451	0.023376	0.040281	0.58	0.562
Telecom~s	-0.36525	0.303862	-1.2	0.229	0.0666037	0.232684	0.29	0.775	0.247721	0.23251	1.07	0.287
Utilities	(omitted)				(omitted)				(omitted)			
_cons	-3.0187	2.762385	-1.09	0.274	-3.503374	1.910559	-1.83	0.067	-4.90067	1.993164	-2.46	0.014
	Number of obs = 350				Number of obs = 710				Number of obs = 763			
	Wald chi2(11) = 39.10				Wald chi2(11) = 76.86				Wald chi2(11) = 80.8			
	Prob > chi2 = 0.0001				Prob > chi2 = 0.0000				Prob > chi2 = 0.0000			
	Log pseudolikelihood = -189.67014				Log pseudolikelihood = -245.82711				Log pseudolikelihood = -287.52571			
	Pseudo R2 = 0.0902				Pseudo R2 = 0.2100				Pseudo R2 = 0.1891			

Table 24 Results of probit regression for three deflated earnings changes: comparison of deferred tax expense (DTE) to asymmetric Ball and Shivakumar accruals (DACC-BS)

	NIAT CHANGES /NO OF SHARES				NIAT CHANGES/MV EQUITY				NIAT CHANGES/TOTAL ASSETS			
		Robust				Robust				Robust		
	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|	Coef.	Std. Err.	z	P>|z|
DTE	9.965397	4.041447	2.47	0.014	19.50783	5.124812	3.81	0	22.34365	4.854397	4.6	0
DACC-BS	3.566419	0.923929	3.86	0	13.01727	1.736301	7.5	0	6.833848	2.211244	3.09	0.002
ΔCFO	1.827795	0.60828	3	0.003	5.796994	1.096198	5.29	0	4.334683	0.91898	4.72	0
Additio~l	1.499263	0.835704	1.79	0.073	-1.177124	0.831474	-1.42	0.157	-0.50319	0.590833	-0.85	0.394
Consum~ds	-0.07638	0.17152	-0.45	0.656	0.1397799	0.136184	1.03	0.305	0.347247	0.119302	2.91	0.004
Consum~es	0.282476	0.106241	2.66	0.008	0.0394687	0.090128	0.44	0.661	-0.00503	0.074156	-0.07	0.946
Health_~e	0.004755	0.243059	0.02	0.984	0.1060692	0.199489	0.53	0.595	-0.25203	0.190085	-1.33	0.185
Industr~s	-0.04958	0.032601	-1.52	0.128	0.0216169	0.033441	0.65	0.518	-0.0446	0.026031	-1.71	0.087
Oil_Gas	0.181789	0.366413	0.5	0.62	-0.645862	0.416592	-1.55	0.121	0.260169	0.294066	0.88	0.376
Technol~y	-0.03793	0.050895	-0.75	0.456	-0.084008	0.046952	-1.79	0.074	0.014631	0.040559	0.36	0.718
Telecom~s	-0.41621	0.308747	-1.35	0.178	-0.140973	0.273185	-0.52	0.606	0.158511	0.230657	0.69	0.492
Utilities	(omitted)				(omitted)				(omitted)			
_cons	-2.65141	2.824189	-0.94	0.348	-1.94062	2.095318	-0.93	0.354	-4.95692	2.010783	-2.47	0.014
	Number of obs = 350				Number of obs = 710				Number of obs = 763			
	Wald chi2(11) = 41.74				Wald chi2(11) = 84.26				Wald chi2(11) = 77.13			
	Prob > chi2 = 0.0000				Prob > chi2 = 0.0000				Prob > chi2 = 0.0000			
	Log pseudolikelihood = -182.03974				Log pseudolikelihood = -196.99185				Log pseudolikelihood = -277.4247			
	Pseudo R2 = 0.1268				Pseudo R2 = 0.3669				Pseudo R2 = 0.2175			

Deferred tax expense vs total accruals

Deferred tax is incrementally useful to total accruals in detecting earnings management to avoid a loss (Table 19) and a decline in earnings (Table 22). The coefficient on DTE is positive and significant across all the deflated distributions[29]. Similarly TACC is consistently positive and significant irrespective of which scalar is used.[30] The results in the NIAT Changes /No of Shares distribution need to be analysed with some caution because of possible multicollinearity that was shown to exist between the dependent variables where accruals total and modified- Jones discretionary accruals were regressed on deferred tax and changes in cash flows. The results of the probit regression where market value of equity is the deflator are comparable to those in PPR who report that DTE is incrementally useful beyond TACC in detecting earnings management and that similarly TACC is incrementally useful in the same circumstance.

Deferred tax expense vs Modified -Jones discretionary accruals

The results of the comparison of DTE and DACC-MJ in the earnings levels distributions are reported in Table 20. Deferred tax is incrementally useful to modified-Jones discretionary accruals in detecting earnings management to avoid a loss. The coefficients on DTE are positive and significant across all the scaled distributions. Where number of shares is the scalar the coefficient is 18.41112 (p=0), the coefficient is 22.32496 (p=0) when deflating by market value of equity and the coefficient is 32.9178 (p=0) when scaling by total assets. The results mean that deferred tax expense is incrementally useful in detecting earnings management to avoid a loss after controlling for DACC-MJ and changes in operating cash flow and industry. The coefficients on DACC-MJ, see Table 20, are also consistently positive and significant indicating that modified- Jones discretionary accruals are incrementally useful to DTE in detecting earnings management to avoid a loss. This result is comparable to PPE who report positive and significant coefficients on DTE and DACC-MJ.

The results of probit regressions to test whether modified- Jones discretionary accruals are incrementally useful in detecting earnings management to avoid an earnings decline are

[29] The coefficient on DTE and significance in the earnings changes distributions scaled by number of shares, market value of equity and total assets are 10.28581 (p=0.008); 23.16995 (p=0) and 25.36507 (p=0) respectively.

[30] The coefficient on TACC and significance in the earnings changes distributions scaled by number of shares, market value of equity and total assets are 2.267364 (p=0); 4.982449 (p=0) and 4.40577 (p= 0) respectively.

displayed in Table 23. These results indicate that DTE is incrementally useful to DACC-MJ in detecting earnings management to avoid reporting an earnings decline and that DACC-MJ is incrementally useful to DTE in detecting earnings management in the same setting. Multicollinearity between DACC-MJ and changes in cash flows was shown to exist between the dependent variables where modified- Jones discretionary accruals were regressed on deferred tax and changes in cash flows when number of shares is the deflator. The results of the probit regression in this thesis are different to that reported in PPR who report an insignificant result on DACC-MJ. The PPR result may be caused by a deferred tax liability being recognised on income decreasing discretionary accruals in both EM and suspected EM firms.

Deferred Tax Expense vs Asymmetric Ball and Shivakumar discretionary accruals

Tables 21 and 24 display the results of the probit regressions where DTE and DACC-BS are the test variables. Quantitatively the results of the probit regressions are the same as those obtained when DACC-MJ was the variable measuring earnings management activity. There is no evidence of multicollinearity when asymmetric BS discretionary accruals are regressed on deferred tax and changes in cash flow.

To summarise the probit regression results are consistent with H1 and H2; deferred tax is incrementally useful to both modified -Jones and asymmetric Ball and Shivakumar discretionary accruals in detecting earnings management to avoid reporting a loss and an earnings decline. Similarly discretionary accruals estimated using both the modified-Jones and asymmetric Ball and Shivakumar models are incrementally useful in detecting earnings management firms. Surprisingly, and in accord with PPR total accruals are incrementally useful to DTE, across all the earnings levels and changes distributions, in identifying suspected earnings management firms.

6.5 Conclusion

Deferred tax movements and its components is a visible number in financial statements. Phillips et al (2003) hypothesise that where earnings manipulation is achieved without affecting tax payable, the deferred taxation expense captures differences between accounting and tax bases of assets and liabilities and can be used instead of discretionary accruals to identify evidence of earnings management. Where earnings management is assumed to take place to avoid reporting a loss and an earnings decline deferred tax is found to be incrementally useful to modified- Jones and the asymmetric BS discretionary accruals in detecting earnings management. The result of this analysis finds the same unexpected finding reported as PPR: total accruals are incrementally useful in detecting earnings management: meaning that total accruals as well as discretionary accruals are a discriminating feature between suspected earnings management and non-earnings management firms.

This result is useful to investors, auditors and regulators. Discretionary accruals have to be estimated: but, IAS 12 *Income Taxes* requires separate disclosure of each type of temporary difference and unused tax loss in the financial statements. Consequently, the components of the deferred tax asset or liability accounts can be analysed to highlight unusual movements which may in turn, focus attention on unusual accruals. Future research could consider decomposing the deferred tax expense into its individual components to discover which of the components of the deferred tax expense are associated with earnings management. Concurrently, that analysis may explain why the movement on accruals and deferred tax do not correspond. A further avenue of research could investigate the recognition of unused tax losses and deferred tax assets. A limitation of this research is that real earnings management is not considered: therefore the incremental usefulness of deferred tax to detect real earnings management has not yet been investigated.

CHAPTER 7 MARKET REACTION TO EARNINGS MANAGEMENT

In a recent study and following Roychowdhury (2006) and Jansen et al (2012), Lemma et al (2013) reported that cross country variations in earnings management (accrual and real) can be explained by firm, industry and country variables, and the evidence can be supported by theories of agency, information asymmetry, institutions and signalling. Undetected earnings management (EM) practice often misleads investors, adds to agency and information asymmetry and places the capital markets under considerable strain. Dechow & Skinner (2000) report that research into capital market consequences of earnings management finds that market participants can be 'fooled' by simple earnings management practices. In contrast, Keung, Lin & Shih (2010) find that if investors have reason to suspect the quality of financial information, for example earnings announcements that just meet or beat analysts' forecasted earnings, cumulative abnormal returns react negatively. This thesis focuses on the pricing of suspected EM firms listed on the JSE and to the best of this researcher's knowledge is the first study to investigate whether there is a difference in the price levels and cumulative abnormal returns of suspected EM and non-EM firms around the date that the annual financial statements are released. In research that is related to the problem examined in this thesis, Watson and Rossouw (2012) find a statistically negative price reaction to forced financial restatement announcements by firms listed on the JSE.

Studies on international IFRS adoption (Barth and Clinch, 1998; Barth et al, 2008; Daske, Hail, Leuz, and Verdi, 2013; Doupnik and Perera, 2012) and emerging markets finance (Beim and Calomiris, 2001; Bruner et al, 2002) generally suggest that financial reporting in emerging economies is characterized by opacity and inferior quality. Earnings management studies suggest that the practice is pervasive in countries that have smaller stock markets and insider economies (Leuz et al, 2003). Recent studies and ranking of economies suggest that, in some respects, the JSE and the financial reporting environment are dissimilar to many other emerging markets. The GRC, prepared by the World Economic Forum, continuously rates the regulation of the JSE and the country's strength of auditing and accounting standards as among the best in the world. In contrast, previous research finds that South Africa shares features of emerging markets; South Africa is characterised as an insider economy, (Dyck and Zingales, 2002; Klapper and Love, 2002; Lee and Ng, 2004; Leuz et al, 2003; Patel et al, 2002) which tends to have a

comparatively smaller but well-regulated stock exchange, concentrated ownership, strong investor rights, but somewhat weaker legal enforcement. More recent research, Lemma et al (2013), report that 55% of the firms listed on the JSE are owned by blocks of shareholders who hold 20% or more of the issued shares and that institutions are the largest investors in 47% of the companies listed.

This research examines the pricing of suspected EM firms listed on the JSE. Following value relevance studies such as (Amir and Lev, 1996; Barth et al, 2001) and the methodological debate about the correct deflation process (Barth and Clinch, 2009; Barth and Kallapur, 1996; Easton and Sommers, 2003) this chapter examines both share prices and cumulative abnormal returns in a short window around the release of annual financial statements, to investigate whether the market prices suspected EM and non-EM firms differently.

Several authors have investigated the information processing capacity of the JSE. Bhana (2007 and 2010) observes that the JSE appears to be inefficient because the market reacts to information that is publicly available and that should already have been impounded into share prices. Bhana (2007) reports that price reaction to the initial announcement of share repurchases is small but that an abnormal share price increase is observed in the 36 month period following the announcement. Likewise, Bhana (2010) finds that investors do not fully understand the implications of corporate governance reports included in financial statements and that share prices continue to perform negatively and display statistically significant negative abnormal returns for two years following the publication of analysts' negative corporate governance comments. Moreover, Bhana (1995), Hoffman (2012) and Ward and Muller (2012) report the presence of stock return (Bhana, 2010)anomalies, which challenge the efficient market hypothesis and the capital asset pricing model (CAPM), for stocks listed on the JSE. Specifically, Hoffman (2012) finds a significant negative relationship between market capitalisation and risk adjusted future returns and a positive relationship between risk adjusted future returns and the book to market ratio and stock price momentum and concludes that returns on specific stocks could not be explained by market risk. In contradiction to CAPM, Ward and Muller (2012) report an inverse relationship between beta and returns for the period 1985-2000 and no relationship between 2005 and 2011.

Studies that examine short-window returns investigate market reaction to either earnings announcements (Baber et al, 2006; Keung et al, 2010) or the issue of a full set of annual financial statements (Balsam et al, 2002; Gavious, 2007). In the context of short- window studies, Balsam et al (2002) identify suspected earnings management firms as those companies whose results just meet or beat analysts' earnings forecasts and identify the event date as the 10-K filing date, which is, the date that the full set of financial statements is, released. They report a negative association between unexpected discretionary accruals and cumulative abnormal returns conditional on shareholder sophistication. Gavious (2007) follows the value relevance genre of research pioneered by Ohlson (1995) and applied by (Barth and Clinch, 1998; Easton, 1999; Lev and Sougiannis, 1999) amongst others, to examine whether the market prices discretionary accruals in suspected EM firms in a short-window design of up to thirty days following the release of financial statements. In this respect Gavious (2007) reports that investors focus obsessively on reported earnings, in suspected earnings management firms identified by positive (i.e. income increasing) discretionary accruals, and seem unable to identify earnings management evidence in the ten day period following the release of the annual financial statements. Investors appear to react negatively to discretionary accruals only thirty days after the release of the annual financial statements when analysts release their revised recommendations and target prices.

In line with Balsam et al (2002), and Gavious (2007) this study uses a short - window approach to examine whether there is a difference in the price levels and cumulative abnormal returns of suspected EM and non-EM firms 1,3, 10 and 30 days after the date that annual financial statements are distributed to shareholders and are published on SENS (the JSE news service)[31]. In contrast to Baber et al (2006) and Keung et al (2010)

[31]In South Africa companies listed on the JSE are required to distribute annual financial statements to shareholders within three months of the financial year- end At the distribution date an abridged version of the annual financial statements must be submitted electronically directly to the information data base maintained by the Issuer Regulation Division for publication on the JSE Web site par 3.21(a) ("JSE Listings Requirements ").At the same time an abridged version of the annual financial statements (abridged report) must be published on SENS- the JSE news service par 21(b). If the annual financial statements are not issued timeously, in compliance with par 3.20, provisional financial statements must be published and distributed to shareholders even if they are unaudited (par 3.16). In addition to this reporting obligation, where a reasonable degree of certainty exists that the financial results to be reported on differ by at least 20% from the last reported results or from any profit forecasts previously provided to the market, issuers must publish a trading statement to that effect in compliance with par 3.4(b)(i).In addition an issuer is permitted to voluntarily publish preliminary annual financial information in advance of being required to do so provided the information complies with IFRS and has at a minimum been reviewed by the issuer's

who identify the event date as the earnings announcement date, this study follows Balsam et al (2002) and Gavious (2007) using the date on which financial statements are distributed and published on SENS (hereafter the AFS release date) as the event date. This choice of event date is based on the supposition that the information in a set of financial statements is more useful than earnings announcement information to assess the integrity and quality of earnings. Evidence from Gavious (2007), Baber et al (2006) and Balsam et al (2002) all implies that the total suite of financial information and not just earnings is needed to interpret annual financial results and to form an opinion about the reliability of earnings.

