CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The misuse of management discretion of accounting choices has been an issue of concern not only to researchers, but to practitioners and regulators. This concern stems from the fact that the reporting framework of accounting (International Financial Reporting Standards) permits management to employ dissimilar choice of accounting judgments in adjusting an entity's cashflows. Perhaps, the dissimilar accounting choiceshave propelled management or preparers of financial statements to employ a seemingly magical practice aimed at *transforming*acco8unting numbers. Transforming accounting numbers brings about heuristic behaviors that results in individuals relating accounting measures of performance (earnings), with real performance, but without unraveling both. A pathway of unraveling accounting measures of performance (hypothetical) and real performance (actual), in fact gave birth to the concept of 'accounting alchemy'.

Accounting alchemy emerged in the accounting literature prior to a documentation by Verrachia (2009) in the Eighth Annual Conference on 'financial system and macroeconomic resilience' by the Bank for International Settlements (BIS). Following the documentation of Verrachia (2009) on accounting alchemy, Barth (2010) and Cole (2017) contended that accounting measures should portray economic reality as opposed to accounting estimates. Broadly speaking, accounting alchemy is a novel concept that is gradually gaining a firm root as well as a topic for debate and analysis in accounting literature; however, there is dearth of empirical

modelin measuring accounting alchemy. Verracchia (2009) asserts that accounting alchemy is an enemy of greater transparency in financial reporting, given the fact that it can hinder the pathway to obtaining transparent and reliable financial reports; however, that accounting alchemy exits is believable and unsettling (Barth, 2010).

Accounting alchemy as Verrecchia (2009) sees it, means that individuals assume that accounting measures of performance accurately reflect real performance, and do not assess the characteristics of accounting measures to determine whether that is, in fact, the case. It also refers to a seemingly magical process of transforming accounting numbers in financial statements in such a way that they would portray good fortunes for firms. For instance, preparers of financial statements consider that using fair value in determining financial statement amounts, including earnings, provides better information to financial statements users compared to historical cost-based amounts. Conversely, others believe that using fair value in financial reporting is problematic given the fact that it decreases income when values decrease and increases income volatility. Rather, those who express these concerns about these diverse accounting choices *inter-alia* are concerned about accounting alchemy in the view of Verrecchia (2009).

Alluding to Verrecchia (2009), Dobre, Brad and Ciobanu (2015) as well as Gnyana (2016) observed that while opportunism is restricted both by the regulatory framework of accounting and independent auditors, there is much recent evidence in accounting literature suggesting that management of firms engage in accounting alchemy in order to accomplish personal gains. This view is further supported by positive accounting theoristslike Hagerman and Zmijewski(1979); and Watts

&Zimmerman (1986; 1990), advocatinga number of reasons why management of firms engage in accounting alchemy in the preparation of financial statements. Notable among these reasons are reporting higher management bonuses (Gaver, Gaver & Austin, 1995); reducing the likelihood of bond-covenant breach (DeFond &Jiambalvo, 1994); and lowering regulation and political scrutiny of firms (Jones, 1991).

Accounting alchemy may have possibly made firms to alter financial statements (Larcker & Richardson, 2004; and Jeanjean & Stolowy, 2008); influence contractual outcomes (Ball & Shivakumar, 2006; and Barth, Landsman & Lang, 2008);and mislead stakeholders about the underlying economic performance of an entity's financial position (Bartov, Gul & Tsui, 2000; and Kothari, Leone & Wasley, 2005). Burgstahler and Dichev (1997) as well as Barth (2010) opine that firms using accounting alchemy in managing their reported financial performance do this either to avoid 'reporting red-ink'.Verrecchia (2009) believes that failure to grapple with accounting alchemy may hinder the pathway to greater transparency in reported financial performance of entities and thus, a pathway to obtaining all of the benefits that transparent reported financial performance can offer. It is in light of the fact that accounting alchemy may affect reported financial performance of firms that triggered this study. The study therefore seeks to investigate the link between accounting alchemy and reported financial performance of firms in sub-Saharan Africa.

1.2 Statement of the Problem

Arecent thread in accounting literature sequel to the emergence of accounting alchemy is how accounting alchemy can be measured or modeled. Regardless of the

viewpoint of the few studies on accounting alchemy (Verracchia, 2009; Barth, 2010; and Cole, 2017), there is no plausible measure or model aimed at gauging or estimating what accounting alchemy should be.Perhaps, the lack of empirical models or measures on accounting alchemy may be the reason why studies on how accounting alchemy affects reported financial performance of firms are scanty. In the light of this, studies in this area had focused on earnings management(Abdoli, Bakhtiarnezhad & Bakshi, 2012; Bhuiyan, Roudaki & Clark, 2013; Elshafie & Nyadroh, 2014; Zunera, Farah & Muhammad, 2015; Gnyana, 2016) due to the methodological bottleneck which led to the difficulties in measurement and construct of accounting alchemy.

Given the fact that earnings management is a major component of accounting alchemy, this study attempts to develop a measure or model of accounting alchemy by drawing inferences from existing models of Jones (1991); and Dechow, Sloan & Sweeney (1995) in order to come up with a measure or model of accounting alchemy and test its effect on reported financial performance of selected quoted firms in sub-Saharan Africa. More worrisome is the fact that why prior studies in this area were mainly country specific, and mostly in developed economies, little or no study had focused on countries in sub-SaharanAfrica in a single study.

Sub-Saharan Africa is divided into four (4) regions namely West Africa, Southern Africa, East Africa and Central Africa. The reported financial performance indicators of the study are return on asset, return on equity, earnings per share, book value per share and Tobin's Q. Consequent upon the above, there is no consensus in accounting literature as to whether accounting alchemy will affect reported financial

performance of firms in sub-Saharan Africa. This requires empirical investigation which this study attempt to satisfy.

1.3 Objectives of the Study

This study investigated the effect of accounting alchemy on reported financial performance of selected quoted firms in sub-Saharan Africa. The specific objectives are:

1. to determine the effect of accounting alchemy on the return on asset of selected quoted firms in sub-Saharan Africa.
2. to examine how accounting alchemy affects the return on equity of selected quoted firms in sub-Saharan Africa.
3. to ascertain the association between accounting alchemy and the earnings per share of selected quoted firms in sub-Saharan Africa.
4. to assess the relationship between accounting alchemy and the book value per share of selected quoted firms in sub-Saharan Africa.
5. to examine the association between accounting alchemy and Tobin's Q of selected quoted firms in sub-Saharan Africa.

1.4 Research Questions

In view of the specific objectives, the following research questions were posed in order to guide the study:

1. What is the effect of accounting alchemy on the return on assets of selected quoted firms in sub-Saharan Africa?
2. To what extent does accounting alchemy influence on the return on equity of selected quoted firms in sub-Saharan Africa?

3. How is accounting alchemy associated with the earnings per share of selected quoted firms in sub-Saharan Africa?
4. What is the relationship between accounting alchemy and the book value per share of selected quoted firms in sub-Saharan Africa?
5. What is the association between accounting alchemy and Tobin's Q of selected quoted firms in sub-Saharan Africa?

1.5 Research Hypotheses

Correspondingly, the following research hypotheses were formulated in line with the specific objectives and research questions of the study:

Hypothesis I

H_o: Accounting alchemy has no significant effect on the return on assets of selected quoted firms in sub-Saharan Africa

Hypothesis II

H_o: Accounting alchemy exerts no significant effect on the return on equity of selected quoted firms in sub-Saharan Africa

Hypothesis III

H_o: Accounting alchemy has no significant association with the earnings per share of selected quoted firms in sub-Saharan Africa

Hypothesis IV

H_o: There is no significant association between accounting alchemy and the book value per share of selected quoted firms in sub-Saharan Africa

Hypothesis V

H_o: There is no significant association between accounting alchemy and Tobin's Q of selected quoted firms in sub-Saharan Africa

1.6 Significance of the Study

The outcome of this study will be of immense importance to stakeholders such as regulatory framework of accounting, shareholders, management and accounting researchers. For regulatory framework of accounting, this study will increase the understanding or depth of knowledge of manager's motivations to use accounting alchemy and how the use of accounting alchemy may affect reported financial performance of corporate entities.

For shareholders, the outcome of this study is geared towards increasing their understanding of when and where accounting alchemy occurs in financial reporting. No doubt, this study will help shareholders in assessing the reliability and relevance of firms' financial statements when they consider investment opportunities. Apparently, this study will be of immense benefit to shareholders if they can determine directly from the financial statements, if accounting alchemy have been managed or not. Because accounting alchemy can take numerous forms and become undetectable to shareholders, it is impossible to provide shareholders with the knowledge needed to detect it in a specific case.

For management, this study will enlighten them on the implication of employing accounting alchemy as well as the adverse effect it may have on reported financial performance. Thus, this study therefore takes a more comprehensive route

as it aims to identify situations when and where accounting alchemy via discretionary divide of accruals are likely to be present.

For accounting researchers, the outcome of this study will contribute to the accounting literature on accounting alchemy and reported financial performance in sub-Saharan Africa as well as a secondary source to researchers in the field of accounting and finance. The results will also provide useful evidence to sub-Saharan Africa, the world over.

1.7 Scope of the Study

This study investigatesthe effect of accounting alchemy on reported financial performance of selected quoted firms in sub-Saharan Africa (West Africa, Southern Africa, East Africa and Central Africa). Thus, the study is delimited in scope to a country from each region and the study period is during 2012– 2016 (i.e. a period of 5years). The period under investigation is based on the fact that this period witnessed improvement in financial reporting (as a result of adoption of International Financial Reporting Accounting Standards) across the globe and high demands for quality financial statements in most capital markets of the world, including sub-SaharanAfrica.

1.8 Limitations of the Study

This study is constrained in the area of unavailability and consistent data set for all the firms listed on the Stock Exchanges in sub-Saharan Africa (West Africa, Southern Africa, East Africa and Central Africa), hence the study was limited to sixty-four (64) consumer and industrial goods firms in the selected countries of sub-Saharan Africa. The identified limitations were surmounted by ensuring that all

firms were duly represented in the study sample for purpose of generalization. However, inspite of the limitation of the study, the outcome of the study was not hampered.

1.9 Operational Definition of Terms

In the course of this study, some terms have been applied. This section thus defines such terms as they are used in this study:

* **Accounting Alchemy:** This refers to the process of transforming accounting numbers such that accounting measures of performance or numbers do not reflect its real performance. It also refers to a seemingly magical process of transforming accounting numbers in financial statements in such a way that they would portray good fortunes for firms.
* **FinancialPerformance:** This refers to the benefits stemming from an entity's shares and from the functioning and operations of that entity. They could be gauged with measures like profitability ratios (e.g. earnings per share, return on asset, return on equity, book value per share etc) or market-based measurement ratios (e.g. Tobin's Q).
* **Return on Assets:** This is the ratio of operating income to total assets for a company in a particular accounting period.
* **Return on Equity:** This is the ratio of profit after tax to equity of a company in a particular accounting period.
* **Tobin's Q**: This is the ratio of market value of the firm to the replacement cost of its assets.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Conceptual Framework

2.1.1 The Concept of Accounting Alchemy

The thread of accounting alchemy literature in essence can be linked to Healy's publication in 1985, intimately accompanied by DeAngelo's research in 1986 and recently Verrecchia'spublication in 2009. First, the term *alchemy*is derived from the Greek word, *Khemia*, whichmeans to *transform*, *create* and *perfect* something; the goal of which is simply geared towards hastened perfection of specific items. By and large, accounting generally is a scientific study in which records of expenditure and income of an entity, individual or government are kept coupled with other useful information for planning, decision-making and control. Fundamental among the delineations of accounting alchemy is that offered by one of the pioneers of accounting alchemy – Verrecchia, R.E. in his paper titled *accounting alchemy* in the Wharton School of University of Pennsylvania.

Accounting alchemy, as Verrecchia (2009) puts it, means that individuals assume that accounting measures of performance accurately reflect real performance, and do not assess the characteristics of accounting measures to determine whether that is, in fact, the case.Moreover, accounting alchemy refersto a superficially magical process of transforming accounting numbers in financial statements in such a way that they would portray good fortunes for firms. The publication and research of Healy in 1985 and DeAngelo's in 1986 respectively suggest that accounting alchemy can be perfected via the divide of accruals while the publication of Verrecchia in

2009 indicates that accounting alchemy can be perfected via earnings transformation. It is worthy of note that some firms in Nigeria and the world over engage in accounting alchemy practice given grey areas in the Generally Accepted Accounting Principles (GAAP). However, following the transition from national GAAP, firms all over the world were mandated to report their financial statements using global GAAP (the International Financial Reporting Standards: IFRS) so as to moderate accounting alchemy acts by management of firms.

According to Dobre, Brad and Ciobanu (2015), the shift to IFRS is considered to bring significant improvements in accounting quality, judgments and choices which are deemed to create more confidence for the users of financial statements. In the same vein, Barth, Landsman and Lang (2008) opine that the shift from national GAAP to global GAAP is deemed to reduce the likelihood that managements disclose information in order to obtain private benefit or increase accounting alchemy considering the flexibility given to preparers of financial statements. Accounting alchemy as noted by Riedl & Suraj (2010), and Nejad, Zeynali & Alavi (2013), is a means by which corporate entities report variability in income streams at the discretion of the company's directors. Also, Siti, Haron and Henny (2013) assert that accounting alchemy assists corporate entities to moderate year-to-year deviation in income streams by shifting income from peak years to less successful years, making their income variation less unstable.

Tokuga and Saki (2011) believe that accounting alchemy is a technique used by corporate entities management to trim-down irregular vagaries in income by exploring the loopholes in accounting principles. To Healy and Wahlen (1999),

accounting alchemy refers to employing accounting judgments in financial reporting and in adjusting transactions to alter financial reports aimed at misleading stakeholders about the underlying economic performance of corporate entities, or to influence contractual results that depend on reported accounting numbers. In order to mislead stakeholders, it thus means that management must have access to information that is not accessible to outside stakeholders so that accounting alchemy is unlikely to be translucent to outsiders. According to Chen, Tang, Jiang and Lin (2010), the frequency of accounting alchemy is higher when corporate entities try to meet analyst's forecasts. However, prior studies (Nejad, Zeynali & Alavi, 2013; and Siti, Haron and Henny, 2013)suggest that more firms engage in accounting alchemy in order to decrease their earnings rather than to avert negative earnings.

Besides, evidences of fraudulent practices by companies such as Enron, WorldCom, Xerox, African Petroleum Development,Afribank Plc., Oceanic Bank International Plc, Mainstreet Bank Plc., and many others can be linked with accounting alchemy practices. No doubt, the demise of these firms have forced the regulatory framework of accounting, accounting practitioners, analysts and scholars to focus on measures aimed at reducing accounting alchemy practices. Nevertheless, the practice of accounting alchemy by corporate entities takes several forms like changes in policy of expenditure capitalisation, revenue recognition, depreciation method among others.

2.1.2 Exploring Reported Financial Performance

The concept of reported financial performance refers to the benefits stemming from the shares, the functioning and operations which are usually captured in the

financial statements of an entity. Reported financial performance could be measured with variables such as profitability ratios in the form of earnings per share, dividend per share, return on asset, return on equity, earnings yield, profit margin, return on investment, operating profit, return on capital employed etc.or market-based measures like Tobin's Q. An entity's reported financial performance can be ascertained from the financial statement. Consequently, a good performing entity is deemed to reinforce quality disclosure in its financial statements (Herly & Sisnuhadi, 2011).

Generally, the performance of an entity is ascertained through the use of financial ratios which express relationships between variables reported in the financial statements. Financial ratios are useful and can meaningfully be employed as financial performance measures when compared with other related meaningful information, either at present or a past similar measure(s) for the same entity or similar ones in the same industry (Kabayeh, Nu'aimat, & Dahmash, 2012). According to Al-Matari, Al-Swidi and Fadzil (2014), in theory, the concept of financial performance forms the core of strategic management. Most strategic studies make use of the construct of business performance in an attempt to examine various strategy content and process concerns. In accounting, the importance of financial performance is vivid through the many prescriptions provided for financial performance enhancement. Research suggests that accounting alchemy and reported financial performance is highly dependent on accounting-based measures. However, there are some studies that either adopted accounting-based or market-based measurements.

Accounting-based measurement is generally considered as an effective dynamics of an entity's performance when compared to benchmark rate of return equal to the risk adjusted weighted average cost of capital. The accounting based measurement indicates the financial performance of an entity on a short term in prior years. It is worthy to note that financial performance ratios are good indicators of the entity's overall efficiency. It is often employed as a measure for earnings generated by the entity during a particular accounting period based on its level of sales, assets, capital employed, net worth and so on. It is seen as an indicator of growth, success and control. For instance, creditorsare interested in financial performance ratios as they indicate the entity's capability to meet interest obligations.

On the other hand, shareholders are interested in financial performance ratios since it indicates the progress and rate of return on their investments (Al-Matarneh, 2009). Kapopoulos and Lazaretou (2007) criticised the profit measure for its backward-looking element and its partial estimation of future events in terms of depreciation and amortization. In accounting, the rate of profit is often limited by standards established by the accountancy profession and hence the various methods employed for the determination of tangible and intangible assets.

Besides, the market-based measurement ratiosare characterised by its forward-looking aspect and its reflection of the expectations of the shareholders regarding the entity's future financial performance, which has its basis on either prior or current financial performance (Wahla, Shah & Hussain, 2012). Examples of the market-based measurement are Tobin's Q, market value added, market-to-book value, annual stock return, dividends yield etc. Market-based expectations for an entity's financial

performance may result in management incentive to modify their holdings on the basis of their expectations of the future performance. Accounting literature has revealed that there are some distinct differences between the two measures of performance. This includes accounting performance ratios which are described as the backward looking measures, and Tobin's Q, mostly seen as a forward-looking measure of an entity's financial performance.

Studies have shown that accounting based measurements like return on asset, return on equity, earnings per share and others are employed for the short-term financial performance of an entity while the market-based performance of an entity is gauged via Tobin's Q as a representation of future long-term performance (Al-Matari, Al-Swidi & Fadzil, 2014).In view of the aforementioned, this study shall focus on both accounting-based and market-based measurements of reported financial performance. The indices are accounting-based measures: return on asset, return on equity, earnings per share, book value per share and market-based measures: Tobins'Q.

2.1.3 Delineation between Accounting Alchemy and Earnings Management

Accounting alchemy is a novel concept that is gradually gaining a firm root as well as a topic for debate and analysis in accounting literature. Accounting alchemy emerged in accounting literature prior to a documentation by Verrachia(2009) in the Eighth Annual Conference on 'financial system and macroeconomic resilience' in Basel, Switzerland by Bank for International Settlements (BIS) Working Paper No 302.Accounting alchemy is based on the philosophy that business transactions should

reflect economic reality (real earnings) (Verrachia, 2009, Barth, 2010 and Cole, 2017) rather than hypothetical (accrual earnings) (Burgstahler & Dichev 1997; Abdoli, Bakhitiarnezhad & Bakshi, 2012; Alhadab & Al-Own, 2017). This perhaps, provides the demarcation between accounting alchemy and earnings management. Thus, accounting alchemy is premised on real earnings while earnings management on accrual earnings.

In addition, while earnings management literature suggests that income and expense are the most manipulated, accounting alchemy proposes that aside income and expense, assets of firms are alchemized and goes on to provide corrective measures like employing changes in earnings before interest and extraordinary items and profit after tax as corrective measures to account for the hypothetical forecast error associated with accounting number under earnings management.

More precisely, earnings management is based on accounting estimates while accounting alchemy on economic reality. Besides, rather than relying on accounting estimates (earnings management), accounting researchers should rely on economic reality (accounting alchemy) in order to substantiate or clearly identify if accounting numbers are alchemized (i.e. if they do not portray economic reality) in financial statements of entities.

2.1.4 Perspective of Positive Accounting Theory on Accounting Alchemy

Positive Accounting Theory (PAT) has been one of the most dominant accounting studies during the last four decades. One fundamental rationale employed to popularize and legitimize PAT is that their view of accounting theory is the same

as that employed in science (Watts & Zimmerman, 1986). Ball and Brown (1968) were the first researchers to popularized PAT. In the views of Ball and Brown (1968), PAT can be used to explicate and predict both capital market-based accounting research and research in accounting choices. There is some argument about what PAT is. According to Watt and Zimmerman (1986), accounting theory seeks to explicate and predict accounting and auditing practice. Thus, empirical evidences of accounting choices and auditing practices constitute PAT. Also, PAT seeks to explicate the economics-based empirical literature in accounting and describes in addition to accounting choice studies as well as capital market-based researches.

Prior to the emergence of PAT, the Normative Accounting Theory (NAR) had been the most influential in accounting (Kabir, 2010). NAR had been preoccupied with developing accounting principles. The prime concern of both PAT and NAR had been recognition and measurement of incomes, assets and equities in accounting. The conventional accounting questions raised and answered by NAR consists of whether to recognise changes in market prices if the entity is not a party to the transaction and what basis (e.g., historical cost, market value, etc.) to use in reporting financial statements (Ijiri, 1975; Littleton, 1953; MacNeal, 1939; and Paton & Littleton, 1940). In contrast with NAR which deals with "should" type question, PAT deals with "is" type question. Instead of asking which measurement basis to employ in accounting, PAT asked, for instance, whether accounting information is of use to stock markets, which accounting measurement basis management actually employs, and why?. Thus, PAT symbolizes a foremost shift in accounting research paradigm.

PAT has been subject to diverse condemnation since its appearance in the accounting literature. For instance, Chambers (1993) refers to the advocates of PAT a "PA Cult". Sterling (1990) condemned PAT on the ground that it restricted itself to the positive study of accounting practice and accounting practitioners and hinders accounting progress by neglecting the need for the assessment of accounting practice. In the view of Sterling (1990), PAT has a nil potential accomplishment. Whittington (1987) condemned PAT for its methodological fanaticism and stressed that NAR had a legitimate place in accounting

Neu (1997) provides a largely negative evaluation of PAT. Sue (1997) asserts that PAT narrowed the researchers' focus. On the other hand, Hall (1997) disagreed with Sterling's (1990) opinion that the potential contribution of PAT was nil. Deegan (1997) investigates how PAT had ignited emotions among academics and found that it attracted many academics and divided some at the same time. Milne (2002) judged PAT's attempt to explain an entity's social disclosures as failure.

In the accounting literature, two strands of empirical studieswere conducted. One set of studies (Ball & Brown, 1968; Beaver, 1968; Foster, 1977; Beaver, Clarke, & Wright, 1979; Beaver, Lambert, & Morse, 1980; Grant, 1980; and McNichols & Manegold, 1983) examined the connection between accounting earnings numbers and stock prices. Results revealed that earnings numbers reflected factors such as cash flow and risk and these (cash flows and risk) are germane to stock valuation. This, according to Watts and Zimmerman (1986), undermined the claim by PAT that accounting earnings numbers were irrelevant because they were prepared through multiple valuation bases. The second set of studies (Kaplan & Roll, 1972; and Ricks,

1982) attempted to differentiate between two opposing hypotheses: no-effects hypothesis and mechanistic hypothesis.Evidence in these studies are mixed and could not successfully discriminate between the opposing hypotheses.

By and large, these studies *inter-alia* raised qualms about the empirical descriptiveness of some postulation underlying normative prescriptions during the 1960s. There is only one source of information about an entity; earnings numbers are of no use because they were not prepared according to a single basis; and it is possible to mislead shareholders by manipulating financial reporting numbers or accounting earnings number via accounting choices. The main idea is that an entity is a nexus of contracts, and accounting choices constitute an integral part of this set of contracts (Sunder, 1997). Though the above idea is general, early empirical evidence of accounting choices examined how accounting manipulations (accounting alchemy) influence the reported financial performance of entities.

The initial research of accrual is now expanded to examine concepts like accounting alchemy. For instance, research has examined accounting alchemy around specific events such as management buyouts (DeAngelo, 1986), labour negotiation (Liberty & Zimmerman, 1986); proxy contests (DeAngelo, 1988), import relief investigation (Jones, 1991); and initial public offerings (Teoh, Wong, & Rao, 1998). Still other studies have examined the connection between corporate governance characteristics, audit quality and accounting alchemy (Reitenga & Tearney, 2003; Francis, Maydew, & Sparks, 1999; Krishnan, 2003; Frankel, Johnson, & Nelson, 2002; Peasnell, Pope, & Young, 2005; and Ahmed & Duellman, 2007). On the other hand, the capital market-based accounting research has expanded to examine the

value relevance of accounting numbers (Barth, Beaver, & Landsman, 2001; Hung & Subramanyam, 2007; and Morais & Curto, 2009).

Further empirical evidences on PAT have suggested circumstances in which management is likely to engage in accounting alchemy. For example, earnings are managed when management's bonus depends on reported earnings (Healy, 1985), when firms are about to violate debt covenants (Duke & Hunt, 1990; and Press & Weintrop, 1990), when current year's earnings is probable to fall short of specific benchmarks (e.g. last year's earnings, avoiding loss, and securities analysts' forecasts) (Burgstahler & Dichev, 1997). Early researchers (Deakin, 1979; Hagerman & Zmijewski, 1979; and Dhaliwal, 1980) examined the choice of a single accounting method like depreciation and inventory costing methods at a time. This led to the condemnation that management engage in accounting alchemy not via a single accounting method but via a number of accounting methods at their disposal.

According to Fay (1996) and Lessnoff (1974), by means of large sample and statistical methods, the relationship between accounting alchemy and reported financial performance can be ascertained but cannot completely resolve the problem raised by prior researches. For instance, accounting alchemy research has relied on separating discretionary accruals from non-discretionary accruals and employed diverse regression models to estimate non-discretionary accruals. The predicted degree of accruals from the models has been treated as non-discretionary accruals and the error term from those models has been unraveled as discretionary and, hence, opportunistic (Ball & Shivakumar, 2006). The legitimacy of the interpretation of the error term as discretionary and opportunistic depends on the postulation that the

association between accruals and model variables is mechanistic, which is unsound. However, accounting standards recognise that management uses its judgments and estimations in the accounting process in order to avoid distortion of reported accounting numbers.

2.1.5 Accounting Method Choice and Timing as Underpinning of Accounting Alchemy

Accounting choice is construed in broad sense as encompassing both the choice of a specific accounting technique, like choice of capitalizing an intangible asset or not, changing policies of capitalization of expenditure, revenue recognition, among others and the choice of how to apply these accounting techniques by corporate entities. The application of these techniques as in the case of capitalization of intangible assets refers to the determination of a suitable depreciation method. On the other hand, timing has two magnitudes; first, management has at their discretion to time when an event is recorded in the books of accounts (e.g. when bad debts or impaired assets are written off); second, is the timing of transactions that influence the reporting earnings of corporate entities. For instance, in the end of a financial period, research and development (R&D) or advertisement campaigns transactions may be timed by corporate entities so that the expenses influence the reported earnings of the subsequent period or suitable timing of asset disposals and the subsequent realization of gains and losses in the statement of comprehensive income.

In the accounting literature, accounting choices have been done to assess if an entity uses income increasing or decreasing reporting method, among others in the

aspect of inventory valuation, depreciation method choices and the capitalization vs. expense decision as regards intangible assets and interest (Watts & Zimmerman, 1986; and Fields, Lys & Vincent, 2001). Prior empirical evidence have shown, for instance, that entities capitalizing R&D are more extremely leveraged, smaller, less profitable and closer to dividend confines than those choosing to expense them (see Daley & Vigeland, 1983; and Aboody & Lev, 1998). This implies that entities chose to capitalize (R&D for instance) so as to appear fiscally stronger and to intensify payment of dividends. In the same vein, a study by Beatty, Ke and Petroni (2002) have shown that bank's loan loss provisions and loan charge-offs have been associated to accounting alchemy.

In the accounting literature, there is the general belief that banks provided abundant grounds for studies of accounting alchemy. For instance, a study by Beatty, et.al (2002) revealed that banks tend to realize more security gains and less security losses to alter small decline in earnings to small reported earnings increases. Apart from banks, there are other entities that employ accounting alchemy in reporting earnings. This is usually connected to the realization (selling) of assets depend the difference between their value in the statement of financial position and their market value, thus creating accounting loss or profit. Some empirical evidences (Bartov, 1993; Herrmann, Inoue & Thomas, 2003; and Hand, 1989) have shown that apart from banks, entities have shown to time sales of long-lived assets or use early debt retirement to control earnings. A debatably more costly form of the timing predisposition is the adjustment of investment decisions to attain a short-term earnings goal (Dechow & Sloan, 1991; and Mande & File, 2000).

There is the general assumption that when entities employ one accounting timing choice at a time, it provides a fairly narrow picture of the entity's accounting choice. Thus, in order to deal with this, several empirical evidences investigated a portfolio of diverse accounting choices to ascertain whether an entity or event is related to income increasing or decreasing reporting (Ayers, Jiang & Yeung, 2006; Bedard, Hoitash, Hoitash & Westermann, 2012; and Elshafie & Nyadroh, 2014; and Gnyana, 2016). According to these authors mentioned above, a probable tactic for doing this is to split each accounting choice into an income increasing and decreasing alternatives and then to test these discretely on the entities. Another option is to go through the portfolio of choices for each entity and to come up with abridged measure on how conservative a firm's reporting policy is.

2.1.6 Basis of Accounting Alchemy Model Development

The major thread in accounting literature is how accounting alchemy can be modelled or measured. Notwithstanding the perspective of prior studies on accounting alchemy like Verracchia (2009); Barth (2010); and Cole (2017), there is no conceivable model/measure aimed at estimating what accounting alchemy should be in accounting literature. This present study attempts to provide a model of accounting alchemy by building on existing accrual models of Jones (1991); and Dechow, Sloan & Sweeney (1995) (with the combination of relevant characteristics of prior accrual models) in order to come up with a measure or model of accounting alchemy. In addition, other accrual models with similar characteristics of Jones (1991); and Dechow, Sloam & Sweeney (1995) was reviewed.

- **DeAngelo's(1986) Model**

The DeAngelo (1986) model employs the last period's total accruals (TA_{t-1}) scaled by lagged total assets (A_{t-2}) as an indicator of nondiscretionary accruals. Consequently, the model for nondiscretionary accruals (NDA_t) is given as:

$$NDA_t = TA_{t-1}/A_{t-2}$$

The discretionary aspect of accruals is the variance between total accruals in the event year *t* scaled by At-1 and NDAt.

- **Healy's (1985) Model**

The Healy (1985) model employs the mean of total accruals (TA_τ) scaled by lagged total assets ($A_{\tau-1}$) from the estimation period as an indicator of non-discretionary accruals. Consequently, the model for non-discretionary accruals in the event year *t* (NDA_t) is given as:

$$NDAt = 1/n \Sigma\tau(TA\tau / A\tau\text{-}1) \quad (2)$$

$NDA_t$is nondiscretionary accruals in year *t* scaled by lagged total assets; n is the number of years in the estimation year; and τ is a year subscript for years (t-n, t-n+1,…,t-1) built-in the estimation period.

The discretionary portion of accruals is the variance between total accruals in the event year *t* scaled by $A_{t-1}$and NDA_t while the DeAngelo model, in which the estimation year for non-discretionary accruals is constrained to the previous year's observation, may appear a special case of the Healy (1985) model. Thus, both models (Healy and DeAngelo) are quite dissimilar. The underlying assumption of DeAngelo Model is that NDA follow a random walk process while the Healy model presumes that NDA follow a mean reverting process.

- **Jones (1991) Model**

One of the major sources of accounting alchemy modelling is the Jones (1991) accrual model. Jones measured accrual as total or net operating accruals (net income – cash flow from operations). This model is similar with the one used in prior studies by Teoh, Welch & Wong, (1998), Xie (2001), Bartov, Gul & Tsui (2000); and Ayers, Jiang & Yeung, (2006). The Jones (1991) model is mathematically expressed as:

$$VTA_i = NI_i - CFO_i$$

VTA_i = Value of total accruals for firm *i*; NI_i = Value of net income for firm *i*; and CFO_i = Value of cash flow from operations for firm *i*

The Jones model implicitly presumes that judgment is not exercised over revenue in either the estimation period or the event period. The Jones model centres on the manipulation of bad debt expenses but underestimates managed earnings when sales are manipulated. Consistent with prior empirical studies like DeAngelo (1986); Jones (1991); Deschow, Sloan and Sweeney, (1995); DeFond and Subramanyam (1998); Phillips, Pincus and Rego (2003), Chen, Tang, Jiang and Lin (2010); and Houqe, Van-Ziji, Dunstan, Waresul-Kasim (2012) accrual model of Jones is deflated by total assets lag in order to reduce the correlation that may exists between them.

- **Deschow, Sloan & Sweeney (1995) Model**

One of the major sources of accounting alchemy modelling is the Deschow, Sloan and Sweeney (1995) accrual model. This model measured accrual as annual current accruals, i.e. earnings before extraordinary items less cash from operations. This model is similar with the one used in prior studies such as Keung and Shih (2014); Zunera, Farah and Muhammad (2015); Dobre, Brad and Ciobanu (2015); and

Gnyana (2016). Deschow, Sloan and Sweeney (1995) model is mathematically expressed as:

$$ACA_i = EBET_i - CFO_i$$

ACA_i = Annual current accruals for firm *i*; $EBET_i$ = Earnings before extraordinary items for firm *i*; CFO_i = Cash from operations for firm *i*. In specific terms, the parameter of the model isdescribed as:

$$\frac{TAC_{ijt}}{TA_{ijt}} = \alpha_j\left(\frac{1}{TA_{ijt-1}}\right) + \beta_{1j}\left(\frac{\Delta Sales_{ijt}}{TA_{ijt-1}}\right) + \varepsilon_{ijt}$$

TAC_{ijt}= Total accruals i.e variation in non-cash currents assets minus variation in operating current liabilities for firm i, industry j and year t; TA_{ijt-1} = Total assets for firm i and year t-1; $\Delta\ Sales_{ijt}$= Variation in revenue for firm i from year t-1 to year t; $\alpha j\ \beta_{1j}$= Specific indicators for industry j; and ε_{ijt}= errors for firm i, industry j and year t.

The Deschow, Sloan and Sweeney (1991) modelencompasses an adjustment to sales premised on the variation in the amount of receivables. This model presumes that all variations in credit sales in the event period result from accruals. Dechow et al. (1995) contend that employing the residuals from the Jones model can result to an underestimation of accruals. These authors advocated modifying the variation in sales analyst parameter in the Jones model by subtracting the firm's variation in accounts receivable from its variation in sales.

Dechow et al. (1995) demonstrate in simulations that modified Jones model provides a superior result in estimating accruals especially when entities engage in transformation or alteration of revenue and, by extension, accounts receivable. Given

the above, a model of accounting alchemy was developed on the perspectives of prior accrual models. However, the modelling of accounting alchemy is articulated in subsequent part of this research work.

2.1.7 International Financial Reporting Standards and Accounting Choices

The term IFRS refers to the International Financial Reporting Standards. IFRS is a global accounting standard that guides the preparation and presentation of the financial results of corporate entities. The guidelines provided by IFRS are applicable to general purpose financial statements and financial reporting of all profit-oriented entities. IFRS is a blend of IFRS (issued by the International Accounting Standards Board: IASB), International Accounting Standards (IAS) (issued by the International Accounting Standard Committee: IASC) and interpretations issued by the Standard Interpretations Committee (SIC) as well as the International Financial Reporting Interpretations Committee (IFRIC) of the IASB (Larsen, 2008). Alistair (2010) sees IFRS as a series of accounting pronouncements published by the IASB to help preparers of financial statements throughout the world, produce and present high quality, transparent and comparable financial information.

One of the fundamental attributes of IFRS is that it is a principle based standard that seeks to circumvent mentally-based rule. Instead, the application of IFRS demands stringent exercise of accounting judgment or choice by preparers and auditors on the basis of economic substance of transactions. IFRS set out recognition, measurement, presentation and disclosure requirements for transactions and other events and/or conditions that are essential in general purpose financial statements.

Also, IFRS sets out such requirements for transactions, events and/or conditions that may arise primarily in specific industries. Thus, IFRS is based on a framework which addresses the concepts underlying information presented in general purpose financial statements.

The objective of the framework is deemed to facilitate the consistent and logical formulation of IFRS as well as providing the basis for use of accounting judgment or choice in resolving accounting concerns (IASB, 2009). The adoption of IFRS is a trend among countries due to the wide array of advantages it gives to countries and multinational companies. As of February, 2012 approximately 120 nations of the world including some sub-Saharan Africa countries have adopted IFRS or have compelled IFRSs for domestic quoted firms of which 90 nations have fully implemented IFRS as promulgated by the IASB and included a statement acknowledging such conformity in audit reports (AICPA, 2012).

A number of scholars have questioned if IFRS should serve as a means of mitigating the practice and misuse of accounting choices among corporate entities in Nigeria, the world over (Okoro & Okoye, 2016; Kiani & Malik, 2015; Velury & Kane, 2012; and Tokuga & Sakai, 2011); even though IFRS should mitigate the practice of accounting alchemy, still, there are scanty empirical evidences in this area especially among sub-Saharan Africa to either prove or disapprove this assertion.

2.1.8 Reported Financial Performance Measures of the Study

In this study, five (5) reported financial performance measures were identified: return on equity, return on asset, earnings per share, book value per share

and Tobin's Q. However, this section of the study dealt with the association between accounting alchemy and the identified reported financial performance measures of the study.

