DETECTION OF FRAUD IN FINANCIAL STATEMENTS USING BENEISH RATIOS FOR COMPANIES LISTED AT NAIROBI SECURITIES EXCHANGE

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DECLARATION

I declare that this Proposal is my original work and has not been submitted for an award of a degree in any other University for examination/academic purposes.

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ABBREVIATIONS

ACFE	Association of Certified Fraud Examiners
CMA	Capital Markets Authority
EM	Earnings Management
FASB	Financial Accounting Standards Board
FDT	Fraud diamond theory
FFR	fraudulent financial Reporting
FFS	Fraudulent Financial Statements
FTT	Fraud triangle theory
IASB	International Accounting Standards Board
ICPAK	Institute of Certified Public Accountants of Kenya
NSE	Nairobi Securities Exchange
SEC	Securities and Exchange Commission
DSRI	Days Sales Receivable Index
AQI	Asset quality Index
GMI	Gross Margin Index
SGI	Sales Growth Index
DEPI	Depreciation Index
SGAI	Selling,General and Administration expenses
TATAI	Total Accruals to Total Assets Index
LEVI	Leverage index

CHAPTER ONE

INTRODUCTION

1.1   Background of the Study

The pressure to present a rosy outlook on company activities is one management will always grapple with. It inevitably leads to earnings management which can be defined as the preparation and presentation of financial statements designed to misinform stakeholders about the organisations financial performance or to influence contractual obligations that depend on declared figures and amounts Marai and Pavlovic (2013). Often earnings management leads to creative accounting which in turn as noted by (Jones, 2011)lends itself to accounting scandals and fraud. Unlike earnings management which can be accomplished within the law Fraudulent financial reporting is that which violates the law or regulatory framework Jones (2011). Scandals that emanate from earnings management and organizations charged with financial reporting fraud are common in history and in every country.

The aim of both earnings management and financial reporting fraud according to Bhattacharya, Daouk and Welker (2003) is to maximize the performance outlook or reduce profit charges such as tax. The companies may either, among other things, record sales before they are realizable, record fictitious sales or overstate inventory thereby distorting the actual situation Deshow and Skinner (2000). The public, therefore, as noted by Eilifsen

(2010) has gradually lost confidence on corporate financial responsibility, eroding confidence in the work of auditors, investors and regulators as most of them are either negligent or engage in the scandalous acts. According to Jiraporn et al., (2008) earnings management is an unlawful act where swindler executives involved in unsuitable accounting events for their own welfares which as Schilit (2010) noted can result into bankruptcies. He noted such cases as giant company WorldCom and Enron in the U.S. Recently Steinhoff holdings in South Africa has become the country's largest financial statement fraud scandal.

Corruption and mismanagement are Kenya's foremost challenges in both the public and private spaces. They provide an almost perfect environment thus making detection, investigation, and punishment of financial fraud a challenge such as a scenario where a whistleblower was publicly blamed as noted by Herbling (2017) for exposing corruption in an international lender, shelter Afrique that operates out of its headquarters in Nairobi. Furthermore the country has had its fair share of accounting scandals and corporate scandals in the financial sector with Trust Bank (2006), Imperial Bank (2015) which contemplated suing its auditors who had acted since 2003 where the fraud can be initially traced to, Dubai Bank (2015), Haco Tiger Brands (2015) and Chase Bank (2016) that were accused of manipulating earnings and subsequently placed under management after a run on the bank. Fraud is investigated by appointed auditors whereas corporate governance issues are handled by the Capital markets authority (CMA). The CMA has been proactive issuing guidelines on corporate governance practices and disclosures as a deterrent to prevent earnings management. These were published under gazette notice No. 369 of 25th

January 2002 and legal notice No. 60 of 3rd May 2002. However, despite valiant efforts, the CMA and the NSE still lag in detection and investigation of both earnings management and fraud and are always reactive.

1.1.1 Financial Reporting Fraud

The purpose of financial reporting is "the provision of accurate information for decision making by various stakeholders through giving information about the reporting entity. These decisions include the provision of resources to the firm or buying and selling of short term and long term securities", Njoki (2016). Elaine and Thomas (2013), identify the statement of financial position, statement of income, statement of cashflow and the statement of changes in equity as key financial statements for any firm. Any willful deviation from the provision of accurate financial transactions in these financial statements and such inaccuracies presented as the truth is, therefore, to be considered fraudulent

Kassem (2012) defined Financial Fraud as "intentional and illegal activities carried out by the perpetrator to steal or misuse the victim organization's resources or assets and the perpetrator can hide his theft by concealing the true nature of the business transaction". More specifically the study will also rely on Jones (2011) definition of fraud where he stated that it was the "fictitious accounting of transactions or those prohibited by Generally Accepted Accounting Principles (GAAP)".

The Association of Certified Fraud Examiners (ACFE) further defines FFR as "The intentional, deliberate, misstatement or omission of material facts or accounting data to

mislead and, when considered with the information made available, and would cause the reader to alter his or her judgments in making a decision, usually with regard to investments". This definition is important because as Oriko (2014) asserted, it emphasizes on the investment decision-making process which relies on the financial statements provided. This decision is corrupted if financial statements include manipulated elements such as overstating assets, sales, and profit or understating liabilities, expenses, or losses.

The study intends to show that there was manipulation of financial reporting figures which distort the intended outcome of portraying a true and fair position of the status of financial affairs and standing of the firm.

1.1.2 Beneish Ratios

The need for methods to determine Earnings management, financial impropriety or financial distress in companies, has over the years led to tools being developed to complete these tasks. With many studies focusing on factors or steps to be taken to correct the error state.

However Messod Beneish developed a model of detection of fraud building upon accrual based earnings management checking tools from DeAngelo (1986) whose model detected optional entitlements, itself a development from Healy (1989) which checked optional receivables, Jones (1991) which focused on Total accruals and the modified Jones which was designed to reduce measurement error of discretionary accruals..

The Beneish Model used a different set of variables in addition to the accruals methods. Key aspects included are the days sales receivable index, Sales growth Index and the asset quality Index, this according to pustlynick(2009) checked the earnings quality on a broader scale

While developing the model he used financial data from companies confirmed to have committed fraud in their reporting and classified them as those that either grew too quick, experienced diminishing fundamentals or outright adopted aggressive accounting.

The eight indices were developed from ratios of related accounting figures. The eventual indices bring out associations which are key and act as pointers to areas that require further investigations or probing, with increases in the variable implying a higher chance of manipulation.

This study analysed the variables as described by Beneish from companies that were flagged by the Beneish M-Score Model as having had fraudulent financials or manipulated earnings.

1.1.3 Beneish M-Score and Financial Statement Fraud

Financial statements and their constituent figures usually follow a consistent path. Moreover there exists linkages within the statements that ensure specific line items move in tandem. Whenever the company struggles, management may be tempted to alter one

item over another. This then throws off the consistency or harmony of the line items and indeed the financials. Consequently, motivation to coat such downturns or impropriety leads earnings managers to commit financial statement fraud. Which in turn diminishes the primary purpose of financials to investors as a basis to assess future earnings potential.

According to McLeavey,(2013) about 20% of companies are involved in earnings management. To prevent investors or credit issuers to screen and further evaluate such companies, there has to be tools and mechanisms that identify them.

The foresnsic formulas developed by Messod Beneish present an exceptional tool to separate between earnings management and financial statemnt fraud.

Brewer (2004) applied the beneish Model and noted it could have flagged the collapse of Enron, 3 years before its ultimate demise in 2001. Beneish et al ,(2011) further tested the model on 17 high profile corporate fraud cases and the model identifed the financial statement fraud amongst 12 of them.

The current study sought to find the number of firms involved in financoal statement fraud and show the trend or simmilarity in the manipulation and motivaton varibales as captured by Messod Beneish M-score model.

1.1.4 Nairobi Securities Exchange

This is the main Kenyan bourse constituted in 1954.It started off as the Nairobi Stock exchange before transitioning to Securities exchange in 2011. The change of Name was

occasioned to accommodate more market instruments other than just stocks. It currently 67 different securities organized under 14 separate sectors.

As the preeminent exchange in eastern Africa, the exchange continually attempts to improve the quality of the trading experience and has rules for which the companies are required to abide by. The NSE listing rules, (2014), a listed firm's securities may be suspended or delisted for failure to adhere to the rules and procedures as laid down. Under these regulations, as noted by Njoki (2016) firms are required to adhere to the continuous listing obligations among them disclosure of periodic financial information and miscellaneous provisions. Failure to adhere to these obligations, besides other rules has seen firms both listed and unlisted at the NSE put under statutory management.

Further as contained in capital market authority operating rules publicly quoted companies are obliged to publish the financial reports at the end of every financial year. The premise behind such disclosure is to enable the investing public make an informed decision on the firm whose securities they are about to trade in. However, this requirement has not prevented companies from presenting factually inaccurate financials to the detriment of the investing public. Hence the need to use other tools even after financial audits to confirm the accuracy, of the financials presented.

Detection and highlighting of financial fraud are paramount since most of the listed companies have employed a very aggressive growth strategy which involves acquiring assets with high growth potential or initiating greenfield projects some using subsidiaries

as investment vehicles with the promise of high returns that instead end up tying capital thus suppressing returns. Mergers and acquisitions and Joint ventures have also been a staple strategy over the years with ventures or investments all across Africa. Some have in the recent past initiated several large capital-intensive investments across their business units which act a double-edged sword with opportunities for future growth but a real present danger in the need for cash it creates hence a need for high debt and needs to show a large balance sheet capable of absorbing such debt. Earnings and liquidity risks may not be covered fully in the short run. It follows therefore that the accounting and reporting of NSE listed firms easily lends itself to earnings management.

The operating environment for listed companies has also been challenging with fluid political considerations and tight economic situations, for example, rising costs of living often leave their business exposed due to the lower disposable income that the populace has. In the financial year 2017, twelve listed firms issued profit warnings Ngunjiri (2018). Profit warnings are issued when a company's results fall by 25 % from the previous full reporting period. Such a scenario requires that financial data for other companies be subjected to secondary checks to ensure that they reflect the true and fair position.

1.2   Research Problem

Collapse of companies in Kenya is common place and the Nairobi securities exchange quoted companies haven't been an exception. However, despite this scenario the discoveries of financial fraud in prior years is always done post facto. To protect

stakeholders, a trend of deceit should have been discovered earlier and corrective actions be taken or in the least warnings issued.

This link or trend can be used as a detection mechanism to flag problem companies for deeper analysis. This research aims to inform the creation of a mechanism where the market regulators and participants can assess and detect fraud in the financials of target investees

The discretion companies have in the provision of accounting data is great. They may choose among which alternative principle to use when measuring assets or liabilities and even how much to estimate to use when presenting financial information this flexibility provides an opportunity to manage earnings. They may also outright commit fraud. However, Healy and Walen (1999) noted that firm face two options once they opt to initially undertake earnings management. They either accept that they can no longer manage the earnings as the reversals occur they take the hit on the financial statements publicly or they may perpetuate more fraud to conceal the reversals. Beneish (1999) Over time the use of income-increasing discretionary measurements or principles eliminates ways to manage earnings. Unfortunately, when earnings management is used as a tool over an extended period, likelihood of fraud being used to sustain positive outlook is also high. Perols & Lougee (2011).

Auditors may also fail to detect chicanery owing to the sampling technique used to test the figures before presenting the financials, while some may be part of the problem (Cotterill, 2018).

In the Kenyan context, the financial scandals subject is a common case; Madiavale (2011) study on financial scandals revealed that organization such as National Bank of Kenya, Unga group, CMC Motors, Euro bank among others have experienced a financial crisis. Dubai bank, Imperial bank and hitherto Kenya's predominant supermarket chain Nakumatt holdings are the latest organization to experience financial crisis due to earnings management and fraud. This shows that earnings management infused with fraudulent financial reporting is still a clear and present problem in Kenyan economy since the majority of these company experience the financial downfall within a short period after recording a better financial performance. Its Pervasive nature means that the problem of earnings management affects all industries; including both listed and unlisted. Bashir (2017)

While studying creative accounting in Kenya Kamau (2016) observed that Firms listed on the NSE face various pressure to alter figures presented to for the public consumption. He (Mutegi, 2018) identified positive relationships between management compensation, tax avoidance contractual obligations, insider dealings, and creative accounting. From his study on determining fraud using financial ratios, Oriko (2014) observed that there was moderate fraud exhibited by firms at the NSE. He noted that it is most unlikely that the companies release audited reports to a watchdog press for fear of losing shareholders. However, firms have resorted to balancing their books perhaps in conjunction with their auditors to deceive an unsuspecting public. They have found a workaround to public disclosure and are essentially hiding fraud in plain sight

Kariuki and Jagongo (2013), in a research on investors' perception on financial reporting quality (FRQ) in Kenya, sought to establish the nature of information in financial statements that are deemed paramount by the institutional investors in Kenya. The researchers studied all the institutional investors in the Nairobi Securities Exchange. The study adopted the descriptive survey design They concluded that institutional investors regarded information on total assets, liabilities, non-current assets, total equity, current and non-current liabilities, operating profits and activities as the most useful. Investors mostly consume data as presented and often don't try to relate figures to confirm authenticity. The study intends to raise awareness among market participants about the possibility of fraud even on audited financial statements and should include in their investing models a risk element to mitigate against such instances

The research attempts to answer the following question: Does a relationship between earnings management and fraudulent financial reporting exist?