Suspected earnings management firms are identified by Gavious (2007) based on the sign of discretionary accruals, whereas, Baber et al (2006), Balsam et al (2002) and Keung et al (2010) use firms that just meet or beat analysts' earnings expectations as their earnings management firms. In contrast, this thesis identifies suspected earnings management firms by searching for a discontinuity in the distribution of scaled earnings (Burgstahler and Chuck 2013; Burgstahler and Dichev, 1997). However, instead of using BD's preselected bandwidths and histograms to construct a reference distribution of no earnings management, this study follows Lahr (2014) who uses a bootstrap test to endogenise bandwidth selection and construct a reference distribution of no earnings management, using kernel density estimation (KDE). In this method, discontinuities in the distribution are identified at points of maximum difference between the constructed kernel and the empirical distribution and are tested for significance. Refer to Chapter 4 of this thesis for a comprehensive discussion of the kernel density methodology and the location of discontinuities in the distribution of earnings in firms listed on the JSE.

auditors. Importantly the "JSE Listings Requirements" do not contain the notion of an "earnings release" as is common practice in the U.S. reporting environment. Market demands for timely information, investor relations, and concerns over liability have resulted in issuers in America providing information about financial results much earlier than required by the federal securities statues and rules, which require that information about financial results be released between 60 to 90 days following the end of the fiscal year (Bochner and Blake, 2008). In the event of an earnings release ahead of the release of an annual financial report the earnings release must be furnished to the SEC on a Form 8-K (Bochner and Blake, 2008). Hence, in this research the event date is defined as the date that the annual financial statements are distributed and the abridged statements are published on SENS.

The remaining sections of the chapter are as follows. The literature review and hypothesis development is presented in Section 7.1; the research design is presented in Section 7.2, the results in Section 7.3 and the conclusion in Section 7.4.

7.1 Relevant literature and hypothesis development

In this chapter suspected EM firms are identified using the Lahr (2014) methodology applied in Chapter 4 of this thesis. Because deflating by number of shares in issue at the end of the financial year does not distort the location of suspected EM and non-EM firms in the unscaled earnings levels distribution, the suspected EM and non-EM firms in this value relevance study are those identified in the net income after tax deflated by number of shares issued distribution.[32] Suspected EM firms are located in the first bandwidth (0, .21) to the right of zero and non-EM firms are located in the three bandwidths stretching from 0, to -.65 to the left of zero.[33] However, it is important to note that it cannot be assumed that all the firms in the earnings band immediately to the right of zero, are in fact, firms that manage their earnings upwards from losses into gains. The KDE discontinuities identified in Chapter 4 of this thesis reveal a region of lower density immediately to the right of the suspected EM region which infers that the band of suspected EM firms could contain firms that have earned genuine profits and firms that have manipulated their profits upwards and downwards.

Hypothesis development

In a short window study Balsam et al (2002) document a negative association, which varies with investor sophistication, between discretionary accruals and cumulative abnormal returns in a 17-day window around the issue of a full set of financial statements. In contrast both Keung et al (2010) and Baber et al (2006) investigate abnormal security price returns in short window studies around the date of earnings announcements. Keung et al (2010) report a lower coefficient on earnings surprises in the range [0,1¢] than for those in adjacent ranges. Similarly Baber et al (2006) provide

[32] It is important to note that this calculation is not equivalent to EPS because the numerator in EPS excludes profits attributable to non-controlling interest and preference shareholders and the definition used in this research is net income after tax without these adjustments.

[33] In Chapter 5 of this thesis all accruals variables were found to be significantly different between suspected earnings management and non-earnings management firms thus confirming that the jump in the discontinuity of earnings may be attributed to earnings management.

evidence that investors discount evidence of earnings management at quarterly earnings announcement dates and that the price reaction is more substantial and significant when balance sheet and /or cash flow information is released concurrently with earnings press releases.

In comparison to these studies Gavious (2007) employs regressions based on Ohlson (1995) to test the value relevance of discretionary accruals over a period that ends 30 days following the issue of financial statements. The study reports that investors seem unable to isolate earnings management information until analysts release revised forecasts 30 days after publication date.

Based on the theory that investors are unable to assess earnings integrity until they have analysed the information in a set of financial statements as opposed to just the information content in an earnings announcement, this research tests the following hypotheses in the null form:

H1: there is no difference in the price levels of suspected EM and non-EM firms subsequent to the date that the annual financial statements are released.

A significant negative coefficient on the EM dummy variable is anticipated if investors price suspected EM and non-EM firms differently.

H2: there is no difference in cumulative abnormal returns (CARS) of suspected EM and non-EM firms around the date that the annual financial statements are released.

Because the suspected EM band may contain firms whose earnings have been manipulated downwards, the first hypothesis will also be tested in a constrained sample of suspected earnings management firms. The suspected earnings management firms will be limited to those firms in the suspected EM band that have positive modified Jones discretionary accruals. In other words, the new sample of suspected earnings management firms are those firms that may originally have reported losses whose results may have been manipulated into profits using income increasing discretionary accruals. The control group of no manipulation would remain the firms in the bands where no manipulation is suspected, that is, in the bands immediately to the left of zero. These are loss making firms whose profits were not manipulated over the threshold into gains and are, therefore, the appropriate control group.

7.2 Research methodology and data

Research design

In this study, stock price and returns reaction to the issue of financial statements in EM and non-EM firms is examined in a short-window design of up to 30 days following the release of the financial statements (AFS release date). The JSE listings requirements par 3.21(a) and (b) require that at the time that an issuer's annual financial statements are distributed to holders of securities, a copy thereof must be submitted electronically to the information database maintained by Issuer Regulation Division for publication on the JSE website and at the same time an abridged version of the annual financial statements must be published on SENS (the JSE news service). Implicitly, annual financial statements must be published within three months of the financial year-end as JSE listing requirements par 3.16 require that if the issuer does not distribute annual financial statements within three months of its financial year-end, it must distribute, and publish on SENS, provisional reports, which must be reviewed. Therefore, in this research the event date is defined as the date that the annual financial statements are distributed and the abridged statements are published on SENS. Given that the premise in this research is that investors need the full set of financial statements and time to examine earnings integrity, the association between earnings variables and price levels will be assessed 1,3,10 and 30 days after the posting of the abridged financial statements on SENS. The CAR accumulation period will consist of 3, 5, 12 and 32 days starting one day before the AFS release date and ending, 1, 3, 10 and 30 days after that date.

Primarily this research is interested in examining whether the market prices suspected EM firms differently from non-EM firms. Price levels are investigated to determine whether the suspicion that earnings may have been manipulated is reflected in firm value and CARS are studied to determine whether changes in market values around the AFS release date have different associations with changes in accounting information in suspected EM and non-EM firms.

Price levels regressions

Price level regressions examine the association between accounting amounts and equity market values and tests whether accounting values explain variation in share prices (Barth et al, 2001). To assess whether the market prices suspected EM firms differently to non-EM firms price levels are compared around the date that the annual financial statements are released. This research evaluates the value relevance of earnings and book value based on the Ohlson (1995) model as applied by, amongst others, (Barth and Clinch, 1998; Barth and Clinch, 2009; Brown et al, 1999; Collins et al, 1997; Easton and Sommers, 2003) by estimating equation 1 below.

$$P_{it} = \alpha + \beta_1 E_{it} + \beta_2 BV_{it} + \beta_3 EM_{it} + e_{it} \quad (1)$$

Where

P_{it} = Price per share of firm i at time t being 1, 3, 10 and 30 days after the annual financial statement release date

E_{it} = earnings of firm i at time t scaled by number of shares in issue at the end of the financial year

BV_{it} = book value per share for firm i at time t

EM_{it} = a dummy variable taking on the value of 1 if a firm is a suspected EM firm and 0 if the firm is not suspected of EM.

Thereafter, dividends are added to the model as dividends signal future profitability (Bhana, 1997; Hand and Landsman, 2005; Swartz and Negash, 2006), and are value relevant in emerging markets where liquidity is important. Interest bearing liabilities are included separately in the regression model because financial leverage exhibits significant correlation with firm value (Bhandari, 1988) and share prices react negatively to the risk that firms may violate debt covenants (DeFond and Jiambalvo, 1994; Richardson, 2000; Sweeney, 1994). Because interest bearing liabilities are included in book value, interest bearing liabilities are added back to book value when they are introduced as an independent variable into the regression equation. Therefore, equation 1 is modified and the ability of financial statement variables to explain share price is estimated using equation 2 below.

$$P_{it} = \alpha + \beta_1 E_{it+} \beta_2 (BV_{it+} IBL_{it}) + \beta_3 EM_{it} + \beta_4 DIVS_{it} + \beta_5 IBL_{it} + e_{it} \quad (2)$$

Where the adjusted/ additional terms are defined as

$(BV_{it+} IBL_{it})$ = book value per share for firm i at time t, adjusted for interest bearing liabilities of firm i at time t, scaled by number of shares in issue at the end of the financial year.

$DIVS_{it}$ = dividends per share declared for firm i in year t

IBL_{it} = interest bearing liabilities of firm i at time t scaled by number of shares in issue at the end of the financial year.

Identifying an appropriate scalar in price levels regressions is an important issue because cross sectional differences among sample firms can result in biased coefficient estimates and heteroscedasticity (Barth and Kallapur 1996:528) and (Easton and Sommers, 2003). Price levels regression literature suggests various deflators to mitigate these scale effects. Barth and Kallapur (1996) investigate coefficient bias and heteroscedasticity resulting from scale differences and propose that deflation or including scale as an independent regression variable are two ways to remedy scale related coefficient bias. If the scale factor is known Barth and Kallapur (1996) suggest that deflation will simultaneously cure coefficient bias and heteroscedasticity. However, where the source of scale is not observed, scale is an omitted variable and Barth and Kallapur (1996) find that using a proxy for scale as an independent variable rather than as a deflator is effective in mitigating coefficient bias. Because Barth and Kallapur (1996) define scale as the original amount invested in a firm, and this value is subsequently not observable, they suggest total assets, sales, book value of equity, net income and number of shares outstanding as proxies for the unknown scale factor. In reply to the concerns raised by Barth and Kallapur (1996), Easton and Sommers (2003) define scale as market capitalization and suggest deflating by market value of equity which results in a regression of a column of ones on the inverse of market capitalisation and each of the remaining dependent variables scaled by market capitalisation Easton and Sommers (2003:29). Their results show that this has the effect of removing the influence of large firms on the regression parameter estimates and weak evidence of heteroscedasticity.

In contrast to Barth and Kallapur (1996) who are concerned with the effect of scale on coefficient bias, Brown et al (1999) show that scale effects present in levels regressions increase R^2. In this context, they suggest that since the explanatory power of the variable of interest and not scale is the subject of research, it is more appropriate to deflate by a proxy for scale. Brown et al (1999) suggest that in market levels regressions, the scale proxy should reflect the size of the share which they assume is the value of the economic resources to which the share has a claim. Because these economic resources may or may not be reflected in the financial statements, the lagged price of the shares is identified as an appropriate proxy for scale based on the assumption that the market price reflects the magnitude of these economic resources. However, Brown et al (1999) point out that deflating by lagged share price results in a returns model which may not be an appropriate methodology to address the hypothesis at hand and they report that their conclusions are not altered if lagged book value per share is used as a scale proxy instead of lagged price.

Barth and Clinch (2009) introduce scale effects into the Ohlson (1995) valuation model of the relationship between market value, book value of equity and earnings. They investigate the effect of scale in the undeflated Ohlson model and the effectiveness of the deflators discussed in the literature, number of shares, book value of equity, lagged price per share, a returns specification and contemporaneous market value of equity, in mitigating the effect of scale. Barth and Clinch (2009:281) find that "the price specification which is deflated by number of shares outstanding performs well in the presence of a variety of scale effects and is consistent with number of shares being an effective proxy for scale".

This thesis therefore uses number of shares in issue at the end of the financial year as the deflator in equation 2 to test whether there is a difference in the price levels of suspected EM and non-EM firms around the date that the annual financial statements are released. The regressions are estimated using panel data with firm and year as fixed effects and include correction for heteroscedasticity (White, 1980). Outliers were deleted by inspection as required.

Cumulative abnormal returns

Easton (1999) states that studies that use returns of the financial period as the market metric provide evidence regarding the role of accounting information as a synopsis of events that have impacted firms over the reporting period. Therefore, this research investigates whether price changes react differently to changes in accounting variables in EM and non-EM firms around the AFS release date.

This research uses event study methodology to investigate whether there is a difference in cumulative abnormal returns (CARS) of suspected EM and non-EM firms around the date that the annual financial statements are released. The event period is defined as 1 day preceding and 1, 3, 10 or 30 days following the date that financial statements are distributed and published on SENS. CARS will be regressed on changes in the same variables that are used in the value relevance study as CARS are assumed to react to new information contained in the annual financial statements. Therefore, the following regression will be estimated

$$CAR\_1to\ X_{it} = \alpha + \beta_1 (E_{it} - E_{it-1}) + \beta_2 [(BV_{it} + IBL_{it}) - (BV_{it-1} + IBL_{it-1})] + \beta_3 EM_{it} +$$

$$\beta_4 (DIVS_{it} - DIVS_{it-1}) + \beta_5 (IBL_{it} - IBL_{it-1}) + \varepsilon_{it} \quad (3)$$

The CAR accumulation period will consist of 3, 5, 12 and 32 days, starting one day before the distribution and SENS publication date and ending, 1, 3, 10 and 30 days after that date.

The estimation period will be 180 days to 40 days before the release of the financial statements. The 40 days cut off for the estimation period is used to ensure that a reaction to news included in trading statements or earnings announcements that precede the annual financial statement release date is excluded from the calculation of the expected return. The cut off period was not arbitrarily selected: SENS announcements for June 2009 and 2010 were inspected to identify the dates on which financial statements were released. June was selected, as companies with 31 March financial year-ends would have had to have issued their annual financial statements three months after the financial year-end; this ensured that the month in which SENS announcements were inspected

contained a number final financial statement releases.[34] The individual company history of companies announcing the issue of their annual financial reports on SENS during June was inspected to identify the date of the earliest trading statement or earnings announcement pertaining to the financial year results. An average of the number of days between the earliest trading statement date and the annual financial statement distribution date was calculated. The average for 2010 was 32 days and for 2009 was 39 days: based on this, the estimation period was considered to end 40 days before the annual financial statement (AFS) distribution date.

Because information may arrive in the market that changes analysts' earnings forecasts between the end of the estimation period and the event date, Keung et al (2010) include abnormal stock returns over a short window between these two dates as an independent variable in their regression.

Following this method, equation 3 will be expanded to include this interim period as follows:

$$CAR\_1toX_{it} = \alpha + \beta_1(E_{it} - E_{it-1})/BV_{it-2} + \beta_2[(BV_{it} + IBL_{it}) - (BV_{it-1} + IBL_{it-1})]/BV_{it-2} + \beta_3 EM_{it} + \beta_4(DIVS_{it} - DIVS_{it-1}) + \beta_5(IBL_{it} - IBL_{it-1})/BV_{it-2} + \beta_6(CAR[-39,-2]_{it} + e_{it} \quad (4)$$

CARS[-39,-2] is the cumulative abnormal return estimated over the period 39 days to 2 days preceding the CARS accumulation period.

Abnormal returns are then estimated over four periods starting one day before the AFS distribution and SENS publication date and ending 1, 3, 10 and 30 days after that date. Four windows are used to allow investors time to interpret and assess the quality of the published accounting information. Daily abnormal returns are calculated using the market model and are averaged across all the companies in the sample for each time period (MacKinlay, 1997).

The market model relates the return of any given share to the return of the market portfolio (MacKinlay, 1997).The following market model (MacKinlay, 1997) is estimated over the 140 day period ending 40 days before the AFS release date.

$$R_{jt} = \alpha + \beta_j R_{mt} + \varepsilon_{jt}$$

[34] Equally May or March could have been selected as these months would contain the financial statements release dates for companies whose financial years end on 28 February or 31 December respectively.

where

R_{jt} is the return for firm *j* on day *t*;

R_{mt} is the market return on day *t*.

Estimates of the coefficients of the market model are used to estimate daily abnormal returns using the equation:

$$AR_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt})$$

Cumulative abnormal returns for the day before the AFS release date (day -1) to the day following the AFS release date (day+1) are calculated as follows:

$$CAR_j [-1, 1] = \sum_{t-1}^{i} ARjt$$

The process is repeated for the event periods, (-1+3), (-1+10), (-1+30) and (-39-2)

Data

The population for this study includes all companies listed on the JSE for the period 1998 to 2010. The relevant data was obtained from the McGregor BFA data base. Like BD banks and insurance companies were excluded from the sample as they are subjected to different forms of regulatory oversights. Mining companies were also excluded as there is as yet no formalized generally accepted accounting practice applicable to these entities. The data set comprised 2026 cases, 227 cases were missing book values for the preceding year (either because they were the first year in the series for a company or because there was a discontinuity in the series), leaving 1799 cases. Of these 1799 cases, 1116 cases were not identified as either suspected EM or non-EM cases using KDE, which left 683 cases consisting of 455 suspected EM and 228 non-EM cases. Of these 683 cases, 268 cases did not have the AFS publication (mainly because the firms had de-listed), leaving 415 cases: a further 27 single firm cases were eliminated because of the requirements of panel regression. This left 388 cases in the study of which 114 were non-EM firms and 274 were suspected EM firms which were the firm years analysed in the price levels regressions.