2.1.8.1 Return on Assets (ROA)

An entity's operating performance is indisputably influenced by the level of accounting alchemy via accrual accounting system and one fundamental operating performance dynamics produced by this accrual accounting system is ROA. This operating performance dynamics – ROA is usually computed on the basis of net income divided by total assets or the ratio of operating income to total assets. Gong, Li and Xie (2008) find a significant positive relationship between accounting alchemy and operating performance (ROA), signifying that entities management seem to over-extrapolate past performance in forecasting future earnings. To Gong et.al (2008), high (low) alchemy may resultfrom superior (poor) operating performance as well as a neutral application of accounting conventions, rather than management's proactive choices that strive to convey their personal judgment about the entity's prospects.

Besides, prior studies (Kothari, Leone & Wasley, 2005; Ayers, Jiang & Yeung, 2006;Lennox & Park, 2006; Moradzadehfard & Nazari, 2013; Elshafie & Nyadroh, 2014; and Dobre, Brad & Ciobanu, 2015) have all included operating performance dynamic such as ROA in estimating reported financial performance. Thus, this study included ROA as a reported financial performance dynamic in order to resolve the puzzle in the accounting literature where some prior studies find either

negative or positive relationship between accounting alchemy and ROA. Hence we hypothesized that accounting alchemy has no significant effect on the return on assets of selected quoted firms in sub-Saharan Africa

2.1.8.2Return on Equity (ROE)

In reality, shareholders place a demand on higher ROE than on debt. ROE is a reported financial performance that shareholders resort to when assessing how efficient an entity has performed over the years. From the viewpoint of shareholders (insiders), retained earnings are a better source of funds than outside financing. The rationale for this is premised on the fact that if retained earnings are insufficient, debt financing will be employed by corporate entities. ROE is a measure of an entity's financial performance. It is the value of net income returned as a percentage of shareholders equity and reveals much profit an entity generates with money invested by shareholders. Thus, ROE is computed as a ratio of profit after tax to equity.

Prior studies find evidence on the relationship between accounting alchemy and ROE. For instance, a study by Rangan (1998) find evidence that equity-issuing entities on an average, tend to have greater positive accruals (alchemy) in the years surrounding the issue and that these accruals can partially affect the performance of such entities to the extent that management employ accounting alchemy for accruals and can potentially employ this accounting gimmicks to manipulate ROE. On the other hand, Teoh and Wong (1998) find evidence that the negative association between accruals and ROE is more obvious for current accruals than for total accruals.

Consequently, to control for the relationship between reported financial performance measure (as in this case, ROE) and accounting alchemy. The finding of empirical evidences hasinformed the inclusion of financial performance measure - ROE in the study. Hence we hypothesized that accounting alchemy exert no significant effect on return on equity of selected quoted firms in sub-Saharan Africa

2.1.8.3Earnings per Share (EPS)

Earnings per Share is a vital performance dynamic for corporations in that it weight the profit attributable to ordinary shareholders in relation the average number of ordinary shares of the corporation. This study will estimate EPS as the difference in profit after tax and preference dividend divided by number of ordinary shares ranking for dividend for a financial year. On the other hand, EPS can be gauged as profit after tax while subtracting preference dividend and minority interest divided by number of ordinary shares ranking for dividend for a financial year. Prior studies have shown that EPS is a key reported financial performance measures that is being alchemized by management compared to performance measures like ROA and ROE.

A study by Dechow, Sloan and Sweeney (1995) finds evidence that accounting alchemy have the tendency to influence reported financial performance like EPS. In addition, Dechow et.al (1995) reports a wide annual variation in the number of firms that engage in accounting alchemy. To the above researchers, when there is enough dispersion in investors beliefs in relation to expected earnings, management will then employ accounting alchemy to beat expected earnings and report the earnings found in financial statements of corporate entities. The above

researchers find a significant positive association between accounting alchemy and EPS. Thus larger EPS reported by corporate entities may connote a larger accounting alchemy.

Besides, prior studies (Dechow, Sloan & Sweeney, 1995, Kasznik, 1999; and Cairney & Murdoch, 1998) have all included EPS in estimating reported financial performance. Thus, this study included EPS as a reported financial performance measure in order to resolve the puzzle in the accounting literature. Hence we hypothesized that accounting alchemy has no association with earnings of selected quoted firms in sub-Saharan Africa.

2.1.8.4 Book Value per Share (BVPS)

This is the shareholders fund less preference dividend and divided by the number of ordinary shares of an entity. Investors resort to using book value per share when earnings and dividend fail to address their needs. Thus, management of firms would prefer to adjust book value per share in order to attract investors to their firm. Studies have not established whether there is relationship between accounting alchemy and reported financial performance measure like book value per share.

The researcher believes that accounting alchemy may have a strong influence on the book value per share of an entity since management may want to portray a strong or better book value of its shares to both existing and potential shareholders. On the basis of the above, the researcher introduced book value per share in the empirical model and hence hypothesized that there is no significant association

between accounting alchemy and book value per share of selected quoted firms in sub-Saharan Africa.

2.1.8.5 Tobin's Q

Tobin's Q is a market ratio estimating the market value of a firm to the replacement cost of its assets. In the accounting literature, there is no empirical evidence on the relationship between accounting alchemy and reported financial performance dynamic like Tobin's Q. However, the researcher believes that accounting alchemy may have a strong influence on the market value of an entity since management of enterprises may want to portray a strong or better market value to both inside and outside shareholders. On the basis of the above, the researcher introduced Tobin's Q in the empirical model and hence hypothesized that here is no connection between accounting alchemy and Tobin's Q of quoted firms in sub-Saharan Africa.

2.1.9 Overview of Sub-Saharan Africa Countries of the Study

In sub-Saharan Africa, growth impetus remains feeble, marking a break from the swift expansion experienced since the turn of the millennium. The year 2016 was demanding for many sub-Saharan countries, with regional growth dipping to 1.4% suggesting the lowest level of growth in more than two decades. This may be connected to the fact that most oil exporting sub-Saharan countries were in recession while economic conditions in other resource-intensive countries remained grueling; other non-resource-intensive countries continued to grow robustly (International Monetary Fund, 2017). Table 2.1 shows the list of sub-Saharan Africa Countries.

Table 2.1: List of Sub-Saharan Africa Countries

Angola	Côte d'Ivoire	Madagascar	Seychelles
Benin	Djibouti	Malawi	Sierra Leone
Botswana	Equatorial	Mali	Somalia
Burkina Faso	Guinea	Mauritania	***South Africa***
Burundi	Eritrea	Mauritius	Sudan
Cameroon	Ethiopia	Mozambique	Swaziland
Cape Verde	Gabon	Namibia	Tanzania
Central African Republic	The Gambia	Niger	Togo
Chad	Ghana	***Nigeria***	Uganda
Comoros	Guinea	Réunion	Western Sahara
Congo (Brazzaville)	Guinea-Bissau	Rwanda	Zambia
Congo (Democratic Republic)	***Kenya***	Sao Tome &	Zimbabwe
	Lesotho	Principe	
	Liberia	Senegal	

Source: Library of Congress and Illustrated Guide, 2010.

In that context, and to reap this potential, strong and sound policy measures are needed to resurrect the region. Against this backdrop, two related questions arise: How can growth be revived in the hardest-hit sub-Saharan countries and how can growth be sustained? To the researcher's view, the answer to these two questions can be achieved by reducing the levels of accounting alchemy. Thus, this section of the study provides an overview of sub-Saharan Africa countries. The sub-Saharan Africa countries studied are Nigeria, South Africa and Kenya.

2.1.9.1 Nigeria

Nigeria is a middle-income and mixed economy with an emerging capital market in West Africa. The economy of the nation is alienated into manufacturing, financial, service, communications, technology and entertainment sectors and is categorized as the 21st biggest economy in the world in area of nominal GDP and 20th biggest in terms of purchasing power parity (PPP). As of 2013, manufacturing sector of Nigeria emerged as the biggest on the continent as it produces a huge relative

amount of goods and services for West Africa subcontinents. With respect to debt-to-GDP-ratio, it recorded 11%, which is 8% below the 2012 ratio (KPMG, 2015). One of the major hindrances to the nation's growth and its capital market is tied to mismanagement and ineffective economic reforms of the past decade (KPMG, 2015).

The country produces only about 2.7% of the world's oil supply when compared to other oil producing nations like Saudi Arabia (12.9%), Russia (12.7%) and the United States of America (8.6%). Although the petroleum sector is important, as government revenues still heavily rely on this sector. The over-reliance on this sector is based on negligence of other sectors such as agriculture and the decline in economic growth attributable to population growth. Consequently, in 2060, the country successfully persuaded the Paris Club to let it buy purchase the bulk of its debts owed to them for a cash payment of roughly US$12 billion (Willem, 2011). Furthermore, table 2.2 below captures the economic landscape of Nigeria.

Table 2.2: Economic Landscape of Nigeria

Year	GDP (PPP, in billions)	US Dollar Exchange	Inflation Index (2000=100)	Per Capita Income (as % of USA)
1980	*58	1 Naira	1.30	7%
1985	*82	3 Naira	3.20	5%
1990	*118	9 Naira	8.10	2.5%
1995	*155	50 Naira	56	3%
2000	170	100 Naira	100	3.5%
2005	291	130 Naira	207	4%
2010	392	150 Naira	108	5%
2012	451	158 Naira	121	7%
2014	972	180 Naira	10	11%
2015	1,089	220 Naira	10	10%
2016	1,093	280 Naira	17	10%
2017	1,125	360 Naira	5 (est)	10%

Source: National Bureau of Statistics, 2017

The decline as shown in the economic landscape of the country is attributable to dwindling exchange rates (scarcity of forex where oil earnings plummeted by half). This and many others led to the decline in economic growth of the country. For instance, 2017 GDPs were 1,125 Billion (Nigeria) vs. 19,417 Billion (USA) and populations estimates at 320 million vs. 190 million respectively (National Bureau of Statistics, 2017). Table 2.3 shows the chart of trend of the global ranking of the Nigerian economy when compared with other nations of the world.

Table 2.3: Trend of Global Ranking of the Nigerian Economy

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017 (est.)
Ranking	52	47	38	37	34	31	31	30	23	20	21	22	23

Source: National Bureau of Statistics, 2017

The table below shows the variation in the exchange rate comparison at which the Dollar can be acquired with the Naira.

Table 2.4: Variation in Exchange Rates with the Dollar from 2015-2017

Year	2015	2016	2017
Best	195	345	350
Worst	237	490	520

Source: National Bureau of Statistics, 2017

Today, as a result of inflation, per capita GDP remains lower than in 1960 compared to other periods while about 33% of its population lives on less than US$2 per day (economists.com, 2017). In terms of capital market, since 1999 the Nigerian Stock Exchange (NSE) has enjoyed strong performance although equity as an avenue to advance corporate growth is being more employed by the country's private sector. No doubt, due to the shift from oil to agriculture, it is expected that the economy will become resilient to underdevelopment.

2.1.9.2 South Africa

South Africa as a nation is found on the southernmost part in sub-Saharan Africa with numerous diverse ecosystems. The country's economy is primarily mineral exporting, agriculture, manufacturing, services and trade but the end of apartheid and democratization of the political landscape which occurred in 1994 brought a turning point in the economic affluence of South Africa (Ogunjiuba, Stiegler & Omoju 2012). Since the democratic transition which took place in 1994, the country has displayed significant socio-political stability which became a boost to Africa and internationally, becoming the most advanced, diversified and biggest economy in Africa. Concurrently, the democratic and macroeconomic stability transformed the country into a regional economic power and mounting to the position of leading emerging economy in sub-Saharan Africa. In addition to the above assertion is the steady and firm budgetary policies of the country which has made them tap into the global bond markets with equitable sovereign risk spreads.

In 2011, South Africa was ranked third ahead of China and India in terms of nominal GDP per capita (USD 8,342 at PPP) and remained the only meaningful economic power in the Southern Africa region and in Africa (Kappel, 2010). South Africa geographical location accords it a privileged role as gateway to sub-Saharan Africa and via its membership in diverse regional and sub-regional bodies; the country supports effort to deepen economic integration (The performance of post-apartheid South Africa has attracted the attention of scholars, policymakers and international bodies cum a stable accounting reporting system and capital market.

In the country's 2015-2016 global competitiveness report, the World Economic Forum ranked them 49th in its Global Competitiveness Index (GCI) amidst the 140 nations, up from 56th in the prior reporting period. The GCI ranked the country 1st in terms of auditing strength, reporting standards as well as financing via local equity market. This no doubt made the country ranked 12thfor financial market development; 29th for market size, 33rd for business sophistication and 38th for innovation, amidst the 140 nations. Presently, the country's capital market, the Johannesburg Stock Exchange (JSE), is ranked among the top 20 in the world in terms of size while Standard and Poor (S&P) observed that JSE is deemed to increase over 2016-2017 as electricity supply, domestic consumption and net exports is improved upon (Brand South Africa, 2017).

2.1.9.3Kenya

Kenya, a sub-Saharan Africa country is domiciled in Eastern Africa and located along the Indian Ocean with capital city in Nairobi. The country is bounded by Tanzania (to the south), Uganda (west), South-Sudan (northwest), Ethiopia (north) and Somalia (northeast). Presently, the country is still the key focus of all adventure travel in Africa with rich culture and diverse environments. As noted in the Revised National Statistics (RNS) released on 30 September 2014, the country attained lower middle income level in 2012. Thus, the country is poised to be among the top growing economies in Eastern Africa, with gross domestic product of about $70.53 US dollars (Price Waterhouse & Coopers, 2018).

The country has a stable macroeconomic and financial stability strategy. These, jointly with the current discoveries of natural resources such as crude oil,

natural gas and other minerals, are expected to trigger more foreign direct investment (FDI) inflows into the country. The country participates in diverse regional program and currently, a member of the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), Intergovernmental Authority on Development (IGAD), etc (Price Waterhouse & Coopers, 2018). After the economic crisis in 2008, economic growth of Kenya has bounced back, attaining 5.8% in 2016 to place Kenya as one of the top growing economies in sub-Saharan Africa (The World Bank, 2018).

The expansion in Kenya's economy was made better due to stable financial and macroeconomic environment coupled with low oil prices, rebound in tourism, robust remittance inflows and government-led infrastructure development programs. According to World Bank (2018), near-term GDP growth slowed down to about 5.5% in 2017 due to drought, weak credit growth, security issues and hike in oil prices. Consequently, medium-term GDP growth is expected to bounce-back to about 5.8% in 2018 and 6.1% in 2019. These anticipated growths are dependent on a number of factors such as the completion of the ongoing infrastructure projects, the resolution of slow credit growth and strengthening of the global economy and tourism.

In terms of long-term accomplishments of the country, the adoption of prudent macroeconomic guidelines perhaps may preserve Kenya's robust economic performance. As reported by the Export Initiatives and Partnerships Division of Kenya (2016), with help of the World Bank Group (WBG), International Monetary Fund (IMF) and other development agencies, the country has made momentous

structural and economic restructuring that have contributed to continued economic growth in the past decade.

2.2 Theoretical Framework

The theoretical framework of this study is anchored on two (2) theories: Utilitarianism Theory and Theory of Accounting Discretion (TAD).

2.2.1 Utilitarianism Theory

The utilitarianism theory was propounded by Kant (1965). The theory focused on the notion of maximizing the ultimate value of good (utility) for the ultimate number of individuals. The basis of utilitarianism as noted by Masten (2012) can be attained in consequentialist settings, where the ends finally justify the means. There are two diverse forms of utilitarianism: first is the rule-utilitarianism (emphasis is on the maximization of happiness with respect to the actions to a particular rule and the second is act-utilitarianism, which evaluates the probable rule and considers the greatest happiness that results from this action (Audi, 2007). The relevance of this theory to accounting alchemy is that accountants are expected to utilize a specific rule (i.e. accounting method choice) so as to maximize the delight of shareholders such that their actions to a specific rule is in conformity with the Generally Accepted Accounting Standards (IFRS).

The rule-utilitarianism lays the foundation for accountants to follow these accounting method choices in their execution of their accounting tasks (i.e. in the preparation of financial statements). The rule-utilitarianism thus implies that when these accounting method choices are duly followed, accountants will not engage

themselves in actions that may be detrimental to the shareholders. Chonko (2012) opined that there is the likelihood of conflicting rules in rule-utilitarianism. No doubt, accountants may explore these conflicting rules and utilize them to the advantage of the organization and detrimental to shareholders, giving rise to accounting alchemy.

2.2.2 Theory of Accounting Discretion

Theory of Accounting Discretion (TAD) as propounded in this study by the researcher is a new theoretical archetype describing how organisation managements employ their 'Freedom of Choice' (FOC) or Private Judgment (PJ) in adjusting an entity's cash flow. The FOC or PJ as regards adjusting organizations cash flow offer managements with diverse accounting treatments and management techniques aimed at reporting accounting numbers in financial statements in such a way that they would portray good fortunes for them. The discretion employed by organisations management is usually created by the International Financial Reporting Standards (IFRSs) which as a matter of fact permits them to employ dissimilar choice of accounting judgments in adjusting cash flows.

The discretions accorded by the framework of accounting (IFRSs) are the drivers of 'Accounting Alchemy'; a sharp treatment of an entity's cash flow that is being practiced in Nigeria, the world over. The underlying philosophy of TAD is that an entity's cash flows are adjusted based on human judgment, personal decisions and normative choices. Consequently, organisations characteristics such as norms, size, management interests, ownership structure, etc are fundamental elements of accounting alchemy; these characteristics *inter-alia* accord management with flexible opportunities to 'experiment' or transform accounting numbers.

More importantly, TAD is a normative accounting theory that describes the diverse accounting choices available to management but totally deviates from the positive accounting theory where the prime concern deals with 'is' question of: 'is accounting judgment or choice ethical or unethical'. Besides, TAD and positive accounting theory are dovetailing in the aspect of recognition and measurement of incomes, assets and equities in accounting.

2.3 Review of Empirical Literatures

Broadly speaking, accounting alchemy is a novel concept that is increasingly gaining attention in the academic literature; however, that accounting alchemy exits is believable and unsettling (Barth, 2010). In the accounting literature, there is dearth of empirical evidence on accounting alchemy, especially how it affects reported financial performance of quoted firms in sub-Saharan Africa. The reason could be attributed to the lack of plausible measure or model aimed at gauging or estimating what accounting alchemy should be. Perhaps, this made prior studies to focus on earnings management; a major component of accounting alchemy.

Consequently, this present study builds on existing accrual or earnings management modelin order to come up with a measure or model of accounting alchemy. Hence, a mixed factor was used in the review of empirical literature, thus leading to review of some prior studies on accrual accounting in order to substantiate for the dearth of empirical evidence on accounting alchemy. In the light of the above, the review of empirical literature was divided into two (2): first, review of

accounting alchemy studies; and second, review of accrual accountingor earnings management studies.

2.3.1 Review of Accounting Alchemy Studies

Previously it has been established that there is dearth of empirical evidence on the relationship between accounting alchemy and reported financial performance of quoted firms in sub-Saharan Africa. The few studies on accounting alchemy examined accounting alchemy and financial system behavior (Verrecchia, 2009); perspectives of accounting alchemy (Barth, 2010); unbelievable financial alchemy and performance (Razor, 2015); and accounting alchemy and earnings volatility (Cole, 2017).

In the United States of America (USA), Verrecchia (2009) examined accounting alchemy and financial system behavior by means of qualitative design.The study focused on whether accounting alchemy systematically alters reported earnings and whether this effect may add or subtract economic value independently of any effect on the underlying cash flows of entities. Findings of the study indicated that accounting alchemy creates heuristic behavior among stakeholders and alters reported earnings. Also, it was revealed that accounting alchemy affects the cash flow of firms in USA.

In Switzerland, Barth (2010) appraised some vital perspectives on accounting alchemyby looking at measures through which accounting alchemy practices can be undermined or reduced. In this study, qualitative design was adopted and findings revealed that there are alternative approaches to reducing accounting alchemy and

this goes beyond management of firms to include accounting regulators, users of financial reports, and politicians.

In Malaysia, Razor (2015) explored financial alchemy and performance of Silverlake Axis Limited (SAL). Content analysis was utilized in describing how financial alchemy influenced the performance of SAL. The content analysis of some performance measures (assets, revenue and sales growth) obtained from the statement of comprehensive income and financial position showed that financial alchemy has undermined the performance of SAL in Malaysia.

In USA, Cole (2017) ascertained the association between accounting alchemy and earnings volatility. Content analysis was used and findings of the study revealed that accounting alchemy is associated with earnings volatility. Besides, it was found that there is significant differences between hypothetical performance (accounting measures of performance) and actual results (real performance) subsequently achieved by firms in the USA.

2.3.2 Review of Accrual Accounting Studies

There have been extensive studies conducted in numerous countries of the world including Nigeria on accrual models of accounting and reported financial performance. For instance, a study by Kyungho & Schroeder (1990) presented evidence on whether analysts' earnings forecasts predict management's accruals choices as well as if analysts predict accruals. In their study, earnings forecast errors were composed of two parts namely cash-flow and accruals forecast errors. By means of regression analysis, it was discovered that management's bonus-maximizing

incentives permit for recognition of situations in which accruals forecast errors are anticipated to offset cash-flow forecast errors and situations in which they are anticipated to aggravate cash-flow errors.

Dechow, Sloan and Sweeney (1995) evaluated the comparative performance of some accrual accounting models by comparing the specification and power of frequently employed tests across accrual values obtained by these models. Their study evaluated the specification of the test statistics by evaluating the occurrence with which the statistics produced type I errors and the power of the tests by evaluating the occurrence with which the statistics produce type II errors. By means of diverse samples and assumptions, they established that all models appear well specified for random samples, produced tests of low power for accruals, suggesting that no accrual at rates exceeded the specified test-levels when applied to samples of firms with acute financial performance. Also, it was found that modified Jones model produced the most powerful test of accruals.

Subramanyam (1996) provides evidenceon the relationship of cashflow from operations, and accruals, with future cash flows. He employed the Jones (1991)model to detach total accruals. He assumedthat if accruals can predict future cashflows, management employ accruals accounting to hint at their private information rather than employing themopportunistically. Findings revealed that total accruals incrementally improve the predictive ability ofearnings for future cash flows over cash flow fromoperations.

A study by Rangan (1998) find evidence that equity-issuing entities on an average, tend to have greater positive accruals in the years surrounding the issue and

that these accruals can partially affect the performance of such entities to the extent that management employ their discretion for accruals and can potentially employ this accounting gimmicks to manipulate ROE. On the other hand, Teoh and Wong (1998) find evidence that the negative association between accruals and ROE is more obvious for current accruals than for total accruals.

Cairney and Murdoch (1998) examined accruals and management forecast errors by means of forecast error computed as management's forecast of earnings less the mean and the analysts forecasts during the last fiscal month of the forecasting year, earnings per share and dummy variables (i.e. high and low levels of standard deviation in analyst's forecast during the period 1986 to 1992. The regression analysis was employed in the analysis of data and findings showed that accruals accounting are adjusted to bring reported earnings more closely to management's forecast. Also, it was found that the adjustments are larger when there is greater investor mixture in relation to expected earnings for the forecast year.

Bartov, Gul and Tsui (2000) examined accruals models and audit qualification using multiple logistic regressions to validate the significance of controlling for research confounds in earnings managementstudies in Hong Kong and United States. Their study period is between 1980-1972 for the first year for which the annual Compustat data are available, and because the estimation of the parameters of the time-series data of Jones Model requires eight years of dataset. The study employed auditors' opinion (proxy for audit qualifications) and three control variables book-to-market ratios, financial leverage and earnings performance. The univariate chi square and logit tests showed that all models, except the DeAngelo Model, are successful in

discriminating between firms that engage in accruals accounting and firms that do not. Also findings indicated that two of the control variables (book-to-market ratios and financial leverage) and the earnings performance variable are imperative variables for studying accruals accounting.

In the United States of America, Maker and Alam (2003) explored the impact of managerial discretion on the information content of reported earnings during the period 1973-1992 for 123 firms. The OLS regression result indicated that firms' discretionary accruals are priced by the stock market, and that earnings have incremental information content as regards future profitability.

Lee, Li and Yue (2005) studied the association between the amount of managed earnings and firms' earningsperformance in the United States of America by means of OLS statistical technique. Results support the predictions that the amount of managed earnings and firm performance are correlated except that the restatement sample test results are mixed.

Kothari, Leone and Wasley (2005) studied performance-matched accrual measures using the Compustat industrial annual and research files from 1962-1999 for 250 samples of 100 firms each. Their study assessed the specification and power of the test based on a performance-matched accrual measure in contrast with traditional accrual measures like Jones and modified-Jones models. The study variables include change in sales deflated by total assets, return on assets and industry and analysis performed by means of regression analysis. The result revealed that inferences about performance-matched accrual indicators are probable to be more consistent than using traditional indicators of accruals.

Ayers, Jiang and Yeung, (2006) examined if there is a positive relationship between accrual proxies and earnings benchmarks of groups set asideat other points in the allocation of earnings, earnings changes, and analysts-basedunpredicted earnings in the United States during 1994-2002. The regression statistical technique was employed. The findings showed similar results for the earnings change allocation. Contrarily, a positive relationship between accruals proxies and beating pseudotargets obtained from analysts-based unpredicted earnings was found to be more pronounced.

A research by Riley (2007) on accounting information and analyst forecast errors used the explanatory power of accruals quality, and errors in sell-side analysts' forecasts of firms' quarterly earnings per share in Texas, United States of America. This study measured analyst forecast error as the variation between the mean forecast and actual earnings as reported by first call. The study period was between 1997-2004 and random coefficients regression analysis was employed in gauging the accruals accounting and to model specific changes in working capital in gauging accruals quality. The study found that discretionary accruals are likely to reduce as the total size of analyst forecast error amplifies. Furthermore, analyst forecast errors are likely to grow bigger in absolute terms, as accruals quality reduces, implying that analysts have a comparatively cumbersome time forecasting firms' earnings when those firms' accruals are of comparative low quality. Thus, accruals and accruals quality are both fundamental in elucidating changes in analyst forecast error levels.

Gong, Li and Xie (2008) analyzed the association between management earnings forecast errors and accruals in Pennsylvania, United States of America.

Management earnings forecasts for financial years 1996-2006 from the firstcall's Company Issued Guidance (CIG) database was obtained and the ordinary least square regression with standard errors adjusted for heteroscedasticity and firm-level clustering was the means of data analysis. Their study found a positive connection between management earnings forecast errors and accruals for firms operating in a highly vague business environment and for industries showing strong co-variation between accruals and employee growth.

Karthik and Sugata (2009) explored the accrual choices of outsourcing firms' linked to the United States congressionalcandidates during the 2004-2005 elections, especially during the period when corporate outsourcing was a foremost campaign concern. The variation between income before extraordinary items and operating cash flows over lagged period assets, the inverse of lagged period assets, one-period change in sales over lagged period assets, lagged period net property, plant, and equipment over lagged period assets ratios were computed at the1st and 99th percentile level of quarterly observations. Findings showed that politically-connected corporations with more extensive outsourcing undertakings have more income-decreasing accruals. Also, evidence showed that there is concentration in two calendar quarters immediately prior to the 2004 elections relative to adjacent periods as well as heightened incentives for firms to manage earnings during the election session.

Gramlich and Sorensen (2010) determined whether management of firms quoted on the Danish Stock Exchange exercise discretion in adjusting earnings forecast targets of initial public offering (IPO) firms. By means of regression

analysis, sample of fifty-eight Danish firms that issued voluntary management earnings forecasts in relation to IPOs that occurred during 1984-1996 were studied. Their empirical evidence unearth that pre-managed earnings are adjusted toward these targets of firms quoted on the Danish Stock Exchange. Consequently, Danish firms exercise discretionary accruals to moderate earnings forecast errors in spite of whether pre-managed earnings are not as much of, or larger than the IPO forecast amount.

Xu, (2010) probed whether management earnings forecasts absolutely replicate the connotation of accruals for future earnings by employing regression analysis in Chinese Stock Exchange. Evidence from the study revealed that management of firms in Chinese Stock Exchange overvalue accrual persistence in range forecasts but not in point forecasts. Also, management's accrual-related forecast predisposition in range forecasts intensifies with forecast range and forecast horizon. Thus, management overvalues accrual persistence when they are faced with greater intricacy forecasting earnings. In addition, management's accrual-related forecast bias in range forecasts is a bit influenced by managerial opportunism and fear of legal action.

In a study by Cohen and Zarowin (2010) on accrual-based and real earnings manipulation activities around seasoned equity offerings for US firms over the period of 1987-2006, it was found that firms utilize both accruals-based and real activities-based earnings manipulation activities around seasoned equity offerings. In addition, that the choice between the two alternative strategies varies predictably as a function of their ability to utilize accruals manipulation.

Fakhari and Taghavi (2010) examined the effect of the quality of financial reporting according to the quality of accruals on the amount of cash in Iranian companies. The evidence of analysis based on the combined cross-sectional data and time series data indicates that the quality of financial reporting has a negative and significant relationship with the cash and cash equivalents. The results also indicate that the growth opportunities variables, cash flow and cash assets have a positive effect on cash holding, and the variables of size, debt maturity and the opportunity cost have a negative relationship with cash holding.

Ikram (2011) explored industry-specific accruals and earnings manipulation in Arizona, United States of America during 1975-2004 by means of regression analysis. The study assessed the post-issue market returns and analysts' forecast errors for a sample of seasoned equity issues during 1975-2004 and found that offering-year firm-specific accruals can in part explicate these abnormal capital market results. Nevertheless, the study revealed that this predictive power of firm-specific accruals are more obvious for issues that occur during 1975 - 1989 when compared to period between 1990-2004. Also, the evidence from this study revealed that investors and analysts are more overoptimistic about the prediction of issuers that have both high firm-specific and industry-specific discretionary accruals (comparing firms with high discretionary accruals in absolute terms). Besides, the results signify no role for industry-specific accruals in buttressing overoptimistic expectations from seasoned equity issues.

Farshadfar and Monem (2011) scrutinized whether total accruals enhance the predictive ability ofearnings for forecasting future cash flows in Australia by means

of both within-sample and out-of-sample forecasting analyses. Findings revealed that total accruals enhance the predictive ability ofearnings in the forecast of future cash flows. Also, total accruals anddirect method cash flow components jointly are more helpful than aggregate earnings and cash flow from operations. The variables of the study are earnings before extraordinary and discontinuing items, cash flow from operations and total accruals; ordinary least squares regression models was employed on a pooled time-series of cross sectionaldata during the period 1992-2004.

Clement, Hales and Xue (2011) investigated how analysts utilize stock returns and other analysts' forecast revisions in adjusting forecasts after the announcement of earnings by means of cross-sectional data. By employing regression statistical tool, they found that analysts react more verily to these signals, especially when the signals are more informative about future earnings variation. Even though analysts under-react to these signals on average, analysts who are most responsive to signal informativeness attain superior forecast precision relative to their peers and have a larger influence on the market. Thus, the ability to obtain information from the actions of others is a source of analyst capability.

Uwuigbe, (2011) assessed the effects of firms' characteristics on earnings manipulation of listed companies in Nigeria. The study used a total of 20 listed firms in the Nigerian stock exchange. The corporate annual reports for the period 2006-2010 were used for the study. In testing the relevant hypothesis, this study adopted the use of both descriptive statistics and econometric analysis using the pooled ordinary least square regression for the listed sampled firms. The study revealed that while firm size and firms' corporate strategy have significant positive impact on

earnings manipulation (proxied by accruals); on the other hand, the relationship between firms' financial leverage and accruals of the sampled firms in Nigeria was not significant.

Ahmed & Scott (2011) showed that firms with good accruals quality hold lower cash levels than firms with poor accruals quality. This finding suggests that the quality of accounting information may reduce the negative effects of information asymmetries and adverse selection costs, allowing firms to reduce their level of corporate cash holdings.

Khajavi, Ghorbani and Maharlouie (2011) examined the performance of traditional and new indicators of liquidity to forecasting companies' earnings manipulation. The results of their research indicated that there is significant relationship between traditional liquidity indexes and size of companies with earnings manipulation, and that the most important effective item is the level of inventory in the examined companies.

Sharifah, Nor, Noor and Fatimah (2012) examined the association between accruals and board diversity in Malaysia. The study data were those obtained from the annual reports and accounts for the year 2008 of top 100 firms in MalaysiaCorporate Governance (MCG) index. Accrual was measured via modified Jonesmodel and association was tested between five board diversity measures such as size, independence, competency,remuneration and gender and regression statistical technique was employed. The study found that accruals occurred yet for the top 100 MCG firms. However, women on board were found to have a positive significant

association with accruals, suggesting that higher number of women board may enhance the accruals undertakings of firms in Malaysia.

In Germany, Bornemann, Kick, Memmel, and Pfingsten (2012) examined whether banks using hidden reserves beat earnings benchmarks by means of OLS. Their study found that banks use earning manipulation techniques to avoid a negative net income, avoid a fall in net income compared to the previous year, avoid a decrease in net income compared to a peer group, and to achieve stable net income over time.

Zang (2012) conducted a study on the trade-off between real activities manipulation and accrual-based earnings over the period 1987-2008 for US firms and finds evidence of firms substituting the two techniques. The study argued that firms encounter diverse constraints for the two methods.

The relationship between earnings manipulation and performance of acquiring firms in Malaysia was studied during the period 2004-2010 by Ardekani, Younesi and Hashemijoo (2012). This study measured earnings manipulation via modified Jones model and performance measure by monthly cumulative abnormal returns obtained from both listed cash and share acquirers firms. By means of ordinary least square statistical technique, it was revealed that share acquirer firms unlike cash acquirers manipulated earnings preceding acquisition announcement date while a negative association between earnings manipulation preceding and firm performance subsequent to acquisition date for share acquirer firms was discovered.

A study by Athanasakou and Olsson (2012) proposed and tested a research design for unraveling earnings quality effects emanating from fundamentals (innate

earnings quality) from effects due to managerial incentives (earnings quality) in United States during the period 1992-2007 by means of regression analysis. Results revealed that innate earnings quality is intrinsically connected with earnings quality, consistent with the enabling and motivating role of firm rudiments for management's reporting decisions. Furthermore, their study applied measures to two research settings: first, the establishment of the Sarbanes-Oxley (SOX) Act in 2002; second, apparently contradictive views from literature on corporate governance and earnings quality. The findings showed that discretionary earnings quality was enhanced considerably after the establishment of SOX, whereas there is no effect on innate earnings quality. Also, that effective governance structures are connected with poor innate earnings quality, consistent with firms building governance mechanisms in response to earnings quality inherent to their business models and operating environments.

Abdoli, Bakhtiarnezhad and Bakshi (2012) ascertained the influence of income manipulation and corporation size on auditopinion in Iran. Data of auditor's opinion, accruals and corporation size of companies were obtained from the Tehran Stock Exchange during the period 2006 to 2011. The logistic regression statistical technique and the Wald test was used to test the hypotheses and the corporations were selected by the systematic random sampling. The results indicated that the effect of manipulating income on auditor's opinion was negative and significant with higher income manipulation. In addition, the influence of corporation size on auditor's opinion has been confirmed as being positive.

Hazarika, Karpoff and Nahata (2012) studied the influence of CEO turnover as it affects earnings manipulation in Pakistan by means of regression and found that the likelihood and speed of CEO turnover are significantly recognized with a corporation's earnings management. Also, they found that the association between earnings manipulation and forceful CEO turnover subsisted in Pakistani firms. These results revealed that boards tend to act proactively to train managers who oversee earnings, before the controls lead to excessive outer consequences.

Velury and Kane (2012) examined whethercorporate firms experiencing excessive earnings variations are more likely than other firms to report income-decreasing special items as well as if these charges for special items are indicative of creative accounting. The study used regression technique and analysis revealed that firms that are bigger, more in debt and undergoing losses are susceptible to report special items.

Ahmed, Chalmers and Khilif (2013) carried out a review on the effects of IFRS adoption on accruals accounting. This study provided evidence not only about the techniques and the samples employed in gauging the value of accruals, but also information about other methods according to which an evaluation of accruals practices has been done. By means of either value relevance models or earnings smoothing methods, mixed results were also identified for accruals elements.

Bhuiyan, Roudaki and Clark (2013) probed the effect of better compliance with corporate governanceregulation on accruals accounting in New Zealand listed firms. Their study focused on free cash flow as an indicator of accruals rather than cash flow from operating activities. The univariate and multivariate regression

analysis was done on 70 New Zealand listed firms during the period 2000-2007. Results showed that better compliance with corporate governance decreases accruals, suggesting lower managerial opportunistic behaviour.

Tang, Chen and Chang (2013) researched the endogenous association between unusual insider exchanging and accrual mishandling, and to see whether corporate administration affect this association or not in Taiwan. The regression statistical technique was employed and results suggested that insiders utilize private data on abnormal accruals to time their sale of securities in Taiwan Stock Exchange.

A research by Moradzadehfard and Nazari (2013) evaluated management earnings forecast error and information content of accruals of listed firms in Tehran Stock Exchange, Iran. Sample of seventy-one firms were obtained for the period 2003-2011. The study variables encompasses total accruals, changes in current assets, liabilities, cash and cash equivalents, interest on long-term debt, cost of depreciation of non-current assets and intangible and company's market value and regression statistical technique was the method of data analysis. Findings from their study showed that there is a significant negative association between earnings management forecast error and the total accruals. Also, that other assumptions that management forecasts for financing via equity or debt engender a significant positive association between positive accruals and management earnings forecast error. Besides, via equity or debt financing outlook, there is no significant association between earnings forecast error and negative accruals.