1.3 Research Objective

To determine and analyse financial statement fraud amongst Nairobi securities exchange listed companies.

1.4 Value of Study

The study is ultimately intended to build upon knowledge towards improving the detection and prevention of financial fraud. For the stakeholders involved it will assist in developing a robust financial system and market which can detect and deter unfair or illegal practices

before they destroy the fabric of trust that the financial system is built on. The study will also expand existing literature related to fraud in financial reporting by localizing known methods of fraud detection.

The findings could be of use to policymakers as well as academics as a literature source as they seek to build watertight methods of discovery. Furthermore, policy-making institutions and accounting regulators such as Institute of Certified Public Accountants (ICPAK) can also benefit from the findings of the study by determining whether to come up with the decision of developing more rules to advance the quality of financial information reported by companies. Other intended beneficiaries are institutional and retail investors while analyzing the financial performance of a firm should holistically consider both financial, non-financial performance and the cash position specifically training their antennae to detect fraud presented as truth.

The study will show areas that need improvement in the current regulatory framework used by the oversight agencies in the country. It should aid particularly the CMA by Providing new insights in monitoring the listed companies whilst helping the firms uphold good corporate governance through ensuring transparency, accountability and responsibility in their financial reporting otherwise they are de-listed.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section summarizes the literature considered and highlights theories guiding the study, previous empirical studies conducted and new developments related to the study. The chapter discusses earnings management and fraudulent financial reporting

2.2 Theoretical Review

Prospect theory, agency theory, and fraud diamond theory offer a basis for research into the area of showcasing the cause and how earnings management evolves into financial misrepresentation or fraudulent financial reporting.

2.2.1 Prospect Theory

The proponent of this theory was Kahneman and Tversky in 1979. The theory states that firms dislike losing more than they prefer winning thus showing their risk-averse nature. However, when faced with unfavorable outcomes such as losses then the firms' management take on greater risk to try and receive a better outcome. It further states that management base their decisions with regard to reference points which can be prior period

earnings or targets. If they are likely to miss the target or reference point prospect theory states that they are more likely to take actions to improve their earnings. Moreover, prospect theory does not assume rationality of the manager or that they will choose the option with the best utility instead it states that with respect to the reference point they will select that option that is less aversive of causes the least loss.

This theory is classic in explaining earnings management and fraudulent presentation since all manipulation are done to show progress relative to a prior period reference point and despite the risk involved in using fraudulent figures, they readily absorb that risk to show a better outcome thus displaying their irrationality. A further argument from the theory is that managers promote income management to gain some paybacks and to sustain the paybacks they find themselves in the fraud territory.

2.2.2 Agency Theory

The theory was developed by Jensen and Meckling (1976). The theory explains a principal-agent relationship and it further highlights the information asymmetry between the two parties, that is, principals and the agents. In this context, the insiders (agents) have information advantage which the principals don't have. This, therefore, motivates the agents, such as managers, to engage in activities which can enhance their own benefits without the principal's knowledge.

Sundaramurthy and Lewis (2003) argued that this situation is worsened by the problem of adverse selection which can occur when the principal has less information during decision-making time by the agent. Another key argument in this theory is that both the principal and the agent act rationally and aim to maximize their own interests hence easy for the agents to engage in activities such as earnings management that aim to improve their benefits in bonuses for the situation where their benefits are attached to performance.

The theory is relevant to this study in explaining the role of benefits schemes and contractual motivations to engage in earnings management. According to the theory, the principals may believe that the agents are making the best decisions for the better of the company. They hence put in place benefits such as bonuses and benefits to reward the agents. But the reward encourages earnings management instead. This normally happens when there is a separation of ownership and control in governance between the shareholders and managers

Companies are oft- castigated by economists for wrestling away control of key decision making or management from the shareholders. The investments made are short term in nature, which is a problem associated with earnings management since they forgo longterm strategy for short term survival or the total investments made over time are not profitable if inflation is accounted for.

2.2.3 Fraud Diamond Theory

Wolfe and Hermanson (2004) developed The Fraud diamond theory, FDT, from the Fraud triangle theory FTT by adding an extra nexus. It included the initial three fraud elements of the FTT that are: Opportunity, incentive and rationalization and included an additional aspect termed capability. They further argued that in addition to FTT elements, capability had to be present.

The potential fraudster must proficiency to commit fraud. According to the authors "Opportunity opens the doorway to fraud, and incentive (i.e. pressure) and rationalization can draw a person toward it. However, the person must have the capability to recognize the open doorway as an opportunity and to take advantage of it by walking through, not just once, but repeatedly". Capability therefore is the necessary ingredient needed to overcome the various checks formulated in policy or accounting regulation to deter fraudulent presentation of financial statements.

This theory is relevant to the study since the pressure caused by declining revenues or earnings might cause directors or capable management or officials to seek opportunities to portray a favourable picture with the rationale perhaps being that the fraud can be covered up and corrected in subsequent reporting periods, but instead are always cornered. Capability is important since they need it to determine where and how to alter the earnings and avoid being cornered.

2.3 Beneish M-Score Model

The Beneish model is a weighted probit model with the binary of manipulator and non manipulator.Beneish (1999) defined manipulators as those that violated the laid out accounting principles with only benefit being reperesentation of the frims performance to third parties.

The research was based on earlier works on cash flows Healy (1985) and accruals (1991). He also used theory proposed by Zimmerman (1986) on contracts based incentives for Earnings management.

To develop the model he used financial statement data from74 companies that had manipulated earnings.The firms were identified either by zeroing in on those who were under SEC enforcement actions or actively mentioned in the news media ,Benish(1999). The manipulations had taken the form of overstated earnings from revenue unearned, fictititous or uncertain ,improper cost capitalization or fictional inventory.

While developing the model he noted that fraud was augmented by (i) uncharacteristic increase in receivables (ii) falling Margins (iii) a decrease in asset quality (iv) Sales growth and (v) Increasing accruals.

While comparing the identified manipulator firms with sample control group Beneish found that manipulators were smaller firms in either assets or sales ,were less profitable and had a higher gearing ,Beneish(1999).

The constituent parts of the Model were 8 ratios. 4 ratios highlight movements that might have occurred due to earnings manipulation or fraudulent statements ,these are the Days

Sales receivable index (DSRI) ,Asset Quality index (AQI) ,Depreciation index (DEPI) and the Total Asset to Total Accrual Index(TATA)

The other 4 create incentive for earnings manipulation.,these are the Gross Margin Index (GMI), the Sales Growth Index (SGI) ,Selling ,Growth and Admin Expenes Index (SGAI) and the Leverage index (LEVI)

2.4 Quality financial reporting

Various stakeholders require financial figures represented in a specific format.This variation causes the financial reports to inherently carry a risk of deterioration and even misrepresentation ,this despite the best efforts FASB and the IASB, whose accounting standards are designed to provide the perfect base for consistent financial reporting quality.

Beest et al (2009) noted financial reporting quality was determined by how aggressive accrual models have been used in financial reports generation and how the value of the firm responds to the financials, that is the value relevance model.

Accruals represent that aspect of financial reporting that allows discretionary methods to be employed in measuring certain aspects of the financials hence management can exert some control. Value relevance on the other hand concerns itself with how the stock pricing reacts to published accounting figures.

The stock price gives the value of the firm, whereas accounting figures show firm value based on accounting procedures. When both move in tandem the financials are said to provide relevant and reliable information Nichols and Wahlen,(2004).

In their study Beest et al (2009) also gave other qualitative aspects that should characterize any financial report if it is to be qualified as quality, these were :Relevance , Faithful representation, Understandability ,Comparability and timeliness. Firms fingured as mainpulators often lack in more than one of these qualitative characteristics

2.5 Empirical Review

This section considers past studies that focused on earnings management or fraudulent financial reporting. The ultimate purpose is to both provide a supporting framework for the research to be performed while still highlighting gaps that can be fulfilled.

2.4.1 International Studies

A study by Bourke and Van Peursem (2004) "Detecting fraudulent financial reporting: Teaching the watchdog" New tricks" purposed to assist auditors with new weapons in fraud detection. Overall they concluded use of multiple techniques will be of beneficial to auditors. They recommended that audit procedures be modified to specifically test for fraud.

Dunn (2004) while studying the impact of inside power in fraudulent financial reporting stated that fraud is more likely in an autocratic environment whereby a few managers (insiders) make the decisions while other should bear the consequences for. In their study, duality was noted to have a positive correlation with improper financial information declaration. Within a 4-year period to 1996 of the 103 firms surveyed due to successful prosecutions due to fraud, they noted that insiders were in key leadership seats as managers and directors (duality).

In a study conducted by Kassem (2012) on earnings management and financial fraud observed that external auditors' and regulators alike need to increase their knowledge on the areas to help them spot the differentiate between the two. According to him, fraud was a result of the organizations leadership motives. Auditors therefore have no choice but to evaluate the motives behind decisions made by the management. Furthermore he stated, regulators have to enable the auditors by creating framework to perform their duties of checking managements motives of pursuing fraud

Perols and Lougee (2011) in their review of how earnings management impacts the likelihood of financial statement fraud noted: "fraud firms are more likely to have managed earnings in prior years and that earnings management in prior years is associated with a higher likelihood that firms that meet or beat analyst forecasts or that inflate revenue are committing fraud ". They further found that "fraud firms are more likely to meet or beat analyst forecasts and inflate revenue than non-fraud firms are even when there is no evidence of prior earnings management". Their research bore three new fraud detection

indicators; aggregated prior discretionary accruals, meeting or beating analyst forecasts, and unexpected revenue per employee.

Kurniawan and Hermawan (2017) sought to measure the effect of earnings management on probability to commit fraud and cause financial distress. They found that earnings management has a positive correlation with fraud. The higher the earnings management the higher the chance of fraud. The opposite is true. Interestingly they found, fraud does not necessarily cause or is not proven to cause financial distress. Though it increases the likelihood of fraud, Earnings management they felt was a good management tool that may lead to fraud but that the fraud thus perpetuated will not lead to financial ruin of the company in the long term

2.4.2 Local Studies

Wanyama (2012) carried out a research on the effectiveness of fraud response adopted by the Co-operative bank in Kenya; this was a case study on the Co-operative bank of Kenya. The data collected was qualitative and through systematic evaluation and coding was converted to quantitative for analysis. The study revealed that poor human resources practices are partly to blame for escalating fraud cases by employees; the study also established that the bank's information technology systems are instrumental in detection and response to fraud related cases. Wanyama (2012) concluded "The more effective the IS system is the quicker the detection and response".

Oriko (2016) in his study to establish the effectiveness of ratios in detecting fraud with a population consisting of all firms listed on the NSE. It stated that a positive relationship exists between firms fraudulent detection and financial ratios. That is, a reasonably strong correlation exists between fraudulent detection and subsequent increase in working capital and firms net profits. While a percentage increase in return on equity can be explained by the firm's disclosure level. However, a shortfall of using ratios for analysis assumes that the figures thus used are correct.

Kamau (2016) sought to evaluate the influence of management practices on creative accounting among corporations listed at the NSE. The study adopted a mixed research design with descriptive design, casual design, and cross-sectional design. The target population for the study was 64 firms listed at NSE as of 2015. Results of the study showed contractual obligations and creative accounting had a positive influence on the performance of firms listed at NSE

Garane (2017) while studying determinants of earnings management in private retail stores in Nairobi observed that contracting motivations and industry performance have a positive and significant influence on earnings management while bonus system and regulatory requirements have a positive but not significant influence on earnings management. He opined that retail stores can also consider reducing the presence of bonus systems such as the compensation of senior management attached to performance, private control benefits by the managers, retirement benefits, the pressure for wage increments and the need for a

new employee to increase their future income potential since it increases engagement in earnings management

2.6 Conceptual Framework

The conceptual framework considers the ideas from expansive related fields which provide a framework for presentation development. This study will be based on the premise that earnings management and fraudulent financials are a factor of irregularly adjusted financial statement items and produce a sub-optimal M-score

Figure 2.1 is a layout of the conceptual framework that will be used in the study.