Further firm years were dropped from the data set for the CARS analysis. Of the remaining 388 cases used in the price levels regressions, 61 cases had no value for BV for 2 years preceding the current year, leaving 327 cases. 6 of these cases had no CARS data, leaving 321 cases (92 non-EM and 229 EM). Of the remaining 321 cases, 12 were single-firm cases which were eliminated because of the requirements of panel regression, leaving 309 cases (85 non-EM and 224 with EM).

7.3 Results

Descriptive statistics

Table 26 presents descriptive statistics for the sample where price level regressions are estimated: the sample is divided into two subsamples, namely suspected EM (EM1) and non-EM (EM 0) firms identified using kernel density estimation in the distribution of earnings levels (refer to Chapter 4 of this thesis). All continuous variables are winsorised at the 1% level. Results that are significant at the 5% level are shaded in grey.

Price per share is insignificantly higher in suspected EM firms 1, 3, 10 and 30 days subsequent to the financial statement release date. The only independent variables that are significantly different between suspected EM and non-EM firms are mean and median earnings deflated by number of shares in issue at the end of the financial year and dividends per share; both variables are significantly higher in suspected EM firms.

Descriptive statistics for the cumulative abnormal returns regressions are displayed in Table 27. Cars 1, 3, 10 and 30 days and for the period 39 days to 2 days preceding the CARS accumulation period are not significantly different between the two firm categories. The variables that are significantly different between suspected EM and non-EM firms are the mean and median earnings change variable, calculated as the difference between earnings in the current and prior year deflated by number of shares in issue at the end of the current financial year, and the earnings change variable deflated by lagged book value, and the difference in book value adjusted for interest bearing liabilities scaled by lagged book value of equity. The median change in book value adjusted for interest bearing liabilities deflated by number of shares in issue at the financial year end is significantly higher for suspected EM firms.

Descriptive statistics are presented in Table 26 and 27 respectively. The share prices 1, 3, 10 and 30 days after the SENS publication date are highly correlated but that is not an issue because regressions are estimated separately for each time period. There are no strong correlations (r>0.75) between any of the independent variables or between the independent variables and dependent variables. Although book value adjusted for interest bearing liabilities (BVIBL) and interest bearing liabilities (IBL) scaled by number of shares in issue at the end of the financial year were found to be strongly correlated (r>0.75), multicollinearity in models where these variables were used together was not an issue.

Table 25 Definitions of variables used in price and CARS regression analysis

Levels regressions	
EM 1	are those firms identified in Chapter 4 of this thesis, as suspected EM firms, using kernel density estimation, in the distribution of net income after tax scaled by number of shares in issue at the end of the financial year in the interval 0.21 to the right of zero
EM 0	are those firms identified in Chapter 4 of this thesis, as non-EM firms, using kernel density estimation, in the distribution of net income after tax scaled by number of shares in issue at the end of the financial year in the three bandwidths stretching 0, to -.65 to the left of zero
P_1	share price of company i in year t determined 1 day after the annual financial statement release date
P_3	share price of company i in year t determined 3 days after the annual financial statement release date
P_10	share price of company i in year t determined 10 days after the annual financial statement release date
P_30	share price of company i in year t determined 30 days after the annual financial statement release date
BV	book value for firm i at time t scaled by number of shares in issue at the end of the financial year
E	earnings for firm i at time t scaled by number of shares in issue at the end of the financial year
DIVS	dividends declared by firm i at time t scaled by number of shares in issue at the end of the financial year
IBL	interest bearing liabilities of firm i at time t scaled by number of shares in issue at the end of the financial year
CARS Regressions	
CAR_1to1	cumulative abnormal return of company i in year t consisting of a 3 day period starting 1 day before the distribution and SENS publication date and ending 1 day after date
CAR_1to3	cumulative abnormal return of company i in year t consisting of a 5 day period starting 1 day before the distribution and SENS

	publication date and ending 3 days after that date
CAR_1to10	cumulative abnormal return of company i in year t consisting of a 12 day period starting 1 day before the distribution and SENS publication date and ending 10 days after that date
CAR_1to30	cumulative abnormal return of company i in year t consisting of a 32 day period starting 1 day before the distribution and SENS publication date and ending 30 days after that date
CAR_39to_2	is the cumulative abnormal return estimated over the period 39 days to 2 days preceding the CARS accumulation period.
delDIVS	dividends per share for firm i at time t minus dividends per share of firm at time t-1
E_Elag1	earnings for firm i at time t scaled by number of shares in issue at the end of the financial year t minus earnings of firm i at time t-1 scaled by number of shares in issue at the end of year t-1
BVIBL_BVIBLlag1	book value plus interest bearing liabilities for firm i at time t scaled by number of shares in issue at the end of the financial year t minus book value plus interest bearing liabilities of firm i at time t-1 scaled by number of shares in issue at the end of year t-1
IBL_IBLlag1	interest bearing liabilities for firm i at time t scaled by number of shares in issue at the end of the financial year t minus interest bearing liabilities of firm i at time t-1 scaled by number of shares in issue at the end of year t-1

Table 26 Descriptive statistics price level regressions

EM	N Obs	Variable	N	Mean	Median	Minimum	Maximum	Std Dev	Skewness	Kurtosis	p-value for H0: no significant difference between means (t-test)	p-value for H0: no significant difference between medians (Wilcoxon rank sum test)
0	114	P_1	114	134.0	32.0	1.0	2 650.0	309.8	5.4	38.9	0.50	0.15
		P_3	114	133.6	30.0	1.0	2 555.0	304.6	5.2	35.8	0.50	0.13
		P_10	114	132.4	32.0	1.0	2 560.0	306.1	5.2	35.7	0.48	0.14
		P_30	114	128.6	29.5	2.0	2 075.0	278.2	4.2	22.4	0.48	0.14
		BV	114	1.2	0.4	-0.1	10.3	2.3	2.7	6.9	0.29	0.29
		E	114	-0.1	-0.1	-0.5	0.0	0.1	-1.2	0.5	<0.0001	<0.0001
		IBL	114	0.7	0.0	0.0	13.9	2.5	4.7	21.3	0.10	0.78
		DIVS	114	5.5	0.0	0.0	270.0	31.8	7.3	54.7	0.024	<0.0001
EM	**N Obs**	**Variable**	**N**	**Mean**	**Median**	**Minimum**	**Maximum**	**Std Dev**	**Skewness**	**Kurtosis**		
1	274	P_1	274	185.7	65.0	1.0	2 960.0	458.2	4.8	24.1		
		P_3	274	184.8	64.5	1.0	2 805.0	449.2	4.7	22.7		
		P_10	274	188.1	65.0	1.0	3 105.0	473.1	5.0	25.6		
		P_30	274	182.4	64.0	2.0	2 975.0	458.2	5.0	25.3		
		BV	274	0.9	0.6	0.0	10.3	1.3	4.0	20.2		
		E	274	0.1	0.1	0.0	0.2	0.1	0.3	-1.1		
		IBL	274	0.2	0.0	0.0	13.9	0.9	12.3	175.5		
		DIVS	274	34.6	0.0	0.0	500.0	83.4	3.8	16.2		

P values significant at the 5% level highlighted in grey

Table 27 Descriptive statistics returns regressions

EM	N Obs	Variable	N	Mean	Median	Minimum	Maximum	Std Dev	Skewness	Kurtosis	p-value for H0: no significant difference between means (t-test)	p-value for H0: no significant difference between medians (Wilcoxon rank sum test)
0	85	CAR_1to1	85	0.02	0.00	-0.34	0.54	0.16	0.73	2.68	0.25	0.12
		CAR_1to3	85	0.04	0.01	-0.41	1.00	0.24	2.22	7.60	0.92	0.15
		CAR_1to10	85	0.05	0.02	-0.52	0.97	0.29	1.27	2.86	0.50	0.23
		CAR_1to30	85	0.19	0.13	-0.55	1.70	0.51	1.57	2.68	0.22	0.94
		CAR_39to_2	85	0.17	0.05	-0.48	1.90	0.50	1.90	4.06	0.40	0.28
		delDIVS	85	-18.53	0.00	-470.00	160.00	72.88	-3.83	19.67	0.016	0.021
		BVIBL_BVIBLlag1	85	-0.28	-0.04	-8.03	4.34	1.80	-2.40	12.01	0.07	<0.0001
		E_Elag1	85	-0.14	-0.09	-1.17	1.96	0.44	1.57	8.65	0.0003	<0.0001
		IBL_IBLlag1	85	0.00	0.00	-3.70	1.18	0.51	-4.18	32.85	0.67	0.15
1	224	CAR_1to1	224	0.04	0.01	-0.34	0.54	0.13	0.91	2.80		
		CAR_1to3	224	0.05	0.02	-0.41	1.00	0.18	1.28	5.09		
		CAR_1to10	224	0.07	0.04	-0.52	0.97	0.21	0.92	2.76		
		CAR_1to30	224	0.10	0.06	-0.55	1.70	0.29	1.68	6.63		
		CAR_39to_2	224	0.11	0.05	-0.48	1.90	0.32	2.56	11.67		
		delDIVS	224	1.51	0.00	-470.00	160.00	46.84	-4.12	47.82		

		BVIBL_BVIBLlag1	224	0.01	0.05	-8.03	4.34	0.85	-5.68	54.42
		E_Elag1	224	0.02	0.01	-1.17	1.90	0.21	2.75	31.44
		IBL_IBLlag1	224	-0.03	0.00	-3.70	1.18	0.40	-7.15	62.59

P values significant at the 5% level highlighted in grey

Regression results

Price level regressions

Value relevance research that examines price levels determines what is reflected in firms' value Barth et al (2001) and the relation between price and the independent variables indicates the information over all prior periods that is relevant to forecasting future firm performance (Barth and Clinch, 2009).

The first hypothesis that there is no difference in the price levels of suspected EM and non-EM firms around the date that the annual financial statements are released is tested by estimating equation 2. Regressing share price on accounting variables tests the relation between equity market value and firm specific variables, which in this research include book value of equity adjusted for interest bearing liabilities, earnings, dividends and interest bearing liabilities. A dummy variable indicating whether a firm is a suspected EM or a non-EM firm is included in the regression analysis. A negative coefficient for the dummy variable is anticipated for earnings management firms if market participants suspect opportunistic earnings manipulation. The results of estimating equation two 1, 3, 10 and 30 days after the issue of the AFS release date are presented in Table 28.

Given the level of the earnings, book value of equity adjusted for interest bearing liabilities and dividends, price does not differ significantly for suspected earnings management firms and non-earnings management firms for any of the periods presented. There is a significant positive relationship between earnings deflated by number of shares in issue at the end of the reporting period and price 1 day after the SENS announcement date but no significant relationship in any of the other research periods. There is a significant and positive relationship between book value adjusted for interest bearing liabilities and dividends and price per share 1, 3, 10 and 30 days after the SENS announcement date and interest bearing liabilities is never associated with price.

Constrained sample of suspected earnings management firms

KDE only identifies the location of suspected EM firms and as observed in Chapter 4 of this report this band of firms may include firm years where earnings have been reduced through accruals. In other words, earnings in the suspected EM band may have been adjusted through both positive and negative discretionary accruals. In this section of the

Chapter, a constrained sample of earnings management companies is created: firm years in the suspected EM band are assigned to the constrained EM sample if modified- Jones discretionary accruals are positive, that is income increasing.

Table 29 presents the results of estimating price level regressions (Equation 2) when the sample of suspected EM firms is limited to the constrained sample. This constraint reduces the available data to 273 cases, 153 suspected EM firm cases and 108 non-EM firm cases. As reported when estimating Equation 2 using the total sample (Table 28), price does not differ in the constrained sample of EM and the non-EM firms. In the constrained sample, the relationship between earnings and dividends per share and price differ from the total sample. In the constrained sample earnings is never significantly associated with price while in the total sample there is a significant positive relationship 1 day after the SENS announcement date; dividends are only significantly related to price 3 days after the earnings announcement date whereas the significant positive relationship between dividends and price exists over all time periods in the total sample. In both the constrained sample of suspected EM firms and the total sample there is a significant positive relationship between book value and price in all the periods, and there is never a significant relationship between debt and price in either of the samples.

Table 28 Results of price level regressions evaluating whether there is a difference in pricing of suspected EM firms (EM1) and non-earnings management firms (EM 0) 1,3,10 and 30 days after the date that the financial statements are issued. Research period 1998-2010

n=388		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
1998-2010																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	5808597.7	DFE	294		SSE	2834818.61	DFE	292		SSE	3052473	DFE	291		SSE	2925357.46	DFE	291	
		MSE	19757.135	Root MSE	140.5601		MSE	9708.2829	Root MSE	98.5306		MSE	10489.5979	Root MSE	102.4187		MSE	10052.7748	Root MSE	100.2635	
		R-Square	0.9066				R-Square	0.9443				R-Square	0.9424				R-Square	0.9419			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		87	294	12.47	<.0001		86	292	17.4	<.0001		86	291	17.53	<.0001		86	291	17.45	<.0001	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E	1	146.93	73.04	2.01	0.045		81.03	55.06	1.47	0.14		66.12	52.12	1.27	0.21		54.08	57.62	0.94	0.35	
BVIBL	1	49.52	11.70	4.23	<.0001		47.05	10.26	4.59	<.0001		46.54	10.65	4.37	<.0001		46.30	10.28	4.5	<.0001	
EM 0	0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0
EM 1	1	-0.94	25.57	-0.04	0.97	EM = 1	-5.71	15.26	-0.37	0.71	EM = 1	-2.81	14.41	-0.19	0.85	EM = 1	-1.35	15.29	-0.09	0.93	EM = 1
DIVS	1	0.89	0.45	1.98	0.048		0.68	0.24	2.88	0.0043		0.88	0.38	2.32	0.021		0.92	0.35	2.59	0.010	
IBL	1	-23.10	20.88	-1.11	0.27		-15.44	20.28	-0.76	0.45		-14.70	20.31	-0.72	0.47		-13.17	23.68	-0.56	0.58	

P values significant at the 5% level highlighted in grey

Table 29 Results of price level regressions evaluating whether there is a difference in pricing of a constrained sample of suspected EM firms with positive accruals (CEM1) management firms (EM 0) 1, 3, 10 and 30 days after the date that the financial statements are issued. Research period 1998-2010

n=261		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
1998-2010																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	1750527.709	DFE	181		SSE	1332451.633	DFE	181		SSE	1939547.933	DFE	181		SSE	1744157.684	DFE	181	
		MSE	9671.4238	Root MSE	98.3434		MSE	7361.6112	Root MSE	85.7998		MSE	10715.7344	Root MSE	103.5168		MSE	9636.2303	Root MSE	98.1643	
		R-Square	0.9581				R-Square	0.9667				R-Square	0.9552				R-Square	0.9574			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		72	181	14.03	<.0001		72	181	17.89	<.0001		72	181	12.19	<.0001		72	181	13.05	<.0001	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E	1	31.13	64.35	0.48	0.63		4.70	59.76	0.08	0.94		22.57	57.67	0.39	0.70		24.68	65.65	0.38	0.71	
BVIBL	1	41.58	14.43	2.88	0.0044		42.78	12.79	3.34	0.0010		41.06	15.42	2.66	0.0084		43.12	15.14	2.85	0.0049	
EM0	0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0
CEM1	1	-12.95	20.72	-0.62	0.53	CEM=1	-7.40	18.81	-0.39	0.69	CEM=1	-9.75	18.13	-0.54	0.59	CEM=1	-13.70	19.13	-0.72	0.47	CEM=1
DIVS	1	1.21	0.66	1.84	0.067		1.03	0.51	2.04	0.043		1.50	0.82	1.84	0.068		1.51	0.83	1.82	0.070	
IBL	1	-8.81	23.02	-0.38	0.70		-8.29	21.70	-0.38	0.70		-5.66	23.89	-0.24	0.81		-7.05	26.60	-0.27	0.79	

P values significant at the 5% level highlighted in grey

Sensitivity analysis

This research follows Ahson Habib, Bhuiyan, and Islam (2013) to test whether the market reacts differently to suspected EM and non-EM firms pre and post the global financial crises period. Equation 2 is estimated across two separate periods, the pre-crisis period being 1998-2007 and the crisis period 2008-2010. The results of estimating the equations in these two time periods are presented in Annexure A in the Appendix to this chapter. The chow test confirms that the regression coefficients were significantly different to each other across both timeframes. As reported in the total research period (1998-2010) the price of suspected EM and non-EM firms does not differ significantly in either the pre-crises or the crises period. In the pre-crises period and in the total sample period (1998-2010) there is a significant positive relationship between share price and earnings one day after the SENS announcement but in the crises period earnings are no longer value relevant, there is an insignificant negative association between share price and earnings the day after results are released. As is evident in the total sample period there is a significant positive relationship between book value of assets adjusted for interest bearing liabilities in both the pre-crises and the post-crises period. In the pre-crises period (1998-2007) there is a positive and significant relationship between dividends and price 3, 10 and 30 days after the SENS announcement date, in the period 2008-2010 and the research period 1998-2010 the positive association emerges for all the periods. In the post-crisis period interest bearing liabilities become value relevant evidenced by a significant negative relationship between price and liabilities 1, 10 and 30 days after the issue date. In contrast, in both the pre-crisis period and the entire research period there is no relationship between price and interest bearing liabilities.

