EFFECT OF EARNINGS QUALITY ON MARKET VALUE OF COMPANIES LISTED AT THE NAIROBI SECURITIES EXCHANGE, KENYA

ARIF MOHAMED YUSUF

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

2020

DECLARATION

I declare this research project is my original work and has not been presented for award of degree in any other university.

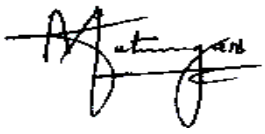
Signature  Date: 30/11/2020.

Arif Mohamed Yusuf

D61/6603/2017

Supervisor

This research project has been presented for examination with my approval as the University Supervisor

Signature  Date 30/11/2020

Dr. Onesmus Mutunga

Lecturer, Department of Finance and Accounting

School of Business, University of Nairobi

ACKNOWLEDGEMENT

First and foremost, am grateful to God for giving me the ability to complete my research project. Furthermore, the preparation and completion of this project would not have materialized were it not for the assistance from various persons. I am therefore indebted to many who I owe appreciation for their encouragement in conducting this study. Special thanks to Dr. Onesmus Mutunga for supervising and offering guidance that made this project be. Sincere thanks to the lecturers and university colleagues who supported me over the course of this project.

DEDICATION

To my parents and family for the inspiration and tremendous support during my studies

TABLE OF CONTENTS

ABSTRACT

This study sought to determine the effect of earnings quality on market value of companies listed at the Nairobi Securities Exchange. A descriptive research design was used. The population of the study comprised of the companies listed at the Nairobi Securities Exchange from 2009 to 2019. A sample of 40 companies was selected using simple random sampling. The study used secondary data obtained from the Nairobi Securities Exchange handbook. Data was summarized using descriptive statistics. Correlation analysis was used to evaluate the relationship between the variables. Multiple linear regression was used to measure effect of accruals quality, earnings persistence, firm size and financial leverage on market value. The study found that market value and accrual quality were weakly positively correlated and the correlation was significant at 5% level of significance. Market value and earning persistence had a weak positive correlation with the correlation being significant at the 5% level. Market value and firm size had a weak positive correlation. The correlation was significant at 5% level. The correlation between market value and financial leverage was positive but weak. The correlation was significant at 5% level. The result of regression showed that accrual quality had a positive effect on market value of companies listed at the Nairobi Securities Exchange. The effect was significant at the 5% level of significance. Earnings persistence had a positive effect on market value of companies. The effect was significant at 5% level of significance. Firm size was found to have a positive effect on market value and was significant at 5% level of significance. Financial leverage was also found to have a positive effect on market value and the effect was significant at 5% level of significance. The adjusted coefficient of determination was obtained as 31.2% indicating that variation in accrual quality, earnings persistence, firm size and financial leverage explained 31.2% of the variation in market value. The study concluded that high quality accruals have the effect of enhancing the market value of companies listed at the Nairobi Securities Exchange. Persistent earnings also have value enhancing effects for companies listed at the Nairobi Securities Exchange. In addition, the study concluded that larger firms at the Nairobi Securities Exchange have higher market value. Finally, it was concluded that financial leverage has the effect of increasing market value of companies listed at the Nairobi Securities Exchange. The study recommended that since accrual quality, earnings persistence, firm size and financial leverage had value enhancing effects, managers of companies listed at the Nairobi Securities Exchange should focus on improving the quality of accruals and earnings persistence, growing the size of the company and increasing leverage. Also, investors and investments analysts should pay attention to accrual quality, earnings persistence, firm size and financial leverage in evaluating companies for the purpose of investment. Further research may extend to evaluating other measures of earnings quality and consider the limit to financial leverage. Also accrual quality could be measured differently by focusing on operating cash flows.