Independent Variables   **Dependent Variable**

Independent Variables	Dependent Variable
• Days Sales Receivables Index • Gross Margin Index • Asset Quality Index • Revenue growth Index • Depreciation Index • Sales and Admin expenses Index • Total Assets to Total Accrual Index • Leverage Index	Financial Reporting M-scores
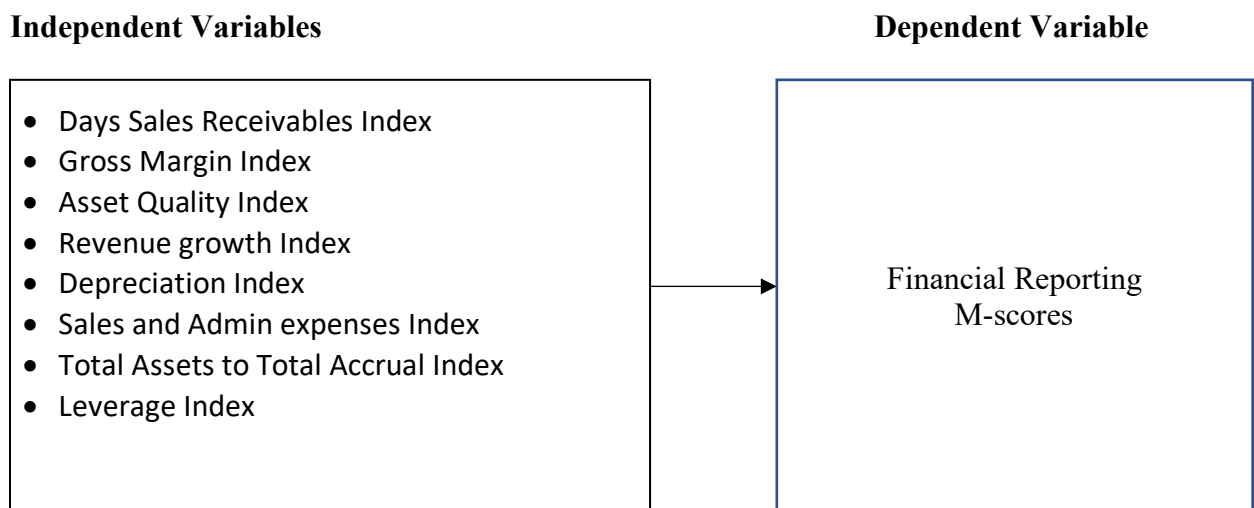
Figure 2.1 Conceptual Framework

From figure 2.1 Beneish showed that movement in any of the indices has an impact on the reported M-score for the company.

2.7 Summary

For as long as financial reporting exists with its inherent subjectivity and there are different consumers of the reporting there will always be an opportunity to misalign the financials. Firm aspects as management discretion and observations that firms hate losing more than they like winning and will therefore do everything within their powers to show success puts the financials in even more peril. Furthermore, as agents, managers may have motives that are incongruent with those of their principals hence creating an avenue for improper recording and reporting. The agents have also become more and more sophisticated in their methods.

It is noted by the various authors that new weapons are required to fight the vice of financial misreporting as well as having a less autocratic management environment, where questions can and should be raised.

Due to this, firms should be proactive in dealing with the menace by abolishing opaque structures or bonus schemes aligned with financials. Even then need for more robust yet effective methods of determining misreporting and fraud post facto such as the beneish M-score or use of financial ratios should be implemented regularly.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The Chapter outlines the methodology that will be employed for the research. It involves research design selection, description of appropriate data collection scheme, tools that will be employed during data analysis, and eventual report writing.

3.2 Research Design

The study will employ a descriptive research design since the data and features thereof are described as they are. This design is preferred since the data collected will be factual, accurate and systematic and will seek to determine the relationship between variables.

3.3 Population

Kothari (2004) stated that population refers to the entire set of elements with observable characteristics that are common amongst them. The population of this study will consist of all firms listed at the NSE. There are 62 companies listed at the NSE and this study will seek to determine earnings manipulation and fraudulent financial reports using the Beneish M- Score for these companies. The study will adopt a census for the companies listed at the NSE as at 31st December 2018

3.4 Data Collection

The study shall use secondary data for the period 2014 to 2018 financial years. The data will be sourced from financial reports and stock return reports from the Nairobi securities exchange

3.5 Data Analysis

Data analyses will involve the data preparation, coding, and arranging data for processing. The data will be initially processed using windows excel and eventually SPSS and tableau data intelligence software.

3.6 Analytical Model

The analytical model used in the study is the probabilistic Beneish 8 factor M – Score Model. The M-score distinguishes between firms that have manipulated earnings from non – manipulators. Beneish described earnings manipulation as instances where the financial performance of a company is exaggerated by disregarding the rules of preparation and preparation as mandated by generally accepted accounting principles (GAAP)

The Model was formulated using financial statement data of 74 known manipulators. The model uses a cut- off mark of -2.22. Whereby firms likely to be involved in earnings management and fraud have an M-Score that is higher than -2.22, while firms below were

non manipulators. Therefore the greater the negative the better.(Beneish, 1999). The sample manipulators had fictitious, unearned or uncertain revenues recorded fictitious inventory or improperly capitalized costs (Beneish, 1999). Therefore M-score is used in assessing the degree of profit control; uncover manipulation of earnings

The linear equation is in the form:

$$M = -4.84 + 0.92X_1 + 0.528X_2 + 0.404X_3 + 0.892X_4 + 0.115X_5 - 0.172X_6 + 4.679X_7 - 0.327X_8$$

Where:

M = Overall score

X_1 = Days sales receivable index - DSRI

X_2 = Gross Margin Index - GMI

X_3 = Asset Quality Index - AQI

X_4 = Sales Growth Index

X_5 = Depreciation Index – DEPI

X_6 = Sales ,General and administrative expenses index - SGAI

X_7 = Total Assets to Total Accruals Index (TATAI)

X_8 = Leverage Index - LVGI

Fraud Determinants levels

M < -2.22 , " Non- manipulator"

M > -2.22 , "Manipulator"

The Beneish model as stated in his paper "identified between 38% and 76% of the manipulated reporting companies correctly and misclassified between 3.5% and 17.5% of the manipulated companies as non-fraudulent companies" (Beneish, 1999).

3.7 Operationalization of variables

An explanation of the variables used to determine earnings manipulation and financial fraud.

3.7.1 Dependent variable

M is the discriminant variable whose value will determine if a firm is classified as a manipulator or non – manipulator. The binary indicates that the events are mutually exclusive

3.7.2 Independent variables

Table 3.1 shows the formula for determining each of the independent indices

Table 3.1 Beneish Indices

	Indicator	Numerator	Denominator	Base formula
1	Day Sales Receivable index	Current Year	Previous year	Accounts Receivable Sales
	The DSRI index captures days sales receivables that may grow faster than anticipated. Greater increase due to falsified revenue			
2	Gross Margin Index	Previous year	Current Year	Sales- Cost of Sales Sales

	Indicator	Numerator	Denominator	Base formula
	If GMI less than 1, it implies a decline in the margin of the company. A possible downturn in the company's forecast and an opportunity for earnings management.			
3	Asset Quality Index	Current Year	Previous year	Total Assets- PPE Total Assets
	When AQI is less than 1, it indicates a propensity to minimize expenses by either considering them capitalized or pushing them to future periods to preserve profitability			
4	Sales Growth Index	Current Year	Previous year	Sales
	SGI ideally should be greater than 1 to signify growth from previous year, a decline, that is a figure lower than 1 indicates contracting revenues . This may precipitate fraud earning recording techniques			
5	Depreciation (rate)Index	Previous year	Current Year	Depreciation Exp Depreciation Exp + PPE
	The rate of depreciation should either remain steady or increase, however a decline in the rate means indicates lower depreciation is being charged which is a earnings increasing technique			

	Indicator	Numerator	Denominator	Base formula
6	Sales General and Admin Expenses	Current Year	Previous year	<u>Sales, Distri. and Admin cost</u> Sales
	Sales and its related expenses usually rise at the same rate. When SGAI is greater than 1 sales increases outpaced those of related expenses thus a signal of improper earnings recording.			
7	Total Assets to Total Accruals Index	Current Year only	-	<u>Working Capital – Depreciation</u> Total Assets
	The ratio measures the extent to which executives distort financial statements through use of discretionary accounting choices favorable to their circumstance			
8	Leverage Index	Current Year only	-	<u>Total Liabilities</u> Total Assets
	Total liabilities should not exceed total assets. Therefore, when it is higher than 1 indicates liabilities are more and also a motivation to manipulate the earnings figures to reduce correct the imbalance. .			

Beneish (1999) also has specific indicator levels for the 8 variables of the M-score model. They can be used to study each index with manipulators and Non Manipulators being sifted as shown in Table 3.2:

Table 3.2 Beneish Indicator Thresholds

Index	Manipulators	Non-manipulators
Days sales receivable index	1.465	1.031

Index	Manipulators	Non-manipulators
Gross Margin Index	1.193	1.014
Asset Quality Index	1.254	1.039
Sales Growth Index	1.607	1.134
Depreciation Index	1.077	1.001
Sales, General, Admin Expenses Index	1.041	1.054
Leverage Index	1.111	1.037
Total Accruals to Total Assets	0.031	0.018

CHAPTER FOUR

DATA ANALYSIS RESULTS AND PRESENTATION

4.1 Introduction

This chapter outlines the data analysis, results and discussion of the results according to the findings. The chapter examines the trends and details of companies that on average were identified having done earnings management, the trend of the variables of the distressed firms in the study period, analysis of descriptive statistics and presents a correlation matrix.

4.2 Data Presentation and Analysis

During the 5 year Study period of 2014- 2018 a possible number of 68 securities were considered.49 firms were eventually selected with 19 dropped due to missing data to suffice in the calculation of the M-score. Furthermore, some firms were also delisted but were still considered in the study.

For the study 219 M-scores were calculated for a combine average M-score of -1.48 during the study period. This indicates that the studied firms were firms were manipulators with probability of 0.069 from the cumulative probability tables.

The year with the lowest M-score was 2015 at 1.681 for all the companies surveyed. This however improved to -2.677 in 2018. As shown in Table 4.1

Table 4.1 Mean Annual M-Scores over study period

	2014	2015	2016	2017	2018
Observations	44	44	46	44	41
Mean M-SCORE	-2.074	1.681	-2.142	-2.207	-2.677

Source : Research Findings

The sectoral breakdown over the period showed that, of the 12 sectors that were represented the only 4 had a mean below the cutoff -2.22 while 8 were above. The worst sector represented was the commercial and services and agricultural came second as presented in Table 4.2

Table 4.2 Sectoral Breakdown of annual M-Scores

Sector	2014	2015	2016	2017	2018	Mean
Telecommunication	-3.46	-2.84	1.25	-4.00	-3.57	-2.52
Automobiles & accessories	-1.97	-2.51	-2.39	-2.78	-2.44	-2.42
Banking	-2.47	-2.15	-2.18	-2.56	-2.65	-2.38
Energy & petroleum	-2.33	-2.85	-1.51	-1.79	-3.08	-2.28
Manufacturing & allied	-2.56	0.55	-2.45	-2.63	-3.10	-2.10

Sector	2014	2015	2016	2017	2018	Mean
Real estate investment trust				-2.48	-1.71	-2.10
Investment services	-1.66	-1.88	-2.60	-1.69	-2.42	-2.05
Investment	-2.54	-0.86	-2.27	-1.84	-2.70	-2.04
Construction & allied	0.57	-2.26	-2.33	-3.20	-3.45	-2.02
Agricultural	-2.22	6.25	-2.47	-0.92	-1.70	-0.37
Commercial and services	-2.38	7.73	-2.14	-2.10	-2.59	-0.09

Source : Research Findings

From the study only 39 firms had at least one year where the M-score recorded was higher than -2.22 . Of these 39 firms ,21 firms had a mean for the five years under study that was lower than the cut-off indicating that they were generally not managing earnings aggressively however, the 18 had a mean M- Score higher than -2.22 during study period indicating that they were likely manipulating their earnings .Table 4.3 Shows the companies that had M-Score means above the cut -off.

Table 4.3 Companies with 5year Average Above Cut-Off

Company Name	Study Period Avg
Centum Investment Co Plc	-0.85
Crown Paints Kenya Plc	0.41
Deacons (East Africa) Plc	-0.91

Company Name	Study Period Avg
Eveready East Africa Ltd	-0.02
Express Kenya Ltd	18.12
Flame Tree Group Holdings Ltd	-1.95
HF Group Plc	-2.05
Kapchorua Tea Co. Ltd	-1.05
KenGen Co. Plc	-0.97
Kenya Orchards Ltd	1.67
Longhorn Publishers Plc	-1.59
Nairobi Securities Exchange Plc	-2.05
Rea Vipingo	-1.90
Stanlib Fahari	-2.10
The Limuru Tea Co. Plc	-2.17
Uchumi Supermarket Plc	-1.60
Unga Group Ltd	-1.94
Williamson Tea Kenya Ltd	7.05

Source : Research Findings

4.3 Variables Analysis

The 18 firms that had a five year mean above the cut-off -2.22 for the 5 year under study were further analysed for the 8 variables that make up the beneish M-score to highlight their make up. From the sample the M- Score mean recorded was -0.707 with a standard

deviation of 2.258.The index with the highest variability as measured by the standard deviation figure is the Gross Margin Index with a mean of 2.236 and a standard deviation of 4.113. Table 4.4 shows the independent variables means for the 18 firms.