South Africa adopted international reporting standards in 2005. To investigate whether price differs significantly for EM and non-EM firms in the pre and post IFRS adoption periods equation 2 is estimated separately across these two periods; the results are presented in Annexure B in the Appendix to this chapter. As reported in the total research period, price does not differ significantly for EM and non-EM firms in the pre IFRS adoption period 1998-2004. In contrast, in the period 2005-2010 there is a significant positive relationship between EM and price 1, 3 and 30 days post the SENS reporting date, however this does not suggest that investors are able to identify suspected EM firms as a negative relationship is anticipated if the market discounts the price of suspected EM

firms. Furthermore, in the post IFRS adoption period, earnings are not value relevant. Adjusted book value is positively associated with price 3, 10 and 30 days after the earnings announcement date, dividends are always value relevant and there is no relationship between price and interest bearing liabilities. Unlike any of the results reported in the total research period and in both the pre-crises and crises period, in the pre IFRS adoption period both earnings and adjusted book value of equity are positively associated with price 1, 3, 10 and 30 days after the SENS reporting date. Dividends are only associated with price 30 days after the issue of financial statements and there is a significant negative relationship between price and interest bearing liabilities 30 days after the SENS reporting date.

Based on the results of price levels regressions, investors are not able to differentiate between genuinely successful companies and those that have manipulated small losses into small profits. Though not the objective of this research, the results of the sensitivity analysis that divides the research period into pre and post crises periods and pre and post IFRS adoption periods adds to the body of research that investigates price formation on the JSE. Book value is significantly positively related to price under all the conditions investigated. The relationship between earnings and price is positive and significant one day after the SENS announcement except in the crises and post IFRS adoption periods where earnings is never value relevant. In the crisis period, 2007-2010, dividends and interest bearing liabilities are value relevant and in the post IFRS adoption period, 2005-2010, dividends are always relevant. This result is comparable to Ward and Muller (2012) who report an inverse relationship between beta and returns in the period 1985-2000 and no relationship between 2005 and 2011.

CARS regressions

Studies that use returns of the financial period as the market metric provide evidence regarding the role of accounting data as a summary of events that have affected firms over the reporting period (Barth et al, 2001; Easton, 1999). Therefore, this research investigates whether price changes (CARS) react differently to changes in accounting variables in EM and non-EM firms around the AFS release date.

The second hypothesis that there is no difference in cumulative abnormal returns (CARS) of suspected EM and non-EM firms around the date that the annual financial statements

are released is tested by estimating equation 4. Regressing cumulative abnormal returns on accounting variables tests whether changes in earnings, book value of equity adjusted for interest bearing liabilities, dividends and interest bearing liabilities are associated with abnormal returns in the time periods post the SENS announcement date. A dummy variable indicating whether a firm is a suspected EM or a non-EM firm is included in the regression analysis. A negative coefficient for the dummy variable is anticipated for earnings management firms if market participants suspect opportunistic earnings manipulation. Following Keung et al (2010), CAR [-39-2] is included in the regression to control for price reaction to earnings news between the end of the CAR estimation period and the AFS release date. The results of estimating Equation Four 1, 3, 10 and 30 days after the issue of the AFS release date for the total sample period (1998-2010) are presented in Table 30. Sensitivity analysis splitting the research period into the pre-financial crises (1998-2007) and financial crises period (2008-2010) and for the pre IFRS (1998-2004) and post IFRS adoption period (2005-2010) are presented in Annexure E and F respectively. Equation 4 is not estimated using the constrained sample of suspected EM firms as there was no difference between the pricing of these firms and the non-EM firms in the price regressions. There are no significant differences in CARS between suspected EM and non-EM firms 1,3,10 and 30 days after the SENS announcement date in the total sample or the sub-samples.

Change in earnings are not associated with CARS 1 and 3 days after the SENS announcement date but there is a significant positive association 10 and 30 days after that date. Change in book value and CARS are significantly and positively associated only 1 day after the SENS date; there is no significant relationship between change in dividends and change in liabilities and price in any of the post announcement periods. CAR [39, 2] is negatively associated with price 1 day after the SENS estimation period.

The results of estimating equation 4 in the pre and post crises periods are presented in Annexure F. CARS does not differ significantly for EM and non-EM firms in either period. In the pre-crises period there are no significant associations between CARS and any of the independent variables. In the crises period there is a significant positive relationship between change in book value and CARS and a significant negative relationship between changes in liabilities and CARS 1 day after the SENS announcement date and CAR [39, 2] is significantly negatively associated with CARS 1

and 3 days post the SENS earnings announcement date and change in dividends are not related to CARS.

The results of dividing the sample period between the pre and post IFRS adoption periods are presented in Annexure E. In both the 1998-2004 and 2005-2010 periods there is no significant difference in CARS between EM and non-EM firms. There is no significant association between earnings or dividends and CARS in either period. In the period 1998-2004, there is a significant negative association between change in adjusted book value and CARS 3 and 10 days post the SENS announcement and a significant positive relationship between change in interest bearing liabilities and CARS 3, 10 and 30 days post the SENS announcement date but no relationship exists in the post adoption period. CAR [39, 2] is negatively associated with CARS 1 and 3 days after the earnings announcement date in the post adoption period but not in the period before IFRS adoption.

To summarise CARS are not significantly different between suspected EM and non-EM firms in a short window around the financial statement release date. The results of the returns regressions estimated in this chapter of the thesis differ from research in the USA. Balsam et al (2002) report a negative association between unexpected discretionary accruals and cumulative abnormal returns over a short period around the 10 K filing date and Baber et al (2006) find a negative reaction to evidence of earnings management at the earnings announcement date which becomes stronger if balance sheet and cash flow information is provided at the announcement In related research Keung et al (2010) find the earnings response coefficient is lower for zero or small earnings surprises than for larger earnings surprises and observe that investors reacted negatively to evidence of earnings management after but not before 2002. In New Zealand Ahson Habib et al (2013) report a positive price reaction to discretionary accruals before the global financial crises but that investors discount this evidence during the crisis. Sample selection is a salient difference between the methodology used in this thesis and prior research. In this thesis suspected EM firms are identified using distribution analysis whereas the samples in the research referred to above consists of firms whose results just meet or beat analysts' forecasts. Therefore in prior research, but not in this thesis, investors have an a priori reason to suspect earnings quality.

Table 30 Results of cumulative abnormal returns evaluating whether there is a difference in pricing of suspected EM firms (EM1) and non-earnings management firms (EM 0) 1, 3, 10 and 30 days after the date t

n=309		DV: CAR [-1,1]					DV: CAR [-1,3]					DV: CAR [-1,10]					DV: CAR [-1,30]				
1998-2010																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	4.3112	DFE	228		SSE	8.8678	DFE	228		SSE	12.3552	DFE	228		SSE	26.3753	DFE	228	
		MSE	0.0189	Root MSE	0.1375		MSE	0.0389	Root MSE	0.1972		MSE	0.0542	Root MSE	0.2328		MSE	0.1157	Root MSE	0.3401	
		R-Square	0.2592				R-Square	0.2804				R-Square	0.2685				R-Square	0.3584			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		74	228	0.9	0.6933		74	228	1.08	0.3323		74	228	1.01	0.4693		74	228	1.49	0.0132	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E_Elag1	1	0.047	0.026	1.790	0.075		0.050	0.040	1.250	0.213		0.075	0.037	2.020	0.045		0.127	0.061	2.080	0.039	
BVIBL_BVIBLlag1	1	0.019	0.008	2.280	0.024		0.013	0.010	1.340	0.182		0.012	0.010	1.160	0.246		0.027	0.017	1.600	0.111	
EM 1	1	-0.012	0.025	-0.490	0.628	EM = 1	-0.013	0.040	-0.330	0.744	EM = 1	-0.016	0.056	-0.290	0.774	EM = 1	-0.114	0.082	-1.390	0.166	EM = 1
EM 0	0	0.000	.	.	.	EM = 0	0.000	.	.	.	EM = 0	0.000	.	.	.	EM = 0	0.000	.	.	.	EM = 0
delDIVS	1	0.000	0.000	1.230	0.221		0.000	0.000	1.410	0.160		0.000	0.000	1.590	0.112		0.000	0.000	1.970	0.050	
IBL_IBLlag1	1	-0.030	0.016	-1.910	0.057		0.003	0.023	0.140	0.887		0.031	0.024	1.290	0.199		0.015	0.036	0.400	0.688	
CAR_39to_2	1	-0.069	0.027	-2.560	0.011		-0.110	0.059	-1.890	0.061		-0.102	0.065	-1.580	0.116		-0.125	0.089	-1.410	0.159	

P values significant at the 5% level highlighted in grey

7.4 Conclusion

This chapter of the thesis investigates whether there is a difference in the price levels and cumulative abnormal returns of suspected EM and non-EM firms around the date that the annual financial statements are released.

The results of this research show that there are no differences in prices and CARS in suspected EM and non-EM firms in a short window around the date of the release of annual financial statements. The result did not change when the suspected EM firms were restricted to those within the suspected EM band with positive discretionary accruals.

The result of this chapter of the thesis should be considered in the context in which this research is conducted. Firstly, South Africa has been classified as a developing market characterized by concentrated ownership and weaker legal enforcement but first class reporting and auditing standards. Bhana (2005 and 2010) reports that the JSE appears to be inefficient evidenced by reaction to information that is publicly available, and stock return anomalies which contradict the efficient market hypothesis (Bhana, 1995; Hoffman, 2012; Ward and Muller, 2012). Secondly, the suspected EM firms in this thesis are identified using a discontinuity in the earnings distribution whereas the suspected earnings management firms in the research cited are those firms which just meet or beat analysts' forecasts. In other words, there is a reason to suspect the quality of earnings in the earnings management sample in the cited research: but, there is no obvious sign which would prompt investors to doubt earnings numbers in suspected EM firms in this thesis.

The finding of this chapter of this thesis suggests that investors in South Africa may be unaware of or unable to detect earnings management particularly when there is no obvious reason to suspect earnings manipulation. In this respect this result is similar to Gavious (2007) who reports that investors were unable to unravel evidence of earnings manipulation until analysts revised their earnings forecasts 30 days after the issue of financial statements and Bhana (2010) who finds that investors on the JSE are not able to fully interpret corporate governance reports until analysts publish their corporate governance comments.

Future research into pricing suspected EM firms may consider identifying suspected earnings management firms as those that just meet or beat analysts' forecasts and directly test whether the market prices discretionary accruals in suspected earnings management firms.

APPENDIX

Annexure A Results of price level regressions evaluating whether there is a difference in pricing of suspected EM firms (EM1) and non-earnings management firms (EM 0) 1, 3, 10 and 30 days after the date that the financial statements are issued ;comparing the period 1998-2007 (pre financial crises) and 2005-2010 (post financial crises)

n=250		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
1998-2007																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	2786762.342	DFE	190		SSE	1828228.869	DFE	189		SSE	1733965.853	DFE	188		SSE	1535038.554	DFE	188	
		MSE	14667.1702	Root MSE	121.1081		MSE	9673.1686	Root MSE	98.3523		MSE	9223.2226	Root MSE	96.0376		MSE	8165.0987	Root MSE	90.3609	
		R-Square	0.9197				R-Square	0.9432				R-Square	0.945				R-Square	0.9487			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		55	190	9.37	<.0001		55	189	14.95	<.0001		55	188	16.48	<.0001		55	188	17.81	<.0001	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E	1	189.85	84.26	2.25	0.025		136.79	70.41	1.94	0.054		128.24	65.75	1.95	0.053		119.58	68.32	1.75	0.082	
BVIBL	1	42.45	11.96	3.55	0.0005		45.98	10.98	4.19	<.0001		45.89	10.61	4.33	<.0001		47.65	11.05	4.31	<.0001	
EM 0	0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0
EM 1	1	-41.31	23.12	1.79	0.076	EM = 1	-26.21	17.58	1.49	0.14	EM = 1	-22.16	16.62	1.33	0.18	EM = 1	-21.28	16.25	1.31	0.19	EM = 1
DIVS	1	1.24	0.63	1.96	0.051		0.74	0.27	2.72	0.0071		0.83	0.37	2.25	0.025		0.97	0.36	2.69	0.0079	
IBL	1	-98.81	72.11	-1.37	0.17		-70.78	59.65	-1.19	0.24		-79.59	62.57	-1.27	0.21		-107.25	63.35	-1.69	0.092	
n=119		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
2008-2010																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	389629.9621	DFE	67		SSE	351316.682	DFE	67		SSE	693973.3905	DFE	67		SSE	754163.8792	DFE	67	
		MSE	5815.3726	Root MSE	76.2586		MSE	5243.5326	Root MSE	72.4122		MSE	10357.8118	Root MSE	101.7733		MSE	11256.1773	Root MSE	106.0951	
		R-Square	0.9779				R-Square	0.9797				R-Square	0.9654				R-Square	0.96			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		46	67	19.79	<.0001		46	67	22.08	<.0001		46	67	12.24	<.0001		46	67	10.61	<.0001	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E	1	-33.52	78.14	-0.43	0.67		-8.74	71.77	-0.12	0.90		-53.58	86.42	-0.62	0.54		-57.49	80.37	-0.72	0.48	
BVIBL	1	89.44	25.33	3.53	0.0008		77.02	23.55	3.27	0.0017		97.72	29.05	3.36	0.0013		95.27	29.57	3.22	0.002	
EM 0	0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0
EM 1	1	36.50	26.45	1.38	0.17	EM = 1	33.03	25.14	1.31	0.19	EM = 1	37.86	33.66	1.12	0.26	EM = 1	36.72	34.13	1.08	0.29	EM = 1
DIVS	1	2.04	0.46	4.48	<.0001		1.59	0.30	5.31	<.0001		2.08	0.47	4.39	<.0001		1.87	0.47	3.99	0.0002	
IBL	1	-98.08	42.21	-2.32	0.023		-78.92	41.23	-1.91	0.060		-112.43	42.51	-2.64	0.010		-119.48	42.30	-2.82	0.0062	

Chow test: 1998-2007 vs 2008-2010

	Sc=	5 808 598		n1=	250		Sc=	2 834 819		n1=	250		Sc=	3 052 473		n1=	250		Sc=	2 925 357		n1=	250
	S1+S2=	3 176 392		n2=	119		S1+S2=	2 179 546		n2=	119		S1+S2=	2 427 939		n2=	119		S1+S2=	2 289 202		n2=	119
		438 701	8 897					109 212	6 105					104 089	6 801					106 026	6 412		
	F(test)=	49.31					F(test)=	17.89					F(test)=	15.31					F(test)=	16.53			
	F(crit)=	2.12					F(crit)=	2.12					F(crit)=	2.12					F(crit)=	2.12			
	The coefficients at Time 1 differ significantly from those at Time 2						The coefficients at Time 1 differ significantly from those at Time 2						The coefficients at Time 1 differ significantly from those at Time 2						The coefficients at Time 1 differ significantly from those at Time 2				

P values significant at the 5% level highlighted in grey

Annexure B Results of price level regressions evaluating whether there is a difference in pricing of suspected EM firms (EM1) and non-earnings management firms (EM 0) 1, 3, 10 and 30 days after the date that the financial statements are issued ;comparing the period 1998-2004 (pre adoption of IFRS in South Africa) and 2005-2010 (post IFRS adoption in South Africa).