Elshafie and Nyadroh (2014) investigated the connection between accrual and some selected indicators of audit quality in the United States. Audit quality

indicators like likelihood restatement, f4 audit, negative internal control report, going concern opinion, and auditor's industry specialization were employed. Ordinary least square estimation technique was the method of data analysis. The results showed that while there is a connection between accrual and audit quality measures such as the likelihood restatement, f4 audit, negative internal control report, a connection is not present in the case of going concern opinion and auditor's industry specialization. These mixed results revealed that accruals are not essentially a good indicator of audit quality.

Doukakis (2014) examined the effect of mandatory IFRS adoption on both accruals-based and real activities-based earnings management for 22 European countries over the period 2000-2010 by means of regression technique. The study found that firms substitute the two techniques.

In Tunisia, Charfeddine, Riahi, and Omri (2014) investigated the determinants of earnings manipulation in emerging countries by means of two earnings forecast: incentives and constraints factors. For 19 Tunisian listed companies during the period 2003-2009. The study regress the residuals of total accruals on performance measures of debt, size, stock returns, board size, audit quality, dividend policy, ownership structure, CEO chairmanship and managerial ownership and empirical results revealed that six from the nine tested performance variables significantly determine earnings management except size, managerial ownership and CEO chairmanship.

A study by Dobre, Brad and Ciobanu (2015) provided information about the value ofaccruals bearing in mind the fact that a switch from RomanianAccounting Standards (RAS) to IFRS was mandatory from 2012, for corporate entities that have

securities quoted on Romania Stock Exchange. Qualitative data of audit quality, separation between CEO and board of directors were obtained for the period 2010-2011 using RAS and 2011-2012 using IFRS. Also, both variables were quantified using dummy variables. For the auditor variable, the value one was conferred if the auditor is a firm from Big 4 and zero if otherwise. For the second dummy variable, value one was conferred if the position of executive manager and the position of firm's president is held by two varied persons and zero if otherwise. In order to obtain the value of total accruals, two methods were utilized: one based on presenting the value of total accruals as a difference between net profit and cash flow from operation and second using earnings components of changes in current sales, cash, current liabilities, income tax and depreciation. The regression statistical method was employed in the analysis of data and findings suggest no statistical significant difference between both methods. Besides, no significant influence of specific factors was observed on the value of accruals.

Trejo-Pech, Weldon and Gunderson (2015) assessed both accruals based earnings forecast (AEF) and real earnings management (REM) in U.S. agribusinesses during the period 1970-2006. Specifically, the focus is on agribusinesses that reported low earnings quality, defined as firms with extreme level of accruals compared to their peers. The cross-sectional modified Jones model was used to test for AEF. In order to describe REM practices, the unrestricted expenses model by Roychowdhury (2006) was utilized. There was evidence of AEF and no evidence of REM in agribusinesses in US. Also, the results showed that managers might be

managing earnings via certain accruals doubtful accounts receivable provisions and special items.

Zunera, Farah and Muhammad (2015) study determined whether the investors manage earnings via accruals if they price these accruals when considering the stock price in Pakistan. Variable of stock returns and stock returns for firms with higher family ownership, proportion of independence board and discretionary accruals were obtained for 30 companies quoted on the Karachi Stock Exchange during the period 2008-2012. The regression method was employed in the analysis of data and study finds indicated that the firms with higher number of institutional ownership, high quality audit production and higher number of independent board have significantly higher influence of accruals on their stock returns as compared to other firms.

Zhu, Shan and Zhang (2015) investigated how Chinese reverse merger firms trade off and conduct income increasing earnings management via both accruals-based and real activities-based methods over the period 1990-2011. Evidence showed that firms substitute the two methods. Also, firms substitute accruals-based earnings management with real earnings management as a result of the costs and constraints of using accruals-based earnings management.

Akram, Hunjra, Butt and Ijaz (2015) assessed the impact of earnings forecast on the organizational performance in construction andmaterial industry in Pakistan and India. The study sample was 20 listed companies of Karachi StockExchange (Pakistan) and 20 of Bombay Stock Exchange (India) during the period 2009-2013. OLStechnique was applied and findings indicated that there is a significant negativerelationship between earnings forecast and organizational performance in

Pakistan while an insignificant relationship was found in India. Moreover, there is a significant mean variation of Pakistani and Indian construction sector firms' accruals forecast, return on assets and return on equity.

Hsu and Wen (2015) investigated the impact of ownership structure and board characteristics on accruals and real earnings manipulation in Chinese Stock Exchange via regression statistical tool. The results indicated that corporations with high shareholding proportion or extraordinary shareholding give managers incentives to control accruals for short-term profitability. In line with board structure, setting up independent directors is unable to monitor earnings manipulation of managers. Also, the bigger the board, the more aptitude for the board to monitor whether the managers engage in earnings manipulation.

The study by Fizza and Malik (2015) which scrutinizes earnings manipulation and financial reporting via structured questionnaires found that earnings manipulation negatively affects financial reporting. The negative influence is caused by the role played by corporate governance in financial reporting. They believed that earnings manipulation destroys the image of the company.

Gnyana (2016) analyzed the earnings manipulation practices of some selected oil firms in India via regression analysis. Data of total accruals, accounts receivable, annual revenues, and property, plant and equipment were obtained for eighteen oil firms including exploration and marketing companies during the period 2003-2012. The study analyses the magnitude of accruals usage via modified Jones model. Findings showed that oil firms in India employ income decreasing accruals to

manage their earnings so as to avert implication of new policies, taxes and political pressure to claim for lesser subsidies.

Obigbemi, Omolehinwa, Mukoro, Egbide and Olusanmi (2016) evaluated the role of board structure in restricting earnings manipulation practices for a sample of 137 quoted firms during the period 2003-2010. Earnings manipulation was measured via the modified Jones model. The statistical technique used was the OLS and Pearson moment correlation coefficient and the study showed that there is a significant relationship between board structure and earnings manipulation practices in Nigeria. Also, it was revealed that there is a negative significant relationship between board size, gender, and board composition with earnings manipulation while a positive significant relationship between board meeting and earnings manipulation practices was found.

In Taiwan, Chen, Fang and Wang (2016) examined whether earnings manipulation is associated with diverse forms of capital reduction that can partially explain long-term share price underperformance by means of OLS. The results showed that firms that reduce their capital under the Company Act engage in earnings manipulation for longer than those engaging in a capital reduction under the Securities Exchange Act. Also, stock performance decreases with increasing aggression of accruals.

Alhadab and Al-Own (2017) examined whether earnings manipulation affects banks' current and future performance by means of regression statistical. Using a sample of 477 bank-year observations representing 55 European banks over the

period 2001 to 2015, findings showed that the negative impact of earnings manipulation (which takes place in a specific year) feeds via into the following year.

Pranesh (2017) by means of cross-sectional data investigated the impact of firm's growth and performance on earnings manipulation in India. The modified Jones model was used to estimate accruals for a sample of 756 firm-year observations from non-financial corporate sector from 2007 to 2015. The study analyzed the panel data via fixed effect model and findings affirmed that there is an existence of earnings manipulation practices across the Indian non-financial firms under study, which followed a mixed trend. Besides, the regression result showed that growth of the firm is positively correlated while performance is negatively correlated with accruals. On the overall, a synthesis of empirical review was provided in order to easily capture the review of empirical studies by showing the title of the study, country, methodology and findings of prior studies.

2.4 Synthesis of Empirical Review

Table 2.5a: Synthesis of Empirical Review on Accounting Alchemy

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Verrecchia (2009)	United States of America (USA)	Accounting alchemy and financial system behavior	Qualitative design	Findings of the study indicated that accounting alchemy creates heuristic behavior among stakeholders and alters reported earnings. Also, it was revealed that accounting alchemy affects the cash flow of firms in the United States of America (USA).

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Barth (2010)	Switzerland	Perspectives on accounting alchemy	Qualitative design	Findings revealed that there are alternative approaches to reducing accounting alchemy and this goes beyond management of firms to include accounting regulators, users of financial reports, and politicians.
Razor (2015)	Malaysia	Financial alchemy and performance of Silverlake Axis Limited	Content analysis of some performance measures (assets, revenue and sales growth)	Findings showed that financial alchemy has undermined the performance of SAL in Malaysia.
Cole (2017)	USA	Accounting alchemy and earnings volatility	Content analysis	Findings indicated that accounting alchemy is associated with earnings volatility. Also, it was found that there is significant differences between hypothetical performance (accounting measures of performance) and actual results (real performance) subsequently achieved by firms in the USA.
Kyungho & Schroeder (1990)		Analysts' earnings forecasts and management's discretionary accruals choices	Total accruals, earnings components & regression analysis	Management's bonus-maximizing incentives permit for recognition of situations in which discretionary-accruals forecast errors are anticipated to offset cash-flow forecast errors and situations in which they are anticipated to aggravate cash-flow errors.

Table 2.5b: Synthesis of Empirical Review on Accrual Accounting

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Dechow, Sloan, & Sweeney (1995)		Detecting earnings management	Total accruals, earnings component and regression analysis	No discretionary accrual at rates exceeded the specified test-levels when applied to samples of firms with acute financial performance. Also, it was found that the Modified Jones Model produced the most powerful test of discretionary accruals.
Subramanyam (1996)		Future cash flow, , discretionary accruals, andnon-discretionary accruals	Total accruals, net accruals and earnings components	Findings revealed that bothdiscretionary and non-discretionary accrualsincrementally improve the predictive ability ofearnings for future cash flows over cash flow fromoperations.
Rangan (1998)		Accruals and equity-issuing entities	Total accruals, return on equity	Findings suggest that equity-issuing entities on an average, tend to have greater positive accruals in the years surrounding the issue and that these accruals can partially affect the performance of such entities to the extent that management employ their discretion for accruals and can potentially employ this accounting gimmicks to manipulate ROE.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Cairney & Murdoch, (1998)		Discretionary accruals and management forecast errors	Management's forecast of earnings less the mean and the analysts forecasts during the last fiscal month of the forecasting year, earnings per share & regression analysis	Findings showed that discretionary accruals are adjusted to bring reported earnings more closely to management's forecast. Also, it was found that the adjustments are larger when there is greater investor mixture in relation to expected earnings for the forecast year
Bartov, Gul & Tsui (2000)	Hong Kong and United States of America	Discretionary accruals models and audit qualification	Audit qualifications, control variables of book-to-market ratios, financial leverage and earnings performance and logistic regressions	Results the univariate chi square and logit tests showed that all models, except the DeAngelo Model, are successful in discriminating between firms that engage in discretionary accruals and firms that do not. Also findings indicated that two of the control variables (book-to-market ratios and financial leverage) and earnings performance variable are imperative for studying discretionary accruals.
Maker & Alam (2003)	USA	Impact of managerial discretion on the information content of reported earnings	OLS	Result indicated that firms' discretionary accruals are priced by the stock market, and that earnings have incremental information content as regards future profitability.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Kothari, Leone & Wasley (2005)	Compustat industrial annual and research files USA	Performance-matched discretionary accrual measures	Change in sales deflated by total assets, return on assets and industry and regression analysis	The result revealed that inferences about performance-matched discretionary accrual indicators are probable to be more consistent than using traditional indicators of discretionary accruals.
Lee, Li & Yue (2005)	USA	Association between the amount of managed earnings and firms' earningsperformance	OLS statistical technique	Results support the predictions that the amount of managed earnings and firm performance are correlated except that the restatement sample test results are mixed.
Ayers, Jiang & Yeung, (2006)	USA	Relationship between discretionaryaccrual proxies and earnings benchmarks	Allocation of earnings, earnings changes, and analysts-basedunpredicted earnings and regression analysis	Findings showed similar results for the earnings change allocation. Contrarily, a positive relationship between discretionary accruals proxies and beating pseudotargets obtained from analysts-based unpredicted earnings was found to be more pronounced.
Riley (2007)	Texas, United States of America	Accounting information and analyst forecast errors	Accruals quality, discretionary accruals and errors in sell-side analysts' forecasts of firms' quarterly earnings per share and random coefficients regression analysis	Findings showed that discretionary accruals are likely to reduce as the total size of analyst forecast error amplifies. Furthermore, analyst forecast errors are likely to grow bigger in absolute terms, as accruals quality reduces, implying that analysts have a comparatively cumbersome time forecasting firms' earnings when those firms' accruals are of comparative low quality.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Gong, Li & Xie (2008)	Pennsylvania, United States of America	Management earnings forecast errors and accruals	Earnings forecast errors and accruals and regression analysis	Found a positive connection between management earnings forecast errors and accruals for firms operating in a highly vague business environment and for industries showing strong co-variation between accruals and employee growth.
Karthik & Sugata (2009)	United States of America	Discretionary accrual choices of outsourcing firms' linked to US congressionalcandidates elections	Income before extraordinary items, operating cash flows over lagged period assets, inverse of lagged period assets, one-period change in sales over lagged period assets, lagged period net property, plant, and equipment over lagged period assets ratios	Findings showed that politically-connected corporations with more extensive outsourcing undertakings have more income-decreasing discretionary accruals. Also, evidence showed that there is concentration in two calendar quarters immediately prior to the 2004 elections relative to adjacent periods as well as heightened incentives for firms to manage earnings during the election session.
Gramlich & Sorensen (2010)	Danish Stock Exchange	Voluntary management earnings forecasts and discretionary accruals	Total and net accruals earnings forecast targets and regression analysis	Empirical evidence unearth that pre-managed earnings are adjusted toward these targets of firms. Also, firms exercise discretionary accruals to moderate earnings forecast errors in spite of whether pre-managed earnings are not as much of, or larger than the IPO forecast amount.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Xu, (2010)	Chinese Stock Exchange	Do management earnings forecasts incorporate information in accruals?	Accruals, future earnings and regression analysis	That management of firms in Chinese Stock Exchange overvalues accrual persistence in range forecasts but not in point forecasts. Also, management's accrual-related forecast predisposition in range forecasts intensifies with forecast range and forecast horizon.
Cohen & Zarowin (2010)	USA	Accrual-based and real earnings management activities around seasoned equity offerings	Accruals-based and real activities-based earnings management techniques around seasoned equity offerings. OLS	Find that firms utilize both accruals-based and real activities-based earnings management techniques around seasoned equity offerings. Also, choice between the two alternative strategies varies predictably as a function of their ability to utilize accruals.
Fakhari & Taghavi (2010)	Iran	Effect of the quality of financial reporting according to the quality of discretionary accruals	Cross-sectional data and time series data of accruals and cash assets, cash holding, and debt size	The results also indicate that the growth opportunities variables, cash flow and cash assets have a positive effect on cash holding, and the variables of size, debt maturity and the opportunity cost have a negative relationship with cash holding.
Ikram (2011)	Arizona, United States of America	Industry-specific discretionary accruals and earnings management	Post-issue market returns, analysts' forecast errors and regression analysis	Found that offering-year firm-specific discretionary accruals can in part explicate these abnormal capital market results. Also predictive power of firm-specific accruals are more obvious for issues that occur during 1975-1989 when compared to 1990-2004.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Farshadfar & Monem (2011)	Australia	Discretionary accruals and the predictiveability of earnings in the forecast of future cashflows	Earnings before extraordinary, cash flow from operations and total accruals and regression analysis	Findings revealed that discretionary accruals enhance the predictive ability ofearnings in the forecast of future cash flows. Also, discretionary and non-discretionary accruals are more helpful than aggregate earnings and cash flow from operations.
Clement, Hales & Xue (2011)	Cross-sectional analysis	Understanding analysts' use of stock returns and other analysts' revisions when forecasting earnings	Future earnings variation, stock returns and regression analysis	Found that analysts react more verily to these signals, especially when the signals are more informative about future earnings variation. Even though analysts under-react to these signals on average, analysts who are most responsive to signal informativeness attain superior forecast precision relative to their peers and have a larger influence on the market.
Uwuigbe (2011)	Nigeria	Effects of firms' characteristics on earnings management of listed companies	Pooled ordinary least square regression, firm size, leverage discretionary accruals	The study revealed that while firm size and firms' corporate strategy have a significant positive impact on earnings management; on the other hand, the relationship between firms' financial leverage and discretionary accruals of the sampled firms in Nigeria was not significant.
Ahmed & Scott (2011)	Tunisia	Quality of accounting information and corporate cash holdings	Regression, discretionary accruals, cash holding	This finding suggests that the quality of accounting information may reduce the negative effects of information asymmetries and adverse selection costs, allowing firms to reduce their level of corporate cash holdings.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Khajavi, Ghorbani & Maharlouie (2011)	Romania	Performance of traditional and new indicators of liquidity to forecasting companies' earnings management	Regression, discretionary accruals, inventory level, liquidity and firm size	The results of their research indicated that there is significant relationship between traditional liquidity indexes and size of companies with earnings management, and that the most important effective item is the level of inventory in the examined companies.
Sharifah, Nor, Noor & Fatimah (2012)	Malaysia	Discretionary accruals and board diversity	Total accruals size, independence, competency,remuneration and gender and regression analysis	Found that discretionary accruals occurred yet for the top 100 MCG firms. However, women on board were found to have a positive significant association with discretionary accruals, suggesting that higher number of women board may enhance the discretionary accruals undertakings of firms.
Athanasakou & Olsson (2012)	United States of America	Earnings quality: Firm fundamentals versus managerial discretion	innate earnings quality from effects due to managerial incentives, discretionary earnings quality and regression analysis	Results revealed that innate earnings quality is intrinsically connected with discretionary earnings quality, consistent with the enabling and motivating role of firm rudiments for management's reporting decisions. Furthermore, their study applied measures to two research settings: first, the establishment of the Sarbanes-Oxley (SOX) Act in 2002; second, apparently contradictive views from literature on corporate governance and earnings quality

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Abdoli, Bakhtiarnezhad & Bakshi (2012)	Tehran Stock Exchange, Iran	Influence of income manipulation and corporation size on auditopinion	Auditor's opinion, discretionary accruals and corporation size, logistic regression and Wald test	Results indicated that the effect of manipulating income on auditor's opinion was negative and significant with higher income manipulation. In addition, the influence of corporation size on auditor's opinion has been confirmed as being positive.
Bornemann, Kick, Memmel, & Pfingsten (2012)	Germany	Relationship between banks using hidden reserves and beating earnings benchmarks	OLS estimation technique	Found that banks use earning management to avoid a negative net income, avoid a fall in net income compared to the previous year, avoid a decrease in net income compared to a peer group, and to achieve stable net income over time.
Hazarika, Karpoff & Nahata (2012)	Pakistan	Internal corporate governance, CEO turnover, and earnings management	CEO turnover, discretionary accruals and earnings and regression analysis	Found that the association between earnings management and forceful CEO turnover subsisted in Pakistani firms. These results revealed that boards tend to act proactively to train managers who oversee earnings, before the controls lead to excessive outer consequences.
Zang (2012)	USA	Trade-off between real activities manipulation and accrual-based earnings management	OLS estimation technique	The study argued that firms encounter diverse constraints for the two methods.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Ardekani, Younesi & Hashemijoo (2012)	Malaysia	Earnings management and performance of acquiring firms	Modified Jones model and performance measure. OLS estimation technique	It was found that share acquirer firms unlike cash acquirers manipulated earnings preceding acquisition announcement date while a negative association between earnings management preceding and firm performance subsequent to acquisition date for share acquirer firms was discovered.
Velury & Kane (2012)	United States of America	Earnings variation and creative accounting	Regression, discretionary accruals, leverage, and size	Analysis revealed that firms that are bigger, more in debt and undergoing losses are susceptible to report special items.
Ahmed, Chalmers & Khilif (2013)	Review of literature	A review on the effects of IFRS adoption on discretionary accruals	Qualitative analysis	Evidence showed that not only about the techniques and the samples employed in gauging the value of discretionary accruals, but also information about other methods according to which an evaluation of discretionary accruals practices has been done.
Bhuiyan, Roudaki & Clark (2013)	Zealand	Corporate governance compliance and discretionary accruals	Free cash flow, cash flow from operating activities, corporate governance variables, univariate and multivariate regression analysis	Results showed that better compliance with corporate governance decreases discretionary accruals, suggesting lower managerial opportunistic behaviour.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Tang, Chen & Chang (2013)	Taiwan	Endogenous association between unusual insider exchanging and accrual mishandling	Insider information, total accruals, earnings and regression analysis	Results suggested that insiders utilize private data on abnormal accruals to time their sale of securities in Taiwan Stock Exchange.
Moradzadehfard & Nazari (2013)	Tehran Stock Exchange, Iran	Management earnings forecast error and information content of accruals	Discretionary and non-discretionary accruals, changes in current assets, liabilities, cash and cash equivalents, and interest on long-term debt	Findings showed that there is a significant negative association between earnings management forecast error and the total discretionary accruals. Besides, via equity or debt financing outlook, there is no significant association between earnings forecast error and negative accruals.
Doukakis (2014)	22 European countries	Effect of mandatory IFRS adoption on accruals-based and real activities-based earnings	OLS estimation technique	The study found that firms substitute the two techniques.
Elshafie & Nyadroh (2014)	United States of America	Discretionary accrual and some selected indicators of audit quality	Restatement, f4 audit, negative internal control report, going concern opinion, auditor's industry specialization and regression analysis	Results showed that while there is a connection between discretionary accrual and audit quality measures such as the likelihood restatement, f4 audit, negative internal control report, a connection is not present in the case of going concern opinion and auditor's industry specialization.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Charfeddine, Riahi, & Omri (2014)	Tunisia	Determinants of earnings management in emerging countries	The study regress the residuals of discretionary accruals on performance measures of debt, size, stock returns, board size, policy, ownership structure, etc.	Empirical results revealed that six from the nine tested performance variables significantly determine earnings management except size, managerial ownership and CEO chairmanship.
Dobre, Brad & Ciobanu (2015)	Romania	The value of discretionary accruals computed using both national and international standards	Audit quality, separation between CEO, board of directors and regression analysis	Findings suggest no statistical significant difference between both methods. Besides, no significant influence of specific factors was observed on the value of discretionary accrual.
Trejo-Pech, Weldon & Gunderson (2015)	United States of America	Accruals based earnings (AEM) management and real earnings management (REM)	Discretionary expenses model and regression analysis	There was evidence of AEM and no evidence of REM in agribusinesses in US. Also, the results showed that managers might be managing earnings via certain accruals doubtful accounts receivable provisions and special items.
Zunera, Farah & Muhammad (2015)	Karachi Stock Exchange, Pakistan	The pricing of discretionary accruals	Stock returns for firms with higher family ownership, proportion of independence board, discretionary accruals and regression analysis	Finds indicated that the firms with higher number of institutional ownership, high quality audit production and higher number of independent board have significantly higher influence of discretionary accruals on their stock returns as compared to other firms.

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Zhu, Shan & Zhang (2015)	Chinese Stock Exchange	Trade off and conduct income increasing earnings management	Accruals-based and real activities-based methods. OLS estimation technique	Evidence showed that firms substitute the two methods. Also, firms substitute accruals-based earnings management with real earnings management as a result of the costs and constraints of using accruals-based earnings management.
Hsu & Wen (2015)	Chinese Stock Exchange	Impact of ownership structure and board characteristics on discretionary accruals and real earnings management	Discretionary accruals, earnings components and regression analysis	Results indicated that corporations with high shareholding proportion or extraordinary shareholding give managers incentives to control discretionary accruals for short-term profitability. In line with board structure, setting up independent directors is unable to monitor earnings management conduct of managers. Also, the bigger the board, the more aptitude for the board to monitor whether the managers engage in earnings management.
Akram, Hunjra, Butt & Ijaz (2015)	Pakistan	Impact of earnings management on the organizational performance in construction andmaterial industry	OLStechnique was applied	Findings indicated that there is a significant negativerelationship between earnings management and organizational performance in Pakistan while an insignificant relationship was found in India.
Fizza & Malik (2015)	Malaysia	Earnings management and financial reporting	Correlation, Structured questionnaire	Found that earnings management negatively affect financial reporting of firms in Malaysia

Source: Researcher's Compilation, 2018

Author(s) & year	Country/ Region	Summary	Methodology	Findings
Gnyana (2016)	India	Earnings management practices of some selected oil firms	Total accruals, accounts receivable, annual revenues, and regression analysis	Findings showed that oil firms in India employ income decreasing accruals to manage their earnings so as to avert implication of new policies, taxes and political pressure to claim for lesser subsidies.
Chen, Fang & Wang (2016)	Taiwan	Earnings management and diverse forms of capital reduction	Long-term share price underperforma nce. OLS technique	Results showed that firms that reduce their capital under the Company Act engage in earnings management for longer than those engaging in a capital reduction under the Securities Exchange Act. Also, stock performance reduces with increasein accruals.
Obigbemi, Omolehinwa, Mukoro, Egbide & Olusanmi (2016)	Nigeria	The role of board structure in restricting earnings management practices	Modified Jones model. statistical technique used was OLS and Pearson moment correlation coefficient	The study showed that there is a significant relationship between board structure and earnings management practices. Also, that there is a negative significant relationship between board size, gender, and board composition with earnings management while a positive significant link between board meeting and earnings management was established.
Pranesh (2017)	India	The modified Jones model was used to estimate discretionary accruals for a sample of 756 firm-year	The study analyzed the panel data via fixed effect model	Findings showed the presence of earnings management practices across Indian non-financial firms, which followed a mixed trend. Besides, the regression result showed that growth of firm is positively correlated while performance is negatively linked with discretionary accruals.
Alhadab & Al-Own (2017)	55 European Banks	Effect of earnings management on banks' performance	Regression statistical	Findings showed that the negative impact of earnings management (which takes place in a specific year) feeds via into the following year.

Source: Researcher's Compilation, 2018

2.5 Conceptual Model of the Study

The conceptual model of the study takes accounting alchemy as a function of reported financial performance measures (earnings per share, return on equity, return on assets, book value per share and Tobin's Q) while controlling for changes in earnings before interest and tax (△EBIT) and net profit after tax (△NPAT). The conceptual model of the study is presented in figure 1:

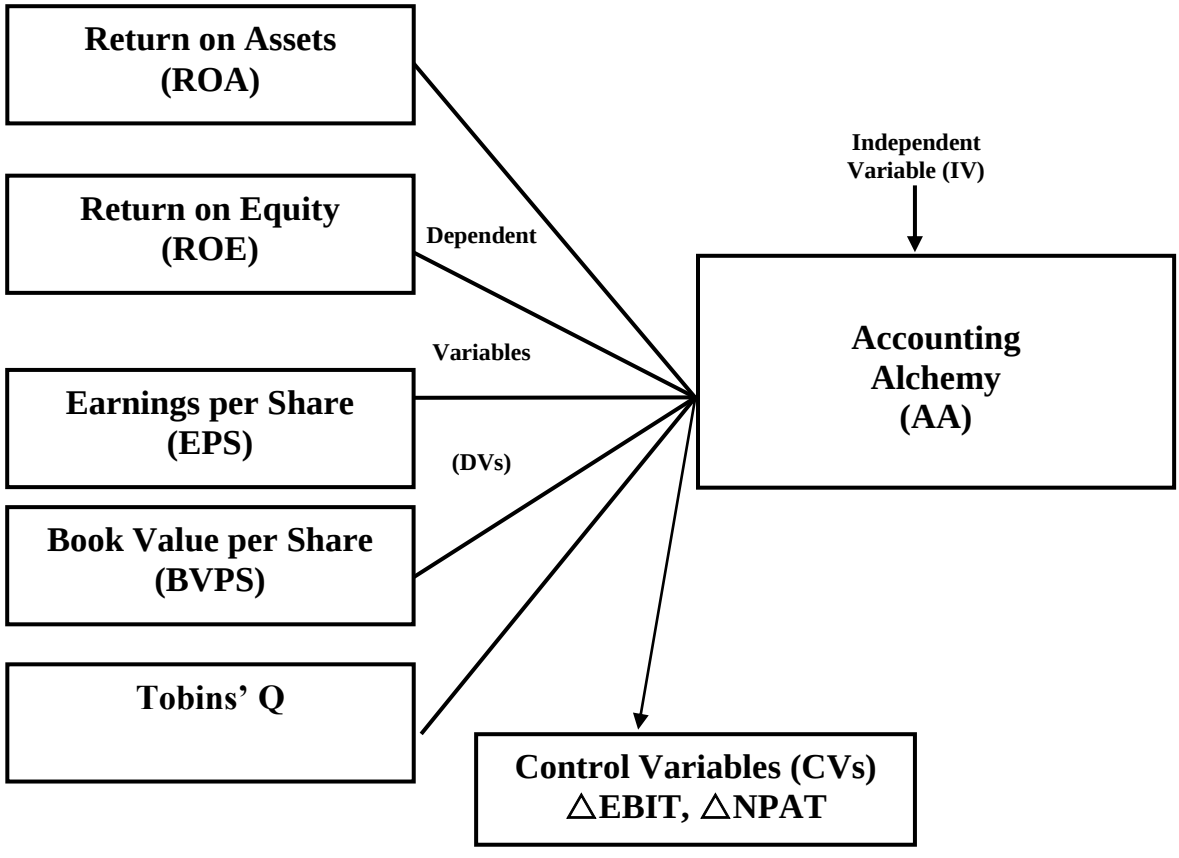

Figure 1: Conceptual Model of the Study
Source: Conceptualized by the Researcher, 2018

The above model tries to establish a relationship between the reported financial performance measures of the study such as earnings per share, book value per share, Tobin's Q, return on equity and return on assets as a function of accounting alchemy while controlling for changes in earnings before interest and tax

(△EBIT) and net profit after tax (△NPAT). Thus, the dependent variables are the reported financial performance measures (earnings per share, return on equity, return on assets, book value per share and Tobin's Q), independent variable is accounting alchemy while control variables are △EBIT and △NPAT. The use of NPAT and EBIT as control variables is based on the suggestions of Riley (2007); Gong, Li and Xie (2008); and Gramlich and Sorensen (2010), that they can be used to correct for management error forecasts associated with accounting numbers.

2.6 Summary and Gap in Literature

A major thread in accounting literature is how accounting alchemy can be measured. Regardless of the viewpoint of the prior studies on accounting alchemy (Verracchia, 2009; Barth, 2010; and Cole, 2017), there is no plausible measure aimed at estimating what accounting alchemy should be. Perhaps, methodological bottleneck may have led to the difficulties in measurement and construct of accounting alchemy, hence prior studies had to focus on earnings management; a major component of accounting alchemy. In view of this, the present study builds on existing accrual models of Jones (1991); and Dechow, Sloan & Sweeney (1995) in order to come up with a measure or model of accounting alchemy.

Besides, why prior studies were mainly country specific, and mostly in developed nations of the world, there are little or no study on countries in sub-Saharan Africa in a single study. Thus, there is a lacuna in accounting literature as to whether accounting alchemy will affect reported financial performance of firms in sub-Saharan Africa.

CHAPTER THREE

RESEARCH METHODS

3.1 Research Design

A research design refers to the overall strategy, approach and framework utilized in conducting research studies. According to Nachmias & Nachmias (2009), research design is the blueprint that enables the researcher to come up with solutions to the problems and guide the researcher in the various stages of the research. However, the ex-postfacto research design was adopted in this study. This design was adopted because it seeks to establish the factors that are associated with certain occurrence or type of behaviour by analyzing past events of already existing condition. Hence, the researcher has no control over certain factors or variables as the events already exist and can neither be manipulated or changed.

3.2 Population of the Study

The population of the study refers to the totality of all the elements or variables under study from which the researcher draws his sample. In this study, the population of the study comprised of all publicly quoted consumer and industrial goods companies on recognized Stock Exchanges in sub-Saharan Africa (West: Nigeria, Southern: South Africa and East: Kenya). There are forty-one (41) publicly quoted consumer and industrial goods firms in Nigeria (The Nigerian Stock Exchange, 2018). In Kenya, there are twenty-three (23) quoted consumer and industrial goods firms (The Nairobi Securities Exchange, 2018) and seventy-seven (77) in South Africa (The Johannesburg Stock Exchange, 2018) (see appendix I)thus,

making a total of one hundred and forty-one (141) publicly quoted consumer and industrial goods firms in the selected sub-Saharan Africa countries.

3.3 Sample and Sampling Technique

This study adopted the stratified random sampling technique by selecting companies from the most viable Stock Exchange in each of the regions in sub-Saharan Africa. Thus, the most capitalized companies in each of these countries was selected and included in the sample of this study. Sub-Saharan Africa is divided into four (4) regions: West Africa, Southern Africa, East Africa and Central Africa. The sample selection is influenced due to the robustness of a country's economy and the viability of their Stock Exchange. Having selected the country based on its economy robustness, the judgmental sampling technique was employed in selecting the numbers of companies from each stratum (sectors) in that country. The judgmental sampling technique became imperative at this stage given that the researcher had no access to relevant data on some companies quoted on the capital market of the selected countries.

Any company whose required data are incomplete or unavailable was eliminated from the sample. Hence, twenty-nine (29) companies was selected in Nigeria, twenty-five (25) in South Africa and ten (10) in Kenya, totaling sixty-four (64) consumer and industrial goods firms in the selected countries of sub-Saharan Africa. On the basis of robustness of economy and viability of Stock Exchange, Central Africa was excluded from the sample of study. Therefore, Nigeria was selected from West Africa (the country where the study is being carried out), South

Africa (Southern Africa) and Kenya (East Africa) (see appendix II for the list of sampled firms from the three countries in sub-Saharan Africa). The justification of the study sample size is based on exchange with the most capitalized stocks; hence South Africa was the highest with the sampled firms, followed by Nigeria and lastly Kenya.

3.4 Sources of Data Collection

Data required for this was obtained from secondary sources. The secondary data was obtained from the Stock Exchange Factbooks, Annual Reports and Accounts and internet webpage of the quoted firms of sub-Saharan Africa countries. In this study, the performance measures comprised of return on equity, return on assets, earnings per share, book value per share, Tobin's Q, accounting alchemy measures consisting of net income, earnings before interest and tax, cashflow from operations, total asset and revenue and control measures such as changes in earnings before interest and tax and net profit after tax.The data obtained in this study have been validated by the regulatory framework of accounting and economic activities in the selected sub-Saharan Africa countries.

3.5 Model Specification

This present study builds on existing accrual models of Jones (1991); and Dechow, Sloan & Sweeney (1995) in order to come up with a measure or model of accounting alchemy. Jones model (1991) measured accruals net income – cash flow from operations while Deschow, Sloan & Sweeney (1995) model, measured accruals as annual current accruals: i.e. earnings before extraordinary items less cash from

operations). Given the above, it would be pertinent to first state both accrual models afterwards, modelling of accounting alchemy.

3.5.1 Jones (1991) and Deschow, Sloan & Sweeney (1995) Models

In light of the above, both accrual models (Jones; and Deschow, Sloan & Sweeney) are estimated as follows:

Equation 1: Jones (1991) Model:

$$VTA_i = NI_i - CFO_i \qquad eq.\ 1$$

Where:

VTA_i = Value of total accruals for firm *i*;

NI_i = Value of net income for firm *i*;

CFO_i = Value of cash flow from operations for firm *i*

Equation 2: Deschow, Sloan & Sweeney (1995) Model:

$$ACA_i = EBIT_i - CFO_i \qquad eq.\ 2$$

Where:

ACA_i = Annual current accruals for firm *i*;

$EBIT_i$ = Earnings before extraordinary items for firm *i*;

CFO_i = Cash from operations for firm *i*

The first model (Jones, 1991) is based on presenting the value of total accruals as the difference between net income and cash flows from operation; the formulae used in equation (1). Equation (1) is similar with the one used in prior studies such as Teoh, Welch & Wong, (1998), Xie (2001), Bartov, Gul & Tsui (2000); and Ayers, Jiang & Yeung, (2006). The second model (Deschow, Sloan and Sweeney, 1995) is based on presenting annual current accruals as the difference between earnings

before interest and taxand cash from operations; the formulae used in equation (2). Equation (2) is similar with the one used in prior studies such as Keung & Shih (2014); Zunera, Farah & Muhammad (2015); Dobre, Brad & Ciobanu (2015); and Gnyana (2016).

3.5.2 Modeling Accounting Alchemy

In this study, accounting alchemy was developed based on existing accrual models of Jones (1991); and Dechow, Sloan & Sweeney (1995). Considering both models, accounting alchemy model is given as:

$$AA = \frac{NI - CFO}{TA} + \frac{EBIT - CFO}{REV} \qquad eq.\ 3$$

Where AA = Accounting Alchemy, REV = Revenue and TA = Total Asset. While earnings management literature suggests that income and expense are the most manipulated, accounting alchemy proposes that aside income and expense, assets of firms are alchemized. Thus, we build on the existing accrual models by taking into cognizance relevant characteristics like revenue and asset components that can be easily transformed by preparers of financial statements. For instance, Jones (1991) proposed that management of firms manipulate expense or bad debts rather than revenue while Deschow, Sloan & Sweeney (1995) proposed that firms manipulate revenue rather than expense. On this note, accounting alchemy model is estimated as:

$$AA = \frac{REV(NI - CFO) + TA(EBIT - CFO)}{TA(REV)} \qquad eq.\ 4$$

Equations (4) can be specified to test the respective hypotheses of the study.