Table 4.4 Variables Mean Scores over 5 years

Index	N	Mean	Std. Deviation
DSRI	18	1.282	0.464
GMI	18	2.236	4.113
AQI	17	2.641	2.876
SGI	18	1.041	0.183
DEPI	18	1.347	0.733
SGAI	18	1.149	0.193
TATAI	18	0.012	0.054
LEVI	18	1.083	0.169
M-SCORE	17	-0.707	2.258

Source : Research Findings

4.3.1 Days Sales Receivable Index: - DSRI:

Where DSRI is greater than 1, it indicates that the proportion of receivables to sales in current year is larger than in prior year. An abnormally large increase usually indicates revenue inflation. Non manipulators as prescribed by beneish had a DSRI of 1.031. During

the analysis period ,of the 18 firms above cutoff , 12 were above the cut off rate with Deacons being the highest at 2.775. The mean for the 18 firms was 1.28 with a standard deviation of 0.46 which shows the spread was not too high

Figure 4.1 Days Sales receivable Index
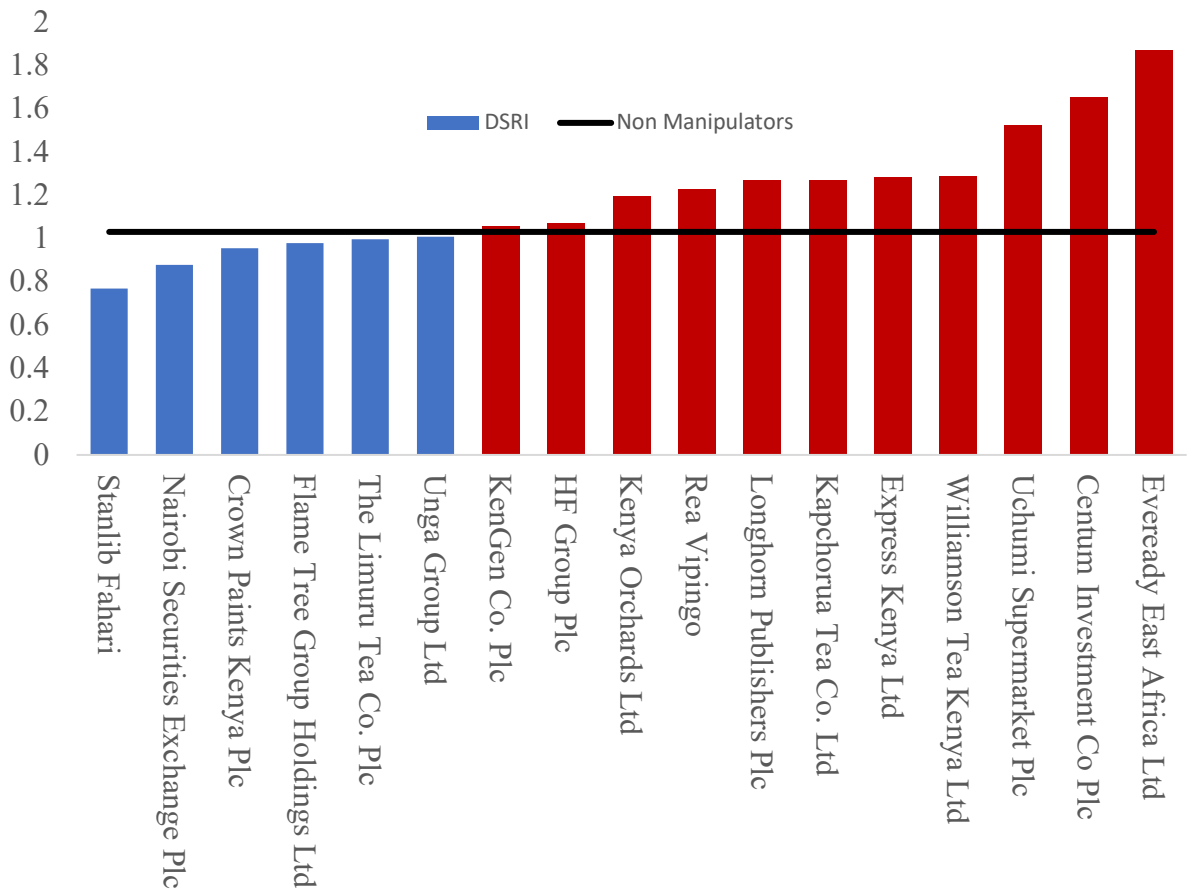
Source : Research Findings

4.3.2 Gross Margin Index - GMI

This index checks whether the gross margin has deteriorated which is negative signal about the company .From the findings the mean GMI for Williamson Tea Kenya was the worst as an outlier at 14 whereas Kapchorua tea second worst at 3.17. This compared to a recommended beneish mean of 1.014 for the growth in profit margins . The mean for the 18 firms was 2.236 with a large standard deviation of 4.113.The mean however and standard deviation however drop significantly with the exclusion of the outlier Williamson tea figure to 1.277 and 0.638 respectively.

Figure 4.2 Gross Margin Index
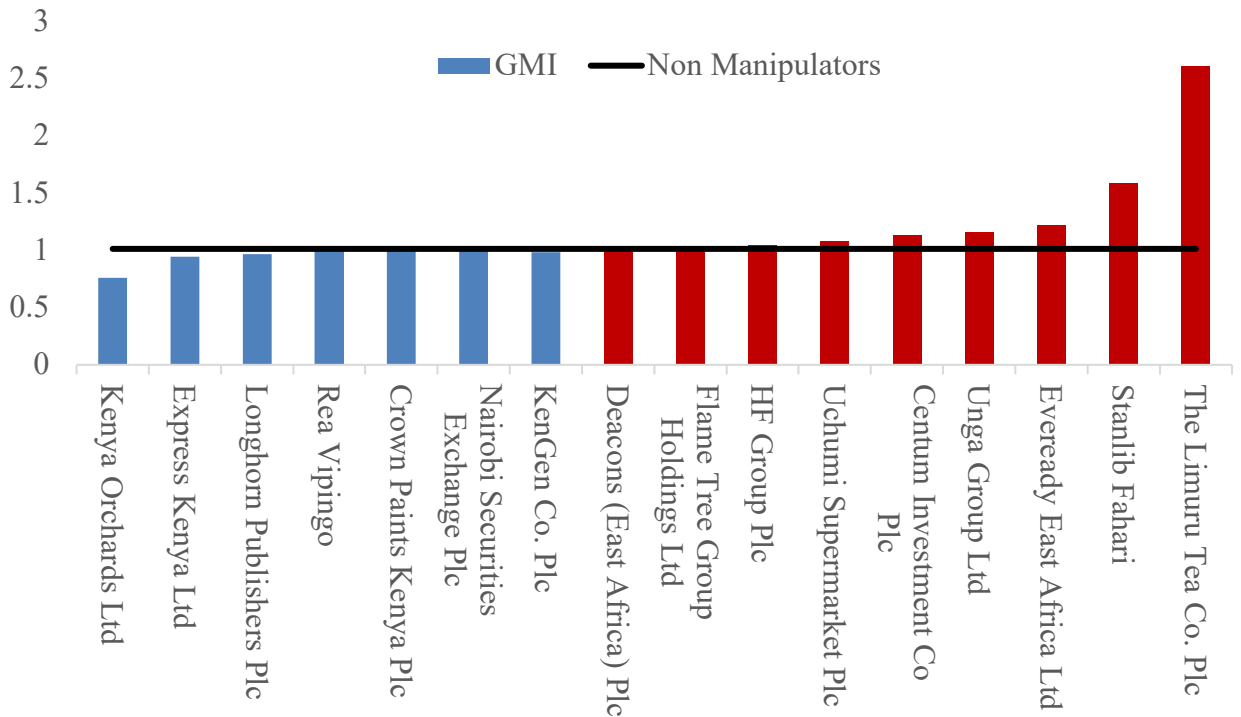
Source : Research Findings

4.3.3 Asset Quality Index –AQI

Checks a companies cost deferral through capitalization of costs to potentially inflate profits. It assesses the increase in long term assets other than property palant and equipment.When the AQI is greater than 1 it means that the cost deferral has increased and potentiall manipulated earnings.

In the study sample the AQI had mean of 5.471 and with an equally high standard deviation of 12.331 . This however was due to outlier effect from Exprss Kenya Limited which had an AQI of 53.601.otherwise the mean fell to 2.640 and a tighter standard deviation of 2.875 . Furthmore, Kenya Orchards at an index of 11 was only behind Express Kenya limited with an index of 53. According to beneish non manipulators are usually below 1.039

Figure 4.3 Asset quality index
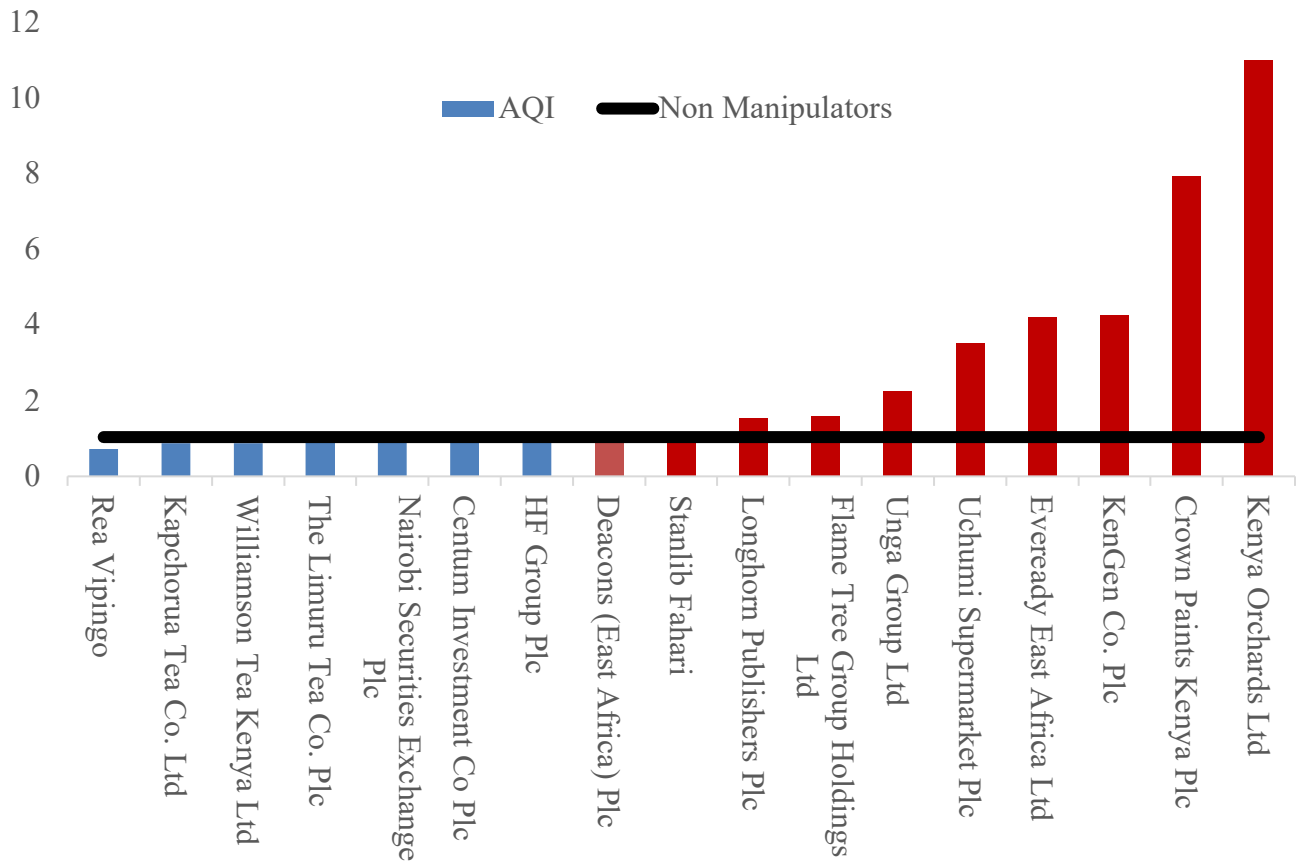
Source : Research Findings