n=182		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
1998-2004																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	1523644.195	DFE	125		SSE	1240851.337	DFE	124		SSE	921528.9017	DFE	123		SSE	848151.5506	DFE	123	
		MSE	12189.1536	Root MSE	110.4045		MSE	10006.8656	Root MSE	100.0343		MSE	7492.1049	Root MSE	86.5569		MSE	6895.5411	Root MSE	83.0394	
		R-Square	0.8824				R-Square	0.8943				R-Square	0.753				R-Square	0.7697			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		51	125	7	<.0001		51	124	8.84	<.0001		50	123	3.11	<.0001		50	123	3.43	<.0001	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E	1	216.41	81.49	2.66	0.0089		177.26	72.59	2.44	0.016		178.50	71.30	2.5	0.014		171.03	72.27	2.37	0.020	
BVIBL	1	48.99	15.30	3.2	0.0017		45.20	14.26	3.17	0.0019		44.33	13.20	3.36	0.001		49.23	13.72	3.59	0.0005	
EM 0	0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0
EM 1	1	-44.20	27.57	1.6	0.11	EM = 1	-30.65	22.80	1.34	0.181	EM = 1	-29.56	21.79	1.36	0.18	EM = 1	-27.18	19.29	1.41	0.16	EM = 1
DIVS	1	0.26	0.24	1.07	0.29		0.11	0.29	0.38	0.705		0.26	0.20	1.32	0.19		0.39	0.17	2.26	0.026	
IBL	1	-122.65	95.27	-1.29	0.20		-113.62	84.37	-1.35	0.181		-122.39	81.16	-1.51	0.13		-151.63	72.57	-2.09	0.039	
n=189		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
2005-2010																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	993658.3865	DFE	128		SSE	783637.2914	DFE	128		SSE	1366877.094	DFE	128		SSE	1251540.354	DFE	128	
		MSE	7762.9561	Root MSE	88.1076		MSE	6122.1663	Root MSE	78.2443		MSE	10678.7273	Root MSE	103.3379		MSE	9777.659	Root MSE	98.882	
		R-Square	0.9682				R-Square	0.9741				R-Square	0.9604				R-Square	0.9619			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		56	128	15.52	<.0001		56	128	19.56	<.0001		56	128	12.33	<.0001		56	128	12.75	<.0001	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E	1	65.84	64.89	1.01	0.31		74.30	60.42	1.23	0.22		38.27	64.61	0.59	0.55		19.70	61.25	0.32	0.75	
BVIBL	1	15.42	10.87	1.42	0.16		22.60	7.90	2.86	0.0049		23.32	9.82	2.37	0.019		31.69	10.10	3.14	0.0021	
EM 0	0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0	0.00	.	.	.	EM = 0
EM 1	1	40.37	20.01	2.02	0.046	EM = 1	40.27	19.61	2.05	0.042	EM = 1	41.77	22.10	1.89	0.061	EM = 1	42.95	21.51	2	0.048	EM = 1
DIVS	1	1.15	0.42	2.71	0.0076		0.92	0.28	3.25	0.0015		1.11	0.37	2.96	0.0037		1.02	0.40	2.58	0.011	
IBL	1	11.65	21.79	0.53	0.59		-0.23	18.96	-0.01	0.99		-2.19	20.27	-0.11	0.91		-26.34	21.69	-1.21	0.23	

Chow test: 1998-2004 vs 2005-2010

Sc=	5 808 598	n1=	182	Sc=	2 834 819	n1=	182	Sc=	3 052 473	n1=	182	Sc=	2 925 357	n1=	182
S1+S2=	2 517 303	n2=	189	S1+S2=	2 024 489	n2=	189	S1+S2=	2 288 406	n2=	189	S1+S2=	2 099 692	n2=	189
	548 549	7 012			135 055	5 639			127 345	6 374			137 611	5 849	
F(test)=	78.23			F(test)=	23.95			F(test)=	19.98			F(test)=	23.53		
F(crit)=	2.12			F(crit)=	2.12			F(crit)=	2.12			F(crit)=	2.12		
The coefficients at Time 1 differ significantly from those at Time 2				The coefficients at Time 1 differ significantly from those at Time 2				The coefficients at Time 1 differ significantly from those at Time 2				The coefficients at Time 1 differ significantly from those at Time 2			

P values significant at the 5% level highlighted in grey

ANNEXURE C Results of price level regressions evaluating whether there is a difference in pricing of a constrained sample of suspected EM firms with positive accruals (CEM1) and non-earnings management firms (EM 0) 1, 3, 10 and 30 days after the date that the financialstatements are issued ; comparing the period 1998-2007 (pre financial crises) and 2005-2010 (post financial crises)

n=173		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
1998-2007																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	1052569.039	DFE	117		SSE	772213.6158	DFE	117		SSE	1150233.731	DFE	117		SSE	961857.2822	DFE	117	
		MSE	8996.3166	Root MSE	94.8489		MSE	6600.1164	Root MSE	81.2411		MSE	9831.0575	Root MSE	99.1517		MSE	8221.0024	Root MSE	90.6697	
		R-Square	0.9641				R-Square	0.9726				R-Square	0.9617				R-Square	0.9663			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		49	117	15.3	<.0001		49	117	20.14	<.0001		49	117	13.26	<.0001		49	117	15.68	<.0001	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E	1	105.39	76.37	1.38	0.17		66.97	70.55	0.95	0.34		87.03	66.50	1.31	0.19		92.00	71.57	1.29	0.20	
BVIBL	1	40.15	11.28	3.56	0.0005		41.66	11.20	3.72	0.0003		38.61	10.89	3.54	0.0006		44.05	12.42	3.55	0.0006	
EM0	0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0
CEM1	1	-28.71	24.22	1.19	0.24	CEM=1	-22.08	20.79	1.06	0.29	CEM=1	-21.99	20.68	1.06	0.29	CEM=1	26.95	19.88	1.36	0.18	CEM=1
DIVS	1	1.02	0.34	3.01	0.0032		0.83	0.25	3.38	0.0010		1.33	0.56	2.36	0.020		1.37	0.59	2.31	0.023	
IBL	1	-89.90	98.11	-0.92	0.36		-72.91	86.96	-0.84	0.40		-103.04	98.25	-1.05	0.30		-141.22	99.70	-1.42	0.16	

n=66		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
2008-2010																					
		Fit Statistics					Fit Statistics					Fit Statistics					Fit Statistics				
		SSE	16908.8083	DFE	31		SSE	17137.157	DFE	31		SSE	18453.7266	DFE	31		SSE	21372.6684	DFE	31	
		MSE	545.4454	Root MSE	23.3548		MSE	552.8115	Root MSE	23.5119		MSE	595.2815	Root MSE	24.3984		MSE	689.4409	Root MSE	26.2572	
		R-Square	0.9458				R-Square	0.944				R-Square	0.9472				R-Square	0.929			
		F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects					F Test for No Fixed Effects				
		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F		Num DF	Den DF	F Value	Pr > F	
		29	31	4.62	<.0001		29	31	4.43	<.0001		29	31	3.96	0.0001		29	31	3.2	0.001	
		Parameter Estimates					Parameter Estimates					Parameter Estimates					Parameter Estimates				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E	1	15.33	51.06	0.3	0.77		31.66	45.84	0.69	0.50		22.65	45.49	0.5	0.62		30.03	43.49	0.69	0.50	
BVIBL	1	-3.05	36.31	-0.08	0.93		-8.22	35.03	-0.23	0.82		0.76	35.42	0.02	0.98		2.17	33.13	0.07	0.95	
EM0	0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0
CEM1	1	14.09	8.75	1.61	0.12	CEM=1	5.11	8.12	0.63	0.53	CEM=1	11.98	9.44	1.27	0.21	CEM=1	5.33	9.69	0.55	0.59	CEM=1
DIVS	1	0.41	0.27	1.49	0.15		0.55	0.23	2.43	0.021		0.46	0.23	2.01	0.053		0.32	0.26	1.21	0.24	
IBL	1	49.34	63.17	0.78	0.44		52.96	60.84	0.87	0.39		44.62	61.27	0.73	0.47		28.84	57.74	0.5	0.62	

Chow test: 1998-2007 vs 2008-2010

Sc=	1 750 528		n1=	173	Sc=	1 332 452		n1=	173	Sc=	1 939 548		n1=	173	Sc=	1 744 158		n1=	172
S1+S2=	1 069 478		n2=	66	S1+S2=	789 351		n2=	66	S1+S2=	1 168 687		n2=	66	S1+S2=	983 230		n2=	66
	113 508	4 711				90 517	3 477				128 477	5 148				126 821	4 351		
F(test)=	24.09				F(test)=	26.03				F(test)=	24.95				F(test)=	29.15			
F(crit)=	2.14				F(crit)=	2.14				F(crit)=	2.14				F(crit)=	2.14			
The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2				

P values significant at the 5% level highlighted in grey

Annexure D Results of level regressions evaluating whether there is a difference in pricing of a constrained sample of suspected EM firms with positive accruals (CEM1) and non-earnings management firms (EM 0) 1, 3, 10 and 30 days after the date that the financial statements are issued ; comparing the period 1998-2004 (pre adoption of (IFRS) in South Africa) and 2005-2010 (post adoption of IFRS in South Africa)

n=120		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
1998-2004																					
		Fit Statistics					**Fit Statistics**					**Fit Statistics**					**Fit Statistics**				
		SSE	636303.7339	**DFE**	71		**SSE**	546148.0788	**DFE**	71		**SSE**	489528.3967	**DFE**	71		**SSE**	433351.8016	**DFE**	71	
		MSE	8962.0244	**Root MSE**	94.668		**MSE**	7692.2265	**Root MSE**	87.7053		**MSE**	6894.7662	**Root MSE**	83.0347		**MSE**	6103.5465	**Root MSE**	78.1252	
		R-Square	0.7676				**R-Square**	0.7896				**R-Square**	0.8015				**R-Square**	0.8255			
		F Test for No Fixed Effects					**F Test for No Fixed Effects**					**F Test for No Fixed Effects**					**F Test for No Fixed Effects**				
		Num DF	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**	
		41	71	1.61	0.0395		41	71	1.63	0.036		41	71	1.79	0.0153		41	71	2.19	0.0018	
		Parameter Estimates					**Parameter Estimates**					**Parameter Estimates**					**Parameter Estimates**				
Variable	**DF**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**
E	1	179.43	96.63	1.86	0.068		134.76	82.17	1.64	0.11		140.37	78.18	1.8	0.077		150.83	74.93	2.01	0.048	
BVIBL	1	42.61	13.59	3.13	0.0025		39.39	12.40	3.18	0.0022		40.97	12.03	3.41	0.0011		45.12	12.73	3.54	0.0007	
EM0	0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0
CEM1	1	-56.35	34.16	1.65	0.10	CEM=1	-43.90	28.09	1.56	0.12	CEM=1	-42.86	28.22	1.52	0.13	CEM=1	43.53	24.90	1.75	0.085	CEM=1
DIVS	1	0.58	0.44	1.32	0.19		0.57	0.39	1.46	0.15		0.48	0.36	1.33	0.19		0.51	0.29	1.79	0.078	
IBL	1	-125.33	205.90	-0.61	0.54		-124.77	180.90	-0.69	0.49		-107.87	169.00	-0.64	0.53		-166.93	150.60	-1.11	0.27	
n=123		DV: P_1					DV: P_3					DV: P_10					DV: P_30				
2005-2010																					
		Fit Statistics					**Fit Statistics**					**Fit Statistics**					**Fit Statistics**				
		SSE	732779.9074	**DFE**	76		**SSE**	460167.6929	**DFE**	76		**SSE**	950733.7141	**DFE**	76		**SSE**	767942.258	**DFE**	76	
		MSE	9641.8409	**Root MSE**	98.1929		**MSE**	6054.8381	**Root MSE**	77.8128		**MSE**	12509.6541	**Root MSE**	111.8466		**MSE**	10104.5034	**Root MSE**	100.5212	
		R-Square	0.9773				**R-Square**	0.9848				**R-Square**	0.9727				**R-Square**	0.9764			
		F Test for No Fixed Effects					**F Test for No Fixed Effects**					**F Test for No Fixed Effects**					**F Test for No Fixed Effects**				
		Num DF	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**	
		43	76	8.13	<.0001		43	76	12.33	<.0001		43	76	6.17	<.0001		43	76	6.8	<.0001	
		Parameter Estimates					**Parameter Estimates**					**Parameter Estimates**					**Parameter Estimates**				
Variable	**DF**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**
E	1	16.22	64.38	0.25	0.80		14.43	54.86	0.26	0.79		7.90	69.52	0.11	0.91		-6.25	66.73	-0.09	0.93	
BVIBL	1	-9.58	21.71	-0.44	0.66		0.95	17.49	0.05	0.96		-10.15	24.60	-0.41	0.68		-0.72	25.39	-0.03	0.98	
EM0	0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0	0.00	.	.	.	EM=0
CEM1	1	29.00	13.09	2.22	0.030	CEM=1	25.26	13.49	1.87	0.065	CEM=1	29.08	13.56	2.14	0.035	CEM=1	26.25	12.24	2.15	0.035	CEM=1
DIVS	1	1.99	0.91	2.19	0.032		1.73	0.73	2.36	0.021		2.34	1.03	2.26	0.026		2.28	1.07	2.12	0.037	
IBL	1	57.30	36.64	1.56	0.12		36.31	29.69	1.22	0.23		59.55	41.31	1.44	0.15		31.85	42.75	0.75	0.46	

Chow test: 1998-2004 vs 2005-2010

	Sc=	1 750 528		n1=	120	Sc=	1 332 452		n1=	120	Sc=	1 939 548		n1=	120	Sc=	1 744 158		n1=	119
	S1+S2=	1 369 084		n2=	123	S1+S2=	1 006 316		n2=	123	S1+S2=	1 440 262		n2=	123	S1+S2=	1 201 294		n2=	122
		63 574	5 927				54 356	4 356				83 214	6 235				90 477	5 246		
	F(test)=	10.73				F(test)=	12.48				F(test)=	13.35				F(test)=	17.25			
	F(crit)=	2.14				F(crit)=	2.14				F(crit)=	2.14				F(crit)=	2.14			
	The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2				

P values significant at the 5% level highlighted in grey

ANNEXURE E Results of cumulative abnormal returns evaluating whether there is a difference in pricing of suspected EM firms (EM1) and non-earnings management firms (EM 0) 1, 3, 10 and 30 days after the date that the financial statements are issued. Comparing the period 1998-2004 (pre adoption of International Financial Reporting Standards (IFRS) in South Africa) and 2005-2010 (post adoption of IFRS in South Africa)

n=139 1998-2004

	DV: CAR [-1,1]					DV: CAR [-1,3]					DV: CAR [-1,10]					DV: CAR [-1,30]				
Fit Statistics																				
SSE	2.6034	DFE	86			SSE	4.5326	DFE	86			SSE	6.4193	DFE	86			SSE	11.2674	DFE	86	
MSE	0.0303	Root MSE	0.174			MSE	0.0527	Root MSE	0.2296			MSE	0.0746	Root MSE	0.2732			MSE	0.131	Root MSE	0.362	
R-Square	0.303					R-Square	0.3834					R-Square	0.3571					R-Square	0.48			
F Test for No Fixed Effects																				
Num DF	Den DF	F Value	Pr > F			Num DF	Den DF	F Value	Pr > F			Num DF	Den DF	F Value	Pr > F			Num DF	Den DF	F Value	Pr > F	
46	86	0.75	0.8596			46	86	1.13	0.3032			46	86	0.97	0.5392			46	86	1.59	0.033	
Parameter Estimates																				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E_Elag1	1	0.054	0.055	0.980	0.331		0.105	0.066	1.590	0.115		0.101	0.078	1.300	0.197		0.143	0.098	1.460	0.147	
BVIBL_BVIBLlag1	1	-0.001	0.016	-0.080	0.936		-0.042	0.015	-2.720	0.008		-0.045	0.018	-2.470	0.016		-0.029	0.022	-1.320	0.191	
EM 1	0	0.000	.	.	.	EM - 1	0.000	.	.	.	EM - 1	0.000	.	.	.	EM - 1	0.079	0.117	0.680	0.497	EM - 1
EM 0	1	-0.007	0.050	-0.130	0.895	EM - 0	-0.003	0.063	-0.050	0.958	EM - 0	0.046	0.081	0.560	0.574	EM - 0	0.000	.	.	.	EM - 0
delDIVS	1	0.000	0.000	0.280	0.781		0.000	0.000	-0.640	0.522		0.000	0.000	0.660	0.508		0.001	0.001	1.110	0.271	
IBL_IBLlag1	1	0.023	0.061	0.370	0.713		0.185	0.068	2.730	0.008		0.213	0.082	2.600	0.011		0.231	0.103	2.230	0.028	
CAR_39to_2	1	-0.053	0.045	-1.200	0.233		0.021	0.095	0.220	0.826		-0.099	0.136	-0.730	0.467		-0.101	0.157	-0.650	0.520	