Accounting Alchemy and Return on Assets

$$ROA = f\left\{\frac{REV(NI - CFO) + TA(EBIT\text{-}CFO)}{TA\ (REV)}\right\} \qquad eq.\ 5$$

Accounting Alchemy and Return on Equity

$$ROE = f\left\{\frac{REV(NI - CFO) + TA(EBIT\text{-}CFO)}{TA\ (REV)}\right\} \qquad eq.\ 6$$

Accounting Alchemy and Earnings per Share

$$EPS = f\left\{\frac{REV(NI - CFO) + TA(EBIT\text{-}CFO)}{TA\ (REV)}\right\} \qquad eq.\ 7$$

Accounting Alchemy and Book Value per Share

$$BVPS = f\left\{\frac{REV(NI - CFO) + TA(EBIT\text{-}CFO)}{TA\ (REV)}\right\} \qquad eq.\ 8$$

Accounting Alchemy and Tobin's Q

$$TobinQ = f\left\{\frac{REV(NI - CFO) + TA(EBIT\text{-}CFO)}{TA\ (REV)}\right\} \qquad eq.\ 9$$

The study expressed equations 5-9 in explicit form and represented in equations 10-14:

$$ROA_{it} = \alpha_0 + ß_1 AA_{it} + €_{it} \qquad eq.\ 10$$

$$ROE_{it} = \alpha_0 + ß_1 AA_{it} + €_{it} \qquad eq.\ 11$$

$$EPS_{it} = \alpha_0 + ß_1 AA_{it} + €_{it} \qquad eq.\ 12$$

$$BVPS_{it} = \alpha_0 + ß_1 AA_{it} + €_{it} \qquad eq.\ 13$$

$$TobinQ_{it} = \alpha_0 + ß_1 AA_{it} + €_{it} \qquad eq.\ 14$$

To control for the relationship between the dependent and independent variables in equation 10-14, we introduced control variables(% change in earnings before interest and tax - △EBIT and % changein net profit after tax - △NPAT).The

use of NPAT and EBIT as control variables is based on the suggestions of Riley (2007); Gong, Li and Xie (2008); and Gramlich and Sorensen (2010), that they can be used to correct for management error forecasts linked with accounting numbers. Accounting alchemy goes on to provide corrective measures like employing changes in earnings before interest and extraordinary items and profit after tax as corrective measures to account for the hypothetical forecast error associated with accounting number. Thus, the composite model of the study on which basis the relevant hypotheses of the study were tested are presented in the following models:

Model 1: Accounting Alchemy and Return on Asset

$$ROA_{it} = \alpha_0 + ß_1 AA_{it} + ß_2 \triangle EBIT_{it} + ß_3 \triangle NPAT_{it} + €_{it} \qquad eq.\ 15$$

Model 2: Accounting Alchemy and Return on Equity

$$ROE_{it} = \alpha_0 + ß_1 AA_{it} + ß_2 \triangle EBIT_{it} + ß_3 \triangle NPAT_{it} + €_{it} \qquad eq.\ 16$$

Model 3: Accounting Alchemy and Earnings per Share

$$EPS_{it} = \alpha_0 + ß_1 AA_{it} + ß_2 \triangle EBIT_{it} + ß_3 \triangle NPAT_{it} + €_{it} \qquad eq.\ 17$$

Model 4: Accounting Alchemy and Book Value per Share

$$BVPS_{it} = \alpha_0 + ß_1 AA_{it} + ß_2 \triangle EBIT_{it} + ß_3 \triangle NPAT_{it} + €_{it} \qquad eq.\ 18$$

Model 5: Accounting Alchemy and Tobin's Q

$$TobinQ_{it} = \alpha_0 + ß_1 AA_{it} + ß_2 \triangle EBIT_{it} + ß_3 \triangle NPAT_{it} + €_{it} \qquad eq.\ 19$$

In order to arrive at the % change in earnings before interest and tax (EBIT), we computed the % change as follows:

$$\triangle EBIT_t = \frac{EBIT_t - EBIT_{t-1}}{EBIT_{t-1}} \qquad eq.\ 20$$

Where:

$\triangle EBIT_t$ = Earnings before interest and tax in current period

$\triangle EBIT_{t-1}$ = Earnings before interest and tax in prior period

Similarly, the % change in net profit after tax (NPAT) was computed as follows:

$$\triangle NPAT_t = \frac{NPAT_t - NPAT_{t-1}}{NPAIT_{t-1}} \quad \textit{eq. 21}$$

$\triangle NPAT_t$ = Net profit after tax in current period

$NPAT_{t-1}$ = Net profit after tax in prior period

Additionally, the other variables are described below:

ROA_{it} = Return on assets of firm *i* in year *t*

ROE_{it} = Return on equity of firm *i* in year *t*

Tobin's Q_{it} = Tobin's Q of firm *i* in year *t*

EPS_{it} = Earnings per share of firm *i* in year *t*

$BVPS_{it}$ = Book value per share of firm *I* in year *t*

AA_{it} = Accounting Alchemy of firm *i* in year *t*

ϵ_{it} = Error term (Non-discretionary accruals)

α &ß = Regression coefficients of the variables

The dependent variable which is reported financial performance (measuredby return on equity, return on assets, earnings per share, book value per share and Tobin's Q), independent variable (accounting alchemy) while control variables are

⊿EBIT and ⊿NPAT. The measurements of the study variables are presented in Table 3.2:

Table 3.1: Measurement of Variables

S/N	Variables	Measurement
1.	Return on Assets (ROA)	Ratio of operating income (profit before tax) to total assets (percentage).
2.	Tobin's Q	Ratio of market value of the firm to the replacement cost of its assets (percentage).
3.	Return on Equity (ROE)	Ratio of profit before tax to equity (percentage).
4.	Earnings per Share (EPS)	Difference in profit after tax and preference dividend divided by number of ordinary shares ranking for dividend (percentage).
5.	Book Value per Share	This is the shareholders fund less preference dividend, divided by number of ordinary shares (percentage).
6.	Total Accruals (TA)	Difference in net income & cashflows from operations
7.	Annual Current Accruals(ACA)	Difference in net income &earnings before extraordinary items
8.	Operating Cash Flows(CFO)	Net cash flow from operating activities.
9.	Earnings before extraordinary Item (EBIT)	This is the difference between earnings and extraordinary items
10.	Net Income (NI)	Profit after tax

Source: Researcher's Compilation, 2018

3.6 Method of Data Analysis

This study employed panel data comprising of earnings per share, book value per share, Tobin's Q, return on equity, return on asset, accounting alchemy components (net income, cash flows from operations, earnings before extraordinary items, total asset and revenue) and ⊿EBIT and ⊿NPAT. The independent variableis

accounting alchemy, dependent variables are reported financial performance measures like earnings per share, book value per share, Tobin's Q, return on equity, and return on asset and control variables are ⊿EBIT and ⊿NPAT. Estimating the parameters of the stated models was done via data related to the period of 2012-2016 for the selected quoted firms in sub-Saharan Africa (West Africa, Southern Africa and East Africa).

The period under investigation is based on the fact that this period experienced improvement in financial reporting across the globe and high demands for quality financial statements in the most capital markets of the world, including Africa.Moreover, given the currency differential of the diverse countries investigated (e.g. Nigeria: *Naira*; South Africa: *Rand*; and Kenya: *Shillings*), all the study variables were transformed using the United States Dollar (USD) in order to avoid scaling problem.

Multiple regression estimation technique was employed in gauging the association between accounting alchemy and reported financial performance of the selected quoted firms in sub-Saharan Africa. The a-priori expectation is that accounting alchemy will influence reported financial performance of firms.First, analysis encompassed descriptive statistics (mean, standard deviation, minimum and maximum values) of the variables; second, correlation matrix (Pearson correlation), third, variance inflator factor and normality test, fourth, heteroscedasticity, fifth, fixed and random effects tests.Nevertheless, Hausman specification test was done in order to determine whether random or fixed effect is more efficient.The analysis was done via STATA 13.0 version.

CHAPTER FOUR

PRESENTATION, ANALYSIS OF DATA AND DISCUSSION

4.1 Data Presentation

In this study, we investigated accounting alchemy and reported financial performance of selected quoted firms in sub-Saharan Africa from 2012-2016. For the purpose of analysis, sampled firms were drawn from the consumer and industrial goods subsector and a panel data analysis was adopted. In this chapter, we presented results for the mean, standard deviation, minimum and maximum values, correlation matrix, variance inflation factor, heteroscedasticity, normality test, Fixed/random effects and Hausman specification tests. The variables of interest include return on asset (ROA), return on equity (ROE), earnings per share (EPS), book value per share (BVPS) and Tobin's Q as the dependent variables. The independent variable is accounting alchemy (AA), and control variables (changes in earnings before interest and tax: △EBIT; and net profit after tax:△NPAT). Additionally, an analysis of accounting alchemy as it affects the reported financial performance on a country by country basis across sub-Saharan Africa was presented.

4.2 Data Analysis

Table 4.1: Mean, Standard Deviation, Minimum & Maximum Values of Dependent (ROE, ROA, EPS, BVPS & TobinQ), Independent (AA) & Control (∆EBIT &∆NPAT) Variables of the Study

Variable	Obs	Mean	Std. Dev.	Min	Max
roe	319	15.67038	104.0443	-989.38	1131.01
roa	319	6.76373	11.1076	-31.6	61.87
eps	319	3.644734	7.123178	-12.6	49.76
bvps	317	21.97426	31.02291	-5.12	226.03
tobinq	313	2.433419	2.936005	.41	23.57
aa	318	7.000943	22.11581	-114.03	162.72
rebit	243	.0293397	1.709439	-16.79283	15.48601
rnpat	255	-3.663777	53.25258	-847.5	43.64505

Source: Researcher's Computation via STATA 13.0

Table 4.1 shows the mean (average) for each of the variables and their respective standard deviation (degree of dispersion). The results above provided shed light on the nature of the selected companies across countries in sub-Saharan Africa. First, book value per share (BVPS) shows the highest average in the study with a value of 21.97. This was followed by return on equity (ROE) and accounting alchemy (AA). ROE shows the highest dispersion in the study with a standard deviation value of 104.04 while △EBIT (rEBIT) shows the least dispersion with a standard deviation of 1.71. The dispersion of △EBIT shows that the sampled companies in sub-Saharan Africa are not too dispersed from each other; an indication of relative change in EBIT across the sampled firms. Also, AA, △EBIT and △NPAT recorded an average of 7.00, 0.03 and -3.66 respectively.

Besides, variation of the variables during the period under review was revealed by the maximum and minimum values. The results of the maximum and minimum valuesfor ROE (1131.01) and Tobin's Q (0.41) respectively suggest among others that most likely, the variables of the study were not constant over time. Given that all the variables of the study are not constant over time, the relationship between accounting alchemy and reported financial performance in sub-Saharan Africa becomes feasible. Consequently, in examining the relationship between accounting alchemy and reported financial performance of companies in sub-Saharan Africa, we employed the Pearson correlation coefficient matrix and the results are presented in Table 4.2.

Table 4.2: Correlation Matrix of Dependent (ROE, ROA, EPS, BVPS & TobinQ), Independent (AA) & Control (∆EBIT &∆NPAT) Variables of the Study

	roe	roa	eps	bvps	tobinq	aa	rebit	rnpat
roe	1.0000							
roa	0.2436	1.0000						
eps	0.1389	0.4852	1.0000					
bvps	0.0181	0.0956	0.5453	1.0000				
tobinq	0.1760	0.3520	0.2127	-0.0689	1.0000			
aa	0.1848	0.7680	0.3597	0.1552	0.2124	1.0000		
rebit	0.0470	0.0706	0.0331	0.0138	-0.0089	0.0552	1.0000	
rnpat	0.0132	0.0384	-0.1099	-0.2394	0.0233	-0.0015	-0.0274	1.0000

Source: Researcher's Computation via STATA 13.0

In Table 4.2, the result shows that accounting alchemy (AA) is positively linked to all the reported financial performance measures of the study such as return on equity (ROE), return on asset (ROA), earnings per share (EPS), book value per share (BVPS) and Tobin's Q. Interestingly, accounting alchemy (AA) is negatively related to △NPAT and △EBIT. However, the correlation matrix also revealed that no two explanatory variables of the study were perfectly correlated, since none of the correlation coefficients exceed 0.8 (Gujarati, 2003). The above position is further confirmed from the result of the multicollinearity test as shown below:

Table 4.3: Multicollinearity/Heteroscedasticity Result of Dependent (ROE, ROA, EPS, BVPS & TobinQ), Independent (AA) & Control(∆EBIT &∆NPAT) Variables of the Study

Variable	VIF	1/VIF
rebit	1.00	0.996205
aa	1.00	0.996954
rnpat	1.00	0.999248
Mean VIF	1.00	