4.3.4 Sales Growth Index – SGI

The SGI for non manipulators as stated by beneish is 1.134. Over the study period Longhorn Kenya and its parent company Centum were the only two companies in the sample manipultors that had indices higher than the beneish non manipulator mark of 1.134 These stood at 1.169 and 1.452 respectively. The Mean for the SGI for the sample was

1.0415 with a small standard deviation of 0.183 The sales growth checks the sales growth

year on year and growth in a pressure point that often influencs managers to

Figure 4.4 Sales growth index
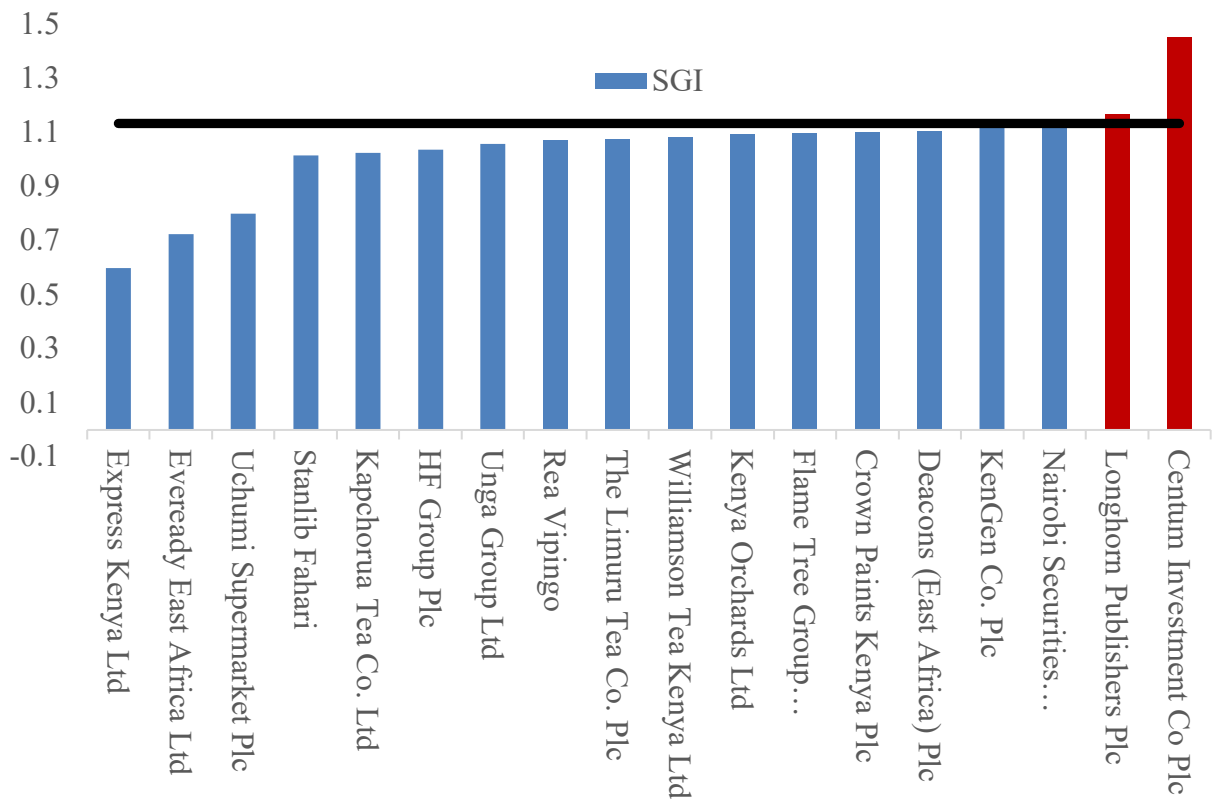
4.3.5 Depreciation Index – DEPI

DEPI as suggested by the model should be at 1.001 when it is higher than that the

prescribed level it indicates a scenario where the company has either increased the useful

life of the PPE or adopted a new income increasing method of depreciation. During the

study period centum had a very high DEPI at 2.943 only second to Eveready at 3.307. The study sample had a mean of 1.347 and standard deviation of 0.7328

Figure 4.5 Depreciation index
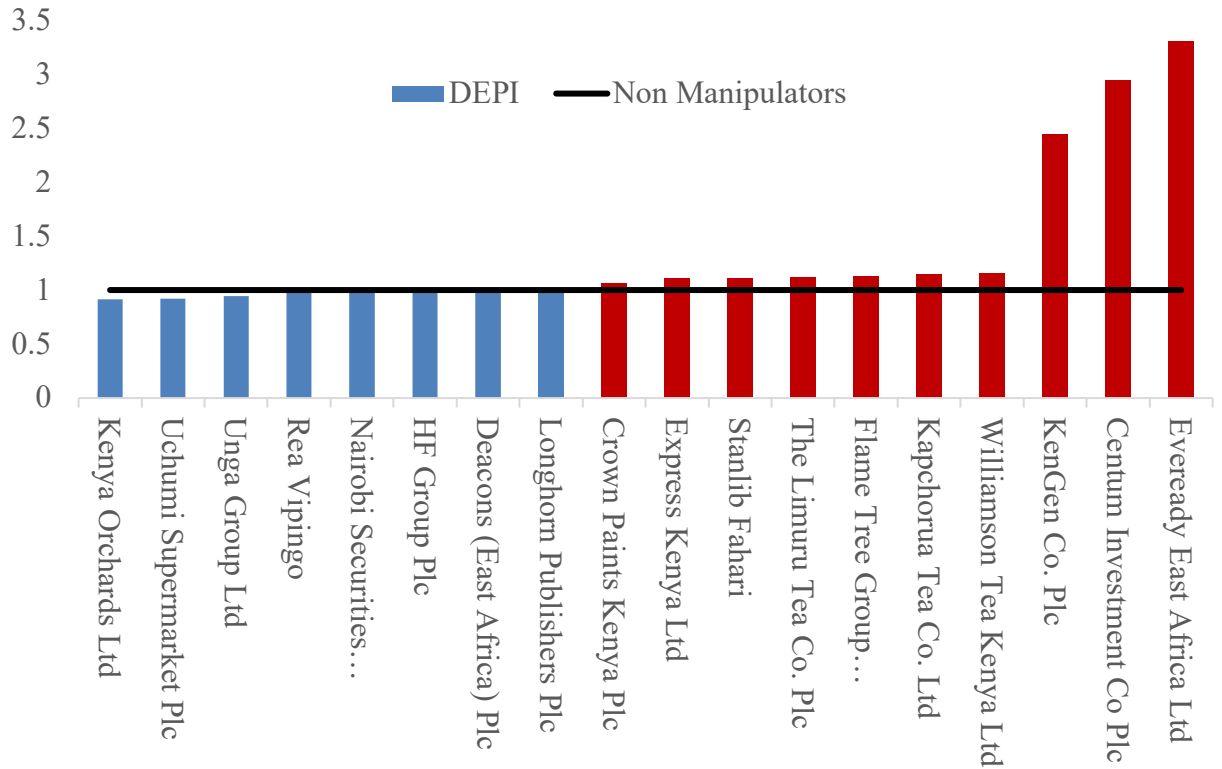
Source : Research Findings

4.3.6 Selling General and Administrative Expenses Index – SGAI

The index tracks the changes to operational expenses to sales. A large increase in expenses relative to sales has an index larger than 1 and indicates that there is inefficiency setting in .This creates an incentive to inflate or manipulate profits.The beneish cut off figure is 1.054. Over the study period ,from the analysis sample express Kenya had the worst average SGAI at 1.779.The Mean for the sample was 1.14 with a standard deviation of 0.192

Figure 4.6 Selling ,General and Adminstrative expenses index
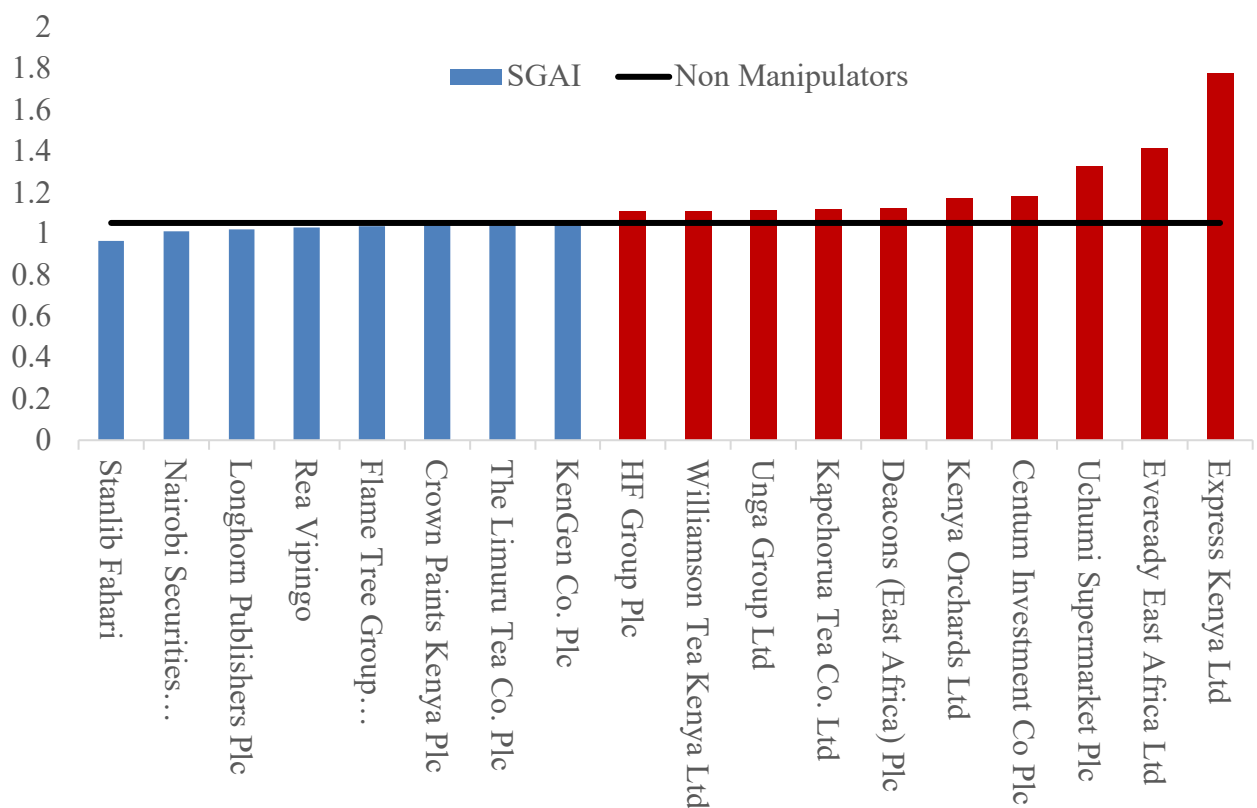
Source : Research Findings

4.3.7 Total Accruals to Total Assets index –TATAI

Discretionary accounting policies are always the preferred avenue by earnings managers .TATAI measures this by checking changes in working capital excluding cash related. A high positive TATAI index a higher likelihood of earnings manipulation. During the analysis period and fro the highlighted firms ,Rea Vipingo which was delisted in 2016 has had the highest TATAI at 0.102 against a noo manipulator mean of 0.018. The sample though had a lower mean of 0.012 and standard deviation of 0.0535

Figure 4.7 Total accruals to total assets index
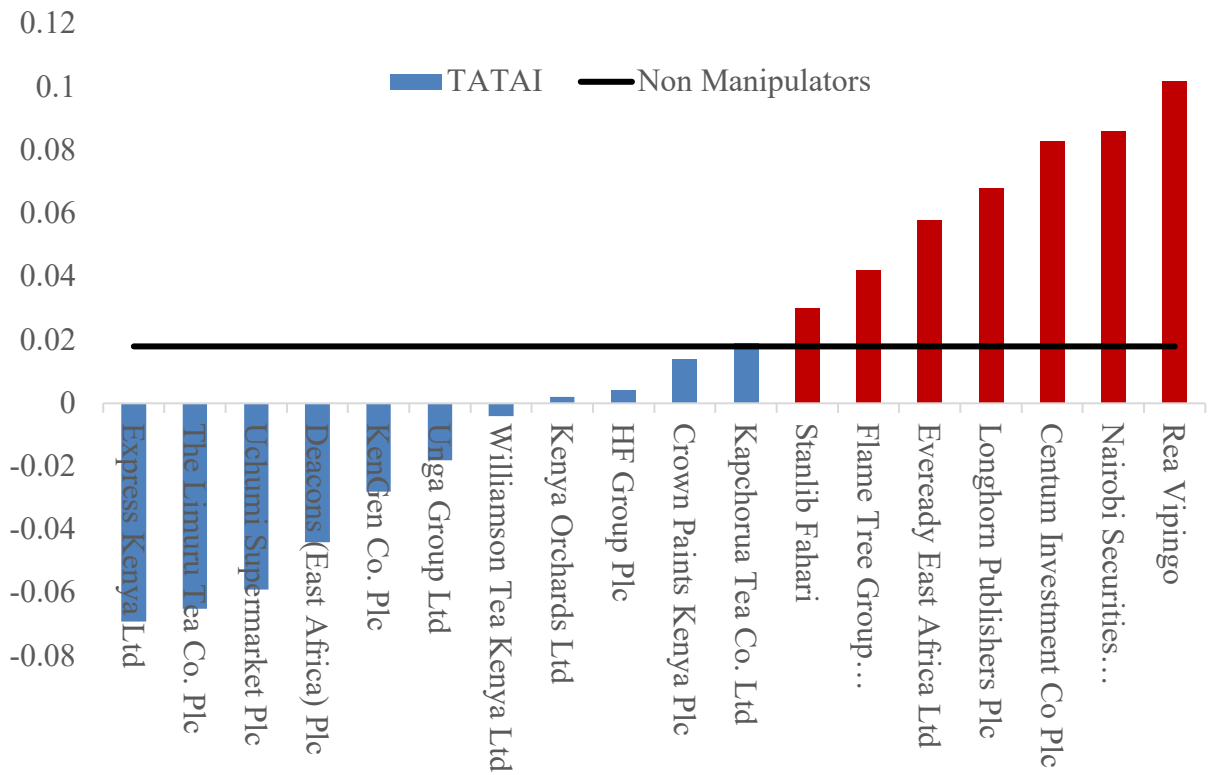
Source : Research Findings