n=155 2005-2010

	DV: CAR [-1,1]					DV: CAR [-1,3]					DV: CAR [-1,10]					DV: CAR [-1,30]				
Fit Statistics																				
SSE	0.9253	DFE	101			SSE	2.3918	DFE	101			SSE	3.4302	DFE	101			SSE	8.8872	DFE	101	
MSE	0.0092	Root MSE	0.0957			MSE	0.0237	Root MSE	0.1539			MSE	0.034	Root MSE	0.1843			MSE	0.088	Root MSE	0.2966	
R-Square	0.462					R-Square	0.3462					R-Square	0.4138					R-Square	0.4601			
F Test for No Fixed Effects																				
Num DF	Den DF	F Value	Pr > F			Num DF	Den DF	F Value	Pr > F			Num DF	Den DF	F Value	Pr > F			Num DF	Den DF	F Value	Pr > F	
47	101	1.45	0.0603			47	101	0.86	0.7108			47	101	1.4	0.0792			47	101	1.44	0.0639	
Parameter Estimates																				
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label	Estimate	Standard Error	t Value	Pr > |t|	Label
E_Elag1	1	0.153	0.089	1.720	0.088		0.019	0.146	0.130	0.898		-0.079	0.144	-0.540	0.587		0.128	0.259	0.500	0.621	
BVIBL_BVIBLlag1	1	0.037	0.019	1.900	0.061		0.005	0.030	0.170	0.867		-0.018	0.035	-0.510	0.608		0.019	0.058	0.320	0.748	
EM 1	1	-0.055	0.036	-1.530	0.130	EM - 1	0.007	0.042	0.160	0.869	EM - 1	-0.064	0.090	-0.720	0.475	EM - 1	-0.137	0.090	-1.520	0.131	EM - 1
EM 0	0	0.000	.	.	.	EM - 0	0.000	.	.	.	EM - 0	0.000	.	.	.	EM - 0	0.000	.	.	.	EM - 0
delDIVS	1	0.000	0.000	1.030	0.306		0.000	0.000	1.200	0.232		0.000	0.000	0.830	0.409		0.000	0.000	1.720	0.088	
IBL_IBLlag1	1	-0.030	0.018	-1.680	0.096		0.009	0.021	0.410	0.684		0.049	0.035	1.400	0.165		0.026	0.053	0.490	0.626	
CAR_39to_2	1	-0.073	0.025	-2.920	0.004		-0.137	0.042	-3.260	0.002		-0.004	0.059	-0.060	0.952		-0.156	0.085	-1.830	0.070	

Chow test: 1998-2004 vs 2005-2010

Sc=	4.31		n1=	139	Sc=	8.87		n1=	139	Sc=	12.36		n1=	139	Sc=	26.38		n1=	139
S1+S2=	3.53		n2=	155	S1+S2=	6.92		n2=	155	S1+S2=	9.85		n2=	155	S1+S2=	20.15		n2=	155
	0.11	0.01				0.32	0.02				0.42	0.03				1.04	0.07		
F(test)=	8.87				F(test)=	13.19				F(test)=	11.96				F(test)=	14.51			
F(crit)=	2.04				F(crit)=	2.13				F(crit)=	2.13				F(crit)=	2.13			
The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2				

P values significant at the 5% level highlighted in grey

ANNEXURE F Results of cumulative abnormal returns evaluating whether there is a difference in pricing of suspected EM firms (EM1) and non-earnings management firms (EM 0) 1, 3, 10 and 30 days after the date that the financial statements are issued . Comparing the period 1998-2007 (pre-financial crisis) and 2008-2010 (post financial crisis)

n=212		DV: CAR [-1,1]					DV: CAR [-1,3]					DV: CAR [-1,10]					DV: CAR [-1,30]				
1998-2007																					
		Fit Statistics					**Fit Statistics**					**Fit Statistics**					**Fit Statistics**				
		SSE	3.3254	**DFE**	152		**SSE**	6.3365	**DFE**	152		**SSE**	8.4754	**DFE**	152		**SSE**	16.3956	**DFE**	152	
		MSE	0.0219	**Root MSE**	0.1479		**MSE**	0.0417	**Root MSE**	0.2042		**MSE**	0.0558	**Root MSE**	0.2361		**MSE**	0.1079	**Root MSE**	0.3284	
		R-Square	0.2555				**R-Square**	0.2925				**R-Square**	0.2795				**R-Square**	0.3962			
		F Test for No Fixed Effects					**F Test for No Fixed Effects**					**F Test for No Fixed Effects**					**F Test for No Fixed Effects**				
		Num DF	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**	
		53	152	0.87	0.7085		53	152	1.12	0.2994		53	152	1	0.4895		53	152	1.68	0.0078	
		Parameter Estimates					**Parameter Estimates**					**Parameter Estimates**					**Parameter Estimates**				
Variable	**DF**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**
E_Elag1	1	0.047	0.030	1.570	0.119		0.072	0.048	1.490	0.138		0.076	0.056	1.380	0.171		0.141	0.082	1.730	0.086	
BVIBL_BVIBLlag1	1	0.009	0.009	0.960	0.338		-0.002	0.013	-0.160	0.876		-0.004	0.014	-0.250	0.799		0.013	0.020	0.660	0.510	
EM 1	0	0.000	.	.	.	EM = 1	0.000	.	.	.	EM = 1	0.000	.	.	.	EM = 1	0.000	.	.	.	EM = 1
EM 0	1	-0.011	0.034	-0.320	0.749	EM = 0	-0.014	0.049	-0.290	0.769	EM = 0	0.020	0.062	0.330	0.742	EM = 0	-0.074	0.090	-0.810	0.416	EM = 0
delDIVS	1	0.000	0.000	0.450	0.654		0.000	0.000	-0.590	0.554		0.000	0.000	0.340	0.737		0.000	0.000	0.030	0.972	
IBL_IBLlag1	1	-0.025	0.018	-1.360	0.175		0.033	0.039	0.840	0.404		0.041	0.046	0.880	0.381		0.029	0.064	0.450	0.651	
CAR_39to_2	1	-0.067	0.036	-1.860	0.064		-0.092	0.079	-1.170	0.245		-0.152	0.082	-1.850	0.067		-0.147	0.118	-1.250	0.213	
n=88		DV: CAR [-1,1]					DV: CAR [-1,3]					DV: CAR [-1,10]					DV: CAR [-1,30]				
2008-2010																					
		Fit Statistics					**Fit Statistics**					**Fit Statistics**					**Fit Statistics**				
		SSE	0.3705	**DFE**	44		**SSE**	1.4432	**DFE**	44		**SSE**	1.9992	**DFE**	44		**SSE**	4.4648	**DFE**	43	
		MSE	0.0084	**Root MSE**	0.0918		**MSE**	0.0328	**Root MSE**	0.1811		**MSE**	0.0454	**Root MSE**	0.2132		**MSE**	0.1038	**Root MSE**	0.3222	
		R-Square	0.7153				**R-Square**	0.56				**R-Square**	0.5981				**R-Square**	0.5962			
		F Test for No Fixed Effects					**F Test for No Fixed Effects**					**F Test for No Fixed Effects**					**F Test for No Fixed Effects**				
		Num DF	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**		**Num DF**	**Den DF**	**F Value**	**Pr > F**	
		37	44	2.29	0.0045		37	44	1.08	0.4023		37	44	1.57	0.0746		37	43	1.34	0.1789	
		Parameter Estimates					**Parameter Estimates**					**Parameter Estimates**					**Parameter Estimates**				
Variable	**DF**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Label**
E_Elag1	1	0.262	0.135	1.940	0.059		0.306	0.315	0.970	0.336		0.324	0.268	1.210	0.232		0.396	0.411	0.960	0.341	
BVIBL_BVIBLlag1	1	0.088	0.032	2.760	0.008		0.064	0.056	1.150	0.257		0.124	0.092	1.340	0.187		0.191	0.113	1.690	0.098	
EM 1	1	-0.067	0.045	-1.500	0.142	EM = 1	-0.066	0.083	-0.790	0.431	EM = 1	-0.204	0.134	-1.520	0.135	EM = 1	-0.187	0.143	-1.300	0.199	EM = 1
EM 0	0	0.000	.	.	.	EM = 0	0.000	.	.	.	EM = 0	0.000	.	.	.	EM = 0	0.000	.	.	.	EM = 0
delDIVS	1	0.000	0.000	0.540	0.594		0.000	0.000	0.900	0.371		0.001	0.000	1.610	0.115		0.001	0.001	1.570	0.123	
IBL_IBLlag1	1	-0.113	0.040	-2.820	0.007		-0.053	0.095	-0.560	0.576		-0.112	0.137	-0.810	0.421		-0.195	0.157	-1.240	0.222	
CAR_39to_2	1	-0.128	0.042	-3.090	0.004		-0.277	0.088	-3.140	0.003		-0.171	0.088	-1.950	0.058		-0.239	0.150	-1.590	0.119	
Chow test: 1998-2007 vs 2008-2010																					
		Sc=	228.00	n1=	212		Sc=	228.00	n1=	212		Sc=	228.00	n1=	212		Sc=	228.00	n1=	212	
		S1+S2=	3.33	n2=	88		S1+S2=	6.34	n2=	88		S1+S2=	8.48	n2=	88		S1+S2=	16.40	n2=	88	
			32.10	0.01				31.67	0.02				31.36	0.03				30.23	0.06		
		F(test)=	2760.44				F(test)=	1429.26				F(test)=	1058.26				F(test)=	527.31			
		F(crit)=	2.04				F(crit)=	2.04				F(crit)=	2.04				F(crit)=	2.04			
		The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2					The coefficients at Time 1 differ significantly from those at Time 2				

P values significant at the 5% level highlighted in grey

CHAPTER 8 CONCLUSION

Earnings management is concealed and its perpetrators seek to mislead investors, analysts, auditors, regulators and oversight bodies. Earnings management has a detrimental effect on the allocation of scarce resources and validity of financial statements. It is therefore in financial statement users' best interest to detect manipulation. Ultimately, researchers aim to establish the most efficient way to detect earnings management and to create a scorecard that can be used to predict misstatements (Beneish, 1999; Dechow et al, 2012). In sophisticated and developed economies this scorecard can be created by analysing data bases of suspected earnings management firms, such as the SEC register of firms subject to enforcement actions. However, in emerging economies such as South Africa, these data bases are not available and researchers need to resort to fundamental methodologies, such as discontinuities in earnings distributions or estimating discretionary accruals, to identify suspected earnings management firms. The objective of this thesis is to examine whether earnings management exists in South African companies and whether investors price suspected earnings management firms differently from non-earnings management firms. The intention is that the results can ultimately inform the future development of a model to predict earnings misstatements in emerging economies and to alert investors, lenders, analysts, auditors and regulators to the existence of manipulation in the financial statements of South African listed companies.

Research into detecting suspected earnings management firms, in developed economies, has evolved from identifying suspected earnings management firms from discontinuities in earnings distributions to isolating suspected earnings management firms using prediction models. However, in the South African environment, few firms have been forced to restate their earnings Watson and Rossouw (2012) and there is virtually no research into earnings management. Before future research can develop a model to predict earnings misstatements a sample of suspected earnings management firms must be identified. This thesis seeks to identify suspected earnings management firms by identifying discontinuities in earnings levels and changes distributions.

Transaction cost theory Williamson (1981) and prospect theory, Kahneman and Tversky (1979), are the conceptual framework which underpins the theory that a discontinuity in earnings distributions is caused by managers using earnings management techniques to manipulate small losses into small profits. Transaction cost theory posits that investors are

not able to analyse all the information presented in financial statements and therefore rely on the net income figure to form an opinion on future prospects. Prospect theory suggests that changes in wealth are most value relevant when they move the investor from a loss position to a gain. This incentivizes preparers to manipulate small losses or zero earnings into small gains. Research subsequent to BD questions whether the identified discontinuities can be attributed to earnings management alone. Methodological concerns raised are that earnings distribution studies only search for discontinuities in the vicinity of zero and those histograms are based on researcher selected binwidths (Lahr, 2014). Durtschi and Easton (2005) question whether the identified discontinuity in earnings distributions is evidence of earnings manipulation and posit that deflating by market value of equity, or any variable that is larger for profit than for loss firms, exacerbates the discontinuity; while Beaver et al (2007) attribute the discontinuity to taxes rather than deflation. This thesis determines firstly whether discontinuities exist in the distribution of earnings and earnings changes in the South African setting and secondly, whether the discontinuity is attributable to earnings management by examining whether total accruals, discretionary accruals, and working capital accruals differ between suspected EM and non-EM firms. Simultaneously, the effect of various deflators on earnings distributions is examined. For researchers in developing markets this thesis highlights problems experienced in applying BD's histogram methodology to earnings distributions in an emerging market and validates kernel density estimation as a viable alternate method to identify distribution discontinuities.

Prior research challenges the efficiency of models developed to estimate discretionary accruals (Dechow et al, 1995; Young, 1999; Kothari et al, 2005). Phillips et al (2003) suggest that the deferred tax expense is a viable alternate metric to discretionary accruals in identifying suspected earnings management firms. Deferred taxation and its components are easily identifiable from the notes to financial statements and could be helpful to all parties interested in the integrity of financial reports in identifying misstatements. Consequently, this thesis examines whether deferred tax is incrementally useful to total and discretionary accruals in identifying suspected earnings management firms.

Finally to assess whether investors are able to identify suspected earnings management firms, this thesis investigates whether the market prices suspected earnings management firms differently from non-earnings management firms.

The result of this thesis is important as it investigates the relevance and efficiency of distribution research in an emerging economy. Furthermore, by studying the pricing of suspected earnings management firms this thesis explores whether investors, in shares listed on the JSE, are able to identify suspected earnings management firms and adds further insight into the efficient functioning of the JSE.

This chapter proceeds by providing a synthesis of the empirical results of this thesis, by discussing the methodological implications of these findings, by indicating areas for future research, by stating the limitations of this thesis and concludes by assessing the opportunities for future research.

8.1 Empirical findings

This thesis is the first to identify suspected earnings management firms in the South African environment and distinguishes itself from other emerging market studies in that it does not replicate work done in developed markets. Prior research into distribution discontinuities in developing markets either apply binwidths used in research in the U.S., for example, Ben Amar and Abaoub (2010), or use Silverman's rule of thumb, Charoenwong and Jiraporn (2009), without proving that the identified discontinuities can be attributed to earnings management. This thesis uses kernel density estimation, Lahr (2014) to construct histograms that represent underlying unmanaged earnings distributions and compares accruals metrics to prove that the discontinuity is caused by earnings management.

Do discontinuities exist in earnings distributions?

Pre-selected binwidths and BD histograms used in distribution research in developed countries failed to detect a discontinuity in the distribution of earnings levels and changes in firms listed on the JSE. Consequently KDE is used to identify discontinuities in earnings distributions. This thesis reports that the location of the discontinuity in earnings distributions is affected by deflation in the levels but not in the changes distributions. The effect of deflation on the position of discontinuities noted in this thesis is consistent with that reported by Donelson et al (2013). Where number of shares is the scalar the position of the discontinuity around zero, in the undeflated distribution, is preserved. Deflating by market value of equity and total assets shifts the location of the excess observations to the second interval to the right of zero. This finding can be ascribed to significant differences between

market value of equity and total assets in small loss and small profit firms that do not exist where number of shares is compared. Furthermore, because KDE explores the entire earnings distribution, evidence of downwards earnings management is identified in an interval, to the right of the suspected EM interval in the undeflated and number of shares scaled distributions. This means that the band of suspected earnings management firms is not homogeneous and contains firms that may have manipulated earnings upwards and downwards. This feature was not evident where the market value of equity and total assets were the deflators. In addition negative discretionary accruals, changes in working capital and accounts receivable in non-earnings management firms indicate downwards earnings management. However, this is not conclusive because there is no evidence of excess observations to the left of the non-EM firms in the KDE results. The observed negative discretionary accruals may be attributable to discretionary accruals reversing in loss firms.