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of roe

         chi2(1)      =    61.87
         Prob > chi2  =   0.0000
```

Source: Researcher's Computation via STATA 13.0

The table above shows the multicollinearity and heteroskcedasticity test results for the data. The result of VIF = 1.00 is less than the accepted VIF value of 10.0, suggesting that there is the absence of multicollinearity problem in the model. Multicollinearity between explanatory variables may result to wrong signs or implausible magnitudesin the estimate model coefficients, and the bias of standard errors of the coefficients. Also, the Breusch-Pagan/Cook-Weisberg test is statistically significant at 0.05% level of significance indicating the absence of heteroscedasticity in the variables. To further confirm the above, variables of the study were subjected to normality test and the results are presented in Table 4.4 and fig(s) 2a-2h.

Table 4.4: Shapiro-Wilk W Test for Normal Dataof Dependent (ROE, ROA, EPS, BVPS & TobinQ), Independent (AA) & Control (∆EBIT &∆NPAT) Variables of the Study

Variable	Obs	W'	V'	z	Prob>z
roe	319	0.29846	170.797	10.955	0.00001
roa	319	0.87047	31.536	7.355	0.00001
eps	319	0.64356	86.779	9.512	0.00001
bvps	317	0.69340	74.236	9.176	0.00001
tobinq	313	0.56219	104.844	9.903	0.00001
aa	318	0.69134	74.940	9.198	0.00001
rebit	243	0.37695	119.867	10.023	0.00001
rnpat	255	0.05018	190.481	11.027	0.00001

Source: Researcher's Computation via STATA 13.0

The result of the normality test is as presented in Table 4.4. The Shapiro-Wilk W statistics shows that most of the variables are normally distributed at 1% significance; hence the data of the study satisfies the normality condition. This above scenario was further captured in the normal probability plots presented as follows:

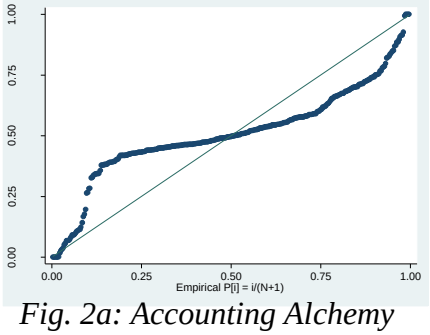

Fig. 2a: Accounting Alchemy

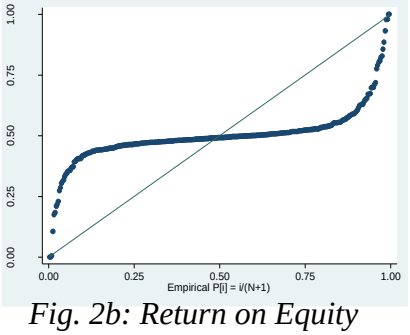

Fig. 2b: Return on Equity

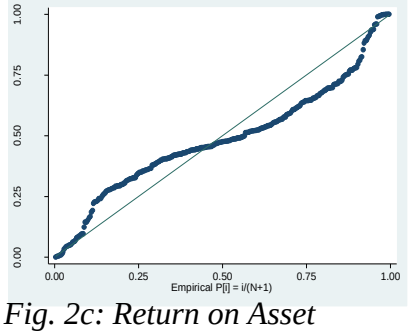

Fig. 2c: Return on Asset

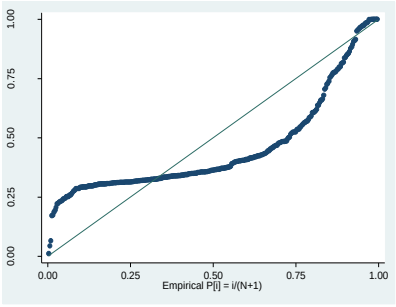

Fig. 2d: Earnings per Share

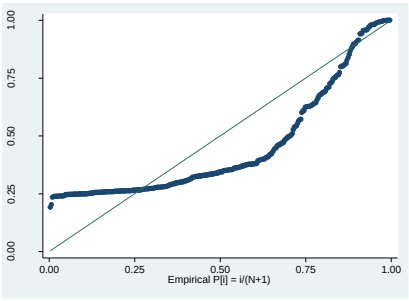

Fig. 2e: Book Value per Share

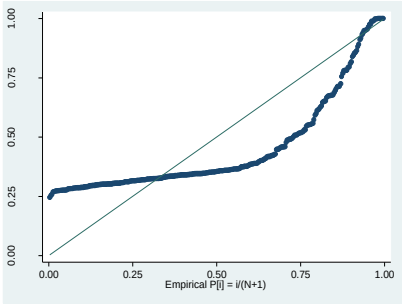

Fig. 2f: Tobin's Q

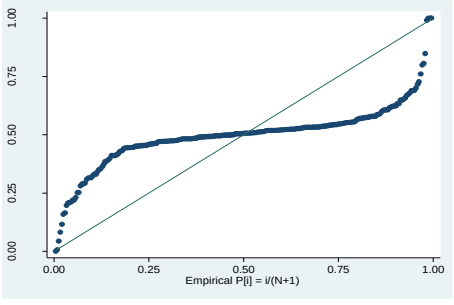

Fig. 2g: ⊿EBIT

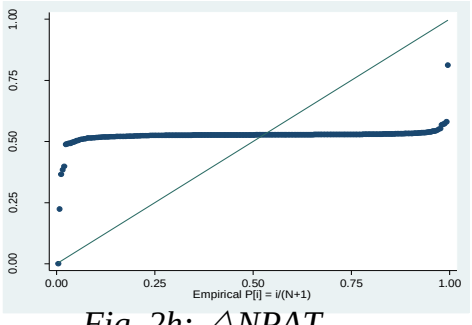

Fig. 2h: ⊿NPAT

4.2.1 Ordinary Least Square (OLS) Result

In this study, OLS resultswere used to check if there is any significant relationship between the dependent and independent variables.Furthermore, fixed and random effects for panel data result was used support the results of the OLS results of the study. The OLS results are presented below:

Table 4.5a: OLS Result Showing the Relationship between Accounting Alchemy (AA) and Return on Equity (ROE)

Source	SS	df	MS	Number of obs =	243
				F(3, 239) =	2.96
Model	53723.2451	3	17907.7484	Prob > F =	0.0329
Residual	1445271.28	239	6047.16016	R-squared =	0.0358
				Adj R-squared =	0.0237
Total	1498994.52	242	6194.19225	Root MSE =	77.763

roe	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.7950168	.2762448	2.88	0.004	.2508311	1.339202
rebit	1.719853	2.929813	0.59	0.558	-4.051701	7.491407
rnpat	.0208693	.0916692	0.23	0.820	-.1597134	.2014519
_cons	9.15366	5.181233	1.77	0.079	-1.053055	19.36037

Source: Researcher's Computation via STATA 13.0

In Table 4.5a, we presented the OLS result and it was observed that the values of the R-squared and adjusted R-squared were (3.58%) and (2.37%) respectively. This indicates that all the independent variables jointly explain about 4% of the systematic variations in the model for the sampled period (2012-2016). The small R-squared shows that there are more excluded variables that drive the dependent variable. The F-statistics (df=3, 239, f-ratio=2.96) with a p-value of 0.0329 shows that the result is significant at 5 percent level which means that the model for accounting alchemy and return on equity was well specified. Also, accounting alchemy (AA) appears to have a positive influence on return on equity (ROE) and was statistically significant at 5%. However, △EBIT and △NPAT appear to be positive but were statistically insignificant at 5 percent level.

Table 4.5b: OLS Result Showing the Relationship between Accounting Alchemy (AA) and Return on Asset (ROA)

Source	SS	df	MS	Number of obs =	243
				F(3, 239) =	115.13
Model	15964.5527	3	5321.51757	Prob > F =	0.0000
Residual	11047.34	239	46.2231799	R-squared =	0.5910
				Adj R-squared =	0.5859
Total	27011.8927	242	111.619391	Root MSE =	6.7988

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.4463125	.0241517	18.48	0.000	.398735	.4938899
rebit	.1822504	.2561498	0.71	0.477	-.3223493	.68685
rnpat	.0078285	.0080145	0.98	0.330	-.0079596	.0236166
_cons	3.99628	.4529886	8.82	0.000	3.10392	4.88864

Source: Researcher's Computation via STATA 13.0

In Table 4.5b, we presented the OLS result and it was found that the values of the R-squared and adjusted R-squared were (59.10%) and (58.59%) respectively.

This implies that all the independent variables jointly explain about 59% of the systematic variations in the model for the sampled period (2012-2016). This value for R-squared shows that about 59% of variations in ROA is accounted for by accounting alchemy. The F-statistics (df=3, 239, f-ratio=115.13) with a p-value of 0.0000 shows that the established relationship is significant at 5 percent level which means that accounting alchemy has significant influence on ROA of the sampled firms. However, △EBIT and △NPAT appear to be positive but were statistically insignificant at 5 percent level. Furthermore, we present the OLS result of the link between AA and EPS (see Table 4.5c)

Table 4.5c: OLS Result Showing the Relationship between Accounting Alchemy (AA) and Earnings per Share (EPS)

Source	SS	df	MS		
				Number of obs	= 243
				F(3, 239)	= 12.99
Model	1799.55643	3	599.852143	Prob > F	= 0.0000
Residual	11035.6153	239	46.1741226	R-squared	= 0.1402
				Adj R-squared	= 0.1294
Total	12835.1717	242	53.0378997	Root MSE	= 6.7952

eps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.1435109	.0241389	5.95	0.000	.0959587	.1910631
rebit	.0460838	.2560139	0.18	0.857	-.4582481	.5504156
rnpat	-.0146081	.0080103	-1.82	0.069	-.0303878	.0011717
_cons	2.951922	.4527482	6.52	0.000	2.060036	3.843809

Source: Researcher's Computation via STATA 13.0

In Table 4.5c, we presented the OLS result and it was found that the values of R-squared and adjusted R-squared were (14.02%) and (12.94%) respectively. This means that all the independent variables jointly explain about 14.02% of the systematic variations in the dependent variable (EPS) for the sampled period (2012-

2016). The small R-squared shows that there are more excluded variables that drive the dependent variable. Despite the value of R-squared, F-statistics (df=3, 239, f-ratio=12.99) with a p-value of 0.0000 suggests that at 5%, there is significant relationship between accounting alchemy and earnings per share. Also, accounting alchemy (AA) appears to have a positive influence on earnings per share (EPS), which again was statistically significant at 5%. However, △EBIT appear to be positive while △NPAT negative; but both were statistically insignificant at 5 percent level.

Table 4.5d: OLS Result Showing the Relationship between Accounting Alchemy (AA) and Book Value per Share (BVPS)

Source	SS	df	MS		
				Number of obs =	241
				F(3, 237) =	6.94
Model	21191.7833	3	7063.92776	Prob > F =	0.0002
Residual	241290.528	237	1018.1035	R-squared =	0.0807
				Adj R-squared =	0.0691
Total	262482.312	240	1093.6763	Root MSE =	31.908

bvps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.2785514	.1134683	2.45	0.015	.0550161	.5020868
rebit	-.0125221	1.202179	-0.01	0.992	-2.380843	2.355799
rnpat	-.1444139	.0376143	-3.84	0.000	-.218515	-.0703128
_cons	21.45122	2.132776	10.06	0.000	17.2496	25.65284

Source: Researcher's Computation via STATA 13.0

In Table 4.5d, we presented the OLS result and it was found that the values of R-squared and adjusted R-squared were (8.07%) and (6.91%) respectively. This means that all the independent variables jointly explain about 8.07% of the systematic variations in the dependent variable (BVPS) for the sampled period (2012-2016). The small R-squared shows that there are more excluded variables that drive the dependent variable. Despite the value of the R-squared, the result of F-

statistics (df=3, 237, f-ratio=6.94) with a p-value of 0.0002 shows that at 5% level of significance, a significant relationship was found between accounting alchemy and book value per share. Also, accounting alchemy (AA) appears to have a positive influence on book value per share (BVPS) and was statistically significant at 5%. However, △EBIT appear to be negative and but was statistically insignificant at 5 percent level except that △NPAT was negative but statistically significant at 5 percent level.

Table 4.5e: OLS Result Showing the Relationship between Accounting Alchemy (AA) and Tobin's Q

Source	SS	df	MS		
				Number of obs =	238
				F(3, 234) =	3.77
Model	113.594385	3	37.8647949	Prob > F =	0.0114
Residual	2351.37689	234	10.0486192	R-squared =	0.0461
				Adj R-squared =	0.0339
Total	2464.97128	237	10.4007227	Root MSE =	3.17

tobinq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.0377019	.0112883	3.34	0.001	.0154622	.0599416
rebit	-.0374068	.1194415	-0.31	0.754	-.272725	.1979114
rnpat	.0013474	.003737	0.36	0.719	-.0060151	.0087099
_cons	2.306971	.2129979	10.83	0.000	1.887333	2.72661

Source: Researcher's Computation via STATA 13.0

In Table 4.5e, we presented the OLS result and it was revealed that the values of R-squared and adjusted R-squared were (4.61%) and (3.39%) respectively. This means that all the independent variables jointly explain about 4.61% of the systematic variations in the dependent variable (Tobin's Q) for the sampled period (2012-2016). The small R-squared shows that there are more excluded variables that drive the dependent variable. Despite the value of the R-squared, the result of F-

statistics (df=3, 234, f-ratio=3.77) with a p-value of 0.0114 shows that at 5% level of significance, a significant relationship was found between accounting alchemy and Tobin's Q. Also, accounting alchemy (AA) appears to have a positive influence on Tobin's Q and was statistically significant at 5%. △EBIT appear to be negative and △NPAT was positive but both were statistically insignificant at 5 percent level.

4.2.2 Country-by-Country Analysis of the Dependent, Independent and Control Variables of the Study

Table 4.6a: Descriptive and Inferential Statistics of the Dependent, Independent and Control Variables of the Study for Kenya (East Africa)

Dependent Variable: Return on Equity (ROE) 2012-2016				
Variable	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
C	11.236	3.848	2.92	0.006
AA	1.136	0.125	9.10	0.000
△EBIT	4.479	3.008	1.49	0.145
△NPAT	1.789	1.394	2.92	0.006
Mean =12.685	Std. Dev.=43.899	R^2 = 0.7035	R^2 Adj. =0.6788	Obs. = 40
Dependent Variable: Return on Asset (ROA): 2012-2016				
C	5.092	1.432	3.56	0.0001
AA	0.409	0.046	8.83	0.000
△EBIT	2.301	1.119	2.06	0.047
△NPAT	0.257	0.519	0.50	0.623
Mean =5.181	Std. Dev.=14.147	R^2 = 0.7022	R^2 Adj. =0.6774	Obs. = 40
Dependent Variable: Earnings per Share (EPS): 2012-2016				
C	7.056	1.888	3.74	0.001
AA	0.239	0.061	3.91	0.000
△EBIT	0.773	1.476	0.52	0.604
△NPAT	0.948	0.684	1.39	0.174
Mean =6.007	Std. Dev.=12.671	R^2 =0.3108	R^2 Adj. =0.2534	Obs.= 40
Dependent Variable: Book Value per Share (BVPS): 2012-2016				
C	31.981	4.446	7.19	0.000
AA	0.399	0.144	2.77	0.009
△EBIT	-0.198	3.475	-0.06	0.955
△NPAT	2.064	1.610	1.28	0.208
Mean =29.762	Std. Dev.= 23.381	R^2 =0.1986	R^2 Adj. =0.1318	Obs. = 40
Dependent Variable: Tobin's Q: 2012-2016				
C	2.067	0.3199	6.46	0.000
AA	0.033	0.100	3.13	0.003
△EBIT	-0.287	0.250	-0.11	0.909
△NPAT	0.123	0.116	1.06	0.296
Mean =1.813	Std. Dev.=2.016	R^2 =0.2267	R^2 Adj. =0.1623	Obs. = 40

Source: Researcher's Computation via STATA 13.0

Table 4.6a presents the country-by-country results for Kenya (East Africa) as regards the dependent, independent and control variables of the study. It is obvious from the table that the coefficients of all the sampled variables except △EBIT (-0.198; -0.287) carry negative signs for BVPS and Tobins Q. The negative sign in the coefficients for △EBIT in Kenya is an indication that accounting alchemy negatively influenced the earnings before interest and tax for the period. However, it was found that all the variables (accounting alchemy and reported financial performance) were statistically significant for Kenya. This implies that accounting alchemy has significant influenceon reported financial performance measures of the study in Kenya, especially for BVPS and Tobin's Q.

Table 4.6b: Descriptive and Inferential Statistics of the Dependent, Independent and Control Variables of the Study for Nigeria (West Africa)

Dependent Variable: Return on Equity (ROE) 2012-2016				
Variable	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
C	7.791	10.977	0.71	0.479
AA	0.641	0.631	1.02	0.312
△EBIT	2.496	4.535	0.55	0.583
△NPAT	1.285	2.205	0.58	0.479
Mean =7.620	Std. Dev.=118.644	R^2 =0.5943	R^2 Adj.=0.0100	Obs. = 113
Dependent Variable: Return on Asset (ROA): 2012-2016				
C	3.324	0.700	4.75	0.000
AA	0.503	0.040	12.51	0.000
△EBIT	-0.046	0.289	-0.16	0.875
△NPAT	0.057	0.141	0.41	0.684
Mean =6.073	Std. Dev.=10.961	R^2 =0.5943	R^2 Adj.=0.5831	Obs. = 113

Dependent Variable: Earnings per Share (EPS): 2012-2016				
C	1.675	0.483	3.47	0.001
AA	0.926	0.277	3.34	0.001
△EBIT	0.038	0.199	0.19	0.850
△NPAT	0.006	0.097	0.06	0.955
Mean =2.134	Std. Dev.= 5.026	R^2 =0.0944	R^2 Adj.=0.0695	Obs. = 113
Dependent Variable: Book Value per Share (BVPS): 2012-2016				
C	9.316	1.25	7.44	0.000
AA	0.195	0.711	2.71	0.008
△EBIT	0.111	0.517	0.21	0.831
△NPAT	0.078	0.251	0.31	0.757
Mean =9.794	Std. Dev.= 12.443	R^2 =0.0667	R^2 Adj.=0.0410	Obs. = 113
Dependent Variable: Tobin's Q: 2012-2016				
C	1.997	0.194	10.32	0.000
AA	0.402	0.110	3.65	0.000
△EBIT	-0.046	0.079	-0.06	0.954
△NPAT	-0.010	0.039	-0.25	0.804
Mean =2.238	Std. Dev.= 1.978	R^2 =0.1107	R^2 Adj.=0.0857	Obs. = 113

Source: Researcher's Computation via STATA 13.0

Table 4.6b presents the country-by-country results for Nigeria (West Africa) as regards the dependent, independent and control variables of the study. It is obvious from the table that the coefficients of all the sampled variables except △EBIT (*-0.046*; *-0.046*) and △NPAT carry negative signs for ROA and Tobin's Q. The negative sign in the coefficients for △EBIT and △NPAT is an indication that accounting alchemy negatively influenced the earnings before interest and tax and net profit after tax for the period. Besides, it was revealed that variables of ROA, EPS, BVPS and Tobin's Q have been affected by accounting alchemy except ROE. This implies that accounting alchemy has significant influenceon reported financial performance measures in Nigeriafor ROA, EPS, BVPS and Tobin's Q.

Table 4.6c: Descriptive and Inferential Statistics of the Dependent, Independent and Control Variables of the Study for South Africa (Southern Africa)

Dependent Variable: Return on Equity (ROE) 2012-2016				
Variable	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
C	13.381	3.619	3.70	0.000
AA	0.635	0.324	1.96	0.054
△EBIT	-21.952	5.947	-3.69	0.000
△NPAT	-0.002	0.0311	-0.06	0.952
Mean =26.139	Std. Dev.=102.846	R^2 =0.1406	R^2 Adj.=0.1106	Obs. = 90
Dependent Variable: Return on Asset (ROA): 2012-2016				
C	3.887	0.724	5.37	0.000
AA	0.446	0.065	6.88	0.000
△EBIT	-0.443	1.189	-0.37	0.710
△NPAT	0.007	0.006	1.13	0.263
Mean =8.193	Std. Dev.= 9.754	R^2 =0.4435	R^2 Adj.=0.4241	Obs. = 90
Dependent Variable: Earnings per Share (EPS): 2012-2016				
C	4.046	0.722	5.60	0.000
AA	0.063	0.065	0.97	0.334
△EBIT	0.606	1.187	0.51	0.611
△NPAT	-0.014	0.006	-2.18	0.032
Mean =4.441	Std. Dev.= 5.658	R^2 =0.0843	R^2 Adj.=0.0523	Obs. = 90
Dependent Variable: Book Value per Share (BVPS): 2012-2016				
C	34.297	6.179	5.55	0.000
AA	0.217	0.554	0.39	0.697
△EBIT	0.641	10.107	0.06	0.950
△NPAT	-0.130	0.053	-2.46	0.016
Mean =2.919	Std. Dev.= 3.964	R^2 =0.0724	R^2 Adj. =0.0392	Obs. = 90
Dependent Variable: Tobin's Q: 2012-2016				
C	2.739	0.651	4.21	0.000
AA	0.052	0.059	0.88	0.381
△EBIT	-0.510	1.071	-0.48	0.635
△NPAT	0.002	0.006	0.27	0.787
Mean =2.919	Std. Dev.= 3.964	R^2 =0.0110	R^2 Adj.=-0.0248	Obs. = 90

Source: Researcher's Computation via STATA 13.0

Table 4.6c presents the country-by-country results for South Africa (Southern Africa) as regards the dependent, independent and control variables of the study. It is obvious from the table that the coefficients of all the sampled variables except △EBIT (*-21.952*; *-0.443, -0.510*) and △NPAT (*-0.002, -0.014, -0.130),* carry negative signs for ROE, ROA, EPS, BVPS and Tobin's Q. The negative sign in the coefficients for △EBIT and △NPAT is an indication that accounting alchemy

negatively influenced the earnings before interest and tax and net profit after tax for the period. Besides, it was found that ROE, ROA, EPS, BVPS and Tobin's Q are affected by accounting alchemy, indicating that accounting alchemy has significant influenceon reported financial performance measures of the study in South Africa.

4.3 Test of Research Hypotheses

H_o1: Accounting alchemy has no significant effect on the return on assets of selected quoted firms in sub-Saharan Africa

Table 4.7a Results of Model 1 Showing Accounting Alchemy and Return on Assets

Dependent Variable: Return on Assets (ROA)						
Estimator	***OLS (Obs.=243)***		***FE (Obs.=243)***		***RE (Obs. =243)***	
Variable	***Coef.***	***Prob.***	***Coef.***	***Prob.***	***Coef.***	***Prob.***
AA	0.4463*	0.000	0.4640*	0.000	0.4463*	0.000
	(18.48)		(18.31)		**(18.48)**	
△EBIT	0.1823	0.477	0.1966	0.448	0.1823	0.477
	(0.71)		(0.76)		**(0.71)**	
△NPAT	0.078	0.330	0.0072	0.375	0.0078	0.329
	(0.98)		(0.89)		**(0.98)**	
R-Squared	0.5910					
R-Squared Adj.	0.5859					
Prob. F.	0.0000					
R-Squared (within)			0.5900		0.5900	
R-Squared (between)			0.8010		0.8073	
R-Squared (overall)			0.5910		0.5190	
Wald Ch2					345.38	
Prob. Ch2					0.000*	
Hausman Test			Chi2(2) = 0.34		Prob>Chi2= 0.9529	

*Source: Researcher's Computation via STATA 13.0 * significant at 1% level** at 5% level*
Items in parentheses are t-ratios;Z-test in parentheses, bold face; AA=Accounting Alchemy; △NPAT=% change in net profit after tax;△EBIT=% change in earnings before interest and tax

Table 4.7a presents the results of Ordinary Least Square (OLS), Fixed Effect (FE) and Random Effect (RE) for Accounting Alchemy (AA) and Return on Asset (ROA) of the entire panel data. In model 1, we found that AA is highly significant at 1% level in explaining ROE. The output of OLS indicates that AA has a larger beta

coefficient in absolute terms than △EBIT and △NPAT. Beta value measures the degree to which each of the explanatory variables affects the dependent variables. Using OLS and RE, the coefficient of AA is 0.4463 and 0.4463 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 44% change in their level of return on assets.

Besides, accounting alchemy has high beta coefficient when FE is employed. The beta coefficientfor FE is 0.4640 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.4640), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 46% change in their level of return on asset. The t-tests of AA are 18.48, 18.31 and 18.48 for OLS, FE and RE respectively; the t-tests of △EBIT are 0.71, 0.76 and 0.71 for OLS, FE and RE respectively while △NPAT are 0.98, 0.89 and 0.98 for OLS, FE and RE respectively.

The purpose of the t-test is to check the individual significance of each explanatory variable. For t-test, any value less than 2 is not significant. The t-test further confirms that △EBIT and △NPAT are not significant in explaining ROA but AA is significant in explaining ROA. However, $R^2$is 0.5910 and is higher than both FE and RE. F-statistics is 115.13 with a probability value (p-value) of 0.000 which is highly significant. F-statistics is a measure of joint significance of all explanatory variables of the model. This may provide support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and return on asset (ROA) among the selected companies in sub-Saharan Africa.

The results of Hausman specification tests are: Chi2(3)=0.34 and p-value= 0.9529; this implies that Fixed Effect (FE) is more efficient than Random Effect(RE). Hausman specification test was performed to determine the model that is more efficient. The result of FE showed that the subjects from which measurements are drawn from are fixed, and that the differences between companies in sub-Saharan Africa are therefore not of interest, thus the subjects and their variances are identical. If Probability (P) value is insignificant, then, FE is more efficient than RE. Also, Wald test provides a likelihood-ratio test of the model's adequacy. The Wald test via STATA presents *p*-values instead of reporting the critical values. The p-values measure the evidence against H_0. They are the largest significant level at which a test can be conducted without rejecting H_0. In model1, the p-value is 0.000; the smaller the *p*-value, the more evidence to reject H_0.

Decision: Since Wald Ch2-statistics is 345.38 with a probability value (p-value) of 0.0000 showing that it is highly significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that accounting alchemy has significant effect on the return on assets of selected quoted firms in sub-Saharan Africa

H_o2: Accounting alchemy exert no significant effect on return on equity of selected quoted firms in sub-Saharan Africa

Table 4.7b Results of Model 2 Showing Accounting Alchemy and Return on Equity

Dependent Variable: Return on Equity (ROE)						
Estimator	**OLS (Obs.=243)**		**FE (Obs.=243)**		**RE (Obs. =243)**	
Variable	**Coef.**	**Prob.**	**Coef.**	**Prob.**	**Coef.**	**Prob.**
AA	0.7950*	0.004	0.7918*	0.005	0.7950*	0.004
	(2.88)		(2.84)		**(2.88)**	
△EBIT	1.7199	0.558	0.1851	0.533	1.7199	0.557
	(0.59)		(0.63)		**(0.59)**	
△NPAT	0.0209	0.820	0.0120	0.897	0.0209	0.820
	(0.23)		(0.13)		**(0.23)**	
R-Squared	0.0358					
R-Squared Adj.	0.0237					
Prob. F.	0.0329					
R-Squared (within)			0.0357		0.0357	
R-Squared (between)			0.0578		0.0986	
R-Squared (overall)			0.0358		0.0358	
Wald Ch2					8.88	
Prob. Ch2					0.0309*	
Hausman Test			Chi2(2) = 0.44		Prob>Chi2= 0.9311	

*Source: Researcher's Computation via STATA 13.0 * significant at 1% level ** at 5% level*
Items in parentheses are t-ratios; Z-test in parentheses, bold face; AA=Accounting Alchemy; △NPAT=% change in net profit after tax;△EBIT=% change in earnings before interest and tax

Table 4.7b shows the results of accounting alchemy (AA) and return on equity (ROE) in the analysis of model 2. The table presents the results of Ordinary Least Square (OLS), Fixed Effect (FE) and Random Effect (RE) for accounting alchemy and return on equity. In this model, accounting alchemy is highly significant at 1% level in explaining return on equity. The output of OLS indicates that accounting alchemy has a larger beta coefficient, absolute terms than △EBIT and △NPAT. Using OLS and RE, the coefficient of accounting alchemy is 0.7950 and 0.7950 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 80% change in their level of return on equity.

Accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.7918 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.918), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 79% change in their level of return on equity. The t-tests of AA are 2.88, 2.84 and 2.88 for OLS, FE and RE respectively; the t-tests of △EBIT are 0.59, 0.63 and 0.59 for OLS, FE and RE respectively while △NPAT are 0.23, 0.13 and 0.23 for OLS, FE and RE respectively. The t-test further confirms that △EBIT and △NPAT are not significant in explaining ROE but AA is significant in explaining ROE. However, $R^2$is 0.0358 and is higher than both FE and RE. F-statistics is 2.96 (p-value = 0.0329) which is significant. The f-statistics provides support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and return on equity (ROE) among the selected companies in sub-Saharan Africa.

The results of Hausman specification tests are: Chi2(3)=0.44 and p-value= 0.9311; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE). The result of FE showed that the subjects from which measurements are drawn from are fixed, and that the differences between companies in sub-Saharan Africa are therefore not of interest, thus the subjects and their variances are identical. The Wald test via STATA presents *p*-values instead of reporting the critical values. The p-values measure the evidence against H_0. They are the largest significant level at which a test can be conducted without rejecting H_0. In model 2, the p-value is 0.0329; the smaller the *p*-value, the more evidence to reject H_0.

Decision: Since the Wald Ch2-statistics is 8.88 (p-value = 0.0309), it means that it is significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that accounting alchemy exert significant effect on return on equity of selected quoted firms in sub-Saharan Africa.

H_o3: Accounting alchemy has no significant association with earnings per share of selected quoted firms in sub-Saharan Africa

Table 4.7c: Results of Model 3 Showing Accounting Alchemy and Earnings per Share

Dependent Variable: Earnings per Share (EPS)						
Estimator	**OLS (Obs.=243)**		**FE (Obs.=243)**		**RE (Obs. =243)**	
Variable	**Coef.**	**Prob.**	**Coef.**	**Prob.**	**Coef.**	**Prob.**
AA	0.1435* (5.95)	0.000	0.1434* (5.88)	0.000	0.1435* **(5.95)**	0.000
△EBIT	0.0461 (0.18)	0.857	0.0521 (0.20)	0.841	0.0461 **(0.18)**	0.857
△NPAT	-0.0146 (-1.82)	0.069	-0.0149 (-1.84)	0.0.067	-0.0146 **(-1.82)**	0.068
R-Squared	0.1402					
R-Squared Adj.	0.1294					
Prob. F.	0.0000					
R-Squared (within)			0.1399		0.1399	
R-Squared (between)			0.4951		0.5089	
R-Squared (overall)			0.1402		0.1402	
Wald Ch2					38.97	
Prob. Ch2					0.000*	
Hausman Test			Chi2(2) = 0.08		Prob>Chi2= 0.9940	

*Source: Researcher's Computation via STATA 13.0 * significant at 1% level ** at 5% level*
Items in parentheses are t-ratios; Z-test in parentheses, bold face; AA=Accounting Alchemy; △NPAT=% change in net profit after tax;△EBIT=% change in earnings before interest and tax

Table 4.7c shows the results of accounting alchemy (AA) and earnings per share (EPS) in the analysis of model 3. The table presents the results of Ordinary Least Square (OLS), Fixed Effect (FE) and Random Effect (RE) for accounting alchemy and earnings per share. In this model, accounting alchemy is highly significant at 1% level in explaining earnings per share. The output of OLS indicates that accounting alchemy has a larger beta coefficient in absolute terms than △EBIT

and △NPAT. Using OLS and RE, the coefficient of accounting alchemy is 0.1435 and 0.1435 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 14.4% change in their level of earnings per share.

Accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.1434 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.1434), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 14.3% change in their level of earnings per share. The t-tests of AA are 5.95, 5.88 and 5.95 for OLS, FE and RE respectively; the t-tests of △EBIT are 0.18, 0.20 and 0.18 for OLS, FE and RE respectively while △NPAT are -1.82, -1.84 and -1.82 for OLS, FE and RE respectively. The t-test further confirms that △EBIT and △NPAT are not significant in explaining EPS but AA is significant in explaining EPS. However, $R^2$is 0.1402and is higher than both FE and RE. F-statistics is 12.99 (p-value = 0.0000), which is highly significant. The f-statistics provides support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and earnings per share (EPS) among the selected companies in sub-Saharan Africa.

The results of Hausman specification tests are: Chi2(3)=0.08 and p-value= 0.9940; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE). The result of FE showed that the subjects from which measurements are drawn from are fixed, and that the differences between companies in sub-Saharan Africa are therefore not of interest, thus the subjects and their variances are identical. The Wald

test via STATA presents *p*-values instead of reporting the critical values. The p-values measure the evidence against H_0. They are the largest significant level at which a test can be conducted without rejecting H_0. In model 3, the p-value is 0.000; the smaller the *p*-value, the more evidence to reject H_0.

Decision: Since Wald Ch2-statistics is 38.97 (0.000) showing that it is highly significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that accounting alchemy has significant association with earnings per share of selected quoted firms in sub-Saharan Africa.

H_o4: There is no significant association between accounting alchemy and book value per share of selected quoted firms in sub-Saharan Africa

Table 4.7d: Results of Model 4 Showing Accounting Alchemy and Book Value per Share

Dependent Variable: Book Value per Share (BVPS)						
Estimator	**OLS (Obs.=241)**		**FE (Obs.=241)**		**RE (Obs. =241)**	
Variable	**Coef.**	**Prob.**	**Coef.**	**Prob.**	**Coef.**	**Prob.**
AA	0.2786* (2.45)	0.015	0.2876* (2.51)	0.013	0.2786* **(2.45)**	0.014
△EBIT	-0.0125 (-0.01)	0.992	-0.0894 (-0.07)	0.941	-0.0125 **(-0.01)**	0.992
△NPAT	-0.1444* (-3.84)	0.000	-0.1442* (-3.79)	0.000	-0.1444* **(-3.84)**	0.000
R-Squared	0.0807					
R-Squared Adj.	0.0691					
Prob. F.	0.0002					
R-Squared (within)			0.0814		0.0814	
R-Squared (between)			0.0073		0.0113	
R-Squared (overall)			0.0807		0.0807	
Wald Ch2					20.81	
Prob. Ch2					0.001*	
Hausman Test			Chi2(2) = 0.43		Prob>Chi2= 0.9338	

*Source: Researcher's Computation via STATA 13.0 * significant at 1% level ** at 5% level*
Items in parentheses are t-ratios; Z-test in parentheses, bold face; AA=Accounting Alchemy; △NPAT=% change in net profit after tax;△EBIT=% change in earnings before interest and tax

Table 4.7d shows the results of accounting alchemy (AA) and book value per share (BVPS) in the analysis of model 4. The table presents the results of Ordinary Least Square (OLS), Fixed Effect (FE) and Random Effect (RE) for accounting alchemy and book value per share. In this model, accounting alchemy is significant at 1% level in explaining book value per share. The output of OLS indicates that accounting alchemy has a larger beta coefficient, absolute terms than △EBIT and △NPAT. Using OLS and RE, the coefficients of accounting alchemy are 0.2786 and 0.2786 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 27.9% change in their level of book value per share.

Accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.2786 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.2786), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 27.9% change in their level of book value per share; however, this result remained unchanged when OLS and RE are applied. The t-tests of AA are 2.45, 2.51 and 2.45 for OLS, FE and RE respectively; the t-tests of △EBIT are -0.01, -0.07 and -0.01 for OLS, FE and RE respectively while △NPAT are -3.84, -3.79 and -3.84 for OLS, FE and RE respectively. The t-test further confirms that △EBIT is not significant in explaining BVPS but AA and △NPAT are significant in explaining BVPS.

A negative sign is attached to △NPAT, suggesting that it negatively affects BVPS. However, $R^2$is 0.0807 and is lower than both FE and RE. F-statistics is 6.94 (p-value = 0.0002), which is highly significant. The f-statistics provides support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and book value per share (BVPS) among the selected companies in sub-Saharan Africa. The results of Hausman specification tests are: Chi2(3)=0.43 and p-value= 0.9338; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE). The result of FE showed that the subjects from which measurements are drawn from are fixed, and that the differences between companies in sub-Saharan Africa are therefore not of interest, thus the subjects and their variances are identical.

The Wald test via STATA presents *p*-values instead of reporting the critical values. The p-values measure the evidence against H_0. They are the largest significant level at which a test can be conducted without rejecting H_0. In model 4, the p-value is 0.001; the smaller the *p*-value, the more evidence to reject H_0.

Decision: Since Wald Ch2-statistics is 20.81 (p-value = 0.001) showing that it is highly significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that there is significant association between accounting alchemy and book value per share of selected quoted firms in sub-Saharan Africa.

H_o5: There is no significant association between accounting alchemy and Tobin's Q of selected quoted firms in sub-Saharan Africa

Table 4.7e: Results of Model 5 Showing Accounting Alchemy and Tobin's Q

Dependent Variable: Tobin's Q						
Estimator	**OLS (Obs.=238)**		**FE (Obs.=238)**		**RE (Obs. =238)**	
Variable	**Coef.**	**Prob.**	**Coef.**	**Prob.**	**Coef.**	**Prob.**
AA	0.0377* (3.34)	0.001	0.0372* (3.27)	0.001	0.0377* **(3.34)**	0.001
△EBIT	-0.0374 (-0.31)	0.754	-0.0383 (-0.32)	0.751	-0.0374 **(-0.31)**	0.754
△NPAT	-0.0013* (0.36)	0.719	0.0017 (0.44)	0.658	-0.0013* **(0.36)**	0.718
R-Squared	0.0461					
R-Squared Adj.	0.0339					
Prob. F.	0.0114					
R-Squared (within)			0.0450		0.0449	
R-Squared (between)			0.3562		0.3851	
R-Squared (overall)			0.0460		0.0461	
Wald Ch2					11.30	
Prob. Ch2					0.0102*	
Hausman Test			Chi2(2) = 0.52		Prob>Chi2= 0.9155	

*Source: Researcher's Computation via STATA 13.0 * significant at 1% level ** at 5% level*
Items in parentheses are t-ratios; Z-test in parentheses, bold face; AA=Accounting Alchemy; △NPAT=% change in net profit after tax;△EBIT=% change in earnings before interest and tax

Table 4.7e shows the results of accounting alchemy (AA) and Tobin's Q in the analysis of model 5. The table presents the results of Ordinary Least Square (OLS), Fixed Effect (FE) and Random Effect (RE) for accounting alchemy and Tobin's Q. In this model, accounting alchemy is highly significant at 1% level in explaining Tobin's Q. The output of OLS indicates that accounting alchemy has a larger beta coefficient, absolute terms than △EBIT and △NPAT. Using OLS and RE, the coefficients of accounting alchemy are 0.0377 and 0.0377 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 37.7% change in Tobin's Q.

Accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.0372 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.0372), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 37.2% change in Tobin's Q; however, this result is similarly to OLS and RE. The t-tests of AA are 3.34, 3.27 and 3.34for OLS, FE and RE respectively; the t-tests of △EBIT are -0.31, -0.32 and -0.31for OLS, FE and RE respectively while △NPAT are 0.36, 0.44 and 0.36 for OLS, FE and RE respectively. The t-test further confirms that △EBIT and △NPAT are not significant in explaining Tobin's Q but AA is significant in explaining Tobin's Q. However, $R^2$is 0.0461 and is higher than both FE and RE. F-statistics is 3.77 (p-value=0.0114) which is significant. The f-statistics provides support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and Tobin's Q among the selected companies in sub-Saharan Africa.

The results of Hausman specification tests are: Chi2(3)=0.52 and p-value= 0.9155; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE). The result of FE showed that the subjects from which measurements are drawn from are fixed, and that the differences between companies in sub-Saharan Africa are therefore not of interest, thus the subjects and their variances are identical. The Wald test via STATA presents *p*-values instead of reporting the critical values. The p-values measure the evidence against H_0. They are the largest significant level at which a test can be conducted without rejecting H_0. In model 4, the p-value is 0.0102; the smaller the *p*-value, the more evidence to reject H_0.

Decision: Since Wald Ch2-statistics is 11.30 (0.0102), showing that it is significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that there is significant association between accounting alchemy and Tobin's Q of selected quoted firms in sub-Saharan Africa.

4.4 Discussion of Findings

This study sought to investigate the effect of accounting alchemy on reported financial performance of some selected quoted firms in sub-Saharan Africa from 2012-2016. The selected quoted firms are those in the consumer and industrial goods subsector. The variables of the study comprised of the dependent variable (return on asset: ROA, return on equity: ROE, earnings per share: EPS, book value per share: BVPS and Tobin's Q), independent variable is accounting alchemy (AA), and control variables are changes in earnings before interest and tax (△EBIT) and net profit after tax (△NPAT). In this section, we discussed the findings of the study based on the outcomes of the descriptive and inferential statistics.

The results above provided some insights into the nature of the selected companies across countries in sub-Saharan Africa. First, book value per share (BVPS) shows the highest average in the study with a value of 21.97. This was followed by return on equity (ROE) and accounting alchemy (AA). ROE shows the highest dispersion in the study with a standard deviation value of 104.04 while △EBIT (rEBIT) shows the least dispersion with a standard deviation of 1.71. The dispersion of △EBIT shows that the sampled companies in sub-Saharan Africa are not too dispersed from each other; an indication of relative change in EBIT across the

sampled firms. Also, AA, △EBIT and △NPAT recorded an average of 7.00, 0.03 and -3.66 respectively. Besides, variation of the variables during the period under review was revealed by the maximum and minimum values. The results of the maximum and minimum values for ROE (1131.01) and Tobin's Q (0.41) respectively suggest among others that most likely, the variables of the study were not constant over time (see Table 4.1). Given that all the variables of the study are not constant over time, the relationship between accounting alchemy and reported financial performance in sub-Saharan Africa becomes feasible.

The correlation result revealed that accounting alchemy (AA) is positively linked to all the reported financial performance measures such as return on equity (ROE), return on asset (ROA), earnings per share (EPS), book value per share (BVPS) and Tobin's Q. Interestingly, accounting alchemy (AA) is negatively related to △NPAT and △EBIT. Nevertheless, the correlation matrix implies that no two explanatory variables of the study were perfectly correlated, since none of the correlation coefficients exceed 0.8 (see Table 4.2). Furthermore, the result of VIF = 1.00 and is less than the accepted VIF value of 10.0 for multicollinearity, thus suggesting that there is the absence of multicollinearity problem in our model.