4.3.8 Leverage Index – LEVI

Debts are oft issued with covenants that have to be adhered to. A firm that increases this covenants tends to have manipulated earnings. During the study the firm identified with largest increase in debt as measured by the LEVI was Uchumi supermarkets whose debts rose to an LEVI index of 1.449 compared with beneish non manipulators that had 1.036. The LEVI mean for the sample was 1.082 with a standard deviation of 0.1690

Figure 4.8 Leverage Index
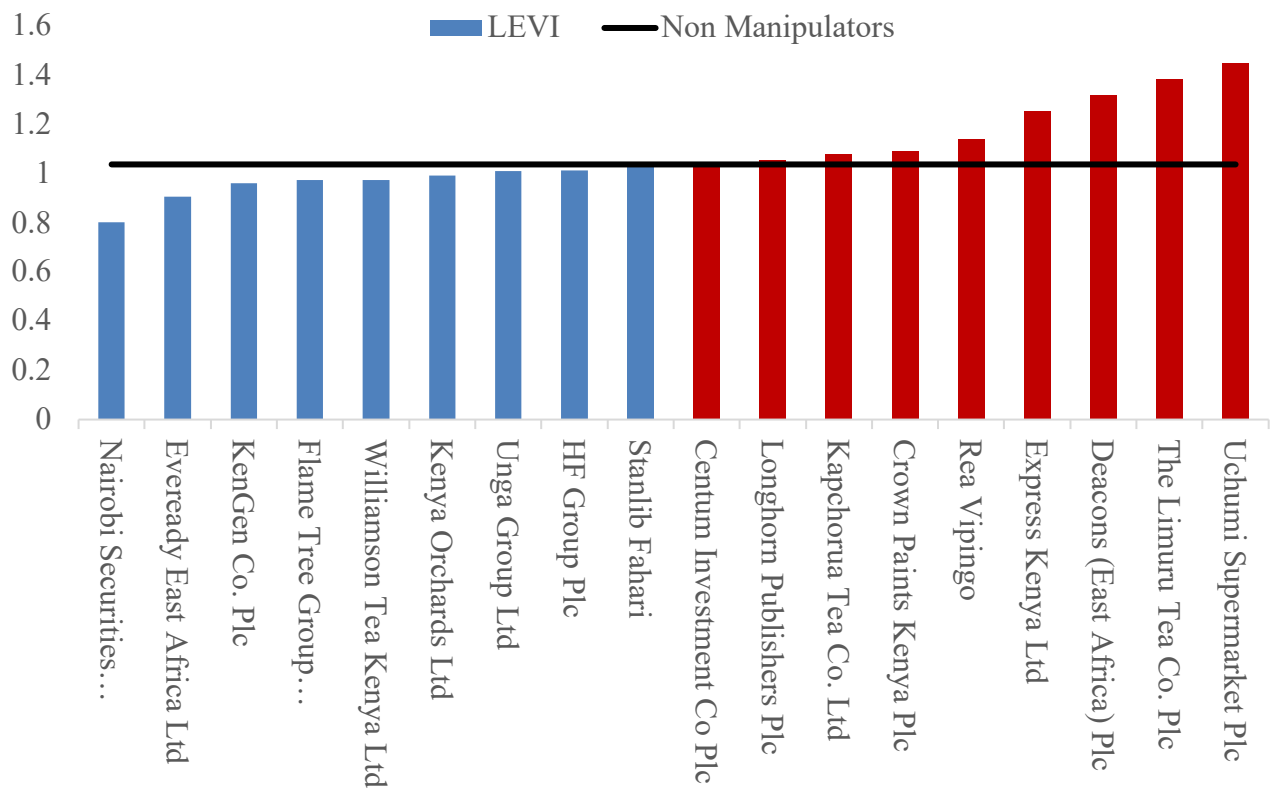
Source : Research Findings

4.4 Inferential Statistics

The correlation co-efficient explains the extent to which the independent variables cause movement to the dependent variable and the strength of such relationship. From the correlation analysis of the Means, it was observed that the relationship between the M-score and the Gross Margin Index mean was the most positive followed by the Asset quality index AQI and finally the DSRI . This implies that an increase in the GMI, DSRI or AQI the more likely earnings manipulation has occurred. Table 4.5 shows the correlation matrix between the Independent variables and the M-score.

Table 4.5 Correlation Co-efficients

	DSRI	GMI	AQI	SGI	DEPI	SGAI	TATAI	LEVI	M-SCORE
DSRI	1.0000	-0.0155	-0.0846	-0.0667	0.2814	0.3051	-0.1429	0.3527	0.1219
GMI		1.0000	-0.2077	0.0561	-0.0721	-0.0713	-0.1007	-0.1259	0.8601
AQI			1.0000	-0.1544	0.0382	0.2670	-0.1742	-0.0994	0.2615
SGI				1.0000	0.0695	-0.7392	0.4404	-0.2791	0.0136
DEPI					1.0000	0.2268	0.2631	-0.3081	0.0611
SGAI						1.0000	-0.3973	0.2950	0.1855
TATAI							1.0000	-0.6354	-0.1102
LEVI								1.0000	-0.2041
M-SCORE									1.0000

Source : Research Findings

From the correlation analysis it was observed that the relationship between the M-score and the Gross Margin Index was the most positive followed by the Asset quality index

AQI and finally the DSRI . This implies that an increase in the GMI, DSRI or AQI the more likely earnings manipulation has occurred.

4.5 Discussion of Key Findings

This study made use of secondary data in detection of earnings management of companies listed at the Nairobi securities exchange. The secondary data was obtained wholly from published annual reports of the selected firms. Deeper analysis was done on companies highlighted as likely manipulators by the beneish M-score

The trend of the M-score over the study period of 5 years generally indicates an improvement from a low of +1.608 in 2015 to a high of -2.677 in 2018 for all survey firms. This implies that on the whole companies in the Nairobi securities exchange did not engage in earnings manipulation. This is in line with ,Kamau,(2016) who in is study of earnings management ,noted that it trended down.

However, the companies with a 5- year average above the M-score cut off of -2.22 the M-score they improved from a low of 3.224 in 2015 to -2.117 n 2018 which was still above the cut-off whereas those who through the study period did not cross the cut-off had a low off -2.483 in 2016 and a high of -3.001 in 2018.

From a sectoral standpoint over the study period , the best performing sector was the Telecommunications sector dominated by the largest listed company {according to who}

.It had a mean Score over the 5 – years of -2.52 whereas the commercial and services sector had the worst mean M-score of -0.09. This sector also had the worst M-score in 2015 at 7.73 . Moreover of the 11 sectors represented in the study only 4 had a mean Score above the Beneish Cut off of -2.22.

Earnings management refers to accounting practices that influence the financial reporting outcomes. The M-score utilizes 8 variables to classify a firm as a one that likely manages or not.

The descriptive statistics focused on the companies highlighted as likely earnings managers to show commonalities.

The DSRI tracks revenue inflation ,over the study period the index peaked in 2015 for companies with average M-score above the cut-off and has been trending downwards implying that the focus for earnings manipulation is moving away from the top line in to other areas of the financials.

Deteriorating margins as checked by the GMI ,creates significant motivational pressure to manage reported earnings. Likely manipulators had a declining GMI though in the final year under study 2018 they recorded 2.397 against 0.748 for those not manipulating.

The quality of Assets index ,the AQI correlated highly the M-scores for the period under study.It checks the propensity of firms to use cost deferaal methods to prop up their

margins.It is a key motivational signal used in measureing the M-score. Over the study period the AQI for companies with high M-score was 2.7004 against 1.1044 for comoanies that showed no Manipulation on average.This shows that they possibly capitalized costs to temporally increase margins by spreading out the costs.

High sales growth periods are excepted for most sustainable firms for a period of time. However, they create undue pressure to be sustained to maintain the glory. The SGI captures this motivational factor. During the period under study the SGI for both the likely manipulators and non manipulators was however low at 1.05 and 1.0082 respectively. This shows that companies didn't record exceptionally high sales spurts over the study period.

Depreciation should generally track the property and equipment. A decrease in this index indicates that the useful life of assets has been increased.for the likely manipulators it has been a volatile index from a low of 0.98 in 2014 a sharp increase to 2.669 in 2015 and back to 0.767 in 2016 ,whereas the non-manipulators didn't have such volatility. This volatility in index shows that the rates could have been altered to compensate for a shortfall in profitability

The SGAI was the one of the more stable indices over the study period. It didn't show a lot of variability over the years for both manipulators and non – manipulators. This shows that the expenses charged ,didn't exhibit an unnatural growth pattern compared to revenue.

Accounting not supported by cash or accruals was captured by the TATAI. Accruals measure the extent to which managers make discretionary accounting changes to alter earnings.For likely manipulator over the study period the TATAI some movement but was generally low. It was however still much higher than those considered non- manipulators in the study. On the whole it indicates that accruals were not heavily relied upon to manipulate earnings.

Debt covenants are motivational factor to manage earnings and are captured in the beneish model using the LEVI. However over the study period the mean LEVI for firms that were likely manipulators was lower than that of non-manipulators. Indicating that they stayed away from increasing debt that has a multiplier effect in earnings management.

CHAPTER FIVE

SUMMARY ,CONCLUSION AND RECOMMENDATIONS

The objective of this chapter is to give a summary, reach conclusion and make necessary recommendations from the quantitative analysis . The study applied the M-score as a method of detecting earnings management and separate likely earnings manipulators from non manipulators

5.1 Summary

The study was conducted with the objective of applying Beneish M-score model in detecting financial earnings manipulation. Earnings manipulation is usually done by companies in financial distress and trying to present a rosy successful picture of their activities. The 8 varibales used by beneish capture all possible pain points for earnings managers. Thus by evaluating them and subjecting them to the formula a reliable Z -score of earnings manipulation existence is developed, also named M-score by its developer Messod Beneish.

The probability is thus obtained from the Z-score tables. The 8 Variables studied are generally classified as manipulation signals and motivation signals. Manipulation signals as stated by {Must Quote} are the days sales in receivables index DSRI ,asset quality index AQI ,depreciation index, DEPI and total accruals to total assets ,TATA. Whereas

motivational signals are gross margin index GMI, sales growth index SGI, selling, general, and administrative index SGA and leverage index LEVI.

From the M-scores ,the companies that were likely manipulators all had peculiarities in their financials as measured by the variables at more than one year over the period of study.

5.2 Conclusion

The M-score model is a very practical and simple instrument that can be utilized by authorities to determine or monitor companies that are engaged on the extreme negative of earnings management .The M-score can be used by credit issuers or private citizens who want to steer clear of companies engaged in unhealthy earnings management especially over a long period of time.

The M-score cannot identify with full certainty whether a firm is a manipulator however at the -2.22 cut-off ,read from the cumulative normal table this z-score gives a probability of 0.0132, a firm has a probability of 0.986 to be classified innocent. 74 times the chances of being labeled a manipulator . As stated by McLeavey (2013), Beneish wants to protect portfolios by making it harder to call a guilty firm innocent

5.3 Recommendations

The beneish Model is a simple model that should be incorporated in the monitoring toolbag by market participants. The results may assist, especially risk averse investors with a long

term outlook avoid calamity. The model may also be used in concert with other methods including in depth analysis.