Modified-Jones discretionary accruals, changes in working capital and changes in accounts receivable are significantly revenue increasing (decreasing) in suspected earnings management (non-earnings management) firms in the earnings level distribution when number of shares is the deflator. This evidence together with the location of the discontinuity offers the most convincing indication that the discontinuity in the distribution of earnings levels may be attributable to earnings manipulation. In related research, Dechow et al (2011) report that modified- Jones discretionary accruals, changes in working capital and changes in accounts receivable are significantly income increasing (decreasing) in SEC restatement firms (non-restating) firms. This result differs from Phillips et al (2003) and Coulton et al (2005) who report that modified-Jones discretionary accruals are insignificantly revenue increasing in earnings management and decreasing in non-earnings management firms.

Is deferred tax incrementally useful to accruals measures in detecting earnings management to avoid a loss or earnings decline?

In this thesis deferred tax emerges as being incrementally useful beyond both discretionary accruals and total accruals in identifying earnings management to avoid both losses and earnings declines. Likewise both total accruals and modified Jones discretionary accruals are incrementally useful beyond deferred tax expense in all settings investigated in detecting earnings management. In other words the probability of a company being classified as an earnings management firm increases with deferred tax, total accruals and modified-Jones discretionary accruals. The pattern reported in this research is consistent with that reported

by Phillips et al (2003) when earnings levels probit regressions are estimated. In contrast Phillips et al (2003) report that modified-Jones discretionary accruals are not incrementally useful to deferred tax in detecting earnings management to avoid a decline. The Phillips et al (2003) result may be explained by modified-Jones discretionary accruals which are earnings decreasing in both suspected earnings management and non-earnings management firms.

Is there a difference in the price levels and cumulative abnormal returns of suspected EM and non-EM firms?

This thesis finds that there is no difference in price levels or cumulative abnormal returns in suspected earnings management and non-earnings management firms in South Africa. The finding implies that investors in South Africa are unable to detect earnings management. In contrast Balsam et al (2002) and Baber et al (2006) report a negative association between unexpected discretionary accruals and cumulative abnormal returns and Keung et al (2010) find that investors react negatively to zero or small earnings surprises. Gavious (2007) reports a price reaction only after the introduction of revised analysts' forecasts. In this thesis suspected earnings management firms are identified using distribution analysis whereas prior research uses firms that just meet or beat analysts' profit forecasts (Baber et al, 2006; Balsam et al, 2002; Keung et al, 2010). Gavious (2007) uses positive discretionary accruals as the partitioning variable and introduces revised analysts' forecasts 30 days after the financial statement release date as a trigger that earnings quality may be suspect. On the one hand, this result may be linked to the apparent inefficiency of the JSE (Bhana, 1995, 2005, 2010; Hoffman, 2012; Ward and Muller, 2012; Watson and Rossouw, 2012): on the other it may be attributed to the fact that there is no signal to investors that the quality of earnings may be suspect in the sample of suspected earnings management firms in this thesis.

8.2 Methodological implications

The findings of this thesis illustrate that preselected binwidths used in distribution analysis in developed economies may be inappropriate in developing economies because of smaller sample sizes and different incentives to manipulate results. This thesis reports that it is more efficient to use KDE (Bollen and Pool, 2009; Christodoulou and Mcleay, 2009; Lahr, 2014) than histograms when exploring earnings distributions in an emerging market environment as this method identifies discontinuities in earnings levels and changes. Furthermore, because KDE explores the whole earnings distribution for discontinuities it may reveal evidence of downwards earnings manipulation which is an important signal to researchers that depending

on the research problem, firms that have reduced earnings may need to be eliminated from the suspected earnings management band. Additionally the evidence produced by this thesis illustrates that number of shares in issue at the end of the financial year is probably the most efficient scalar in an emerging market and that it is necessary to compare deflators between profit and loss firms before a deflator is selected.

Deferred tax emerges as an appropriate alternate indicator of suspected earnings management activity. However, where the sign of accruals measures and deferred tax were compared, it became evident that total deferred tax expense is likely to capture the tax consequences of discretionary and non-discretionary accruals, meaning that it is likely that some of the components of the deferred tax expense are not associated with earnings management.

Finally, sample selection seems to be a critical factor in research that examines the pricing of suspected earnings management firms. It appears that no reaction can be expected if the partitioning variable between EM and non-EM firms is not an indicator of suspected earnings management.

8.3 Recommendations for future research

Even though earnings misstatement is detrimental to the efficient functioning of capital markets it is a largely unexplored topic in the South African environment. The results of this thesis are enlightening and reveal further avenues for research into the subject.

The primary objective of this research was to identify suspected earnings management firms in South Africa with the intention that future research will be able to ascertain whether the *F-score* model developed by Dechow et al (2011) is appropriate for prediciting earnings misstatements in an emerging economy and whether there is an association between corporate governence and earnining management in specifically identified supected earnings management(Dechow et al, 2012; Dechow et al, 1995) firms. The next step is to study whether the *F-score* predicts earnings management firms in an emerging economy. Identifying downwards earnings management firms, the reversal of discretionary accruals and their effect on the estimation of discretionary accruals and earnings distributions is a further matter for future research. Thirdly, the finding that deferred tax is a useful alternate metric in detecting earnings management firms is only the initial step in using deferred tax to identify earnings misstatements. The next step is to follow Phillips et al (2004) and to investigate

which components of the deferred tax expense are associated with detecting earnings management firms in an emerging economy.

Finally, in order to appreciate whether investors are able to identify suspected earnings management firms it is probably advisable to repeat the price levels and returns analysis employed in this thesis on a sample of firms that are obvious earnings manipulators, for example, firms that just meet or beat analysts' forecasts.

An area of future research arises from the delimitations imposed on this thesis: future researches may wish to examine the effect that real earnings management activities have on the location of discontinuities in earnings distributions.

Areas of earnings management that are unexplored in South Africa are the association between corporate governance and earnings management and whether the proactive IFRS enforcement process in South Africa is efficient.

8.4 Limitations of the study

This thesis examines price reaction in a sample of suspected earnings management firms identified using distributional analysis and kernel density estimation. As a direct consequence of this methodology there is no indication that would alert investors that the quality of earnings in the suspected earnings management firms may be questionable. In contrast, earnings management firms in prior research are selected on results which just meet or beat analysts' forecasts or introduce a change in profit forecasts as a stimulus to warn investors to the possibility of earnings management.

The total current period change in deferred tax assets or liabilities is examined to determine if it is incrementally useful to total and discretionary accruals in identifying suspected earnings management firms. This approach assumes that deferred tax has been correctly recognised and measured however, there is a possibility that the deferred tax figure itself may have been manipulated. Therefore it is left to future research to investigate and authenticate the individual elements of the deferred tax expense.

8.5 Conclusion

This thesis is the first to examine earnings management in South Africa and integrates distribution analysis and value relevance research. For practitioners, regulators and investors the primary contributions of this thesis are that despite strong stock exchange regulation,

investor protection and first class accounting and auditing standards there is evidence that earnings management exists in firms listed on the JSE and investors are unable to detect or price evidence of earnings management. The primary contribution of this thesis for academics is that earnings management measurement and detection methodologies that are appropriate for research in developed markets, are not necessarily suited to emerging market research.

REFERENCES

Ahson Habib, Bhuiyan, M. B. U., & Islam, A. (2013). Financial distress, earnings management and market pricing of accruals during the global financial crisis *Managerial Finance 39*(2), 155-180.

Al-Fayoumi, N., Abuzayed, B., & Alexander, D. (2010). Ownership structure and earnings management in emerging markets: The case of Jordan *International Research Journal of Finance and Economics*(38), 28-47.

Amar, A. B., & Abaoub, E. (2010). Earnings management thresholds: the case in Tunisia *Asian Academy of Management Journal of Accounting and Finance 6*(2), 35-56.

Amir, E., & Lev, B. (1996). Value-relevance of nonfinancial information: The wireless communications industry. *Journal of Accounting and Economics, 36*, 105-146.

Arnedo, L., Lizarraga, F., & Sanchez, F. (2007). Does public/private status affect the level of earnings management in code-law contexts outside the United States? A study based on the Spanis case. . *The International Journal of Accounting, 42*, 305-328.

Arya, A., Glover, J. C., & Sunder, S. (2003). Are unmanaged earnings always better for shareholders? . *Accounting Horizons*(17), 111-116.

Baber, W. R., Shuping, C., & Sok-Hyong, K. (2006). Stock price reaction to evidence of earnings management: implications for supplementary financial disclosure. *Review of Accounting Studies 11*, 5-19.

Badertscher, B., Phillips, J., Pincus, M., & Rego, S. O. (2009). Earnings management strategies and the trade-off between tax benefits and detection risk: To conform or not conform *The Accounting Review, 84*(1), 63-97.

Ball, R., Kothari, S. P., & Robin, A. (2000). The effect of international institutional factors on properties of accounting earnings *Journal of Accounting and Economics, 29*, 1-51.

Ball, R., Robin, A., & Shuang Wu, J. (2003). Incentives versus standards: properties of accounting income in four Asian countries *Journal of Accounting and Economics, 36*, 235-270.

Ball, R., & Shivakumar, L. (2006). The role of accruals in asymmetrically timely gain and loss recognition *Journal of Accounting Research, 44*(2), 207-242.

Balsam, S., Bartov, E., & Marquardt, C. (2002). Accruals management, investor sophistication, and equity valuation: evidence from 10-Q filings *Journal of Accounting Research, 40*(4), 987-1012.

Barth, M. E. (2008). Global Financial Reporting: Implications for U. S. Academics. *The Accounting Review, 83*(5), 1159-1179.

Barth, M. E., Beaver, W. H., & Landsman, W. R. (2001). The relevance of the value relevance literature for financial accounting standard setting: another view *Journal of Accounting and Economics, 31*, 77-104.

Barth, M. E., & Clinch, G. (1998). Revalued financial, tangible and intangible Aassets: associations with share prices and non-market-based value estimates *Journal of Accounting Research, 36*(Supplement), 199-233.

Barth, M. E., & Clinch, G. (2009). Scale Effects in Capital Markets-Based Accounting Research *Journal of Business Finance & Accounting, 36*(3), 253-288

Barth, M. E., Elliot, J. A., & Finn, M. W. (1999). Market awards associated with patterns of increasing earnings *Journal of Accounting Research 37*(2), 387- 413.

Barth, M. E., & Kallapur, S. (1996). The effects of cross-sectional scale differences on regression results in empirical accounting research. *Contemporary Accounting Research, 13*(2), 527-567.

Barth, M. E., Landsman, W. R., & Lang, M. H. (2008). International accounting standards and accounting quality *Journal of Accounting Research, 46*(467-498).

Bayley, L., & Taylor, S. (2007). *Identifying earnings overstatements. A practical test* Working paper. ABN Amro Sydney and University of New South Wales

Beatty, A. L., Bin Ke, & Petroni, K. R. (2002). Earnings management to avoid earnings declines across publicly and privately held banks. *The Accounting Review, 77*(3), 547-570.

Beaver, W. H., McNichols, M. F., & Nelson, K. K. (2007). An alternative interpretation of the discontinuity in earnings distributions *Rev Acc Stud 12*, 525-556.

Beim, D., & Calomiris, C. (2001). *Emerging Financial Markets* Irwin: McGraw-Hill

Ben Amar, A., & Abaoub, E. (2010). Earnings management thresholds: the case in Tunisia. *Asian Academy of Management Journal of Accounting and Finance, 6*(2), 35-56.

Beneish, M. D. (1999). The detection of earnings manipulation *Financial Analysts Journal, 55 (5)*(5), 24-36.

Bhana, N. (1995). The sharemarket reaction to earnings announcements - a test of the efficiency of the Johannesburg Stock Exchange *Investment Analysts Journal, 42*(Summer), 45-57.

Bhana, N. (1997). Price adjustments to the JSE for announcement of share (stock) dividends *Investment Analysts Journal, 46*, 35-44.

Bhana, N. (2005). The share price reaction to management buyout announcements in companies listed on the JSE Securities Exchange. *Investment Analysts Journal, 62*(34), 19-30.

Bhana, N. (2007). The market reaction to open market share repurchases announcements: The South African experience *Investment Analysts Journal, 65*(36), 25-36.

Bhana, N. (2010). The stock market reaction to criticism of corporate governance practices of companies listed on the JSE *Investment Analysts Journal, 39*(72), 1-12.

Bhandari, L. (1988). Debt/equity ratio and expected common stock returns:Empirical evidence. . *The Journal of Finanace* (43), 507-528.

Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity *The Accounting Review, 78*(3), 641-678.

Bochner, S. E., & Blake, R. C. (2008). The earnings release:legal requirements and best practice. *The Corporate & Securities Law Advisor 22*(1-16).

Bollen, N. P. B., & Pool, V. K. (2009). Do hedge fund managers misreport returns? Evidence from the pooled distribution *The Journal of Finance LXIV*(5), 2257-2288.

Brown, & Caylor, M. L. (2005). A temporal analysis of quarterly thresholds: propensities and valuation consequences. *The Accounting Review, 80*(2), 423-440.

Brown, Kin, L., & Lys, T. (1999). Use of R^2 in accounting research: measuring changes in value relevance over the last four decades *Journal of Accounting and Economics, 28*, 83-115.

Bruner, R. F., Conroy, R. M., Estrada, J., Kritzman, M., & Wei, L. (2002). Introduction to 'valuation of emerging markets' *Emerging Markets Review, 3*, 310-324.

Burgstahler, D., & Chuck , L. (2013). What have we learned about earnings management? Correcting disinformation about discontinuities, *American Accounting Association, Annual Meeting* Anaheim: https://aaahq.org/AM2013/abstract.cfm?submissionID=2496Burgstahler, D. and Chuk L. (2013). What Have We Learned About Earnings Management?

Correcting Disinformation about Discontinuities, , https://aaahq.org/AM2013/abstract.cfm?submissionID=2496; available at http://leeds-faculty.colorado.edu/zeyun/workshop12-13_files/BurgstahlerChuk-06-24-12.pdf

Burgstahler, D., & Dichev, I. (1997). Earnings management to avoid earnings decreases and losses *Journal of Accounting and Economics, 24*, 99-126.

Charoenwong, C., & Jiraporn, P. (2009). Earnings management to exceed thresholds: Evidence from Singapore and Thailand *Journal of Mulinational Financial Management* (19), 221-236.

Chen, Hope, O. K., Li, Q., & Wang, X. (2011). Financial reporting quality and investment efficiency in private firms in emerging markets. *Accounting Review 86* (4), 1255-1288.

Chen, Lin, B., Wong, & Wu, L. (2010). The frequency and magnitude of earnings management: time series and multi-threshold comparisons *International Review of Economics and Finance 19*(2010), 671-685.