The Breusch-Pagan/Cook-Weisberg test is statistically significant at 0.05% level of significance indicating the absence of heteroscedasticity in the variables (see Table 4.3). The Shapiro-Wilk W statistics revealed that most of the variables are normally distributed at 1% significance; hence the data of the study satisfies the normality condition (see Table 4.4 and Figure 2a-2h).

The Ordinary Least Square (OLS) results revealed that the values of R-squared and adjusted R-squared were (3.58%) and (2.37%) respectively. This indicates that all the independent variables jointly explain about 4% of the systematic variations in the model for the sampled period (2012-2016). The small R-squared shows that there are more excluded variables that drive the dependent variable. The F-statistics (df=3, 239, f-ratio=2.96) with a p-value of 0.0329 shows that the result is significant at 5 percent level which means that the model for accounting alchemy and return on equity was well specified. Also, accounting alchemy (AA) appears to have a positive influence on return on equity (ROE) and was statistically significant at 5%. However, △EBIT and △NPAT appear to be positive but were statistically insignificant at 5 percent level (see Table 4.5a).

In the case of accounting alchemy and return on asset, it was found that the values of the R-squared and adjusted R-squared were (59.10%) and (58.59%) respectively. This implies that all the independent variables jointly explain about 59% of the systematic variations in the model for the sampled period (2012-2016). This value for R-squared shows that about 59% of variations in ROA is accounted for by accounting alchemy. The F-statistics (df=3, 239, f-ratio=115.13) with a p-value of 0.0000 shows that the established relationship is significant at 5 percent level which means that accounting alchemy has significant influence on ROA of the sampled firms. However, △EBIT and △NPAT appear to be positive but were statistically insignificant at 5 percent level (see Table 4.5b).

The model of accounting alchemy and earnings per share revealed that the values of R-squared and adjusted R-squared were (14.02%) and (12.94%)

respectively. This means that all the independent variables jointly explain about 14.02% of the systematic variations in the dependent variable (EPS) for the sampled period (2012-2016). The small R-squared shows that there are more excluded variables that drive the dependent variable. Despite the value of R-squared, F-statistics (df=3, 239, f-ratio=12.99) with a p-value of 0.0000 suggests that at 5%, there is significant relationship between accounting alchemy and earnings per share. Also, accounting alchemy (AA) appears to have a positive influence on earnings per share (EPS), which again was statistically significant at 5%. However, △EBIT appear to be positive while △NPAT negative; but both were statistically insignificant at 5 percent level (see Table 4.5c).

The OLS result for accounting alchemy and book value per share revealed that the values of R-squared and adjusted R-squared were (8.07%) and (6.91%) respectively. This means that all the independent variables jointly explain about 8.07% of the systematic variations in the dependent variable (BVPS) for the sampled period (2012-2016). The small R-squared shows that there are more excluded variables that drive the dependent variable. Despite the value of the R-squared, the result of F-statistics (df=3, 237, f-ratio=6.94) with a p-value of 0.0002 shows that at 5% level of significance, a significant relationship was found between accounting alchemy and book value per share. Also, accounting alchemy (AA) appears to have a positive influence on book value per share (BVPS) and was statistically significant at 5%. However, △EBIT appear to be negative and but was statistically insignificant at 5 percent level except that △NPAT was negative but statistically significant at 5 percent level (see Table 4.5d).

The OLS result for accounting alchemy and Tobin's Q showed that the values of R-squared and adjusted R-squared were (4.61%) and (3.39%) respectively. This means that all the independent variables jointly explain about 4.61% of the systematic variations in the dependent variable (Tobin's Q) for the sampled period (2012-2016). The small R-squared shows that there are more excluded variables that drive the dependent variable. Despite the value of the R-squared, the result of F-statistics (df=3, 234, f-ratio=3.77) with a p-value of 0.0114 shows that at 5% level of significance, a significant relationship was found between accounting alchemy and Tobin's Q. Also, accounting alchemy (AA) appears to have a positive influence on Tobin's Q and was statistically significant at 5%. △EBIT appear to be negative and △NPAT was positive but both were statistically insignificant at 5 percent level.

In this study, a country-by-country analysis was conducted and some insightful revelations were made. First, in Kenya (East Africa), it was revealed that the coefficients of all the sampled variables except △EBIT (-0.198; -0.287) carry negative signs for BVPS and Tobin's Q. The negative sign in the coefficients for △EBIT in Kenya is an indication that accounting alchemy negatively influenced the earnings before interest and tax for the period. However, it was found that all the variables (accounting alchemy and reported financial performance) were statistically significant for Kenya. This implies that accounting alchemy has significantly influenced the reported financial performance measures of the study in Kenya, especially for BVPS and Tobin's Q (see Table 4.6a).

Second, in Nigeria (West Africa), it was shown that the coefficients of all the sampled variables except △EBIT (*-0.046*; *-0.046*) and △NPAT are negative signs for

ROA and Tobin's Q. The negative sign in the coefficients for △EBIT and △NPAT is an indication that accounting alchemy negatively influenced the earnings before interest and tax and net profit after tax for the period. Besides, it was revealed that variables of ROA, EPS, BVPS and Tobin's Q have been affected by accounting alchemy except ROE. This implies that accounting alchemy significantly influenced the reported financial performance measures in Nigeria for ROA, EPS, BVPS and Tobin's Q (see Table 4.6b).

Third, in South Africa (Southern Africa), it was shown that the coefficients of all the sampled variables except △EBIT (*-21.952*; *-0.443, -0.510*) and △NPAT (*-0.002, -0.014, -0.130),* carry negative signs for ROE, ROA, EPS, BVPS and Tobin's Q. The negative sign in the coefficients for △EBIT and △NPAT is an indication that accounting alchemy negatively influenced the earnings before interest and tax and net profit after tax for the period. Besides, it was found that ROE, ROA, EPS, BVPS and Tobin's Q are affected by accounting alchemy, indicating that accounting alchemy significantly influence the reported financial performance measures of the study in South Africa (see Table 4.6c).

More importantly, the regression outcomes of Ordinary Least Square (OLS), Fixed Effect (FE) and Random Effect (RE) of the entire panel data for the selected companies in sub-Saharan Africa were presented. In model 1, the results of OLS, FE and RE for accounting alchemy and return on asset of the entire panel data was presented. In model 1, we found that accounting alchemy (AA) is highly significant at 1% level in explaining return on equity (ROE). The output of OLS indicates that AA has a larger beta coefficient, absolute terms than △EBIT and △NPAT. Using

OLS and RE, the coefficient of AA is 0.4463 and 0.4463 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 44% change in their level of return on assets. Besides, accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.4640 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.4640), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 46% change in their level of return on asset. The t-tests of AA are 18.48, 18.31 and 18.48 for OLS, FE and RE respectively; the t-tests of △EBIT are 0.71, 0.76 and 0.71 for OLS, FE and RE respectively while △NPAT are 0.98, 0.89 and 0.98 for OLS, FE and RE respectively.

The t-test further confirms that △EBIT and △NPAT are not significant in explaining ROA but AA is significant in explaining ROA. However, $R^2$is 0.5910 and is higher than both FE and RE. F-statistics is 115.13 (p-value = 0.000), which is highly significant. This may provide support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and return on asset (ROA) among the selected companies in sub-Saharan Africa. The results of Hausman specification tests are: Chi2(3)=0.34 and p-value= 0.9529; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE) (see Table 4.7a). Since Wald Ch2-statistics is 345.38 (p-value =0.000) showing that it is highly significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that there is significant relationship between accounting alchemy and return on assets of selected quoted firms in sub-Saharan Africa.This finding conforms

to prior studies on accounting alchemy done by Verrecchia (2009) in USA; and Razor (2015) in Malaysia, suggesting that accounting alchemy alters firm performance. Also, this finding verifies the position of accrual accounting studies conducted by Moradzadehfard & Nazari (2013) in Iran and Akram, Hunjra, Butt & Ijaz (2015) in Pakistan.

In model 2, accounting alchemy is highly significant at 1% level in explaining return on equity. The output of OLS indicates that accounting alchemy has a larger beta coefficient, absolute terms than △EBIT and △NPAT. Using OLS and RE, the coefficient of accounting alchemy is 0.7950 and 0.7950 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 80% change in their level of return on equity. Accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.7918 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.918), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 79% change in their level of return on equity. The t-tests of AA are 2.88, 2.84 and 2.88 for OLS, FE and RE respectively; the t-tests of △EBIT are 0.59, 0.63 and 0.59 for OLS, FE and RE respectively while △NPAT are 0.23, 0.13 and 0.23 for OLS, FE and RE respectively.

The t-test further confirms that △EBIT and △NPAT are not significant in explaining ROE but AA is significant in explaining ROE. However, $R^2$is 0.0358 and is higher than both FE and RE. F-statistics is 2.94 (p-value =0.00329) which is significant. The f-statistics provides support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and return on equity (ROE)

among the selected companies in sub-Saharan Africa. The results of Hausman specification tests are: Chi2(3)=0.44 and p-value= 0.9311; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE) (see Table 4.7b). Since Wald Ch2-statistics is 8.88 showing that it is highly significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that accounting alchemy exert significant effect on return on equity of selected quoted firms in sub-Saharan Africa.This finding conforms to prior studies on accounting alchemy done by Verrecchia (2009) in USA; and Razor (2015) in Malaysia, suggesting that accounting alchemy alters firm performance. In addition, this finding validates the position of accrual accounting studies conducted by Moradzadehfard & Nazari (2013) in Iran; Akram, Hunjra, Butt & Ijaz (2015) in Pakistan; and Kothari, Leone & Wasley (2005) in USA.

In model 3, accounting alchemy is highly significant at 1% level in explaining earnings per share. The output of OLS indicates that accounting alchemy has a larger beta coefficient, absolute terms than △EBIT and △NPAT. Using OLS and RE, the coefficient of accounting alchemy is 0.1435 and 0.1435 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 14.4% change in their level of earnings per share. Accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.1434 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.1434), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 14.3% change in their level of earnings per share. The t-tests of AA are 5.95, 5.88 and 5.95 for OLS, FE

and RE respectively; the t-tests of △EBIT are 0.18, 0.20 and 0.18 for OLS, FE and RE respectively while △NPAT are -1.82, -1.84 and -1.82 for OLS, FE and RE respectively.

The t-test further confirms that △EBIT and △NPAT are not significant in explaining EPS but AA is significant in explaining EPS. However, $R^2$is 0.1402 and is higher than both FE and RE (see Table 4.7c). F-statistics is 12.99 (p-value=0.0000) which is highly significant. The f-statistics provides support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and earnings per share (EPS) among the selected companies in sub-Saharan Africa. The results of Hausman specification tests are: Chi2(3)=0.08 and p-value= 0.9940; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE). Since Wald Ch2-statistics is 38.97 showing that it is highly significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that accounting alchemy has significant association with earnings per share of selected quoted firms in sub-Saharan Africa.This finding conforms to prior studies on accounting alchemy done by Verrecchia (2009) in USA; and Razor (2015) in Malaysia, indicating that accounting alchemy alters earnings of firms. Also, this finding corroborates with prior studies on accrual accounting conducted by Riley (2007) in USA; Lee, Li & Yue (2005) in USA; and Bartov, Gul & Tsui (2000) in Hong Kong.

In model 4, accounting alchemy is highly significant at 1% level in explaining book value per share. The output of OLS indicates that accounting alchemy has a larger beta coefficient, absolute terms than △EBIT and △NPAT. Using OLS and

RE, the coefficients of accounting alchemy are 0.2786 and 0.2786 respectively, indicating that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 27.9% change in their level of book value per share. Accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.2786 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.2786), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 27.9% change in their level of book value per share; however, this result remained unchanged when OLS and RE are applied.

The t-tests of AA are 2.45, 2.51 and 2.45 for OLS, FE and RE respectively; the t-tests of △EBIT are -0.01, -0.07 and -0.01 for OLS, FE and RE respectively while △NPAT are -3.84, -3.79 and -3.84 for OLS, FE and RE respectively. The t-test further confirms that △EBIT is not significant in explaining BVPS but AA and △NPAT are significant in explaining BVPS. A negative sign is attached to △NPAT, suggesting that it negatively affects BVPS. However, $R^2$is 0.0807 and is lower than both FE and RE. F-statistics is 6.94 (p-value = 0.002) which is highly significant. The f-statistics provides support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and book value per share (BVPS) among the selected companies in sub-Saharan Africa. The results of Hausman specification tests are: Chi2(3)=0.43 and p-value= 0.9338; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE) (see Table4.7d). Since Wald Ch2-statistics is 20.81 showing that it is highly significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting

that there is significant association between accounting alchemy and book value per share of selected quoted firms in sub-Saharan Africa. This finding is novel in the accounting literature as there are no empirical evidences conforming that accounting alchemy significant affects book value per share, especially in sub-Saharan Africa.

In model 5, accounting alchemy has high beta coefficient when FE is employed. The beta coefficient for FE is 0.0372 but both FE and RE are significant at 1% levels. In the case of the coefficient of FE (0.0372), it implies that when companies in sub-Saharan Africa engage in accounting alchemy, it will lead to approximately 37.2% change in Tobin's Q; however, this result is similarly to OLS and RE. The t-tests of AA are 3.34, 3.27 and 3.34 for OLS, FE and RE respectively; the t-tests of △EBIT are -0.31, -0.32 and -0.31for OLS, FE and RE respectively while △NPAT are 0.36, 0.44 and 0.36 for OLS, FE and RE respectively. The t-test further confirms that △EBIT and △NPAT are not significant in explaining Tobin's Q but AA is significant in explaining Tobin's Q. However, $R^2$is 0.0461 and is higher than both FE and RE. F-statistics is 3.77 (p-value =0.0114) which is significant. The f-statistics provides support for the proposition that: first, there is a positive relationship between accounting alchemy (AA) and Tobin's Q among the selected companies in sub-Saharan Africa.

The results of Hausman specification tests are: Chi2(3)=0.52 and p-value= 0.9155; this implies that Fixed Effect (FE) is more efficient than Random Effect (RE) (see Table 4.7e). Since Wald Ch2-statistics is 11.30 showing that it is significant, it thus led to the rejection of null hypothesis and acceptance of the alternate hypothesis, suggesting that there is significant association between accounting alchemy and

Tobin's Q of selected quoted firms in sub-Saharan Africa. This finding is novel in the accounting literature as there are no empirical evidences conforming that accounting alchemy significant affects Tobin's Q, especially in sub-Saharan Africa.

More importantly the result showed that return on equity, return on assets and Tobin's Q are more significantly affected by accounting alchemy when compared with other reported financial measures like earnings, and book value per share (see Table 4.7a, 4.7b & 4.7e). Thus ROE, ROA and Tobin's Q are more affected by accounting alchemy, followed by book value per share and earnings per share. In addition, the t-test confirms that while △EBIT and △NPAT are not significant in explaining reported financial performance variants such as ROE, ROA and EPS, △EBIT is not significant in explaining BVPS but △NPAT is significant in explaining BVPS. Consequently, it is more appropriate to use △NPAT as control variable in accounting alchemy model while at the same time, BVPS can be relied upon as the most reliable performance measures of firms in sub-Saharan Africa countries.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The primary aim of this research is to examine the effect of accounting alchemy on reported financial performance of selected quoted companies in sub-Saharan Africa. The study population for aggregate accounting alchemy to reported financial performance measures consisted of all the quoted companies on the consumer and industrial goods subsectors in the three regions of sub-Saharan Africa. The population of the study comprised of a total number of one hundred and forty-one (141) publicly quoted consumer and industrial goods firms in the selected sub-Saharan Africa countries. However, a total of sixty-four (64) quoted consumer and industrial goods companies were sampled from Kenya (East Africa), Nigeria (West Africa) and South Africa (Southern Africa) during the period 2012-2016. The data obtained in the study were analyzed using both descriptive and inferential statistics. On the basis of the analysis of data, the following findings emerged:

1. That accounting alchemy has significant and positive effects on the return on assets of selected quoted firms in sub-Saharan Africa
2. That accounting alchemy exert significant and positive effects on return on equity of selected quoted firms in sub-Saharan Africa
3. That accounting alchemy has significant and positive associations with earnings per share of selected quoted firms in sub-Saharan Africa
4. That there is significant and positive associations between accounting alchemy and book value per share of selected quoted firms in sub-Saharan Africa

5. That there is significant and positive associations between accounting alchemy and Tobin's Q of selected quoted firms in sub-Saharan Africa.

5.2 Conclusion

There is no plausible measure aimed at estimating what accounting alchemy should be. The dearth of empirical measure of accounting alchemy is the reason why studies on how accounting alchemy affects reported financial performance of firms has not been widespread in accounting literature. Thus most studies focused on earnings management as a result of the methodological bottleneck which led to the difficulties in measurement and construct of accounting alchemy. In order to fill the gap in accounting literature, given the fact that earnings management is a major component of accounting alchemy, this study developed a measure of accounting alchemy so as to investigate the dynamic relationship between accounting alchemy and reported financial performance of selected quoted companies in sub-Saharan Africa.

The study revealed that return on equity, return on assets and Tobin's Q are more significantly affected by accounting alchemy when compared with other reported financial measures like earnings, and book value per share. Thus, ROE, ROA and Tobin's Q are more affected by accounting alchemy, followed by book value per share and earnings per share. In addition, the t-test confirms that while $\triangle$EBIT and $\triangle$NPAT are not significant in explaining reported financial performance variants such as ROE, ROA and EPS, $\triangle$EBIT is not significant in explaining BVPS but $\triangle$NPAT is significant in explaining BVPS. Given the outcome of Ordinary Least Square (OLS), Hausman Specification Test (HST), Fixed Effect (FE) and

Random Effect (RE), the study concluded that reported financial performance of the study (ROE, ROA, BVPS, EPS, and Tobin's Q) are significantly affected by accounting alchemy. The outcome of study followed a-priori expectation such that accounting alchemy is deemed to affect reported financial performance of firms quoted in sub-Saharan Africa.

5.3 Recommendations

On the basis of the findings of the study, the following recommendations were proffered:

1. The regulatory framework of accounting should consider revising information reported in financial statements. The information includes return on equity, return on asset, earnings per share, book value per share and Tobin's Q. As a matter of fact, firms should be compelled to disclose further information on incomes, expenses and assets of the firm and provide supporting documents that can help verify that these incomes/expenses were made and that such asset exits.
2. There should be proper and adequate measures that must be put in place for the valuation, examination and scrutiny of reported financial performance of companies in sub-Saharan Africa.This can be done by empowering the regulatory framework of accounting to draft a well-structured framework of accounting regulation that may checkmate all forms of alchemieslinked with reported financial performance measures of companies in sub-Saharan Africa.
3. That accounting standard setters should be diligent in focusing on developing requirements to faithfully represent the economic performance of the firm and

should resist the calls for abetting accounting alchemy by including more items in other comprehensive incomes.

4. That the regulatory framework of accounting should ensure that companies in sub-Saharan Africa comply with IFRS and other reporting frameworks in order to ensure that management of companies are properly guided or monitored as regards the applicability of management discretion in reporting accounting numbers, especially in the area of revenues and expenses.

5. Accounting researchers and regulatory framework of accounting must strive towards resolving the controversy about the choice of accounting alternatives. This they can do by emphasizing the timing of revenues and expenses in the financial statements of companies.

5.4 Contributions to Knowledge

The study has contributed to knowledge in the following areas:

1. This study provides information on the basis of assessing or measuring accounting alchemy. The measure or model of accounting alchemy can be used by researchers to assess the effect of accounting alchemy on reported financial performance of firms in both developed and developing countries.

2. This study establishes that rather than focusing on accounting estimates, accounting researchers should focus on economic reality in reporting accounting numbers. Focusing on economic reality will help mediate the effects of accounting alchemy on reported financial performance of firms

3. This study acknowledges that return on equity, return on assets and Tobin's Q are more significantly affected by accounting alchemy when compared with other reported financial measures like earnings, and book value per share.
4. This study verifies the position of accrual accounting models, by showing that expenses and income on which basis the statement of comprehensive income and cash flow statements are prepared are alchemized.
5. This study has established a new strand in the academic literature on accounting alchemy and reported financial performance in developed (South Africa) and developing (Kenya and Nigeria) countries and introduces important insights from the accounting literature.

5.5 Suggestions for Further Study

1. This study only examined sixty-four (64) publicly quoted companies in the consumer and industrial goods subsector in sub-Saharan Africa from 2012-2016. Future studies could employ the accounting alchemy model proposed in this study and try to establish if accounting alchemy affects reported financial performance in other sectors of sub-Saharan Africa countries.
2. This study only covers a period of five years from 2012 to 2016 because of dearth of data. Future studies could increase the scope and extend data till 2019 and beyond.
3. In this study, five (5) reported financial performance variants were used such as return on asset, return on equity, earnings per share, book value per share and Tobin's Q. However, future researches should consider employing other reported financial performance variants such as dividend per share, share

prices and so on to see if accounting alchemy affects them since that are capable of being alchemized by management.

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APPENDIX I: Quoted Firms on Stock Exchanges in Sub-Saharan Africa

Quoted Consumer/Industrial Goods Firms on the Nigerian Stock Exchange (NSE)

COMPANY	TICKER	SECTOR
1. Cadbury Nigeria Plc.	CADBURY	Consumer Goods
2. Champion Brew. Plc.	CHAMPION	Consumer Goods
3. Dangote Flour Mills Plc	DANGFLOUR	Consumer Goods
4. Dangote Sugar Refinery Plc	DANGSUGAR	Consumer Goods
5. Dn Tyre & Rubber Plc	DUNLOP	Consumer Goods
6. Flour Mills Nig. Plc.	FLOURMILL	Consumer Goods
7. Golden Guinea Brew. Plc.[Mrs]	GOLDBREW	Consumer Goods
8. Guinness Nig Plc	GUINNESS	Consumer Goods
9. Honeywell Flour Mill Plc	HONYFLOUR	Consumer Goods
10. International Breweries Plc.	INTBREW	Consumer Goods
11. Mcnichols Plc	MCNICHOLS	Consumer Goods
12. Multi-Trex Integrated Foods Plc	MULTITREX	Consumer Goods
13. N Nig. Flour Mills Plc.	NNFM	Consumer Goods
14. Nascon Allied Industries Plc	NASCON	Consumer Goods
15. Nestle Nigeria Plc.	NESTLE	Consumer Goods
16. Nigerian Brew. Plc.	NB	Consumer Goods
17. Nigerian Enamelware Plc.	ENAMELWA	Consumer Goods
18. Nigerian Northern Flour Mill Plc.	NNF	Consumer Goods
19. P Z Cussons Nigeria Plc.	PZ	Consumer Goods
20. 7Up Nigeria	7UP	Consumer Goods
21. Unilever Nigeria Plc.	UNILEVER	Consumer Goods
22. Union Dicon Salt Plc.	UNIONDICON	Consumer Goods
23. Vitafoam Nig Plc.	VITAFOAM	Consumer Goods
24. African Paints (Nigeria) Plc.	AFRPAINTS	Industrial Goods
25. Austin Laz & Company Plc	AUSTINLAZ	Industrial Goods

COMPANY	TICKER	SECTOR
26. Avon Crowncaps & Containers	AVON	Industrial Goods
27. Berger Paints Plc	BERGER	Industrial Goods
28. Beta Glass Plc.	BETAGLAS	Industrial Goods
29. Chemical & Allied Products Plc	CAP	Industrial Goods
30. Cement Co. Of North.Nig. Plc	CCNN	Industrial Goods
31. Cutix Plc.	CUTIX	Industrial Goods
32. Dangote Cement Plc	DANGCEM	Industrial Goods
33. Dangote Sugar Plc.	DANGSUG	Consumer Goods
34. First Aluminium Nigeria Plc	FIRSTALUM	Industrial Goods
35. Greif Nigeria Plc	VANLEER	Industrial Goods
36. Lafarge Africa Plc.	WAPCO	Industrial Goods
37. Meyer Plc.	MEYER	Industrial Goods
38. Paints And Coatings Manufactures Plc	PAINTCOM	Industrial Goods
39. Portland Paints & Products Nigeria Plc	PORTPAINT	Industrial Goods
40. Premier Paints Plc.	PREMPAINTS	Industrial Goods
41. Tiger Branded	TIB	Industrial Goods

Source: The Nigerian Stock Exchange (2018). *Listed companies.* Available online at http://www.nse.com.ng/Listings-site/listed-securities/listed-companies [Accessed 4/3/2018]

APPENDIX I …Contd

Quoted Industrial/Consumer Goods Firms on Nairobi Securities Exchange (NSE)

COMPANY	TICKER	SECTOR
1 ARM Cement	ARM	Industrials
2 Atlas African Industries	AAI	Industrials
3 Bamburi Cement	BAMB	Industrials
4 TransCentury	TCL	Industrials
5 Car & General	CAG	Industrials
6 Crown Berger Paints Kenya	CBPK	Industrials
7 East African Cables	CABL	Industrials
8 East African Portland Cement	EAPC	Industrials
9 Olympia Capital Holdings	OCH	Industrials
10 British American Tobacco Kenya	BATK	Consumer Goods
11 Eaagads	EGAD	Consumer Goods
12 East African Breweries	EABL	Consumer Goods
13 Eveready East Africa	EVRD	Consumer Goods
14 Kakuzi	KUKZ	Consumer Goods
15 Kapchorua Tea Company	KAPC	Consumer Goods
16 Kenya Orchards	ORCH	Consumer Goods
17 Limuru Tea Co	LIMT	Consumer Goods
18 Mumias Sugar Co	MSC	Consumer Goods
19 Sameer Africa	FIRE	Consumer Goods
20 Sasini	SASN	Consumer Goods
21 Uchumi Supermarkets	UCHM	Consumer Services
22 Unga Group	UNGA	Consumer Goods
23 Williamson Tea Kenya	WTK	Consumer Goods

Source: Nairobi Securities Exchange (NSE) – Listed Companies. Available online at https://www.african-markets.com/en/stock-markets/nse/listed-companies [Accessed 4/3/208]

APPENDIX I …Contd

Quoted Industrial/Consumer Goods Firms on Johannesburg Stock Exchange (JSE)

	COMPANY	TICKER	SECTOR
1	African Eagle Resources Plc	AEA	Industrial Metals & Mining
2	African Rainbow Minerals Limited	ARI	Industrial Metals & Mining
3	AH-Vest Limited	AHL	Food Producers
4	Andulela Investment Holdings Limited	AND	Industrial Metals & Mining
5	AB InBev	ANB	Beverages
6	Arcelormittal South Africa Limited	ACL	Industrial Metals & Mining
7	Assore Limited	ASR	Industrial Metals & Mining
8	Astral Foods Limited	ARL	Food Producers
9	Astrapak Limited	APK	General Industrials
10	AVI Limited	AVI	Food Producers
11	Bowler Metcalf	BMF	General Industrial
12	Awethu Breweries Limited	AWT	Food Producers
13	Bell Equipment Limited	BEL	Industrial Engineering
14	BHP Billiton Plc	BIL	Industrial Metals & Mining
15	British American Tobacco Plc	BTI	Tobacco
16	BSI Steel Limited	BSS	Industrial Metals & Mining
17	Capevin Holdings Limited	CVH	Beverages
18	Cashbuild	CASH	General Industrial
19	Cartrack Holdings Limited	CTK	Technology Hardware & Equipment
20	Chrometco Limited	CMO	Industrial Metals & Mining
21	Clover Industries Limited	CLR	Food Producers
22	Crookes Brothers Limited	CKS	Food Producers
23	Delrand Resources Limited	DRN	Industrial Metals & Mining

COMPANY	TICKER	SECTOR
24 Diamondcorp Plc	DMC	Industrial Metals & Mining
25 Distell Group Limited	DST	Beverages
26 Eastern Platinum Limited	EPS	Industrial Metals & Mining
27 Enx Group	ENX	General Industrials
28 Evraz Highveld Steel & Vanadium Ltd	EHS	Industrial Metals & Mining
29 Famous Brands	FAB	General Industrials
30 Ferrum Crescent Limited	FCR	Industrial Metals & Mining
31 Giyani Gold Corporation	GIY	Industrial Metals & Mining
32 Hosken Consolidated Investments Ltd	HCI	General Industrials
33 Howden Africa Holdings Limited	HWN	Industrial Engineering
34 Hulamin Limited	HLM	Industrial Metals & Mining
35 Imperial Holdings	IMH	General Industrials
36 Jubilee Platinum Plc	JBL	Industrial Metals & Mining
37 Kaap Agri Limited	KAL	Food Producers
38 KAP Industrial Holdings Limited	KAP	General Industrials
39 Kaydav Group	KAG	General Industrials
40 Kumba Iron Ore Limited	KIO	Industrial Metals & Mining
41 Lewis Group	LEG	General Industrials
42 Lonmin Plc	LON	Industrial Metals & Mining
43 Master Drilling Group Ltd	MDI	Industrial Metals & Mining
44 Master Plastics Limited	MAP	General Industrials
45 Merafe Resources Limited	MRF	Industrial Metals & Mining
46 Middle East Diamond Resources Limited	MED	Industrial Metals & Mining
47 Miranda Mineral Holdings Limited	MMH	Industrial Metals & Mining

COMPANY	TICKER	SECTOR
48 Mondi Plc	MNP	General Industrials
49 Mpact Limited	MPT	General Industrials
50 Metair Investments	MEI	General Industrials
51 Nampak Limited	NPK	General Industrials
52 Nu-World Holdings Limited	NWL	Household Goods & Home Construction
53 Nutritional Holdings Limited	NUT	Food Producers
54 Nictus	NI	General Industrials
55 Oceana Group Limited	OCE	Food Producers
56 Pan African Resources Plc	PAN	Industrial Metals & Mining
57 Petmin Limited	PET	Industrial Metals & Mining
58 Pioneer Food Group Limited	PFG	Food Producers
59 Premier Food and Fishing Limited	PFF	Food Producers
60 Quantum Food Holdings Limited	QFH	Food Producers
61 RCL Foods Limited	RCL	Food Producers
62 Reunert Limited	RLO	General Industrials
63 Rhodes Food Group Holdings Limited	RFG	Food Producers
64 Rockwell Diamonds Incorporated	RDI	Industrial Metals & Mining
65 Remgro	REM	General Industrials
66 South32 Limited	S32	Industrial Metals & Mining
67 Sovereign Food Investments Limited	SOV	Food Producers
68 Steinhoff International Holdings Limited	SHF	Personal Goods
69 Steinhoff International Holdings NV	SNH	Personal Goods
70 Stellar Capital Partners Limited	SCP	Software & Computer Services
71 Tawana Resources NL	TAW	Industrial Metals & Mining

COMPANY	TICKER	SECTOR
72 The Bidvest Group Limited	BVT	General Industrials
73 Tiger Brands Limited	TBS	Food Producers
74 Tongaat Hulett Limited	TON	Food Producers
75 Transpaco Limited	TPC	General Industrials
76 Winhold Limited	WNH	General Industrials
77 ZCI Limited	ZCI	Industrial Metals & Mining

Source: Johannesburg Stock Exchange (JSE) – Listed companies. Available online at https://www.african-markets.com/en/stock-markets/jse/listed-companies[Accessed4/3/2018]

APPENDIX II

List of Sampled Firms from Three Countries in Sub-Saharan Africa

S/N	Country	Company	Sector
1	Kenya	British American Tobacco Kenya	Consumer
2	Kenya	Car & General	Industrial
3	Kenya	Crown Berger Paints Kenya	Industrial
4	Kenya	E.A.Cables	Industrial
5	Kenya	East African Breweries	Consumer
6	Kenya	Eveready East Africa	Industrial
7	Kenya	Mumias Sugar Co.	Consumer
8	Kenya	Sameer Africa	Industrial
9	Kenya	Trans-Century	Industrial
10	Kenya	Unga Group	Consumer
11	Nigeria	7Up Nigeria	Consumer
12	Nigeria	Austin Laz & Co	Industrial
13	Nigeria	Avon Crowncaps & Containers	Industrial
14	Nigeria	Berger Paints Nig	Industrial
15	Nigeria	Beta Glass Company	Industrial
16	Nigeria	Cadbury Nig	Consumer
17	Nigeria	Champion Breweries	Consumer
18	Nigeria	Chemical & Allied Product	Industrial
19	Nigeria	Cutix	Industrial
20	Nigeria	Dangote Sugar	Consumer
21	Nigeria	Dn Meyer	Industrial
22	Nigeria	Flour Mills Of Nigeria	Consumer
23	Nigeria	Greif Nig	Industrial
24	Nigeria	Guinness Nig	Consumer
25	Nigeria	Honywell Flour Mill	Consumer
26	Nigeria	International Breweries	Consumer
27	Nigeria	Mcnichols Consolidated	Consumer
28	Nigeria	Nascon Allied	Consumer
29	Nigeria	Nestle Nig	Consumer
30	Nigeria	Nigeria Breweries	Consumer
31	Nigeria	Nigerian Enamelware	Consumer
32	Nigeria	Nigerian Northen Flour Mill	Consumer
33	Nigeria	Paints & Coatings Man	Industrial
34	Nigeria	Portland Paint Nig	Industrial
35	Nigeria	Premier Paints	Industrial
36	Nigeria	Pz Cussons	Consumer
37	Nigeria	Tiger Branded	Consumer
38	Nigeria	Unilever Nig	Consumer

S/N	Country	Company	Sector
39	Nigeria	Vitafoam Nig	Consumer
40	South Africa	Astrapak	Industrial
41	South Africa	Avi	Consumer
42	South Africa	Bowler Metcalf	Industrial
43	South Africa	Capevin Holdings	Consumer
44	South Africa	Cashbuild	Consumer
45	South Africa	Clover Industries	Consumer
46	South Africa	Distell Group	Consumer
47	South Africa	Enx Group	Industrial
48	South Africa	Famous Brands	Consumer
49	South Africa	Imperial Holdings	Industrial
50	South Africa	Kaydav Group	Consumer
51	South Africa	Labat Africa	Industrial
52	South Africa	Lewis Group	Consumer
53	South Africa	Metair Investments	Industrial
54	South Africa	Mondi	Industrial
55	South Africa	Mpact	Industrial
56	South Africa	Nampak	Industrial
57	South Africa	Nictus	Consumer
58	South Africa	Nu-World Holdings	Consumer
59	South Africa	Pioneer Food Group	Consumer
60	South Africa	Rcl Foods	Consumer
61	South Africa	Remgro	Consumer
62	South Africa	Tiger Brands	Consumer
63	South Africa	Tongaat-Hulett	Consumer
64	South Africa	Transpaco	Industrial

Source: Compiled by Researcher, 2018

APPENDIX III: Data for the Study

Start Year	COUNTRY	Company	SECTOR	ROE	ROA	EPS
2012	Kenya	British American Tobacco Kenya	Consumer	46.08	21.55	32.71
2013	Kenya	British American Tobacco Kenya	Consumer	49.18	21.92	37.24
2014	Kenya	British American Tobacco Kenya	Consumer	52.36	38.44	42.55
2015	Kenya	British American Tobacco Kenya	Consumer	56.21	41.19	49.76
2016	Kenya	British American Tobacco Kenya	Consumer	48.63	34.84	42.34
2012	Kenya	Car & General	Industrial	12.44	4.67	7.48
2013	Kenya	Car & General	Industrial	12.61	4.58	8.83
2014	Kenya	Car & General	Industrial	20.98	7.49	6.57
2015	Kenya	Car & General	Industrial	8.57	2.96	0.76
2016	Kenya	Car & General	Industrial	2.74	0.92	2.22
2012	Kenya	Crown Berger Paints Kenya	Industrial	11.35	5.91	1.88
2013	Kenya	Crown Berger Paints Kenya	Industrial	15.70	7.26	9.01
2014	Kenya	Crown Berger Paints Kenya	Industrial	1.46	0.51	0.28
2015	Kenya	Crown Berger Paints Kenya	Industrial	2.27	0.68	0.43
2016	Kenya	Crown Berger Paints Kenya	Industrial	8.44	2.61	1.85
2012	Kenya	E.A.Cables	Industrial	22.48	8.35	1.74
2013	Kenya	E.A.Cables	Industrial	16.51	5.85	1.37
2014	Kenya	E.A.Cables	Industrial	11.03	4.32	1.16
2015	Kenya	E.A.Cables	Industrial	-23.53	-8.84	-2.21
2016	Kenya	E.A.Cables	Industrial	-22.79	-7.72	-1.80
2012	Kenya	East African Breweries	Consumer	171.01	20.49	13.46
2013	Kenya	East African Breweries	Consumer	94.88	11.30	8.55
2014	Kenya	East African Breweries	Consumer	76.05	10.91	8.21
2015	Kenya	East African Breweries	Consumer	69.65	14.24	11.26
2016	Kenya	East African Breweries	Consumer	73.81	12.99	12.20
2012	Kenya	Eveready East Africa	Industrial	20.05	6.09	0.33
2013	Kenya	Eveready East Africa	Industrial	11.39	4.79	0.21
2014	Kenya	Eveready East Africa	Industrial	-81.29	-19.09	-0.85
2015	Kenya	Eveready East Africa	Industrial	-26.68	-13.65	-0.96
2016	Kenya	Eveready East Africa	Industrial	-35.31	-15.87	-0.98
2012	Kenya	Mumias Sugar Co.	Consumer	12.80	7.35	1.32
2013	Kenya	Mumias Sugar Co.	Consumer	-12.41	-6.09	-1.09
2014	Kenya	Mumias Sugar Co.	Consumer	-25.43	-11.49	-1.77
2015	Kenya	Mumias Sugar Co.	Consumer	-78.30	-22.76	-3.04
2016	Kenya	Mumias Sugar Co.	Consumer	-61.49	-17.51	-3.09
2012	Kenya	Sameer Africa	Industrial	8.10	5.54	0.68
2013	Kenya	Sameer Africa	Industrial	14.97	10.94	1.44
2014	Kenya	Sameer Africa	Industrial	-2.64	-1.74	-0.24
2015	Kenya	Sameer Africa	Industrial	57.14	33.44	4.27
2016	Kenya	Sameer Africa	Industrial	49.97	26.23	3.39