Companies managers should also be cognizant of the negative relationship earnings manipulation and future company outlook and should not account to factor in the detection .Finally, there is the need to strengthen the compliance function of the capital markets to construct and display publicly the relevant indices to support reporting and investment research in Kenya.

5.4 Limitations of the study

The study set out to include all reporting entities of the securities exchange however only 49 were included. Even then entire insurance industry was left out due to how reporting formats which don't clearly give line items needed for analysis.

Banking stocks even though, included have peculiarities such as mandated provisioning and normally mandated capital management maybe incorrectly captured as earnings management.

Dominant stocks in sectors with low participants might overly influence the ultimate M-score of the sector, for Instance, Safaricom in the telecommunication sector. Hence care should be taken when focusing on sectoral scores

5.5 Suggestion for further studies

A study could be carried out on companies that have defaulted on bank loans to develop a localized version of the M-score which banks can use to screen potential borrowers.

A comparative study may be done with other security exchanges to check on either sectoral Scores or trends of M-scores.

Case studies could also be done on companies cautioned for flouting reporting rules or under receivership to check on the M-scores versus other signals like the Altmans Z-Score.

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APPENDICES

Appendix i : Indices

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
ARM Cement Plc	2018									
	2017	0.74	-1.06	0.74	0.68	0.907	1.29	-0.14	1.19	-4.99
	2016	1.5	1.92	1.2	0.87	0.524	0.68	-0.03	0.65	-1.6
	2015	0.88	0.92	0.81	1.07	1.123	4.44	-0.05	0.83	-3.41
	2014	1.39	0.9	0.87	0.97	1.255	1.13	0.02	1.05	-2.16
B.O.C Kenya Plc	2018	1.18	1.04	0.86	1	0.918	0.9	0.03	1.05	-2.22
	2017	0.9	0.99	0.9	0.9	0.939	1.22	-0.06	1.17	-3.09
	2016	0.98	0.96	0.83	0.91	1.011	1.09	0.02	0.91	-2.57
	2015	1.22	1.23	0.77	0.92	0.746	1.08	-0.03	1.09	-2.51
	2014	0.95	0.91	0.55	1.04	1.545	0.98	0.05	1.16	-2.44
Bamburi Cement Ltd	2018	0.62	1.52	1.33	1.03	0.962	1.05	-0.04	1.32	-2.72
	2017	0.88	1.26	1.44	0.95	1.447	0.99	-0.06	1	-2.57
	2016	1.93	0.92	0.74	0.97	0.948	1.06	0.05	0.94	-1.57
	2015	1.23	0.81	0.88	1.09	0.943	1.19	-0.01	1.11	-2.46

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2014	1.4	0.97	0.87	1.06	0.89	1.17	-0.05	1.13	-2.44
British American Tobacco Kenya Plc	2018	0.91	0.94	3.76	1.11	1.465	1.05	-0.07	0.87	-1.62
	2017	1.17	1.05	0.89	0.94	0.938	1.03	-0.08	1.07	-2.79
	2016	1.14	1.05	0.55	0.89	1.031	1.14	-0.05	0.98	-2.85
	2015	0.9	0.93	2.07	1.06	0.903	0.94	0.06	0.92	-1.84
	2014	0.71	1.02	0.45	1.07	0.952	0.91	-0.03	0.98	-3
Car & General (K) Ltd	2018	1.12	0.97	1.04	1.05	1.202	0.93	-0.03	1.01	-2.44
	2017	0.8	1.08	1.27	0.99	0.903	1.11	-0.06	0.9	-2.78
	2016	0.95	1.01	0.91	0.98	1.322	1.01	0.03	1	-2.39
	2015	0.82	1.09	1.1	1.2	1.142	0.92	-0.03	1.03	-2.51
	2014	1.18	0.95	0.97	1.18	0.889	1.16	0.06	1.03	-1.97
Carbacid Investments Ltd	2018	1	1.02	1.03	0.99	1.374	1.16	0	0.75	-2.36
	2017	0.91	0.87	1.32	0.91	0.898	0.97	0.01	0.82	-2.5
	2016	1.03	1.03	1.02	1.03	0.915	1	0	0.65	-2.3
	2015	0.96	0.88	1.23	0.98	1.1	1.65	-0.06	1.35	-2.98
	2014	1.38	1.05	1.05	0.87	1.582	1.01	-0.02	1.53	-2.39
Centum Investment Co Plc	2018	1.46	1.13	1.01	0.9	0.784	1.33	0	1.06	-2.16

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2017	2.12	0.98	1.02	1.11	1.291	0.71	0.08	1.22	-0.97
	2016	0.66	1.55	0.98	1.58	0.093	1.66	0.1	1.21	-1.8
	2015	3.33	1	0.79	2.42	11.829	1.12	0.12	0.96	2.65
	2014	0.7	1	1.06	1.25	0.719	1.1	0.11	0.77	-1.97
Crown Paints Kenya Plc	2018	0.63	1.04	-0.07	1.13	0.995	1.03	0.03	1.14	-3.04
	2017	1.2	1.05	0	1	1.391	0.99	0.07	0.95	-2.27
	2016	1.07	1.03	0.83	1.09	0.944	0.9	-0.04	1.06	-2.58
	2015	0.79	0.95	1.16	1.12	1.05	1.04	-0.07	1.08	-2.87
	2014	1.08	0.9	37.83	1.17	0.938	1.26	0.08	1.22	12.82
Deacons (East Africa) Plc	2018									
	2017									
	2016	0.45	1.06	1.71	0.97	1.217	1.22	-0.27	1.24	-4.06
	2015	5.1	0.98	0.4	1.24	0.782	1.02	0.25	1.4	2.24
	2014							-0.11		
Diamond Trust Bank Kenya Ltd	2018	0.72	1	1.29	1.02	0.944	0.95	-0.05	1.04	-2.83
	2017	1.19	1.01	0.86	1.02	0.909	1.07	0.01	0.94	-2.28
	2016	0.73	1.02	1	1.31	1.043	1	0.03	0.96	-2.26
	2015	1.05	1.02	1.01	1.24	0.977	1.02	0.07	1.08	-1.92

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2014	1.04	1.04	0.94	1.21	0.754	0.93	-0.28	0.98	-3.57
E.A.Cables Ltd	2018									
	2017	1.04	0.78	0.74	0.64	0.876	1.2	-0.11	1.18	-3.61
	2016	0.69	0.75	0.91	0.98	0.956	1.18	-0.16	1.1	-3.76
	2015	0.94	1.57	2.79	0.73	0.916	1.72	-0.11	0.93	-2.35
	2014	0.94	1.18	1.03	1.13	1.14	0.84	-0.03	1.11	-2.44
E.A.Portland Cement Co. Ltd	2018	2.1	-6.35	1.17	0.75	1.231	2.26	0.24	1.1	-4.58
	2017	0.98	1.63	1.01	0.78	0.969	0.9	-0.03	1.14	-2.54
	2016	0.46	1.21	1.27	1.05	0.799	1.18	0.14	1	-2.13
	2015	1.39	1.22	1.6	0.93	0.999	1.01	0.33	0.71	-0.21
	2014	0.97	0.96	0.85	0.98	1.103	1.36	-0.05	1.15	-2.95
East African Breweries Ltd	2018	0.77	1	0.57	1.05	1.145	1.05	-0.09	1.07	-3.26
	2017	0.79	1.13	1.46	1.09	1.057	0.83	-0.08	0.93	-2.66
	2016	1.27	0.99	1.07	1	1.047	1.08	-0.13	1.07	-2.87
	2015	1.12	0.99	0.75	1.05	0.868	0.88	-0.06	0.95	-2.69
	2014	0.82	0.95	0.98	1.04	1.021	1.15	0.01	0.98	-2.61
Equity Group Holdings Plc	2018	1.03	1	0.87	1.1	1.05	0.92	-0.04	1.14	-2.63
	2017	1.15	1.04	1.06	0.93	0.874	1.05	-0.06	1.05	-2.68

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2016	1.12	0.97	0.97	1.2	0.901	0.91	-0.1	0.86	-2.63
	2015	0.92	1.05	0.94	1.22	1.004	0.98	-0.02	1.29	-2.52
	2014	1.43	1.01	0.93	1.11	0.937	1.08	-0.02	1.4	-2.24
Eveready East Africa Ltd	2018	1.4	2.05	1.77	0.74	1.307	0.89	0	0.8	-1.34
	2017	2.59	0.9	0.33	0.61	1.09	1.82	0.67	0.51	1.49
	2016	3.82	0.84	17.73	0.49	0.052	1.49	-0.16	1.13	5.37
	2015	0.22	1.41	0.12	0.92	13.855	1.56	-0.2	0.78	-2.86
	2014	1.33	0.89	1.06	0.85	0.233	1.32	-0.03	1.31	-2.75
Express Kenya Ltd	2018	1.13	-0.44	0.56	0.52	0.939	1.33	0.04	1.24	-3.7
	2017	1.16	2.28	0.7	0.8	0.943	1.06	-0.11	1.43	-2.64
	2016	0.86	1.42	0.87	0.51	1.084	1.97	-0.22	1.33	-4.18
	2015	1.78	0.56	264.87	0.72	0.964	1.65	-0.09	1.32	103.7
	2014	1.49	0.9	1.01	0.45	1.618	2.88	0.05	0.95	-2.59
Flame Tree Group Holdings Ltd	2018	0.91	1.08	0.79	1.03	1.615	0.91	0.01	1.01	-2.47
	2017	1.04	1.08	2.06	0.95	0.765	1.12	-0.06	1.1	-2.38
	2016	0.92	0.99	3.57	1.11	1.031	1.1	0.07	1.16	-1.16
	2015	0.99	0.91		1.29	0.975	0.98	0.04	0.97	
	2014	1.03	1.13	0	1.1	1.247	1.08	0.16	0.62	-1.8
HF Group Plc	2018		1.11		0.85	1.243	1.25	-0.05	1.24	

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2017		1.1		0.83	0.954	1.44	-0.08	0.62	
	2016	0.96	0.98	1.05	1.06	0.683	1.01	0.08	1.08	-2.14
	2015	1.26	1.07	1.02	1.27	0.876	1	0.1	1.13	-1.56
	2014	0.99	0.99	1	1.17	1.193	0.86	-0.04	0.98	-2.47
I&M Holdings Plc	2018		1.06		1.06	1.299	0.96	-0.07	1.09	
	2017		1		1	1.232	1.16	0.03	1.36	
	2016	0.8	0.72		1.44	1.204	0.95	-0.01	0.98	
	2015	1.07	1.27		1.08	0.868	1.45	-0.02	0.93	
	2014	1.08	1.06		1.09	1.126	0.85	0.21	1.04	
KCB Group Plc	2018	1.12	1.03	0.93	1.04	0.984	0.88	0.02	1	-2.22
	2017	1.05	0.99	1.11	1.01	1.044	1.09	0	1.13	-2.44
	2016	0.29	0.93	2.15	1.11	1.179	1.02	0.05	0.87	-2.32
	2015	0.75	1.09	1.58	1.19	1.006	0.87	0.03	1.03	-2.11
	2014	1.09	1.05	0.73	1.14	1.128	0.99	-0.01	1.02	-2.41
Kakuzi Plc	2018	1.11	1.01	0.97	1.11	1.023	1.42	0.02	0.61	-2.13
	2017	1.02	1.03	1.15	1.07	1.006	0.9	-0.06	1.31	-2.67
	2016	0.98	1.01	0.9	1.06	0.934	0.89	-0.03	0.99	-2.59
	2015	1.36	0.75	0.9	1.45	0.999	0.93	-0.04	1.8	-2.35
	2014	0.63	0.95	0.32	1.19	1.255	1.15	-0.09	1.16	-3.4
Kapchorua Tea Co. Ltd	2018	1.64	0.1	0.94	1.09	1.198	1.42	0.05	1.35	-2.21

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2017	0.92	10.49	0.38	1	1.472	1.26	-0.11	1.24	1.64
	2016	0.84	0.19	1.01	1.39	0.586	0.77	0.04	1.56	-2.72
	2015	2.01	4.04	0.87	0.75	1.478	0.84	-0.01	0.91	-0.14
	2014	0.94	1.03	1.17	0.9	1.002	1.32	0.12	0.34	-1.83
KenGen Co. Plc	2018	1.33	1	0.85	1.04	0.925	1.04	-0.03	0.95	-2.32
	2017	1.51	1.15	0.07	1.04	8.745	0.94	-0.01	1	-1.42
	2016	1.02	0.88	18.52	1.13	0.086	1.06	-0.06	0.84	4.32
	2015	0.67	0.73	0.86	1.17	1.149	1.34	0	0.79	-2.81
	2014	0.75	1.14	0.97	1.22	1.305	0.91	-0.04	1.21	-2.64
Kenya Airways Ltd	2018	0.87	1.05	0.81	1.41	0.605	0.96	-0.1	1.06	-2.82
	2017	1.13	1.16	1.61	0.7	1.344	0.8	-0.09	0.79	-2.58
	2016	0.97	0.74	0.58	1.05	1.447	1.02	-0.21	1.16	-3.74
	2015	1.04	0.94	0.41	1.04	0.785	1.48	-0.15	1.33	-3.58
	2014	1.23	0.75	1.13	1.07	0.991	1.05	-0.04	1.14	-2.53
Kenya Orchards Ltd	2018	0.96	0.67	0.57	0.98	0.817	1.09	0.06	0.89	-2.63
	2017	1.15	0.7	0.76	1.14	0.44	1.64	0.02	0.96	-2.56
	2016	1.33	0.9	0.82	1.06	1.107	1.19	0.06	0.96	-1.95
	2015	1.28	0.6	52.85	1.05	1.101	0.97	0.37	0.64	20.43
	2014	1.25	0.94	0.02	1.23	1.101	0.97	-0.5	1.5	-4.95