Christodoulou, & Mcleay, S. (2009). Bounded variation and the asymmetric distribution of scaled earnings. *Accounting and Business Research, 39*(4), 347-372.
Collins, D., Maydew, E. L., & Weiss, I. S. (1997). Changes in the value relevance of earnings and book values over the past forty years. *Journal of Accounting and Economics, 24*, 39-67.
Cook, K. A., Huston, G. R., & Omer, T. C. (2008). Earnings management through effective tax rates: the effect of tax planning investment and the Surbanes Oxley Act of 2002. *Contemporary Accounting Research, 25*(2), 447-471.
Coppens, P., & Peek, E. (2005). An analysis of earnings management by European private firms. *Journal of International Accounting, Auditing and Taxation 14*, 1-17.
Coulton, J., Taylor, S., & Taylor, S. (2005). Is 'benchmark beating' by Australian firms evidence of earnings management? . *Accounting and Finance 45*, 553-576.
Daske, H., Hail, L., Leuz, C., & Verdi, R. (2008). Mandatory IFRS adoption around the world: early evidence on the economic consequences *Journal of Accounting Research, 46*(5).
Daske, H., Hail, L., Leuz, C., & Verdi, R. (2013). Adopting a label; heterogeneity in the economic consequences around IAS/IFRS adoptions. *Journal of Accounting Research, 51*(495-547).
De Fond, M., Hung, M., & Trezevant, R. (2007). Investor protection and the information content of annual earnings announcements *Journal of Accounting and Economics, 43*, 37-67.
DeAngelo, L. E. (1986). Accounting numbers as market valuation substitutes: a study of management buyouts of public stockholders *The Accounting Review, LXI*(3), 400-420.
Dechow, P. M., Ge, W., Larson, C. R., & Sloan, R. (2011). Predicting material accounting misstatements *Contemporary Accounting Research, 28*(1), 17-82.
Dechow, P. M., Hutton, A. P., Kim, J. H., & Sloan, R. G. (2012). Detecting earnings management: a new approach. *Journal of Accounting Research, 50*, 275-334.
Dechow, P. M., Kothari, S. P., & Watts, R. L. (1998). The relation between earnings and cash flows *Journal of Accounting and Economics, 25*, 131-214.
Dechow, P. M., Richardson, S. A., & Tuna, I. (2003). Why are earnings kinky? An examination of the earnings management explanation *Review of Accounting Studies 8* (Jun-Sep), 355-384.
Dechow, P. M., & Skinner, D. J. (2000). Earnings management: reconciling the views of accounting academics, practitioners and regulators *Accounting Horizons, 14*(2), 235-250.
Dechow, P. M., Sloan, R., & Sweeney, A. (1995). Detecting earnings management. *The Accounting Review, 70*(2), 193-225.
Dechow, P. M., Sloan, R., & Sweeney, A. (1996). Causes and consequences of earnings manipulation: an analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research, 13*(1-36).
DeFond, M., & Jiambalvo, J. (1994). Debt covenant violation and manipulation of accruals *Journal of Accounting and Economics, 17*, 145-176.
Degeorge, F., Patel, J., & Zeckhauser, R. (1999). Earnings management to exceed thresholds *The Journal of Business 72*(1), 1-33.
Denis, D. K., & Mcconnell, J. J. (2003). International Corporate Governance *Journal of Financial and Quantative Analysis 38*(1), 1-36.
Dichev, I., Graham, J. R., Harvey, C. R., & Rajgopal, S. (2013). Earnings quality:Evidence from the Field. *Journal of Accounting and Economics, 56*(1-33).
Ding, Y., Hope, O. K., Jeanjean, T., & Stoloway, H. (2007). Differences between domestic accounting standards and IAS: determinants and implications *Journal of Accounting and Public Policy, 26*(1), 1-38.
Donelson, D. C., Mcinnis, J. M., & Mergenthaler, R. D. (2013). Discontinuities and earnings management:evidence from restatements related to securities litigation *Contemporary Accounting Research, 30*(1), 242-268.
Doupnik, T. (2008). Influence of culture on earnings management: a note. *Abacus, 44*(3), 317-340.
Doupnik, T., & Perera, H. (2012). *International Accounting* Business and Economics

Durtschi, C., & Easton, P. D. (2005). Earnings management ? The shapes of frequency distributions of earnings metrics are not evidence ipso facto *Journal of Accounting Research 43*(4), 557-592.
Durtschi, C., & Easton, P. D. (2009). Earnings management? Erroneous inferences based on earnings frequency distributions *Journal of Accounting Research 47*(5), 1249-1281.
Dyck, A., & Zingales, L. (2002). *Private benefits of control: an international comparison* National Bureau of Economic Research Massachusetts
Easton, P. D. (1999). Security returns and the value relevance of accounting data *Accounting Horizons, 13*(4), 399-412.
Easton, P. D., Eddey, P. H., & Harris, T. S. (1993). An investigation of revaluation of tangible long-lived assets *Journal of Accounting Research, 31*(Supplement), 1-38.
Easton, P. D., & Sommers, G. A. (2003). Scale and the scale effect in market based accounting research. *Journal of Business Finance & Accounting, 30*((1) &2), 25-53.
Eleswarapu, V. R., & Venkataraman, K. (2006). The impact of legal and political institutions on equity trading costs: a cross country analysis *The Review of Financial Studies 19*(3), 1081-1111.
Enomoto, M., Kimura, F., & Yamaguchi, T. (2012). *Accrual-based and real earnings management : an international comparison for investor protection* SSRN 2066797.
Erikson, M., Hanlon, M., & Maydew, E. L. (2004). How much will firms pay for earnings that do not exist? Evidence of taxes paid on allegedly fraudulent earnings *The Accounting Review, 79*(2), 387-408.
Ettredge, S. M., Sun, L., Lee, P., & Anandarajan, A. A. (2008). Is earnings fraud associated with high deferred tax and/or book minus tax levels? . *Auditing: A Journal of Practice and Theory, 27*(1), 1-33.
Ewert, R., & Wagenhofer, A. (2005). Economic effects of tightening accounting standards to restrict earnings mangement *The Accounting Review, 80*(4), 1101-1124.
Fakhfakh, H. (2011). Earnings management and board oversight: an international comparison *Managerial Auditing Journal, 27*(1), 66-86.
Fan, J. P. H., & Wong, T. J. (2002). Corporate ownership strucuture and the informativeness of accounting earnings in East Asia *Journal of Accounting and Economics, 33*, 401-425.
Gaio, C. (2010). The relative importance of firm and country characteristics for earnings quality around the world *European Accounting review, 19*(4), 693-738.
Gavious, I. (2007). Market reaction to earnings management. *International Research Journal of Finance and Economics* (8), 196-214.
Glaum, M., Lichtblau, K., & Lindemann, J. (2004). The extent of earnings management in the U.S. and Germany *Journal of International Accounting Research 3*(2), 45-77.
Gong, G., Louis, H., & Sun, A. (2008). Earnings management and firm performance following open-market repurchase *Journal of Finance, 63*, 947-986.
Gore, P., Pope, P. F., & Singh, A. K. (2007). Earnings management and the distribution of earnings relative to targets:UK evidence *Accounting and Business Research 37*(2), 123-150.
Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting *Journal of Accounting and Economics, 40*, 3-73.
Guay, W. R., Kothari, S. P., & Watts, R. L. (1996). A market-based evaluation of discretionary accruals models *Journal of Accounting Research 34*(Supplement 1996), 83-105.
Gujarati, D. N. (2003). *Basic Econometrics* New York McGraw-Hill/Irwin
Han, S., Kang, T., Salter, S., & Yoo, Y. K. (2010). A cross-country study on the effects of national culture on earnings management *Journal of International Business Studies, 41*, 123-141.
Hand, J. R. M., & Landsman, W. (2005). The pricing of dividends in equity valuation *Journal of Business Finance & Accounting, 32*(3&4), 435-469.
Harebottle, J. (2015). *Identifying earnings management using changes in asset turnover and profit margin* MCom University of the Witwatersrand Johannesburg
Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics, 7*, 85-107.

Healy, P. M., & Palepu, K. G. (1993). The effect of firms' financial disclosure policies on stock prices. *Accounting Horizons*(7), 1-11.
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.
Hee Choi, T., & Pae, J. (2011). Business ethics and financial reporting quality: evidence from Korea. *Journal of Business Ethics 103*(3), 403-427.
Hoffman, A. J. (2012). Stock return anomalies: evidence from the Johannesburg Stock Exchange *Investment Analysts Journal, 75*(41), 21-41.
Holland, D., & Ramsay, A. (2003). Do Australian companies manage earnings to meet simple earnings benchmarks? *Accounting and Finance 43*, 41-62.
Holthausen, R. W. (1990). Accounting method choice: opportunistic behaviour, efficient contracting and information perspectives. *Journal of Accounting and Economics*(12), 207-218.
Hribar, P., & Collins, D. (2002). Errors in estimating accruals:implications for empirical research. *Journal of Accounting Research 40*(1), 105-134.
IASB. (2001). International Financial Reporting Standards *IAS 1 Presentation of Financial Statements*

London IFRS Foundation
International Accounting Standards Board. (2008). International Accounting Standard 12 *Income Taxes* London International Accounting Standards Commitee Foundation
IRBA. (2014/2015). Public inspections report 2014 /2015 (https:wwwirbacoza/uploadpublicinspectionreport2015.PDF). Retrieved 06/12/2016
Jacob, J., & and Jorgensen, B. (2007). Earnings management and accounting income aggregation. *Journal of Accounting and Economics, 43*, 399-419.
Jaggi, B., Leung, S., & Gul, F. (2009). Family control, board independence and earnings management: evidence based on Hong Kong firms. *J. Account, Public Policy, 28*, 281-300.
Jansen, I. P. H., Ramnath, S., & Yohn, T. L. (2012). A diagnostic for earnings management using changes in asset turnover and profit margin *Contemporary Accounting Research, 29*(221-251).
Jeanjean, T. (2012). The Effect of IFRS Adoption,investor protection and earnings quality: some reflections *The International Journal of Accounting 47*, 352-362.
Jensen, M., & Meckling, W. (1976). Theory of the firm, managerial behaviour, agency costs and ownership structures *Journal of Financial Economics*(3), 305-360.
Jiang, H., Habib, A., & Smallman, C. (2009). The effect of ownership concerntration-firm performance relationship in New Zealand *Pacific Accounting Review 21*(2), 104-131.
Jones, J. J. (1991). Earnings management during import relief investigations *Journal of Accounting Research 29*(2), 193-228.
JSE Listings Requirements
Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk *Econometrica 47*(2), 263-292.
Kaplan, R. S. (1985). Comments on Paul Healy:evidence on the effect of bonus schemes on accounting proceedures and accrual decisions *Journal of Accounting and Economics, 7*, 109-113.
Kasznik, R. (1999). On the Association between voluntary disclosure and earnings management *Journal of Accounting Research Spring* (37), 57-82.
Keung, E., Lin, Z., & Shih, M. (2010). Does the stock market see a zero see small positive earnings surprise as a red flag? *Journal of Accounting Research, Vol 48*(1), 91-121.
Klapper, L. F., & Love, I. (2002). *Corporate governance, investor protection and performance in emerging markets* The World Bank Washington
Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures *Journal of Accounting and Economics, 39*, 163-197.
La Porta, R., Lopez-de-Silanes, F., & Vishny, R. (2000). Investor protection and corporate governance *Journal of Finance and Economics 58*, 3-27.

Lahr, H. (2010). Identifying discontinuities in distributions of earnings by kernel density estimation
Lahr, H. (2014). An improved test for earnings management using kernel density estimation *European Accounting Review 23*(4), 559-591.
Lee, C. M. C., & Ng, D. (2004). *Corruption and international valuation: does virtue pay?* Johnson Graduate School of Management Ithaca
Lemma, T., Negash, M., & Mlilo, M. (2013). *Determinants of earnings management: evidence from around the world* Retrieved from http://dx.doi.org/10.2139/ssrn.2370926
Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection; an international comparison *Journal of Financial Economics 69*, 505-527.
Lev, B., & Sougiannis, T. (1999). Penetrating the book-to-market black box: The R& D effect. *Journal of Business Finance and Accounting, 26*(3-4), 419-449.
Levitt, A. (1998). The numbers game Retrieved from
Lin, F., & Sheng-Fu , W. (2014). Comparison of cosmetic earnings management for the developed markets and emerging markets: Some empirical evidence from the United States and Taiwan *Economic Modelling 36*, 466-471.
MacKinlay, A. C. (1997). Event Studies in Economics and Finance *Journal of Economic Literature XXXV*(March), 13-39.
Matsumoto, D. A. (2002). Managements' incentives to avoid negative earnings surprises *The Accounting Review, 77*(3), 483-514.
Mauro, P. (1995). Corruption and growth *The Quarterly Journal of Economics, 110*(3), 681-712.
Memis, M., & Cetenak, E. (2012). Earnings management, audit quality and the legal environment: an international comparison. *International Journal of Economics and Financial Issues 2*(4), 460-461.
Mills, L., & Newberry, K. (2001). The influence of tax and nontax costson book-tax reporting differences :Public and private firms *The Journal of the American Tax Association, 23*(1), 1-19.
Nelson, M. W., Elliot, J. A., & Tarpley, R. L. (2002). Evidence from auditors about managers and auditors earnings management decisons *The Accounting Review, 77*(S-1), 175-202.
Ng, D. (2006). Misuse of public office for private gain *Managerial Finance 32*(10), 822-836.
Ohlson, J. (1995). Earnings, book values and dividends in equity valuation. *Contemporary Accounting Research, 11*, 661-687.
Parfet, W. U. (2000). Accounting subjectivity and earnings management: a preparer perspective *Accounting Horizons, 14*(4), 481-488.
Patel, S. A., Balic, A., & Bwakira, L. (2002). Measuring transparency and disclosure at firm-level in emerging markets *Emerging Markets Review 3*(4), 325-337.
Pelucio-Grecco, M., Geron, C., Grecco, G., & Lima, J. (2014). The effect of IFRS on earnings management in Brazilian non-financial companies. . *Emerging Markets Review, 21*, 42-66.
Phillips, J., Pincus, M., & Rego, S. O. (2003). Earnings management: new evidence based on deferred tax expense *The Accounting Review, 78*(2), 491-521.
Phillips, J., Pincus, M., Rego, S. O., & Wan, H. (2004). Decomposing changes in deferred tax assets and liabiliites to isolate earnings management activities. *The Journal of the American Tax Association Supplement* 43-66.
Rabin, E. (2005). Determinants of auditors' attitudes towards creative accounting *Meditari Accountancy Research 13*(2), 67-88.
Rahman, R., & Mohamed-Ali, F. (2006). Board, audit committee, culture and earnings management: Malaysian evidence. *Managerial Auditing Journal, 21*(7), 783-804.
Report, G. C. (2014). World Economic Forum Retrieved from
Reverte, C. (2008). Institutional differences in European countries *Journal of Accounting and Organizational Change, 4*(2), 182-200.
Richardson, V. (2000). Information asymmetry and earnings management: some evidence. *Review of Quantitative Finance and Accounting* (15), 325-347.

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics, 42*(335-370).
Schrand, C. M., & Wong, M. H. (2003). Earnings management using the valuation allowance for deferred tax assets under SFAS No.109. *Contemporary Accounting Research, 20*(3), 579-611.
Scott, D. W. (1992). *Multivariate density estimation: theory, practice and visualization*. New York: Wiley.
Shen, C.-H., & Chih, H.-L. (2007). Earnings management and corporate governance in Asia's emerging markets *Corporate Governance 15*(5), 999-1021.
Shleifer, A., & Vishney, R. (1997). A Survey of corporate governance *The Journal of Finanace, 33*, 1133-1151.
Silverman, B. W. (1986). *Density estimation for statistics and data analysis*. London: Chapman & Hall
Singh, A. K., & Weisse, B. A. (1998). Emerging stock markets, portfolio capital flows and long term economic growth: micro and macroeconomic perspectives *World Development 26*(4), 607-622.
Stocken, P. C., & Verrechia, R. E. (2004). Financial reporting system choice and disclosure management *The Accounting Review, 79*(4), 1181-1203
Subramaniam, N., Mcmanus, L., & Zhang, J. (2009). Corporate governance,firm characteristics and risk management committee formation in Australian companies. *Managerial Auditing Journal 24*(4), 316-339.
Subramanyam, K. R. (1996). The pricing of discretionary accruals *Journal of Accounting and Economics, 22*, 249-281.
Swartz, G., & Negash, M. (2006). An empirical examination of the Ohlson (1995) model. *SA Journal of Accounting Research, 20*(1), 67-82.
Sweeney, A. (1994). Debt-covenant violation and managers' accounting responses *Journal of Accounting and Economics 3*, 281-308.
Teoh, S. H., Welch, I., & Wong, T. J. (1998). Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics, 50*, 63-99.
Tsipouridou, M., & Spathis, C. (2012). Earnings management and the role of auditors in an unusual IFRS context: The case of Greece. *Journal of International Accounting, Auditing and Taxation, 21*, 62-78.
Van de Wouw, P. (2015). *Detecting earnings management:the South African Perspective* Masters Report University of the Witwatersrand Johannesburg
Wang, L., & Yung, K. (2011). Do state enterprises manage earnings more than privately owned firms? The case of China. *Journal of Business Finance & Accounting, 38*(7&8), 794-812.
Wang, Y., & Campbell, M. (2012). Corporate governance, earnings management, and IFRS: empirical evidence from Chinese domestically listed companies *Advances in Accounting incorporating Advances in International Accounting 28*, 189-192.
Ward, M., & Muller, C. (2012). Empirical Testing of the CAPM on the JSE *Investment Analysts Journal, 76*(41), 1-12.
Watson, S., & Rossouw, J. (2012). JSE efficiency and share price reaction to forced financial statement restatements *Journal of Economic and Financial Sciences 5*(2), 417-436.
Watts, R. L., & Zimmerman, J. (1978). Towards positive theory of the determination of accounting standards. *The Accounting Review, 53*(1), 112-134.
Waweru, N., & Riro, G. (2013). Corporate governanace, firm characteristics and earnings management in an emerging economy. *Journal of Applied Management Accounting and Research 11*(1), 43.
White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica 48*, 817-838.
Williamson, O. E. (1981). The Economics of organisation: the transaction cost approach *American Journal of Sociology 87*(3), 548-577.

Yet, C. E., & Imm, S. S. (2010). Information asymmetry and earnings management causes of inefficient investment in Malaysia. *Capital Market Review* (18), 1-21.
Young, S. (1999). Systematic measurement error in estimation of discretionary accruals: An evaluation of alternative modelling procedures *Journal of Business Finance and Accounting 26*(7&8), 833-862.