2012	Kenya	Trans-Century	Industrial	6.10	3.37	1.66
2013	Kenya	Trans-Century	Industrial	4.74	2.63	1.06
2014	Kenya	Trans-Century	Industrial	-19.84	-11.70	-8.53
2015	Kenya	Trans-Century	Industrial	-68.32	-11.10	-7.09
2016	Kenya	Trans-Century	Industrial	-22.56	-4.57	-1.56
2012	Kenya	Unga Group	Consumer	8.73	5.43	2.81
2013	Kenya	Unga Group	Consumer	11.28	6.11	4.09

Start Year	COUNTRY	Company	SECTOR	ROE	ROA	EPS
2014	Kenya	Unga Group	Consumer	8.17	4.77	2.43
2015	Kenya	Unga Group	Consumer	8.03	4.96	3.70
2016	Kenya	Unga Group	Consumer	8.93	5.53	4.32
2012	Nigeria	7Up Nigeria	Consumer	20.25	4.67	3.23
2013	Nigeria	7Up Nigeria	Consumer	22.71	5.56	4.46
2014	Nigeria	7Up Nigeria	Consumer	37.13	11.52	10.04
2015	Nigeria	7Up Nigeria	Consumer	29.77	10.53	11.12
2016	Nigeria	7Up Nigeria	Consumer	13.51	4.94	5.23
2012	Nigeria	Austin Laz & Co	Industrial	3.10	2.68	0.06
2013	Nigeria	Austin Laz & Co	Industrial	0.39	0.32	0.01
2014	Nigeria	Austin Laz & Co	Industrial	-8.88	-7.79	-0.15
2015	Nigeria	Austin Laz & Co	Industrial	-3.41	-3.16	-0.05
2016	Nigeria	Austin Laz & Co	Industrial	-9.22	-8.30	-0.14
2012	Nigeria	Avon Crowncaps & Containers	Industrial	4.04	0.76	0.12
2013	Nigeria	Avon Crowncaps & Containers	Industrial	-5.28	-1.06	-0.15
2014	Nigeria	Avon Crowncaps & Containers	Industrial	6.21	1.41	0.19
2015	Nigeria	Avon Crowncaps & Containers	Industrial	-2.10	-0.36	-0.06
2016	Nigeria	Avon Crowncaps & Containers	Industrial	-9.17	-1.36	-0.25
2012	Nigeria	Berger Paints Nig	Industrial	10.82	6.61	0.88
2013	Nigeria	Berger Paints Nig	Industrial	10.32	7.11	0.87
2014	Nigeria	Berger Paints Nig	Industrial	6.05	4.09	0.51
2015	Nigeria	Berger Paints Nig	Industrial	12.77	8.48	1.14
2016	Nigeria	Berger Paints Nig	Industrial	8.60	5.46	0.77
2012	Nigeria	Beta Glass Company	Industrial	10.67	5.92	2.66
2013	Nigeria	Beta Glass Company	Industrial	10.67	5.40	2.93
2014	Nigeria	Beta Glass Company	Industrial	14.98	8.88	4.78
2015	Nigeria	Beta Glass Company	Industrial	11.33	7.33	3.98
2016	Nigeria	Beta Glass Company	Industrial	17.69	11.45	7.60
2012	Nigeria	Cadbury Nig	Consumer	17.24	8.60	1.10
2013	Nigeria	Cadbury Nig	Consumer	25.10	13.95	1.92
2014	Nigeria	Cadbury Nig	Consumer	13.11	5.25	0.75
2015	Nigeria	Cadbury Nig	Consumer	9.39	4.06	0.61
2016	Nigeria	Cadbury Nig	Consumer	-2.68	-1.04	0.16
2012	Nigeria	Champion Breweries	Consumer	38.97	-19.66	-1.49
2013	Nigeria	Champion Breweries	Consumer	25.56	-12.89	-1.31
2014	Nigeria	Champion Breweries	Consumer	-12.85	-7.87	-0.24
2015	Nigeria	Champion Breweries	Consumer	1.08	0.75	0.10
2016	Nigeria	Champion Breweries	Consumer	6.91	5.32	0.70
2012	Nigeria	Chemical & Allied Product	Industrial	99.73	38.79	1.99
2013	Nigeria	Chemical & Allied Product	Industrial	111.72	46.68	2.02
2014	Nigeria	Chemical & Allied Product	Industrial	140.82	53.96	2.37
2015	Nigeria	Chemical & Allied Product	Industrial	114.43	51.02	2.49
2016	Nigeria	Chemical & Allied Product	Industrial	70.22	32.62	2.29
2012	Nigeria	Cutix	Industrial	15.46	8.39	0.15
2013	Nigeria	Cutix	Industrial	25.34	14.10	0.17
2014	Nigeria	Cutix	Industrial	29.60	11.87	0.24
2015	Nigeria	Cutix	Industrial	20.06	7.58	0.17
2016	Nigeria	Cutix	Industrial	21.90	10.07	0.22

Start Year	COUNTRY	Company	SECTOR	ROE	ROA	EPS
2012	Nigeria	Dangote Sugar	Consumer	23.33	13.01	0.90
2013	Nigeria	Dangote Sugar	Consumer	23.09	13.04	0.90
2014	Nigeria	Dangote Sugar	Consumer	22.63	12.54	0.97
2015	Nigeria	Dangote Sugar	Consumer	19.84	11.24	0.96
2016	Nigeria	Dangote Sugar	Consumer	21.76	8.07	1.20
2012	Nigeria	Dn Meyer	Industrial	-4.14	-1.04	-0.08
2013	Nigeria	Dn Meyer	Industrial	6.79	1.79	0.14
2014	Nigeria	Dn Meyer	Industrial	-5.64	-1.49	-0.12
2015	Nigeria	Dn Meyer	Industrial	7.71	2.27	0.18
2016	Nigeria	Dn Meyer	Industrial	-47.03	-9.94	-0.75
2012	Nigeria	Flour Mills Of Nigeria	Consumer	10.17	3.60	3.08
2013	Nigeria	Flour Mills Of Nigeria	Consumer	9.21	2.76	2.91
2014	Nigeria	Flour Mills Of Nigeria	Consumer	6.42	1.81	1.93
2015	Nigeria	Flour Mills Of Nigeria	Consumer	10.03	2.47	3.43
2016	Nigeria	Flour Mills Of Nigeria	Consumer	15.06	4.18	5.57
2012	Nigeria	Greif Nig	Industrial	9.32	5.10	0.85
2013	Nigeria	Greif Nig	Industrial	9.60	4.49	0.72
2014	Nigeria	Greif Nig	Industrial	12.89	6.54	1.02
2015	Nigeria	Greif Nig	Industrial	7.33	3.44	0.58
2016	Nigeria	Greif Nig	Industrial	8.03	3.75	0.64
2012	Nigeria	Guinness Nig	Consumer	36.81	13.41	9.64
2013	Nigeria	Guinness Nig	Consumer	25.77	9.80	7.93
2014	Nigeria	Guinness Nig	Consumer	21.25	7.23	6.36
2015	Nigeria	Guinness Nig	Consumer	16.12	6.38	5.18
2016	Nigeria	Guinness Nig	Consumer	-4.84	-1.47	-1.34
2012	Nigeria	Honywell Flour Mill	Consumer	16.08	6.01	0.34
2013	Nigeria	Honywell Flour Mill	Consumer	15.33	5.13	0.36
2014	Nigeria	Honywell Flour Mill	Consumer	16.27	5.25	0.42
2015	Nigeria	Honywell Flour Mill	Consumer	5.51	1.65	0.14
2016	Nigeria	Honywell Flour Mill	Consumer	-18.48	-3.98	-0.38
2012	Nigeria	International Breweries	Consumer	.	.	.
2013	Nigeria	International Breweries	Consumer	26.72	10.88	0.71
2014	Nigeria	International Breweries	Consumer	18.68	8.64	0.71
2015	Nigeria	International Breweries	Consumer	16.00	6.45	0.59
2016	Nigeria	International Breweries	Consumer	18.95	7.92	0.81
2012	Nigeria	Mcnichols Consolidated	Consumer	5.32	3.50	0.03
2013	Nigeria	Mcnichols Consolidated	Consumer	12.35	7.29	8.67
2014	Nigeria	Mcnichols Consolidated	Consumer	18.26	10.72	0.15
2015	Nigeria	Mcnichols Consolidated	Consumer	23.17	14.36	0.17
2016	Nigeria	Mcnichols Consolidated	Consumer	19.18	12.17	0.17
2012	Nigeria	Nascon Allied	Consumer	42.06	25.88	1.04
2013	Nigeria	Nascon Allied	Consumer	39.17	23.62	1.02
2014	Nigeria	Nascon Allied	Consumer	29.60	14.87	0.70
2015	Nigeria	Nascon Allied	Consumer	29.71	12.92	0.79
2016	Nigeria	Nascon Allied	Consumer	30.02	9.82	0.91
2012	Nigeria	Nestle Nig	Consumer	61.83	23.76	26.67
2013	Nigeria	Nestle Nig	Consumer	54.83	20.57	28.10
2014	Nigeria	Nestle Nig	Consumer	61.87	20.96	28.05

Start Year	COUNTRY	Company	SECTOR	ROE	ROA	EPS
2015	Nigeria	Nestle Nig	Consumer	62.45	19.91	29.95
2016	Nigeria	Nestle Nig	Consumer	25.67	4.67	10.00
2012	Nigeria	Nigeria Breweries	Consumer	40.71	15.00	5.03
2013	Nigeria	Nigeria Breweries	Consumer	38.34	17.04	5.70
2014	Nigeria	Nigeria Breweries	Consumer	24.73	12.18	5.62
2015	Nigeria	Nigeria Breweries	Consumer	22.08	10.68	4.82
2016	Nigeria	Nigeria Breweries	Consumer	17.13	7.74	3.58
2012	Nigeria	Nigerian Enamelware	Consumer	24.52	4.06	1.39
2013	Nigeria	Nigerian Enamelware	Consumer	6.25	3.36	1.01
2014	Nigeria	Nigerian Enamelware	Consumer	6.94	2.79	1.36
2015	Nigeria	Nigerian Enamelware	Consumer	5.70	1.48	1.17
2016	Nigeria	Nigerian Enamelware	Consumer	9.46	2.94	2.11
2012	Nigeria	Nigerian Northen Flour Mill	Consumer	0.37	0.15	0.03
2013	Nigeria	Nigerian Northen Flour Mill	Consumer	14.02	6.21	1.42
2014	Nigeria	Nigerian Northen Flour Mill	Consumer	13.17	7.15	1.31
2015	Nigeria	Nigerian Northen Flour Mill	Consumer	-989.38	-4.85	-1.12
2016	Nigeria	Nigerian Northen Flour Mill	Consumer	-6.66	-5.01	-1.11
2012	Nigeria	Paints & Coatings Man	Industrial	20.10	13.39	0.32
2013	Nigeria	Paints & Coatings Man	Industrial	18.92	12.32	0.36
2014	Nigeria	Paints & Coatings Man	Industrial	12.24	6.10	0.26
2015	Nigeria	Paints & Coatings Man	Industrial	7.03	5.42	0.16
2016	Nigeria	Paints & Coatings Man	Industrial	1.23	0.89	0.03
2012	Nigeria	Portland Paint Nig	Industrial	-29.41	-9.57	-0.56
2013	Nigeria	Portland Paint Nig	Industrial	12.16	4.93	0.27
2014	Nigeria	Portland Paint Nig	Industrial	16.08	6.53	0.37
2015	Nigeria	Portland Paint Nig	Industrial	-33.69	-12.27	-0.58
2016	Nigeria	Portland Paint Nig	Industrial	1.23	0.49	0.02
2012	Nigeria	Premier Paints	Industrial	-254.07	-10.36	-0.25
2013	Nigeria	Premier Paints	Industrial	228.83	-8.39	-0.17
2014	Nigeria	Premier Paints	Industrial	-707.87	2.80	0.07
2015	Nigeria	Premier Paints	Industrial	-114.01	-8.64	-0.24
2016	Nigeria	Premier Paints	Industrial	104.49	-12.09	-0.31
2012	Nigeria	Pz Cussons	Consumer	6.20	3.94	0.61
2013	Nigeria	Pz Cussons	Consumer	12.06	7.36	1.23
2014	Nigeria	Pz Cussons	Consumer	12.53	7.16	1.16
2015	Nigeria	Pz Cussons	Consumer	11.03	6.78	1.02
2016	Nigeria	Pz Cussons	Consumer	4.91	2.86	0.47
2012	Nigeria	Tiger Branded	Consumer	-8.94	-2.92	0.55
2013	Nigeria	Tiger Branded	Consumer	-37.36	-10.27	-1.59
2014	Nigeria	Tiger Branded	Consumer	-65.34	-11.46	-1.24
2015	Nigeria	Tiger Branded	Consumer	520.52	-25.69	-2.51
2016	Nigeria	Tiger Branded	Consumer	43.70	13.38	2.12
2012	Nigeria	Unilever Nig	Consumer	39.52	15.34	1.48
2013	Nigeria	Unilever Nig	Consumer	49.87	10.99	1.27
2014	Nigeria	Unilever Nig	Consumer	32.26	5.27	0.64
2015	Nigeria	Unilever Nig	Consumer	14.90	2.38	0.32
2016	Nigeria	Unilever Nig	Consumer	26.28	4.24	0.81

Start Year	COUNTRY	Company	SECTOR	ROE	ROA	EPS
2012	Nigeria	Vitafoam Nig	Consumer	16.28	4.82	0.68
2013	Nigeria	Vitafoam Nig	Consumer	13.19	4.12	0.50
2014	Nigeria	Vitafoam Nig	Consumer	14.38	3.64	0.63
2015	Nigeria	Vitafoam Nig	Consumer	5.37	1.72	0.29
2016	Nigeria	Vitafoam Nig	Consumer	-0.91	-0.24	-0.39
2012	South Africa	Astrapak	Industrial	2.46	1.08	0.01
2013	South Africa	Astrapak	Industrial	13.71	6.72	1.21
2014	South Africa	Astrapak	Industrial	0.48	0.24	-0.14
2015	South Africa	Astrapak	Industrial	-1.09	-0.53	-0.22
2016	South Africa	Astrapak	Industrial	0.62	0.36	-2.70
2012	South Africa	Avi	Consumer	26.21	17.14	3.01
2013	South Africa	Avi	Consumer	28.39	15.90	3.25
2014	South Africa	Avi	Consumer	31.21	18.52	4.09
2015	South Africa	Avi	Consumer	33.81	16.58	4.11
2016	South Africa	Avi	Consumer	32.99	16.40	4.61
2012	South Africa	Bowler Metcalf	Industrial	14.08	11.53	0.72
2013	South Africa	Bowler Metcalf	Industrial	13.54	11.18	0.67
2014	South Africa	Bowler Metcalf	Industrial	13.09	10.88	0.73
2015	South Africa	Bowler Metcalf	Industrial	10.78	9.34	0.87
2016	South Africa	Bowler Metcalf	Industrial	10.53	8.93	0.88
2012	South Africa	Capevin Holdings	Consumer	15.43	15.37	0.31
2013	South Africa	Capevin Holdings	Consumer	15.04	14.99	0.35
2014	South Africa	Capevin Holdings	Consumer	11.79	11.76	0.31
2015	South Africa	Capevin Holdings	Consumer	16.71	15.02	0.44
2016	South Africa	Capevin Holdings	Consumer	14.35	14.29	0.46
2012	South Africa	Cashbuild	Consumer	29.66	15.21	12.60
2013	South Africa	Cashbuild	Consumer	22.26	12.01	10.63
2014	South Africa	Cashbuild	Consumer	21.75	10.30	11.48
2015	South Africa	Cashbuild	Consumer	27.07	11.84	15.37
2016	South Africa	Cashbuild	Consumer	30.16	12.49	19.20
2012	South Africa	Clover Industries	Consumer	106.62	54.30	1.24
2013	South Africa	Clover Industries	Consumer	11.35	5.41	1.33
2014	South Africa	Clover Industries	Consumer	8.32	4.10	1.02
2015	South Africa	Clover Industries	Consumer	13.37	6.31	1.90
2016	South Africa	Clover Industries	Consumer	12.18	6.00	1.85
2012	South Africa	Distell Group	Consumer	15.68	9.85	4.47
2013	South Africa	Distell Group	Consumer	14.88	7.62	4.92
2014	South Africa	Distell Group	Consumer	17.72	9.61	6.96
2015	South Africa	Distell Group	Consumer	14.86	7.97	6.55
2016	South Africa	Distell Group	Consumer	14.35	7.68	6.14
2012	South Africa	Enx Group	Industrial	-43.25	-31.60	-0.39
2013	South Africa	Enx Group	Industrial	2.11	1.66	0.02
2014	South Africa	Enx Group	Industrial	6.29	4.77	0.06
2015	South Africa	Enx Group	Industrial	4.73	2.47	0.05
2016	South Africa	Enx Group	Industrial	-10.39	-5.01	-12.60
2012	South Africa	Famous Brands	Consumer	16.05	10.97	2.80

Start Year	COUNTRY	Company	SECTOR	ROE	ROA	EPS
2013	South Africa	Famous Brands	Consumer	13.19	8.66	3.40
2014	South Africa	Famous Brands	Consumer	33.12	23.95	4.06
2015	South Africa	Famous Brands	Consumer	34.89	26.17	4.68
2016	South Africa	Famous Brands	Consumer	35.57	22.90	5.29
2012	South Africa	Imperial Holdings	Industrial	23.10	7.41	17.65
2013	South Africa	Imperial Holdings	Industrial	21.03	7.13	19.25
2014	South Africa	Imperial Holdings	Industrial	20.03	6.15	18.71
2015	South Africa	Imperial Holdings	Industrial	17.61	5.15	17.53
2016	South Africa	Imperial Holdings	Industrial	16.20	4.59	16.61
2012	South Africa	Kaydav Group	Consumer	15.76	8.71	0.12
2013	South Africa	Kaydav Group	Consumer	16.85	9.18	0.14
2014	South Africa	Kaydav Group	Consumer	17.88	8.23	0.16
2015	South Africa	Kaydav Group	Consumer	17.96	8.28	0.18
2016	South Africa	Kaydav Group	Consumer	13.88	6.42	15.80
2012	South Africa	Labat Africa	Industrial	1,131.01	61.87	13.06
2013	South Africa	Labat Africa	Industrial	12.44	0.95	0.42
2014	South Africa	Labat Africa	Industrial	70.16	-22.65	-0.03
2015	South Africa	Labat Africa	Industrial	226.67	4.64	0.42
2016	South Africa	Labat Africa	Industrial	126.73	35.68	3.28
2012	South Africa	Lewis Group	Consumer	18.73	13.06	9.05
2013	South Africa	Lewis Group	Consumer	18.77	12.52	10.17
2014	South Africa	Lewis Group	Consumer	16.85	9.24	9.40
2015	South Africa	Lewis Group	Consumer	15.41	8.94	9.37
2016	South Africa	Lewis Group	Consumer	17.64	10.22	1.08
2012	South Africa	Metair Investments	Industrial	23.12	14.41	3.04
2013	South Africa	Metair Investments	Industrial	9.87	5.02	2.23
2014	South Africa	Metair Investments	Industrial	14.92	7.97	3.08
2015	South Africa	Metair Investments	Industrial	11.15	6.14	2.67
2016	South Africa	Metair Investments	Industrial	11.20	5.83	2.27
2012	South Africa	Mondi	Industrial	9.70	4.21	0.50
2013	South Africa	Mondi	Industrial	14.55	6.63	0.80
2014	South Africa	Mondi	Industrial	16.60	7.83	0.97
2015	South Africa	Mondi	Industrial	20.24	9.97	1.24
2016	South Africa	Mondi	Industrial	18.56	9.38	1.32
2012	South Africa	Mpact	Industrial	12.59	5.51	1.88
2013	South Africa	Mpact	Industrial	13.79	6.41	2.30
2014	South Africa	Mpact	Industrial	13.92	6.32	2.57
2015	South Africa	Mpact	Industrial	0.17	0.76	3.67
2016	South Africa	Mpact	Industrial	9.87	4.55	2.34
2012	South Africa	Nampak	Industrial	19.17	7.82	2.01
2013	South Africa	Nampak	Industrial	17.74	6.50	2.15
2014	South Africa	Nampak	Industrial	15.27	5.50	1.92
2015	South Africa	Nampak	Industrial	11.57	4.35	1.68
2016	South Africa	Nampak	Industrial	15.65	6.13	2.35
2012	South Africa	Nictus	Consumer	13.66	2.10	0.43
2013	South Africa	Nictus	Consumer	-18.04	-4.11	-0.23
2014	South Africa	Nictus	Consumer	3.69	0.69	0.05

Start Year	COUNTRY	Company	SECTOR	ROE	ROA	EPS
2015	South Africa	Nictus	Consumer	7.71	1.36	0.10
2016	South Africa	Nictus	Consumer	8.46	1.55	0.12
2012	South Africa	Nu-World Holdings	Consumer	9.04	6.53	1.80
2013	South Africa	Nu-World Holdings	Consumer	6.83	5.38	2.19
2014	South Africa	Nu-World Holdings	Consumer	9.86	7.43	3.37
2015	South Africa	Nu-World Holdings	Consumer	10.36	7.32	4.30
2016	South Africa	Nu-World Holdings	Consumer	8.62	6.21	4.88
2012	South Africa	Pioneer Food Group	Consumer	9.78	5.70	3.36
2013	South Africa	Pioneer Food Group	Consumer	10.75	6.03	3.91
2014	South Africa	Pioneer Food Group	Consumer	16.74	7.93	5.58
2015	South Africa	Pioneer Food Group	Consumer	16.24	9.30	6.14
2016	South Africa	Pioneer Food Group	Consumer	21.48	12.49	9.12
2012	South Africa	Rcl Foods	Consumer	9.18	5.13	0.88
2013	South Africa	Rcl Foods	Consumer	0.10	0.04	0.02
2014	South Africa	Rcl Foods	Consumer	-3.25	-1.54	-0.36
2015	South Africa	Rcl Foods	Consumer	8.84	4.54	1.04
2016	South Africa	Rcl Foods	Consumer	2.25	1.12	0.26
2012	South Africa	Remgro	Consumer	8.91	8.33	1.80
2013	South Africa	Remgro	Consumer	0.24	0.20	8.01
2014	South Africa	Remgro	Consumer	0.00	0.00	13.26
2015	South Africa	Remgro	Consumer	2.23	1.79	16.81
2016	South Africa	Remgro	Consumer	-0.98	-0.73	-1.66
2012	South Africa	Tiger Brands	Consumer	24.31	15.39	17.25
2013	South Africa	Tiger Brands	Consumer	18.49	10.12	15.99
2014	South Africa	Tiger Brands	Consumer	13.66	7.66	11.90
2015	South Africa	Tiger Brands	Consumer	6.84	3.79	5.83
2016	South Africa	Tiger Brands	Consumer	20.72	13.54	20.44
2012	South Africa	Tongaat-Hulett	Consumer	15.22	5.74	9.61
2013	South Africa	Tongaat-Hulett	Consumer	14.15	5.53	10.70
2014	South Africa	Tongaat-Hulett	Consumer	11.62	5.12	10.99
2015	South Africa	Tongaat-Hulett	Consumer	7.60	3.94	9.15
2016	South Africa	Tongaat-Hulett	Consumer	4.96	2.50	6.67
2012	South Africa	Transpaco	Industrial	21.94	12.44	2.01
2013	South Africa	Transpaco	Industrial	18.52	11.20	2.09
2014	South Africa	Transpaco	Industrial	17.32	10.63	2.13
2015	South Africa	Transpaco	Industrial	17.42	10.87	2.45
2016	South Africa	Transpaco	Industrial	20.89	12.56	3.33

Source: Annual Reports and Accounts and Stock Exchange Fact Book, 2012-2016

Start Year	COUNTRY	Company	SECTOR	BVPS	TOBIN'S Q	AA	△EBIT	△NPAT
2012	Kenya	British American Tobacco Kenya	Consumer	70.98	3.78	24.50		
2013	Kenya	British American Tobacco Kenya	Consumer	75.72	4.09	27.88	0.125741	0.138447
2014	Kenya	British American Tobacco Kenya	Consumer	81.27	9.12	28.98	0.107992	0.142684
2015	Kenya	British American Tobacco Kenya	Consumer	88.53	7.31	32.07	0.193459	0.169508
2016	Kenya	British American Tobacco Kenya	Consumer	87.07	7.76	29.78	-0.17397	-0.14909
2012	Kenya	Car & General	Industrial	64.13	0.74	6.21	.	.
2013	Kenya	Car & General	Industrial	74.93	0.76	6.50	0.082701	0.184704
2014	Kenya	Car & General	Industrial	33.08	1.23	5.06	0.056348	-0.11852
2015	Kenya	Car & General	Industrial	36.99	1.02	0.82	-0.32693	-0.54323
2016	Kenya	Car & General	Industrial	80.76	0.78	1.54	0.183621	-0.30103
2012	Kenya	Crown Berger Paints Kenya	Industrial	49.57	0.63	5.06	.	.
2013	Kenya	Crown Berger Paints Kenya	Industrial	19.13	1.14	6.46	0.455974	0.601318
2014	Kenya	Crown Berger Paints Kenya	Industrial	18.93	1.33	2.51	-0.20408	-0.90783
2015	Kenya	Crown Berger Paints Kenya	Industrial	19.01	1.66	3.22	0.340499	0.56002
2016	Kenya	Crown Berger Paints Kenya	Industrial	21.95	1.28	3.70	0.236499	3.286328
2012	Kenya	E.A.Cables	Industrial	9.18	1.10	17.51	.	.
2013	Kenya	E.A.Cables	Industrial	9.53	1.27	13.00	-0.18052	-0.23725
2014	Kenya	E.A.Cables	Industrial	12.22	1.13	9.95	-0.10185	-0.14327
2015	Kenya	E.A.Cables	Industrial	12.44	0.94	-29.19	-2.01466	-3.17266
2016	Kenya	E.A.Cables	Industrial	10.10	0.86	-22.20	-0.61735	-0.21398
2012	Kenya	East African Breweries	Consumer	8.27	4.72	27.47	.	.
2013	Kenya	East African Breweries	Consumer	8.69	4.85	18.82	-0.20883	-0.41694
2014	Kenya	East African Breweries	Consumer	11.41	4.73	16.98	-0.00894	0.051579
2015	Kenya	East African Breweries	Consumer	17.31	4.02	21.97	-0.06868	0.390255
2016	Kenya	East African Breweries	Consumer	13.74	3.95	21.17	0.018901	-0.15876
2012	Kenya	Eveready East Africa	Industrial	1.66	1.07	5.01	.	.
2013	Kenya	Eveready East Africa	Industrial	1.89	1.18	4.21	0.349044	-0.35659
2014	Kenya	Eveready East Africa	Industrial	1.04	1.60	-20.39	-2.34738	-4.93857
2015	Kenya	Eveready East Africa	Industrial	3.25	0.91	-13.46	-0.52147	0.025255
2016	Kenya	Eveready East Africa	Industrial	2.32	1.01	-39.57	0.53414	-0.0563
2012	Kenya	Mumias Sugar Co.	Consumer	10.28	0.70	11.35	.	.
2013	Kenya	Mumias Sugar Co.	Consumer	8.75	0.69	-18.59	-1.10897	-1.82497
2014	Kenya	Mumias Sugar Co.	Consumer	6.96	0.67	-26.04	4.051551	0.630073
2015	Kenya	Mumias Sugar Co.	Consumer	3.88	0.83	-114.03	1.792199	0.716108
2016	Kenya	Mumias Sugar Co.	Consumer	5.03	0.79	-96.52	-0.09182	0.018564
2012	Kenya	Sameer Africa	Industrial	8.36	0.66	7.49	.	.
2013	Kenya	Sameer Africa	Industrial	9.63	0.67	11.33	0.166818	1.128843
2014	Kenya	Sameer Africa	Industrial	9.11	0.78	-1.84	-0.71832	-1.16683
2015	Kenya	Sameer Africa	Industrial	6.92	0.73	37.30	6.394536	-17.4532
2016	Kenya	Sameer Africa	Industrial	5.48	0.74	28.59	-0.04737	-0.30817
2012	Kenya	Trans-Century	Industrial	32.58	0.85	9.09	.	.
2013	Kenya	Trans-Century	Industrial	48.25	0.78	7.27	-0.1641	-0.14899
2014	Kenya	Trans-Century	Industrial	41.43	0.69	-20.63	-1.29261	-4.63635
2015	Kenya	Trans-Century	Industrial	12.65	0.94	-25.07	1.009708	0.063498
2016	Kenya	Trans-Century	Industrial	13.61	0.90	-19.75	-0.79685	-0.6434
2012	Kenya	Unga Group	Consumer	52.69	0.53	3.21	.	.
2013	Kenya	Unga Group	Consumer	59.49	0.62	4.20	0.263404	0.459031
2014	Kenya	Unga Group	Consumer	61.91	0.79	3.34	-0.07462	-0.24655
2015	Kenya	Unga Group	Consumer	70.73	0.68	3.40	0.165053	0.122815

Start Year	COUNTRY	Company	SECTOR	BVPS	TOBIN'S Q	AA	△EBIT	△NPAT
2016	Kenya	Unga Group	Consumer	75.24	0.66	3.72	-0.04873	0.183899
2012	Nigeria	7Up Nigeria	Consumer	15.94	1.38	4.89	.	.
2014	Nigeria	7Up Nigeria	Consumer	27.05	2.59	9.78	0.330775	1.252614
2015	Nigeria	7Up Nigeria	Consumer	37.36	2.37	10.61	0.157993	0.107418
2016	Nigeria	7Up Nigeria	Consumer	38.68	1.85	4.39	-0.17177	-0.53023
2012	Nigeria	Austin Laz & Co	Industrial	1.80	1.10	12.03	.	.
2013	Nigeria	Austin Laz & Co	Industrial	1.80	1.09	2.84	-0.20616	-0.87415
2014	Nigeria	Austin Laz & Co	Industrial	1.66	1.23	-25.73	-0.79195	-22.0157
2015	Nigeria	Austin Laz & Co	Industrial	1.60	1.28	-22.41	1.507768	-0.62822
2016	Nigeria	Austin Laz & Co	Industrial	1.47	1.38	-67.17	-0.46267	1.472856
2012	Nigeria	Avon Crowncaps & Containers	Industrial	3.06	0.93	1.05	.	.
2013	Nigeria	Avon Crowncaps & Containers	Industrial	2.91	0.92	-1.09	0.243612	-2.24416
2014	Nigeria	Avon Crowncaps & Containers	Industrial	3.05	0.89	2.13	0.171728	-2.23076
2015	Nigeria	Avon Crowncaps & Containers	Industrial	2.96	0.91	0.17	-0.14428	-1.32736
2016	Nigeria	Avon Crowncaps & Containers	Industrial	2.70	0.91	1.06	0.568151	2.990654
2012	Nigeria	Berger Paints Nig	Industrial	8.16	1.06	11.32	.	.
2013	Nigeria	Berger Paints Nig	Industrial	8.43	0.96	13.15	0.308358	0.309032
2014	Nigeria	Berger Paints Nig	Industrial	8.49	1.04	8.09	-0.08279	-0.40796
2015	Nigeria	Berger Paints Nig	Industrial	8.93	1.08	18.70	0.61176	1.219746
2016	Nigeria	Berger Paints Nig	Industrial	8.99	0.82	10.44	-0.43587	-0.32184
2012	Nigeria	Beta Glass Company	Industrial	24.94	0.68	14.36	.	.
2013	Nigeria	Beta Glass Company	Industrial	27.46	0.76	14.50	-0.00093	0.104445
2014	Nigeria	Beta Glass Company	Industrial	31.90	0.92	20.08	0.375905	0.628945
2015	Nigeria	Beta Glass Company	Industrial	35.16	1.34	19.52	-0.07992	-0.16697
2016	Nigeria	Beta Glass Company	Industrial	42.95	0.81	27.32	0.400538	0.908162
2012	Nigeria	Cadbury Nig	Consumer	6.38	2.77	16.43	.	.
2013	Nigeria	Cadbury Nig	Consumer	7.65	4.73	20.75	0.259929	0.743339
2014	Nigeria	Cadbury Nig	Consumer	5.70	3.41	4.81	-0.62617	-0.74886
2015	Nigeria	Cadbury Nig	Consumer	6.54	1.70	5.60	-0.01463	-0.23759
2016	Nigeria	Cadbury Nig	Consumer	5.89	1.29	-1.88	-0.71783	-1.257
2013	Nigeria	Champion Breweries	Consumer	-5.12	3.17	-77.48	-1.35393	-0.1187
2014	Nigeria	Champion Breweries	Consumer	1.88	2.66	-32.45	5.867849	-0.3595
2015	Nigeria	Champion Breweries	Consumer	0.92	2.83	7.09	-0.17908	-1.10224
2016	Nigeria	Champion Breweries	Consumer	0.99	2.13	17.63	0.495412	5.875668
2012	Nigeria	Chemical & Allied Product	Industrial	2.00	6.07	31.75	.	.
2013	Nigeria	Chemical & Allied Product	Industrial	1.81	11.78	33.68	0.246921	0.270037
2014	Nigeria	Chemical & Allied Product	Industrial	1.68	9.15	34.95	0.165041	0.17337
2015	Nigeria	Chemical & Allied Product	Industrial	2.17	8.27	36.42	0.049765	0.046398
2016	Nigeria	Chemical & Allied Product	Industrial	3.26	5.09	33.71	-0.08695	-0.0783
2012	Nigeria	Cutix	Industrial	0.97	1.32	7.54	.	.
2013	Nigeria	Cutix	Industrial	0.68	1.90	11.88	0.571539	0.916407
2014	Nigeria	Cutix	Industrial	0.81	1.24	11.85	0.263596	0.367797
2015	Nigeria	Cutix	Industrial	0.84	1.36	8.57	0.023963	-0.27959
2016	Nigeria	Cutix	Industrial	0.99	1.38	9.81	0.253685	0.277074
2012	Nigeria	Dangote Sugar	Consumer	3.86	1.31	15.28	.	.
2013	Nigeria	Dangote Sugar	Consumer	3.90	2.13	15.77	-0.00586	0.004586
2014	Nigeria	Dangote Sugar	Consumer	4.28	1.27	16.10	0.116036	0.072824
2015	Nigeria	Dangote Sugar	Consumer	4.85	1.15	16.38	0.105657	-0.00866

Start Year	COUNTRY	Company	SECTOR	BVPS	TOBIN'S Q	AA	△EBIT	△NPAT
2016	Nigeria	Dangote Sugar	Consumer	5.51	1.03	11.56	0.171476	0.248016
2012	Nigeria	Dn Meyer	Industrial	2.23	0.92	-1.94	.	.
2013	Nigeria	Dn Meyer	Industrial	2.38	0.89	3.22	0.492205	-2.74669
2014	Nigeria	Dn Meyer	Industrial	2.23	0.84	-2.79	-0.35415	-1.77707
2015	Nigeria	Dn Meyer	Industrial	2.35	0.79	5.09	0.331392	-2.44525
2016	Nigeria	Dn Meyer	Industrial	1.60	0.90	-19.78	-1.6797	-5.14673
2012	Nigeria	Flour Mills Of Nigeria	Consumer	32.06	1.36	4.67	.	.
2013	Nigeria	Flour Mills Of Nigeria	Consumer	31.97	1.52	3.70	0.131716	-0.07759
2014	Nigeria	Flour Mills Of Nigeria	Consumer	31.84	1.06	2.48	0.141795	-0.30528
2015	Nigeria	Flour Mills Of Nigeria	Consumer	32.14	0.91	2.50	0.053401	0.576613
2016	Nigeria	Flour Mills Of Nigeria	Consumer	36.49	0.86	3.35	0.25398	0.703909
2012	Nigeria	Greif Nig	Industrial	9.12	1.23	7.49	.	.
2013	Nigeria	Greif Nig	Industrial	7.50	1.32	6.60	-0.05973	-0.1583
2014	Nigeria	Greif Nig	Industrial	7.91	1.27	7.37	0.054903	0.418501
2015	Nigeria	Greif Nig	Industrial	7.89	1.21	4.99	-0.27147	-0.43319
2016	Nigeria	Greif Nig	Industrial	7.93	.	2.76	-0.22233	0.100796
2012	Nigeria	Guinness Nig	Consumer	26.18	4.46	17.50	.	.
2013	Nigeria	Guinness Nig	Consumer	30.57	3.56	13.89	0.028813	-0.16539
2014	Nigeria	Guinness Nig	Consumer	29.92	2.57	10.70	-0.13651	-0.19305
2015	Nigeria	Guinness Nig	Consumer	32.10	2.09	9.11	0.012947	-0.18578
2016	Nigeria	Guinness Nig	Consumer	27.67	1.61	-2.30	-0.46833	-1.25862
2012	Nigeria	Honywell Flour Mill	Consumer	2.12	0.99	9.62	.	.
2013	Nigeria	Honywell Flour Mill	Consumer	2.34	1.19	8.35	0.04854	0.052208
2014	Nigeria	Honywell Flour Mill	Consumer	2.60	1.11	7.69	0.425003	0.178667
2015	Nigeria	Honywell Flour Mill	Consumer	2.56	0.94	2.92	-0.41376	-0.66575
2016	Nigeria	Honywell Flour Mill	Consumer	2.06	0.92	-5.64	-0.92317	-3.69922
2012	Nigeria	International Breweries	Consumer	.	.	.	.	.
2013	Nigeria	International Breweries	Consumer	2.84	4.71	21.48	.	.
2014	Nigeria	International Breweries	Consumer	3.41	3.70	21.23	0.144805	-0.15998
2015	Nigeria	International Breweries	Consumer	3.69	2.34	13.64	0.003257	-0.07552
2016	Nigeria	International Breweries	Consumer	4.25	2.40	15.72	0.144805	0.362837
2012	Nigeria	Mcnichols Consolidated	Consumer	0.64	1.17	3.07	.	.
2013	Nigeria	Mcnichols Consolidated	Consumer	0.70	2.14	6.23	0.685211	1.548117
2014	Nigeria	Mcnichols Consolidated	Consumer	0.75	1.58	8.75	0.927664	0.731875
2015	Nigeria	Mcnichols Consolidated	Consumer	0.88	1.23	6.46	0.370539	0.488406
2016	Nigeria	Mcnichols Consolidated	Consumer	1.02	.	5.29	-0.0975	-0.04125
2012	Nigeria	Nascon Allied	Consumer	2.48	2.37	30.09	.	.
2013	Nigeria	Nascon Allied	Consumer	2.60	3.87	37.26	-0.00914	-0.02414
2014	Nigeria	Nascon Allied	Consumer	2.38	1.81	25.39	-0.20958	-0.30839
2015	Nigeria	Nascon Allied	Consumer	2.68	1.73	18.65	0.105913	0.1278
2016	Nigeria	Nascon Allied	Consumer	3.04	1.59	19.22	0.228939	0.147003
2012	Nigeria	Nestle Nig	Consumer	43.13	6.85	21.46	.	.
2013	Nigeria	Nestle Nig	Consumer	51.22	9.41	19.57	0.065917	0.053034
2014	Nigeria	Nestle Nig	Consumer	45.34	8.22	17.06	0.08158	-0.00102
2015	Nigeria	Nestle Nig	Consumer	47.95	6.40	19.38	0.128727	0.06751
2016	Nigeria	Nestle Nig	Consumer	38.96	4.60	11.85	0.205983	-0.66613
2012	Nigeria	Nigeria Breweries	Consumer	12.36	5.01	22.01	.	.
2013	Nigeria	Nigeria Breweries	Consumer	14.87	5.58	23.17	0.124555	0.13242
2014	Nigeria	Nigeria Breweries	Consumer	22.73	4.09	23.07	-0.00076	-0.013

Start Year	COUNTRY	Company	SECTOR	BVPS	TOBIN'S Q	AA	△EBIT	△NPAT
2015	Nigeria	Nigeria Breweries	Consumer	21.73	3.54	18.55	-0.00877	-0.10499
2016	Nigeria	Nigeria Breweries	Consumer	20.92	3.74	12.65	-0.08313	-0.25329
2012	Nigeria	Nigerian Enamelware	Consumer	5.66	1.83	5.54	.	.
2013	Nigeria	Nigerian Enamelware	Consumer	18.69	1.39	4.68	0.402086	-0.15887
2014	Nigeria	Nigerian Enamelware	Consumer	19.60	1.25	4.35	-0.04534	0.164729
2015	Nigeria	Nigerian Enamelware	Consumer	20.61	1.10	4.68	0.065777	-0.1369
2016	Nigeria	Nigerian Enamelware	Consumer	22.26	1.08	6.33	0.357902	0.794984
2012	Nigeria	Nigerian Northen Flour Mill	Consumer	8.10	1.51	0.37	.	.
2013	Nigeria	Nigerian Northen Flour Mill	Consumer	10.13	1.57	2.82	0.883405	43.64505
2014	Nigeria	Nigerian Northen Flour Mill	Consumer	9.95	1.44	3.00	-0.03626	0.037309
2015	Nigeria	Nigerian Northen Flour Mill	Consumer	0.11	1.37	-2.05	-1.234	-1.85447
2016	Nigeria	Nigerian Northen Flour Mill	Consumer	16.61	0.41	-23.81	0.216142	-0.01162
2012	Nigeria	Paints & Coatings Man	Industrial	1.59	1.15	9.46	.	.
2013	Nigeria	Paints & Coatings Man	Industrial	1.92	0.99	9.46	0.011312	0.077481
2014	Nigeria	Paints & Coatings Man	Industrial	2.12	0.86	6.55	-0.21419	-0.29351
2015	Nigeria	Paints & Coatings Man	Industrial	2.28	0.65	4.38	-0.26727	-0.38251
2016	Nigeria	Paints & Coatings Man	Industrial	2.23	0.49	1.39	-0.5689	-0.82615
2012	Nigeria	Portland Paint Nig	Industrial	1.90	1.42	-6.95	.	.
2013	Nigeria	Portland Paint Nig	Industrial	2.22	1.60	4.46	-16.7928	-1.47063
2014	Nigeria	Portland Paint Nig	Industrial	2.31	1.19	6.94	0.216035	0.383073
2015	Nigeria	Portland Paint Nig	Industrial	1.73	1.43	-11.91	-0.96789	-2.56741
2016	Nigeria	Portland Paint Nig	Industrial	1.75	1.01	0.38	15.48601	-1.0369
2012	Nigeria	Premier Paints	Industrial	0.10	1.31	-16.69	.	.
2013	Nigeria	Premier Paints	Industrial	-0.07	1.42	4.49	.	-0.30084
2014	Nigeria	Premier Paints	Industrial	-0.01	5.66	3.20	.	-1.38292
2015	Nigeria	Premier Paints	Industrial	0.21	4.86	-21.50	-1.36702	-4.64566
2016	Nigeria	Premier Paints	Industrial	-0.30	5.34	-14.36	-0.91857	0.305997
2012	Nigeria	Pz Cussons	Consumer	10.31	2.06	5.97	.	.
2013	Nigeria	Pz Cussons	Consumer	11.11	2.39	10.72	1.063587	1.095906
2014	Nigeria	Pz Cussons	Consumer	10.22	1.70	9.53	-0.35482	-0.04481
2015	Nigeria	Pz Cussons	Consumer	10.93	1.83	8.97	-0.00332	-0.10073
2016	Nigeria	Pz Cussons	Consumer	10.93	1.19	4.53	-0.34771	-0.53407
2012	Nigeria	Tiger Branded	Consumer	6.20	1.11	-6.82	.	.
2013	Nigeria	Tiger Branded	Consumer	3.62	1.50	-27.84	-1.63659	1.988643
2014	Nigeria	Tiger Branded	Consumer	1.92	1.24	-22.50	0.344312	-0.07185
2015	Nigeria	Tiger Branded	Consumer	-0.49	1.18	-25.96	0.871647	1.019544
2016	Nigeria	Tiger Branded	Consumer	4.84	0.96	11.17	-4.22286	-1.83359
2012	Nigeria	Unilever Nig	Consumer	3.75	5.54	14.74	.	.
2013	Nigeria	Unilever Nig	Consumer	2.55	5.43	11.52	-0.09073	-0.14126
2014	Nigeria	Unilever Nig	Consumer	1.98	3.79	5.15	-0.29126	-0.49815
2015	Nigeria	Unilever Nig	Consumer	2.12	4.09	2.99	0.023397	-0.50572
2016	Nigeria	Unilever Nig	Consumer	3.10	2.66	5.89	0.324562	1.576294
2012	Nigeria	Vitafoam Nig	Consumer	3.77	0.99	5.62	.	.
2013	Nigeria	Vitafoam Nig	Consumer	3.80	1.09	3.85	0.047006	-0.18283
2014	Nigeria	Vitafoam Nig	Consumer	3.70	1.02	4.25	0.079884	0.061616
2015	Nigeria	Vitafoam Nig	Consumer	4.72	1.05	3.11	0.059046	-0.42825
2016	Nigeria	Vitafoam Nig	Consumer	3.57	0.91	0.45	-0.35696	-1.12862
2012	South Africa	Astrapak	Industrial	8.04	0.95	2.54	.	.
2013	South Africa	Astrapak	Industrial	10.32	0.85	8.79	0.821586	6.181016

Start Year	COUNTRY	Company	SECTOR	BVPS	TOBIN'S Q	AA	△EBIT	△NPAT
2014	South Africa	Astrapak	Industrial	9.55	0.81	0.89	-0.79213	-0.96783
2015	South Africa	Astrapak	Industrial	8.31	0.74	0.28	-0.00716	-3.00727
2016	South Africa	Astrapak	Industrial	8.86	.	1.60	.	-1.60507
2012	South Africa	Avi	Consumer	12.08	3.59	16.79	.	.
2013	South Africa	Avi	Consumer	11.98	3.12	16.19	0.086792	0.101942
2014	South Africa	Avi	Consumer	13.44	3.78	17.83	0.2083	0.260008
2015	South Africa	Avi	Consumer	12.35	3.58	16.54	0.025417	0.012617
2016	South Africa	Avi	Consumer	13.96	3.76	16.97	.	0.111762
2012	South Africa	Bowler Metcalf	Industrial	5.18	1.38	12.55	.	.
2013	South Africa	Bowler Metcalf	Industrial	5.21	1.35	12.06	0.003612	-0.02922
2014	South Africa	Bowler Metcalf	Industrial	5.60	1.42	11.09	-0.0353	0.047503
2015	South Africa	Bowler Metcalf	Industrial	8.10	1.27	20.30	0.122337	0.196013
2016	South Africa	Bowler Metcalf	Industrial	8.44	.	19.39	-0.04779	0.021875
2012	South Africa	Capevin Holdings	Consumer	4.00	1.59	98.34	.	.
2013	South Africa	Capevin Holdings	Consumer	2.52	3.30	100.22	.	0.138362
2014	South Africa	Capevin Holdings	Consumer	2.62	3.38	62.77	.	-0.13626
2015	South Africa	Capevin Holdings	Consumer	2.62	3.32	99.90	.	0.417605
2016	South Africa	Capevin Holdings	Consumer	3.25	2.86	.	.	0.063888
2012	South Africa	Cashbuild	Consumer	39.23	2.50	6.87	.	.
2013	South Africa	Cashbuild	Consumer	44.32	2.35	5.52	-0.12789	-0.1518
2014	South Africa	Cashbuild	Consumer	49.19	2.11	5.61	0.108156	0.084095
2015	South Africa	Cashbuild	Consumer	58.22	2.82	6.53	.	0.348584
2016	South Africa	Cashbuild	Consumer	64.33	2.80	7.14	.	0.216363
2012	South Africa	Clover Industries	Consumer	10.98	1.32	5.31	.	.
2013	South Africa	Clover Industries	Consumer	11.66	1.27	4.77	0.020199	-0.88566
2014	South Africa	Clover Industries	Consumer	12.45	1.25	2.99	-0.18417	-0.21211
2015	South Africa	Clover Industries	Consumer	14.05	1.10	4.81	0.608943	0.829068
2016	South Africa	Clover Industries	Consumer	.	.	4.74	0.170107	0.018052
2012	South Africa	Distell Group	Consumer	30.62	2.55	10.05	.	.
2013	South Africa	Distell Group	Consumer	35.89	2.60	10.15	0.227288	0.115641
2014	South Africa	Distell Group	Consumer	40.98	2.26	11.51	0.226182	0.407277
2015	South Africa	Distell Group	Consumer	43.71	2.49	10.15	0.010507	-0.06863
2016	South Africa	Distell Group	Consumer	48.72	2.06	10.04	0.098529	0.079054
2012	South Africa	Enx Group	Industrial	0.90	4.19	-35.75	.	.
2013	South Africa	Enx Group	Industrial	0.92	11.21	0.94	-1.1167	-1.04983
2014	South Africa	Enx Group	Industrial	0.99	18.01	4.30	1.237118	2.185185
2015	South Africa	Enx Group	Industrial	1.11	11.33	3.77	0.497348	-0.10894
2016	South Africa	Enx Group	Industrial	1.21	7.43	-5.74	.	-4.26891
2012	South Africa	Famous Brands	Consumer	8.69	5.90	18.65	.	.
2013	South Africa	Famous Brands	Consumer	10.18	6.52	18.36	0.130645	-0.02337
2014	South Africa	Famous Brands	Consumer	12.37	7.02	20.01	0.215782	2.099373
2015	South Africa	Famous Brands	Consumer	13.95	7.24	20.69	0.188358	0.195462
2016	South Africa	Famous Brands	Consumer	.	.	17.93	0.182034	0.137925
2012	South Africa	Imperial Holdings	Industrial	76.39	1.51	5.90	.	.
2013	South Africa	Imperial Holdings	Industrial	91.52	1.41	5.51	0.105125	0.088548
2014	South Africa	Imperial Holdings	Industrial	93.39	1.30	4.79	0.057599	-0.01654
2015	South Africa	Imperial Holdings	Industrial	99.60	1.06	4.16	0.025581	-0.06645
2016	South Africa	Imperial Holdings	Industrial	102.55	1.22	3.73	0.074023	-0.05257
2012	South Africa	Kaydav Group	Consumer	0.75	1.20	5.17	.	.

Start Year	COUNTRY	Company	SECTOR	BVPS	TOBIN'S Q	AA	△EBIT	△NPAT
2013	South Africa	Kaydav Group	Consumer	0.81	1.19	4.98	0.178163	0.165111
2014	South Africa	Kaydav Group	Consumer	0.90	1.06	5.11	0.191775	0.173345
2015	South Africa	Kaydav Group	Consumer	1.04	1.21	5.22	0.148494	0.156398
2016	South Africa	Kaydav Group	Consumer	1.14	1.02	3.98	-0.09586	-0.15035
2012	South Africa	Labat Africa	Industrial	0.01	1.69	162.72	.	.
2013	South Africa	Labat Africa	Industrial	0.01	1.27	2.49	-0.89876	-0.98719
2014	South Africa	Labat Africa	Industrial	-0.04	2.45	-60.57	-2.89142	-19.2424
2015	South Africa	Labat Africa	Industrial	0.00	17.69	8.41	-1.28645	-1.16944
2016	South Africa	Labat Africa	Industrial	0.03	3.76	2.56	-0.66598	7.231373
2012	South Africa	Lewis Group	Consumer	48.32	1.30	24.04	.	.
2013	South Africa	Lewis Group	Consumer	54.47	1.20	24.35	0.10551	0.1334
2014	South Africa	Lewis Group	Consumer	56.33	1.17	22.29	-0.0439	-0.07185
2015	South Africa	Lewis Group	Consumer	61.33	0.94	20.49	0.011091	-0.00332
2016	South Africa	Lewis Group	Consumer	61.36	0.82	22.12	0.114158	0.145461
2012	South Africa	Metair Investments	Industrial	14.45	1.77	13.94	.	.
2013	South Africa	Metair Investments	Industrial	25.38	1.28	9.47	-0.14646	-0.21215
2014	South Africa	Metair Investments	Industrial	21.69	1.25	11.03	0.772555	0.691107
2015	South Africa	Metair Investments	Industrial	25.22	1.04	9.63	-0.04676	-0.12243
2016	South Africa	Metair Investments	Industrial	21.13	1.02	6.77	-0.05186	-0.15649
2012	South Africa	Mondi	Industrial	5.95	7.29	6.39	.	.
2013	South Africa	Mondi	Industrial	5.86	14.53	7.71	0.172043	0.483871
2014	South Africa	Mondi	Industrial	6.17	14.96	9.67	0.115189	0.200483
2015	South Africa	Mondi	Industrial	6.56	23.57	11.67	0.16362	0.297787
2016	South Africa	Mondi	Industrial	7.63	19.04	12.65	0.059701	0.063566
2012	South Africa	Mpact	Industrial	15.58	1.12	6.74	.	.
2013	South Africa	Mpact	Industrial	17.64	1.26	7.12	0.108766	0.236703
2014	South Africa	Mpact	Industrial	19.64	1.40	7.23	0.122792	0.122233
2015	South Africa	Mpact	Industrial	226.03	1.50	8.28	0.165696	-0.86172
2016	South Africa	Mpact	Industrial	24.11	1.08	5.74	-0.04765	5.431118
2012	South Africa	Nampak	Industrial	10.51	1.83	9.28	.	.
2013	South Africa	Nampak	Industrial	12.12	1.87	8.46	0.058284	0.070314
2014	South Africa	Nampak	Industrial	12.55	1.89	6.00	-0.08506	-0.05644
2015	South Africa	Nampak	Industrial	14.56	1.27	4.22	-0.17236	-0.11823
2016	South Africa	Nampak	Industrial	14.99	1.09	8.76	0.564323	0.392914
2012	South Africa	Nictus	Consumer	3.15	0.92	3.88	.	.
2013	South Africa	Nictus	Consumer	1.27	0.94	-34.09	-1.43089	-1.59574
2014	South Africa	Nictus	Consumer	1.23	0.95	7.53	-1.33267	-1.21939
2015	South Africa	Nictus	Consumer	1.33	0.93	12.05	0.726248	1.265781
2016	South Africa	Nictus	Consumer	1.42	0.88	18.21	0.371647	0.171554
2012	South Africa	Nu-World Holdings	Consumer	32.50	0.77	3.62	.	.
2013	South Africa	Nu-World Holdings	Consumer	33.20	0.69	3.75	-0.21452	-0.22787
2014	South Africa	Nu-World Holdings	Consumer	37.31	0.69	4.98	0.54551	0.61844
2015	South Africa	Nu-World Holdings	Consumer	40.60	0.73	5.74	0.201679	0.150941
2016	South Africa	Nu-World Holdings	Consumer	44.21	0.77	3.81	-0.13099	-0.12004
2012	South Africa	Pioneer Food Group	Consumer	34.39	1.55	4.93	.	.
2013	South Africa	Pioneer Food Group	Consumer	36.35	1.86	4.76	0.035637	0.171045
2014	South Africa	Pioneer Food Group	Consumer	33.35	2.56	7.03	0.488274	0.445062
2015	South Africa	Pioneer Food Group	Consumer	37.78	2.84	9.27	0.062473	0.106461
2016	South Africa	Pioneer Food Group	Consumer	42.46	2.53	11.26	0.276006	0.492674

Start Year	COUNTRY	Company	SECTOR	BVPS	TOBIN'S Q	AA	△EBIT	△NPAT
2012	South Africa	Rcl Foods	Consumer	9.62	1.26	5.22	.	.
2013	South Africa	Rcl Foods	Consumer	18.02	0.99	0.87	-0.16281	-0.97328
2014	South Africa	Rcl Foods	Consumer	10.99	1.36	-1.80	1.460172	-44.0327
2015	South Africa	Rcl Foods	Consumer	11.74	1.12	5.35	0.872434	-3.9141
2016	South Africa	Rcl Foods	Consumer	11.70	1.04	0.64	.	-0.7465
2012	South Africa	Remgro	Consumer	105.53	1.45	39.13	.	.
2013	South Africa	Remgro	Consumer	118.91	1.60	2.48	-0.82134	-0.96958
2014	South Africa	Remgro	Consumer	133.62	1.75	0.22	0.682132	-1.01361
2015	South Africa	Remgro	Consumer	147.57	1.51	8.16	0.799296	-847.5
2016	South Africa	Remgro	Consumer	169.82	1.23	-2.89	-0.74821	-1.47076
2012	South Africa	Tiger Brands	Consumer	70.97	3.27	16.65	.	.
2013	South Africa	Tiger Brands	Consumer	86.48	2.14	11.95	0.017926	-0.07013
2014	South Africa	Tiger Brands	Consumer	87.10	2.81	9.06	-0.13356	-0.25451
2015	South Africa	Tiger Brands	Consumer	85.21	2.50	6.81	-0.16494	-0.50546
2016	South Africa	Tiger Brands	Consumer	98.68	2.98	13.64	0.699222	2.526221
2012	South Africa	Tongaat-Hulett	Consumer	63.17	1.43	11.36	.	.
2013	South Africa	Tongaat-Hulett	Consumer	75.59	1.20	10.93	0.16652	0.15475
2014	South Africa	Tongaat-Hulett	Consumer	94.59	1.36	11.23	0.131798	0.040712
2015	South Africa	Tongaat-Hulett	Consumer	120.43	0.88	9.11	-0.08909	-0.1467
2016	South Africa	Tongaat-Hulett	Consumer	134.49	0.99	6.76	-0.09414	-0.26457
2012	South Africa	Transpaco	Industrial	10.08	1.41	9.51	.	.
2013	South Africa	Transpaco	Industrial	11.27	1.31	8.20	-0.03093	-0.0492
2014	South Africa	Transpaco	Industrial	12.49	1.35	7.76	0.04684	0.041729
2015	South Africa	Transpaco	Industrial	14.07	1.23	8.14	0.113555	0.138406
2016	South Africa	Transpaco	Industrial	15.90	1.50	8.91	0.367828	0.377828

Source: Annual Reports and Accounts and Stock Exchange Fact Book, 2012-2016

APPENDIX IVa: Descriptive Statistics
Data Output via STATA 13.0