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
Kenya Power & Lighting Co Ltd	2018	0.79	1.01	1.12	1.04	0.841	1.09	-0.08	1.05	-3
	2017	1.44	1.05	0.57	1.11	0.898	1.09	-0.07	1.09	-2.5
	2016	0.9	0.9	1.11	1.02	1.013	1.17	-0.06	0.98	-2.87
	2015	1.25	0.99	1.15	1.01	1.049	1.05	-0.07	1.15	-2.59
	2014	1.2	0.97	1.45	1.19	0.965	0.91	-0.06	1.04	-2.24
Kurwitu Ventures Ltd	2018			1.04		1.012		-0.02	3.08	
	2017							0.01		
	2016									
	2015									
	2014									
Longhorn Publishers Plc	2018	0.87	0.96	1.09	1.17	1.002	0.92	-0.11	1.16	-2.99
	2017	0.97	0.96	3.14	1.02	0.999	0.99	-0.06	1	-1.93
	2016	1.51	1.1	1.05	1.71	0.996	0.9	0.35	1.1	0.34
	2015	2.19	0.89	1.4	0.6	1.001	1.09	0.12	1.07	-1.1
	2014	0.8	0.94	0.97	1.35	0.999	1.22	0.03	0.96	-2.25
Mumias Sugar Co. Ltd	2018	0.14	0.84	0.25	0.66	0.76	1.82	-0.93	1.74	-8.72
	2017	2.33	0.58	5.79	0.49	0.645	3.02	-0.23	1.46	-1.6

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2016	0.88	0.34	1.14	0.77	1.334	1.2	-0.09	0.94	-3.47
	2015	1.42	-0.22	0.64	0.42	0.941	2.58	-0.03	1.49	-3.96
	2014	0.57	1.05	0.73	1.18	0.922	0.95	-0.15	1.13	-3.53
Nairobi Securities Exchange Plc	2018	0.84	1	1	1.04	1.138	1.09	0.06	1.28	-2.42
	2017	0.91	1	0.94	1.43	1.112	0.71	0.07	0.62	-1.69
	2016	1.17	1	0.95	0.79	1.226	1.37	-0.01	0.99	-2.6
	2015	0.5	1	1.01	1.03	0.969	1.07	0.22	0.9	-1.88
	2014	0.98	1	0.73	1.31	0.435	0.82	0.1	0.21	-1.66
Nation Media Group Ltd	2018	1.54	1	1.07	0.9	0.886	1.02	0.05	1.07	-1.85
	2017	0.97	1.01	1.55	0.94	0.85	1.03	-0.03	0.92	-2.49
	2016	0.92	0.97	1.12	0.92	0.856	1.06	-0.09	1.06	-3.04
	2015	1.11	1.01	0.8	0.92	1.357	1.06	-0.06	1.07	-2.77
	2014	1.13	0.99	1.29	1	0.876	1.04	-0.01	0.93	-2.27
National Bank of Kenya Ltd	2018	0.48	0.99	1.25	0.91	1.095	1.08	0.01	1.04	-2.9
	2017	0.93	0.89	0.95	0.97	0.688	0.97	0	1.46	-2.84
	2016	1.56	0.8	1.06	1.01	0.818	0.96	0.09	0.72	-1.53
	2015	0.83	1.22	1.05	1.14	0.956	1.3	-0.04	1.01	-2.64
	2014	3.51	1.09	0.69	1.31	1.079	0.86	0.03	6.61	-1.66

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
Olympia Capital Holdings ltd	2018	1.32	1.06	0.96	0.97	0.93	1.09	-0.02	1.01	-2.34
	2017	0.74	0.98	1.12	0.98	8.422	0.93	0.01	1.02	-1.8
	2016	1.11	0.96	0.58	1.02	0.155	1.02	-0.09	0.77	-3
	2015	0.92	0.8	0.89	1.04	1.837	0.98	0.01	0.89	-2.49
	2014	0.73	0.97	2.22	0.61	0.518	1.35	0.05	1.37	-2.59
Safaricom Plc	2018	0.81	0.98	0.91	1.1	1.021	1.03	-0.22	0.78	-3.57
	2017	0.23	0.99	1.2	1.09	0.842	0.82	-0.19	1.26	-4
	2016	5.72	0.96	0.94	1.2	0.944	1.17	-0.17	0.79	1.25
	2015	1.18	0.98	1.66	1.13	1.061	1	-0.19	1.04	-2.84
	2014	0.82	0.97	0.96	1.16	0.968	0.98	-0.21	0.86	-3.46
Sameer Africa Plc	2018	0.94	1.8	1.49	0.79	0.553	1.28	-0.08	1.48	-2.74
	2017	1.23	0.68	1.11	0.91	2.97	0.6	-0.18	0.86	-3
	2016	1.21	0.77	1.63	0.86	0.829	1.82	-0.02	1.32	-2.63
	2015	0.83	1.39	1.13	0.89	0.801	1.02	-0.09	1.13	-2.95
	2014	1.11	1.24	1.06	0.94	0.741	1.17	-0.06	1.29	-2.7
Sasini Plc	2018	0.88	0.98	1.2	0.84	0.98	1.21	0	0.66	-2.61
	2017	1.86	1.15	0.33	1.18	0.89	0.85	0.01	1.57	-1.86
	2016	0.7	0.96	0.98	1.28	1.323	0.84	0.02	1.16	-2.43
	2015	0.87	0.94	0.91	1.01	1.195	0.95	0.06	0.81	-2.28
	2014	1.15	1.11	0.6	0.98	3.939	1.12	-0.02	0.44	-2.05

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
Standard Group Plc	2018	1.03	0.94	1.05	1.04	1.315	0.86	-0.01	1.01	-2.4
	2017	0.86	1.03	1.4	0.97	0.893	1.19	-0.1	1.16	-3.02
	2016	1.12	1.01	0.88	1.07	0.849	0.82	-0.07	0.93	-2.61
	2015	1.28	0.96	1.7	0.94	0.93	1.25	0.09	1.44	-1.78
	2014	0.97	0.93	1.03	0.99	0.992	1.07	-0.06	0.88	-2.82
TPS Eastern Africa Ltd	2018	0.92	1	0.98	1.03	1.047	1.02	-0.03	1.04	-2.66
	2017	1.16	0.99	0.89	0.99	1.472	1.05	-0.04	1.16	-2.58
	2016	0.95	1.01	0.8	1.05	0.813	0.9	-0.04	1.19	-2.81
	2015	0.83	1	1.15	0.98	0.982	1.05	-0.04	1.12	-2.84
	2014	1.04	1	0.99	0.93	0.904	1.1	-0.01	1.07	-2.62
The Limuru Tea Co. Plc	2018	0.86	7.03	0.76	1.35	1.333	1.01	0	1.13	0.8
	2017	1.26	0.88	0.6	0.77	0.915	1	-0.13	1.52	-3.46
	2016	0.92	-0.08	1.36	0.85	1.105	1.14	-0.11	1.59	-3.84
	2015	0.94		0.98	1.33			-0.02	1.3	
	2014									
Total Kenya Ltd	2018	0.93	0.96	0.93	0.97	0.957	1.11	-0.24	0.98	-3.77
	2017	1.11	3.59	0.9	1.01	1.061	1.08	0.06	0.94	-0.74
	2016	1.15	0.68	0.93	0.8	0.978	1.27	-0.04	0.95	-2.92
	2015	1.35	0.73	1.03	0.81	0.944	1.33	-0.18	0.98	-3.36

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2014	0.96	0.95	1.3	1.1	0.957	0.95	0.26	0.78	-1.03
Uchumi Supermarket Plc	2018									
	2017									
	2016	1.46	1.08	1.25	0.5	0.364	1.38	-0.26	1.61	-3.91
	2015	0.46	1.18	8.75	0.9	1.514	1.48	-0.07	1.62	-0.4
	2014	2.64	0.99	0.59	1.01	0.893	1.13	0.15	1.12	-0.48
Umeme Ltd	2018	0.63	0.91	1.19	1.01	0.883	0.74	-0.11	0.89	-3.23
	2017	0.82	0.93	1.93	1.13	0.602	1.59	-0.11	0.98	-2.86
	2016	0.9	1.1	1.12	1.13	0.975	0.86	-0.03	1.02	-2.5
	2015	1	0.9	1.99	1.19	1.436	0.99	-0.04	0.82	-2.04
	2014	1.21	0.92	0.86	1.01	1.245	1.27	-0.06	1.15	-2.72
Unga Group Ltd	2018	1.05	2.1	0.56	1.02	0.976	0.97	0.1	0.9	-1.5
	2017	1.19	0.99	0.51	0.99	0.926	1.33	-0.16	1.4	-3.45
	2016	0.97	0.91	1.57	1.05	0.792	1.25	-0.02	1.01	-2.42
	2015	1.07	0.93	0.39	1.1	1.141	0.97	-0.01	0.95	-2.61
	2014	0.77	0.84	8.29	1.12	0.903	1.06	-0.01	0.79	0.27
WPP Scangroup Plc	2018	0.89	0.9	1.08	0.98	1.088	1.06	-0.03	1.08	-2.8
	2017	1.19	1.02	1.24	0.87	1.107	0.96	0.03	1	-2.19
	2016	1.19	1.01	0.99	0.97	0.77	0.99	0.03	1.17	-2.25

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2015	0.81	1.01	1.06	0.99	0.925	1.05	-0.01	0.88	-2.66
	2014	0.78	0.89	1.02	1.19	0.786	1.04	-0.04	1	-2.76
Williamson Tea Kenya Ltd	2018	1.3	0.07	0.95	1.18	1.271	1.17	0.02	1.05	-2.47
	2017	1.11	14.69	0.49	0.96	1.257	1.05	-0.06	0.68	4.44
	2016	0.67	0.01	1	1.68	0.657	0.69	0	1.49	-2.86
	2015	2.42	76.91	0.9	0.55	1.401	1.67	-0.03	1.01	38.25
	2014	0.94	0.96	1.05	1.05	1.186	0.98	0.05	0.64	-2.1
Kenol Kobil	2018									
	2017	0.73	1.43	0.74	1.53	1.682	0.77	0.07	0.25	-1.43
	2016	1	0.95	0.6	1.2	0.802	0.93	0	4.2	-3.57
	2015	0.7	0.84	1.16	0.96	0.939	1.27	-0.19	0.11	-3.47
	2014	1.1	0.81	1.09	0.82	1.726	0.75	-0.17	0.23	-3.02
Rea Vipingo	2018	1.28	1.05	0.9	0.97	1.034	1.17	0.25	2.41	-1.59
	2017	0.8	1.24	0.09	0.86	0.981	1.17	-0.13	0.81	-3.59
	2016	1.93	0.88	0.63	1.15	1.014	0.98	0.26	0.69	-0.36
	2015	0.71	0.81	1.04	1.32	0.908	0.8	0.07	0.99	-2.21
	2014	1.42	0.99	0.98	1.05	0.938	1.04	0.06	0.81	-1.73
Stanlib Fahari	2018	0.56	2.23	1.34	1.23	1.166	0.84	0.05	1.32	-1.71
	2017	0.98	0.95	1	0.8	1.061	1.09	0.03	0.76	-2.48
	2016							0.01		

Company Name	Year	Dsri	GMI	AQI	SGI	Depi	Sgai	Tatai	Levi	Score
	2015									
	2014									
Transcentury	2018	0.81	0.55	1.42	0.75	0.882	1.54	-0.1	1.19	-3.6
	2017	1.3	1.15	0.95	0.69	1.132	1.07	-0.05	1.29	-2.75
	2016	0.84	1.64	1.24	0.69	1.088	1.5	0.1	0.93	-2.02
	2015	0.94	1.17	1.17	1.15	0.927	0.85	-0.03	2.17	-2.75
	2014	0.99	1.2	0.58	0.87	1.166	1.17	-0.09	0.87	-3.05