```
  ___  ____  ____  ____  ____ (R)
 /__    /   ____/   /   ____/
___/   /   /___/   /   /___/   13.0   Copyright 1985-2013 StataCorp LP
  Statistics/Data Analysis             StataCorp
                                       4905 Lakeway Drive
                                       College Station, Texas 77845 USA
                                       800-STATA-PC        http://www.stata.com
                                       979-696-4600        stata@stata.com
                                       979-696-4601 (fax)

3-user Stata network perpetual license:
Notes: Serial number:  501306208483

. *(10 variables, 320 observations pasted into data editor)
```

Mean, Standard Deviation, Minimum and Maximum Values: (General)

```
. summarize roe roa eps bvps tobinq aa rebit rnpat
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roe	319	15.67038	104.0443	-989.38	1131.01
roa	319	6.76373	11.1076	-31.6	61.87
eps	319	3.644734	7.123178	-12.6	49.76
bvps	317	21.97426	31.02291	-5.12	226.03
tobinq	313	2.433419	2.936005	.41	23.57
aa	318	7.000943	22.11581	-114.03	162.72
rebit	243	.0293397	1.709439	-16.79283	15.48601
rnpat	255	-3.663777	53.25258	-847.5	43.64505

Correlation Matrix: (General)

```
. correlate roe roa eps bvps tobinq aa rebit rnpat
(obs=238)
```

	roe	roa	eps	bvps	tobinq	aa	rebit	rnpat
roe	1.0000							
roa	0.2436	1.0000						
eps	0.1389	0.4852	1.0000					
bvps	0.0181	0.0956	0.5453	1.0000				
tobinq	0.1760	0.3520	0.2127	-0.0689	1.0000			
aa	0.1848	0.7680	0.3597	0.1552	0.2124	1.0000		
rebit	0.0470	0.0706	0.0331	0.0138	-0.0089	0.0552	1.0000	
rnpat	0.0132	0.0384	-0.1099	-0.2394	0.0233	-0.0015	-0.0274	1.0000

Multi-collinearity/Heteroscedasticity Test Results (General)

```
. estat vif
```

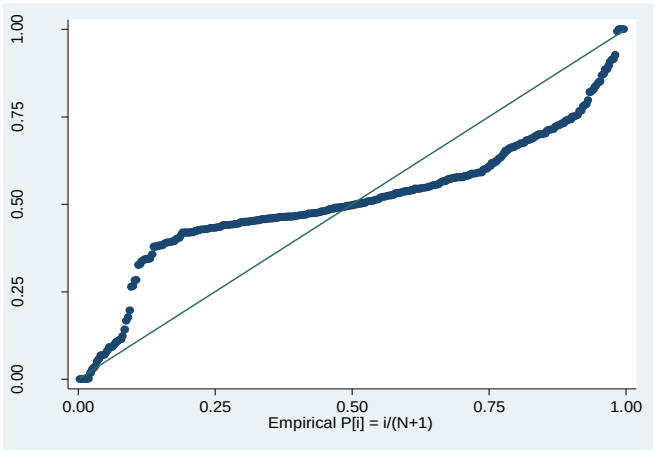
Variable	VIF	1/VIF
rebit	1.00	0.996205
aa	1.00	0.996954
rnpat	1.00	0.999248
Mean VIF	1.00	

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of roe

         chi2(1)      =    61.87
         Prob > chi2  =   0.0000
```

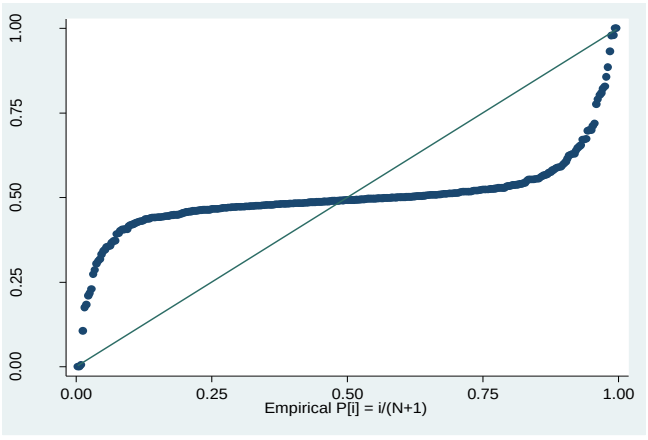
Normality Tests: (General)

```
. sfrancia roe roa eps bvps tobinq aa rebit rnpat

                  Shapiro-Francia W' test for normal data
```

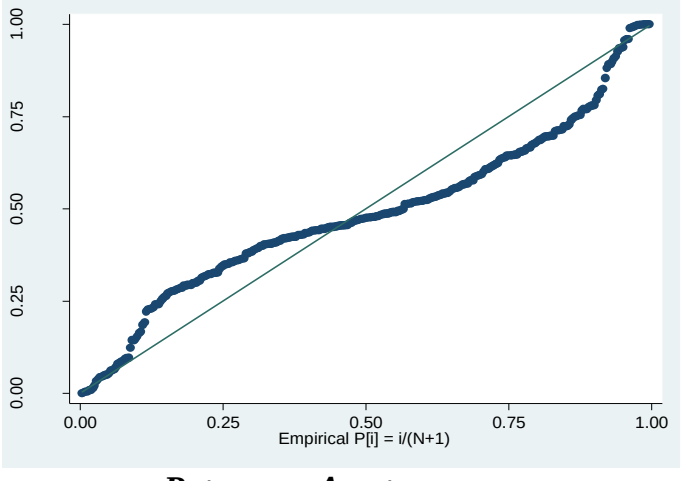
Variable	Obs	W'	V'	z	Prob>z
roe	319	0.29846	170.797	10.955	0.00001
roa	319	0.87047	31.536	7.355	0.00001
eps	319	0.64356	86.779	9.512	0.00001
bvps	317	0.69340	74.236	9.176	0.00001
tobinq	313	0.56219	104.844	9.903	0.00001
aa	318	0.69134	74.940	9.198	0.00001
rebit	243	0.37695	119.867	10.023	0.00001
rnpat	255	0.05018	190.481	11.027	0.00001



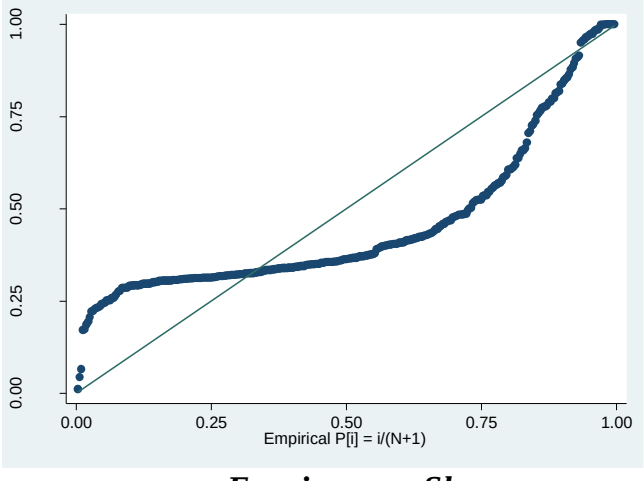
Accounting Alchemy



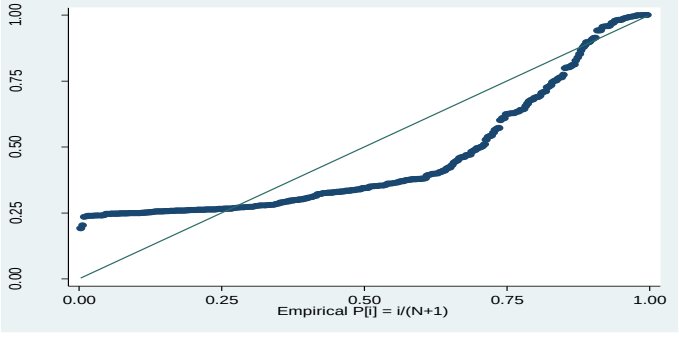
Return on Equity



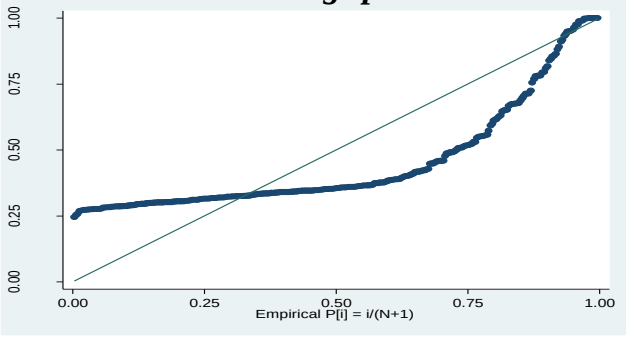
Return on Asset



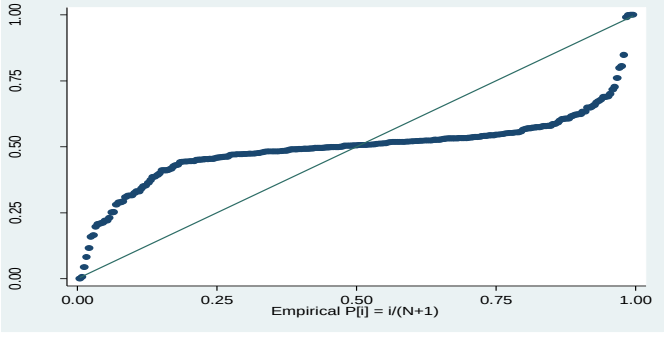
Earnings per Share



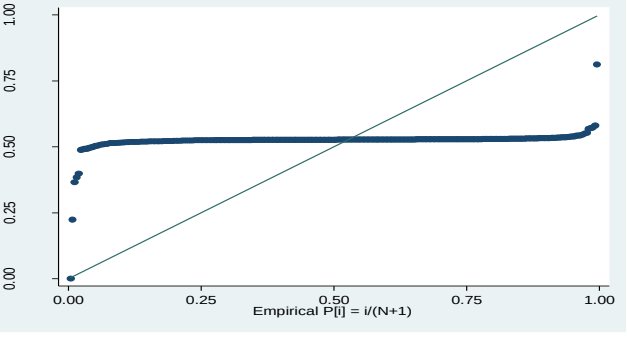
Book Value per Share



Tobin's Q



⊿EBIT



⊿NPAT

APPENDIX IVb: Ordinary Least Square Result
Data Output via STATA 13.0

Ordinary Least Square (OLS) Result (General)

```
. regress roe aa rebit rnpat
```

Source	SS	df	MS		
Model	53723.2451	3	17907.7484	Number of obs	= 243
Residual	1445271.28	239	6047.16016	F(3, 239)	= 2.96
				Prob > F	= 0.0329
Total	1498994.52	242	6194.19225	R-squared	= 0.0358
				Adj R-squared	= 0.0237
				Root MSE	= 77.763

roe	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.7950168	.2762448	2.88	0.004	.2508311	1.339202
rebit	1.719853	2.929813	0.59	0.558	-4.051701	7.491407
rnpat	.0208693	.0916692	0.23	0.820	-.1597134	.2014519
_cons	9.15366	5.181233	1.77	0.079	-1.053055	19.36037

```
. regress roa aa rebit rnpat
```

Source	SS	df	MS		
Model	15964.5527	3	5321.51757	Number of obs	= 243
Residual	11047.34	239	46.2231799	F(3, 239)	= 115.13
				Prob > F	= 0.0000
Total	27011.8927	242	111.619391	R-squared	= 0.5910
				Adj R-squared	= 0.5859
				Root MSE	= 6.7988

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.4463125	.0241517	18.48	0.000	.398735	.4938899
rebit	.1822504	.2561498	0.71	0.477	-.3223493	.68685
rnpat	.0078285	.0080145	0.98	0.330	-.0079596	.0236166
_cons	3.99628	.4529886	8.82	0.000	3.10392	4.88864

```
. regress eps aa rebit rnpat
```

Source	SS	df	MS	Number of obs =	243
				F(3, 239) =	12.99
Model	1799.55643	3	599.852143	Prob > F =	0.0000
Residual	11035.6153	239	46.1741226	R-squared =	0.1402
				Adj R-squared =	0.1294
Total	12835.1717	242	53.0378997	Root MSE =	6.7952

eps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.1435109	.0241389	5.95	0.000	.0959587	.1910631
rebit	.0460838	.2560139	0.18	0.857	-.4582481	.5504156
rnpat	-.0146081	.0080103	-1.82	0.069	-.0303878	.0011717
_cons	2.951922	.4527482	6.52	0.000	2.060036	3.843809

```
. regress bvps aa rebit rnpat
```

Source	SS	df	MS	Number of obs =	241
				F(3, 237) =	6.94
Model	21191.7833	3	7063.92776	Prob > F =	0.0002
Residual	241290.528	237	1018.1035	R-squared =	0.0807
				Adj R-squared =	0.0691
Total	262482.312	240	1093.6763	Root MSE =	31.908

bvps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.2785514	.1134683	2.45	0.015	.0550161	.5020868
rebit	-.0125221	1.202179	-0.01	0.992	-2.380843	2.355799
rnpat	-.1444139	.0376143	-3.84	0.000	-.218515	-.0703128
_cons	21.45122	2.132776	10.06	0.000	17.2496	25.65284

```
. regress tobinq aa rebit rnpat
```

Source	SS	df	MS		
Model	113.594385	3	37.8647949	Prob > F	0.0114
Residual	2351.37689	234	10.0486192	R-squared	0.0461
Total	2464.97128	237	10.4007227	Adj R-squared	0.0339
				Root MSE	3.17

tobinq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.0377019	.0112883	3.34	0.001	.0154622	.0599416
rebit	-.0374068	.1194415	-0.31	0.754	-.272725	.1979114
rnpat	.0013474	.003737	0.36	0.719	-.0060151	.0087099
_cons	2.306971	.2129979	10.83	0.000	1.887333	2.72661

APPENDIX IVc: Country-By-Country Results in sub-Saharan Africa
Data Output via STATA 13.0

Kenya

```
. summarize roe roa eps bvps tobinq aa rebit rnpat
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roe	50	12.685	43.89948	-81.29	171.01
roa	50	5.1806	14.14731	-22.76	41.19
eps	50	6.0072	12.67047	-8.53	49.76
bvps	50	29.7616	28.38113	1.04	88.53
tobinq	50	1.8134	2.016081	.53	9.12
aa	50	.4678	27.95552	-114.03	37.3
rebit	40	.1352533	1.399768	-2.347375	6.394536
rnpat	40	-.7317388	3.039528	-17.45319	3.286328

```
. regress roa aa rebit rnpat
```

Source	SS	df	MS		
Model	6496.16022	3	2165.38674	Number of obs =	40
Residual	2754.71513	36	76.5198649	F(3, 36) =	28.30
				Prob > F =	0.0000
Total	9250.87536	39	237.201932	R-squared =	0.7022
				Adj R-squared =	0.6774
				Root MSE =	8.7476

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.4099384	.0464388	8.83	0.000	.3157562	.5041206
rebit	2.300945	1.119132	2.06	0.047	.031241	4.57065
rnpat	.257216	.5185599	0.50	0.623	-.7944722	1.308904
_cons	5.092338	1.431757	3.56	0.001	2.1886	7.996075

```
. regress roe aa rebit rnpat
```

Source	SS	df	MS		
Model	47197.6995	3	15732.5665	Number of obs =	40
Residual	19894.8524	36	552.63479	F(3, 36) =	28.47
				Prob > F =	0.0000
Total	67092.5519	39	1720.32184	R-squared =	0.7035
				Adj R-squared =	0.6788
				Root MSE =	23.508

roe	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	1.135775	.1247995	9.10	0.000	.8826696	1.38888
rebit	4.479973	3.007553	1.49	0.145	-1.619626	10.57957
rnpat	1.789157	1.393577	1.28	0.207	-1.037148	4.615462
_cons	11.23617	3.847701	2.92	0.006	3.432672	19.03967

Kenya Contd…

```
. regress roa aa rebit rnpat
```

Source	SS	df	MS	Number of obs	=	40
				F(3, 36)	=	28.30
Model	6496.16022	3	2165.38674	Prob > F	=	0.0000
Residual	2754.71513	36	76.5198649	R-squared	=	0.7022
				Adj R-squared	=	0.6774
Total	9250.87536	39	237.201932	Root MSE	=	8.7476

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.4099384	.0464388	8.83	0.000	.3157562	.5041206
rebit	2.300945	1.119132	2.06	0.047	.031241	4.57065
rnpat	.257216	.5185599	0.50	0.623	-.7944722	1.308904
_cons	5.092338	1.431757	3.56	0.001	2.1886	7.996075

```
. regress eps aa rebit rnpat
```

Source	SS	df	MS	Number of obs	=	40
				F(3, 36)	=	5.41
Model	2159.7127	3	719.904234	Prob > F	=	0.0035
Residual	4788.69	36	133.019167	R-squared	=	0.3108
				Adj R-squared	=	0.2534
Total	6948.4027	39	178.164172	Root MSE	=	11.533

eps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.2394774	.0612281	3.91	0.000	.1153011	.3636537
rebit	.7725347	1.475541	0.52	0.604	-2.220001	3.76507
rnpat	.9482443	.6837053	1.39	0.174	-.4383743	2.334863
_cons	7.056468	1.887728	3.74	0.001	3.227979	10.88496

Kenya Contd…

```
. regress bvps aa rebit rnpat
```

Source	SS	df	MS		
Model	6584.00673	3	2194.66891	Number of obs =	40
Residual	26563.4656	36	737.874044	F(3, 36) =	2.97
				Prob > F =	0.0444
Total	33147.4723	39	849.935187	R-squared =	0.1986
				Adj R-squared =	0.1318
				Root MSE =	27.164

bvps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.3993607	.1442065	2.77	0.009	.1068965	.691825
rebit	-.1982633	3.475244	-0.06	0.955	-7.246384	6.849857
rnpat	2.064443	1.610286	1.28	0.208	-1.201368	5.330254
_cons	31.98055	4.446039	7.19	0.000	22.96357	40.99754

```
. regress tobinq aa rebit rnpat
```

Source	SS	df	MS		
Model	40.3171882	3	13.4390627	Number of obs =	40
Residual	137.49081	36	3.81918917	F(3, 36) =	3.52
				Prob > F =	0.0246
Total	177.807998	39	4.55917944	R-squared =	0.2267
				Adj R-squared =	0.1623
				Root MSE =	1.9543

tobinq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.0325144	.0103748	3.13	0.003	.0114734	.0535555
rebit	-.0286584	.2500229	-0.11	0.909	-.5357282	.4784115
rnpat	.1228125	.1158504	1.06	0.296	-.1121429	.357768
_cons	2.067003	.3198658	6.46	0.000	1.418286	2.715721

Nigeria

```
. *(12 variables, 145 observations pasted into data editor)

. summarize roe roa eps bvps tobinq aa rebit rnpat
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roe	144	7.619514	118.644	-989.38	520.52
roa	144	6.072778	10.96132	-25.69	53.96
eps	144	2.133542	5.026156	-2.51	29.95
bvps	144	9.794375	12.44288	-5.12	51.22
tobinq	142	2.238028	1.977544	.41	11.78
aa	144	5.390139	18.27241	-108.04	37.26
rebit	113	-.0066529	2.317212	-16.79283	15.48601
rnpat	115	-.0101825	4.753681	-22.01573	43.64505

```
. regress roe aa rebit rnpat
```

Source	SS	df	MS
Model	23239.886	3	7746.62866
Residual	1338866.02	109	12283.1745
Total	1362105.91	112	12161.6599

```
Number of obs =     113
F(  3,   109) =    0.63
Prob > F      =  0.5968
R-squared     =  0.0171
Adj R-squared = -0.0100
Root MSE      =  110.83
```

roe	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.6405606	.6310021	1.02	0.312	-.610065	1.891186
rebit	2.496054	4.535054	0.55	0.583	-6.492275	11.48438
rnpat	1.284736	2.20514	0.58	0.561	-3.08578	5.655252
_cons	7.79063	10.97706	0.71	0.479	-13.96554	29.5468

Nigeria Contd…

```
. regress roa aa rebit rnpat
```

Source	SS	df	MS		
Model	7975.45649	3	2658.4855	Number of obs =	113
Residual	5445.33235	109	49.9571775	F(3, 109) =	53.22
				Prob > F =	0.0000
Total	13420.7888	112	119.828472	R-squared =	0.5943
				Adj R-squared =	0.5831
				Root MSE =	7.068

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.5033717	.0402415	12.51	0.000	.4236143	.5831291
rebit	-.0454904	.2892185	-0.16	0.875	-.618712	.5277313
rnpat	.0574429	.1406306	0.41	0.684	-.2212823	.3361682
_cons	3.324045	.7000508	4.75	0.000	1.936567	4.711523

```
. regress eps aa rebit rnpat
```

Source	SS	df	MS		
Model	269.742577	3	89.9141925	Number of obs =	113
Residual	2588.23349	109	23.7452613	F(3, 109) =	3.79
				Prob > F =	0.0125
Total	2857.97606	112	25.5176434	R-squared =	0.0944
				Adj R-squared =	0.0695
				Root MSE =	4.8729

eps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.0925452	.0277437	3.34	0.001	.0375581	.1475323
rebit	.0378039	.1993956	0.19	0.850	-.3573917	.4329995
rnpat	.0055092	.0969548	0.06	0.955	-.1866521	.1976705
_cons	1.674891	.4826353	3.47	0.001	.7183238	2.631459

Nigeria Contd….

```
. regress bvps aa rebit rnpat
```

Source	SS	df	MS		
Model	1243.674	3	414.557999	Number of obs =	113
Residual	17400.9318	109	159.641576	F(3, 109) =	2.60
				Prob > F =	0.0561
Total	18644.6058	112	166.469694	R-squared =	0.0667
				Adj R-squared =	0.0410
				Root MSE =	12.635

bvps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.1949782	.0719364	2.71	0.008	.0524026	.3375537
rebit	.1107219	.5170114	0.21	0.831	-.9139779	1.135422
rnpat	.077845	.2513934	0.31	0.757	-.4204085	.5760986
_cons	9.316148	1.251421	7.44	0.000	6.835871	11.79642

```
. regress tobinq aa rebit rnpat
```

Source	SS	df	MS		
Model	49.9478835	3	16.6492945	Number of obs =	111
Residual	401.347347	107	3.75090978	F(3, 107) =	4.44
				Prob > F =	0.0056
Total	451.29523	110	4.10268391	R-squared =	0.1107
				Adj R-squared =	0.0857
				Root MSE =	1.9367

tobinq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.0402065	.011028	3.65	0.000	.0183448	.0620682
rebit	-.004568	.0792531	-0.06	0.954	-.161678	.1525419
rnpat	-.0095754	.0385348	-0.25	0.804	-.0859662	.0668154
_cons	1.99686	.1934648	10.32	0.000	1.613338	2.380381

South Africa

```
. summarize roe roa eps bvps tobinq aa rebit rnpat
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roe	125	26.13912	102.8459	-43.25	1131.01
roa	125	8.19296	9.753561	-31.6	61.87
eps	125	4.44064	5.657649	-12.6	20.44
bvps	123	33.06805	40.78971	-.04	226.03
tobinq	121	2.918926	3.964157	.69	23.57
aa	124	11.50589	22.80783	-60.57	162.72
rebit	90	.0274576	.5686322	-2.891418	1.460172
rnpat	100	-9.038226	84.84084	-847.5	7.231372

```
. regress roe aa rebit rnpat
```

Source	SS	df	MS
Model	9354.90583	3	3118.30194
Residual	57197.2041	86	665.083769
Total	66552.11	89	747.776517

```
Number of obs =      90
F(  3,    86) =    4.69
Prob > F      =  0.0044
R-squared     =  0.1406
Adj R-squared =  0.1106
Root MSE      =  25.789
```

roe	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.6345007	.3243862	1.96	0.054	-.0103578	1.279359
rebit	-21.95173	5.946998	-3.69	0.000	-33.77397	-10.12948
rnpat	-.0018858	.0311071	-0.06	0.952	-.0637246	.059953
_cons	13.38062	3.619215	3.70	0.000	6.185863	20.57538

South Africa Contd…

```
. regress roa aa rebit rnpat
```

Source	SS	df	MS		
Model	1821.98384	3	607.327945	Number of obs =	90
Residual	2285.84346	86	26.5795752	F(3, 86) =	22.85
				Prob > F =	0.0000
Total	4107.8273	89	46.1553629	R-squared =	0.4435
				Adj R-squared =	0.4241
				Root MSE =	5.1555

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.4461633	.0648483	6.88	0.000	.3172492	.5750773
rebit	-.4431639	1.188868	-0.37	0.710	-2.806555	1.920228
rnpat	.0070098	.0062186	1.13	0.263	-.0053524	.0193721
_cons	3.887029	.7235194	5.37	0.000	2.44872	5.325338

```
. regress eps aa rebit rnpat
```

Source	SS	df	MS		
Model	209.616096	3	69.8720319	Number of obs =	90
Residual	2278.34788	86	26.4924172	F(3, 86) =	2.64
				Prob > F =	0.0547
Total	2487.96397	89	27.9546514	R-squared =	0.0843
				Adj R-squared =	0.0523
				Root MSE =	5.1471

eps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.0629131	.0647418	0.97	0.334	-.0657894	.1916157
rebit	.6064325	1.186917	0.51	0.611	-1.753081	2.965946
rnpat	-.0135395	.0062084	-2.18	0.032	-.0258815	-.0011976
_cons	4.046285	.7223322	5.60	0.000	2.610336	5.482234

South Africa Contd…

```
. regress bvps aa rebit rnpat
```

Source	SS	df	MS		
Model	12532.103	3	4177.36767	Number of obs	= 88
Residual	160649.164	84	1912.49005	F(3, 84)	= 2.18
				Prob > F	= 0.0959
Total	173181.267	87	1990.58928	R-squared	= 0.0724
				Adj R-squared	= 0.0392
				Root MSE	= 43.732

bvps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.2169227	.5542579	0.39	0.697	-.8852798	1.319125
rebit	.6410029	10.10738	0.06	0.950	-19.45863	20.74064
rnpat	-.1296402	.0527633	-2.46	0.016	-.2345658	-.0247146
_cons	34.29664	6.17882	5.55	0.000	22.00938	46.5839

```
. regress tobinq aa rebit rnpat
```

Source	SS	df	MS		
Model	19.5223603	3	6.50745344	Number of obs	= 87
Residual	1762.80768	83	21.2386467	F(3, 83)	= 0.31
				Prob > F	= 0.8207
Total	1782.33004	86	20.7247679	R-squared	= 0.0110
				Adj R-squared	= -0.0248
				Root MSE	= 4.6085

tobinq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.052112	.0591823	0.88	0.381	-.0655992	.1698232
rebit	-.5101028	1.070906	-0.48	0.635	-2.640092	1.619886
rnpat	.0015097	.0055605	0.27	0.787	-.0095499	.0125693
_cons	2.739414	.651304	4.21	0.000	1.443997	4.034832

APPENDIX IVd
Data Output via STATA 13.0

Fixed/Random Effects Test: Accounting Alchemy & Return on Equity

```
. xtreg roe aa rebit rnpat, fe

Fixed-effects (within) regression               Number of obs      =       243
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.0357                         Obs per group: min =        58
       between = 0.0578                                        avg =      60.8
       overall = 0.0358                                        max =        62

                                                F(3,236)           =      2.91
corr(u_i, Xb)  = 0.0035                         Prob > F           =    0.0351
```

roe	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.7918209	.278482	2.84	0.005	.2431927	1.340449
rebit	1.85098	2.961184	0.63	0.533	-3.982751	7.684711
rnpat	.0119626	.0927001	0.13	0.897	-.1706628	.1945881
_cons	9.131541	5.207151	1.75	0.081	-1.126894	19.38998
sigma_u	4.9464052					
sigma_e	78.135787					
rho	.00399156	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(3, 236) =     0.24                 Prob > F = 0.8665

. xtreg roe aa rebit rnpat, re

Random-effects GLS regression                   Number of obs      =       243
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.0357                         Obs per group: min =        58
       between = 0.0986                                        avg =      60.8
       overall = 0.0358                                        max =        62

                                                Wald chi2(3)       =      8.88
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0309
```

roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
aa	.7950168	.2762448	2.88	0.004	.2535868	1.336447
rebit	1.719853	2.929813	0.59	0.557	-4.022475	7.462181
rnpat	.0208693	.0916692	0.23	0.820	-.158799	.2005375
_cons	9.15366	5.181233	1.77	0.077	-1.00137	19.30869
sigma_u	0					
sigma_e	78.135787					
rho	0	(fraction of variance due to u_i)				

Fixed/Random Effects Test: Accounting Alchemy & Return on Assets

```
. xtreg roa aa rebit rnpat, fe

Fixed-effects (within) regression               Number of obs      =       243
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.5900                         Obs per group: min =        58
       between = 0.8010                                        avg =      60.8
       overall = 0.5910                                        max =        62

                                                F(3,236)           =    113.21
corr(u_i, Xb)  = 0.0168                         Prob > F           =    0.0000

------------------------------------------------------------------------------
         roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          aa |   .4459535   .0243541    18.31   0.000     .3979743    .4939326
       rebit |   .1966249   .2589643     0.76   0.448    -.3135521    .7068019
       rnpat |   .0072021   .0081069     0.89   0.375    -.0087691    .0231732
       _cons |   3.995233   .4553807     8.77   0.000     3.098102    4.892363
-------------+----------------------------------------------------------------
     sigma_u |  .39277175
     sigma_e |  6.8332048
         rho |  .00329306   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(3, 236) =     0.20                 Prob > F = 0.8971

. xtreg roa aa rebit rnpat, re

Random-effects GLS regression                   Number of obs      =       243
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.5900                         Obs per group: min =        58
       between = 0.8073                                        avg =      60.8
       overall = 0.5910                                        max =        62

                                                Wald chi2(3)       =    345.38
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         roa |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          aa |   .4463125   .0241517    18.48   0.000     .3989759     .493649
       rebit |   .1822504   .2561498     0.71   0.477    -.3197941    .6842948
       rnpat |   .0078285   .0080145     0.98   0.329    -.0078797    .0235366
       _cons |    3.99628   .4529886     8.82   0.000     3.108438    4.884121
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  6.8332048
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Fixed/Random Effects Test: Accounting Alchemy & Earnings per Share

```
. xtreg eps aa rebit rnpat, fe

Fixed-effects (within) regression               Number of obs      =       243
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.1399                         Obs per group: min =        58
       between = 0.4951                                        avg =      60.8
       overall = 0.1402                                        max =        62

                                                F(3,236)           =     12.80
corr(u_i, Xb)  = -0.0227                        Prob > F           =    0.0000

------------------------------------------------------------------------------
         eps |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          aa |   .1433534   .0243646     5.88   0.000     .0953536    .1913533
       rebit |   .0521074   .2590759     0.20   0.841    -.4582894    .5625041
       rnpat |  -.0149466   .0081104    -1.84   0.067    -.0309247    .0010314
       _cons |   2.951228   .4555769     6.48   0.000     2.053711    3.848745
-------------+----------------------------------------------------------------
     sigma_u |  .19152423
     sigma_e |  6.8361485
         rho |   .0007843   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(3, 236) =     0.05                 Prob > F = 0.9863

. xtreg eps aa rebit rnpat, re

Random-effects GLS regression                   Number of obs      =       243
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.1399                         Obs per group: min =        58
       between = 0.5089                                        avg =      60.8
       overall = 0.1402                                        max =        62

                                                Wald chi2(3)       =     38.97
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         eps |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          aa |   .1435109   .0241389     5.95   0.000     .0961995    .1908223
       rebit |   .0460838   .2560139     0.18   0.857    -.4556942    .5478617
       rnpat |  -.0146081   .0080103    -1.82   0.068    -.0303079    .0010918
       _cons |   2.951922   .4527482     6.52   0.000     2.064552    3.839292
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  6.8361485
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Fixed/Random Effects Test: Accounting Alchemy & Book Value per Share

```
. xtreg bvps aa rebit rnpat, fe

Fixed-effects (within) regression               Number of obs      =       241
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.0814                         Obs per group: min =        56
       between = 0.0073                                        avg =      60.3
       overall = 0.0807                                        max =        62

                                                F(3,234)           =      6.91
corr(u_i, Xb)  = -0.0350                        Prob > F           =    0.0002
```

bvps	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.2875853	.1143649	2.51	0.013	.0622689	.5129016
rebit	-.0893743	1.214286	-0.07	0.941	-2.481705	2.302956
rnpat	-.1441524	.0380133	-3.79	0.000	-.2190444	-.0692604
_cons	21.41046	2.142194	9.99	0.000	17.19001	25.63091
sigma_u	2.4818915					
sigma_e	32.040919					
rho	.00596427	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(3, 234) =     0.34                 Prob > F = 0.7931

. xtreg bvps aa rebit rnpat, re

Random-effects GLS regression                   Number of obs      =       241
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.0814                         Obs per group: min =        56
       between = 0.0113                                        avg =      60.3
       overall = 0.0807                                        max =        62

                                                Wald chi2(3)       =     20.81
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0001
```

bvps	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
aa	.2785514	.1134683	2.45	0.014	.0561576	.5009453
rebit	-.0125221	1.202179	-0.01	0.992	-2.368749	2.343705
rnpat	-.1444139	.0376143	-3.84	0.000	-.2181366	-.0706912
_cons	21.45122	2.132776	10.06	0.000	17.27106	25.63139
sigma_u	0					
sigma_e	32.040919					
rho	0	(fraction of variance due to u_i)				

Fixed/Random Effects Test: Accounting Alchemy &Tobin's Q

```
. xtreg tobinq aa rebit rnpat, fe

Fixed-effects (within) regression               Number of obs      =       238
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.0450                         Obs per group: min =        53
       between = 0.3562                                        avg =      59.5
       overall = 0.0460                                        max =        62

                                                F(3,231)           =      3.63
corr(u_i, Xb)  = 0.0324                         Prob > F           =    0.0138
```

tobinq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
aa	.0371736	.0113832	3.27	0.001	.0147455	.0596017
rebit	-.0383334	.1206551	-0.32	0.751	-.2760584	.1993917
rnpat	.0016753	.0037764	0.44	0.658	-.0057652	.0091158
_cons	2.310817	.2139357	10.80	0.000	1.889303	2.732332
sigma_u	.25502629					
sigma_e	3.1830514					
rho	.00637828	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(3, 231) =     0.36                 Prob > F = 0.7823

. xtreg tobinq aa rebit rnpat, re

Random-effects GLS regression                   Number of obs      =       238
Group variable: startyear                       Number of groups   =         4

R-sq:  within  = 0.0449                         Obs per group: min =        53
       between = 0.3851                                        avg =      59.5
       overall = 0.0461                                        max =        62

                                                Wald chi2(3)       =     11.30
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0102
```

tobinq	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
aa	.0377019	.0112883	3.34	0.001	.0155772	.0598266
rebit	-.0374068	.1194415	-0.31	0.754	-.2715079	.1966943
rnpat	.0013474	.003737	0.36	0.718	-.005977	.0086718
_cons	2.306971	.2129979	10.83	0.000	1.889503	2.72444
sigma_u	0					
sigma_e	3.1830514					
rho	0	(fraction of variance due to u_i)				

APPENDIX IVe
Data Output via STATA 13.0

Hausman Specification Tests: General

```
. estimates store ROER

. hausman ROEF ROER, alleqs
```

	Coefficients (b) ROEF	(B) ROER	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
aa	.7918209	.7950168	-.0031958	.035228
rebit	1.85098	1.719853	.1311276	.4298932
rnpat	.0119626	.0208693	-.0089066	.0137871

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.44
Prob>chi2 = 0.9311

```
. estimates store ROAF

. hausman ROAR ROAF, alleqs
```

	Coefficients (b) ROAR	(B) ROAF	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
aa	.4459535	.4463125	-.000359	.0031328
rebit	.1966249	.1822504	.0143745	.0380758
rnpat	.0072021	.0078285	-.0006264	.0012204

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.34
Prob>chi2 = 0.9529

```
. estimates store EPSR

. hausman EPSF EPSR, alleqs
```

	(b) EPSF	(B) EPSR	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
aa	.1433534	.1435109	-.0001575	.0033083
rebit	.0521074	.0460838	.0060236	.0397139
rnpat	-.0149466	-.0146081	-.0003386	.0012705

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.08
Prob>chi2 = 0.9940

```
. estimates store BVPSR

. hausman BVPSF BVPSR, alleqs
```

	(b) BVPSF	(B) BVPSR	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
aa	.2875853	.2785514	.0090338	.0142919
rebit	-.0893743	-.0125221	-.0768523	.1710473
rnpat	-.1441524	-.1444139	.0002615	.0054929

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.43
Prob>chi2 = 0.9338

```
. estimates store TOBINR

. hausman TOBINF TOBINR, alleqs
```

	Coefficients (b) TOBINF	(B) TOBINR	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
aa	.0371736	.0377019	-.0005283	.0014664
rebit	-.0383334	-.0374068	-.0009265	.0170693
rnpat	.0016753	.0013474	.0003279	.0005438

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.52
Prob>chi2 = 0.9155