LIST OF ABBREVIATIONS

CBK: Central Bank of Kenya

DPS: Dividend per Share

EPS: Earnings per Share

EQ: Earnings Quality

GDP: Gross domestic product

IASB: International Accounting Standards Board

IFRS: International Financial Reporting Standards

M/B: Market-to-Book

NSE: Nairobi Securities Exchange

OLS: Ordinary Least Squares

ROA: Return on Assets

ROE: Return on Equity

VIF: Variance Inflation Factors

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Earnings Quality (EQ) indicates the ability of present period earnings being indicative of expected earnings. If earnings are not expected to reverse in future, they possess superior quality characteristics (Penman & Zhang, 2002). Schipper and Vincent (2003) explained that superior quality shows how precisely earnings numbers reflect an entity's present operating performance, and is a pointer to future earnings and gives an informative summary for measuring value of the firm. Dechow, Ge and Schrand (2010) views EQ to be the degree that profit reflects true economic earnings. According to Petresen (2010) quality earnings reflect characteristics that enhance the utility of financial information to decision makers relating to relevance, comparability, faithful representation, completeness, verifiability, timeliness and understandability. Teets (2012) noted that, earnings quality is evaluated depending on how well accounting earnings reflect the result relevant in company valuation. Earnings of good quality accurately reflect the present performance, are indicative of prospective performance and offer a useful basis to evaluating firms value (Dechow & Schrand, 2004).

Three theories inform this study namely; Efficient Market Hypothesis (EMH) by Fama (1970), signaling theory (Spencer, 1973) and theory of agency (Jensen & Meckling, 1976). EMH is centered on efficiency of markets in processing information. If markets are informationally efficient, the prices of assets traded in those markets reflect relevant information affecting the company's performance in a timely and unbiased manner. Accordingly, historical and expected earnings information is assimilated into security

prices and the prices changes in a random manner as new information becomes available. Essentially, the new information reflects the quality of earnings forecast built into security prices based on current earnings. Signaling theory focuses on information imbalances that exist between managers and persons outside the company. Managers by virtue of their position have access to better quality information regarding their company's performance both present and expected. Managers' actions are interpreted as signals by stakeholders on the quality of the company's operations in particular expected earnings and cash flows. Agency theory concerns how managers and shareholders in a corporation relate, with managers being appointed as agents of shareholders. In theory, managers should promote the interest of shareholders if they take actions that maximize shareholders wealth. If managers' compensation is pegged to reported financial performance, it is expected that some earnings manipulation aimed at enhancing executive compensation is likely to occur (Cheng & Warfield, 2005). In execution of their stewardship responsibility, managers may attempt to engage in activity that generate high EQ that results in maximization of wealth for the shareholders as reflected by the market value of the company.

The Nairobi Securities Exchange (NSE) is the only securities exchange registered in Kenya. The exchange has grown over the decades since its formation in the 1920's where trading took place on the basis of gentleman's agreement; to the open outcry system of the 1990's and is currently automated with the possibility of trading via remote terminals (Ngugi, 2018). There are a total of sixty three companies whose shares are listed and traded at the NSE. The companies are classified into sectors reflecting the characteristics of the economic activity it engages in (NSE, 2019). To facilitate efficient trading and decision making by participants in the exchange, the companies listed are obligated to issue

published interim as well as full year financial statements and to make prompt disclosure of any material information that may affect investors decisions (Ngunjiri, 2017). In essence, the financial reports allow investors to evaluate the earning potential of the company. Investors in shares buy the earnings stream of the investee company and are concerned about the company's ability to generate promised earnings. Consequently, market participants are able to gauge a reporting entity's earnings quality in making investment decisions.

1.1.1 Earnings Quality

Earnings of high quality are crucial to the financial wellbeing of companies which in turn affects efficiency of financial markets. Investors, investment analysts and regulators rely on the information reported by companies in their financial reports in evaluating financial health the company; this in turn affects the efficient functioning of financial markets. The earnings reported by the company are one of the most anticipated elements of corporate performance (Chan, Jagadeesh & Lakonishok, 2006). EQ is the level to which earnings announced reflect faithfully an entity's earnings and its utility in predicting future earnings (Bellovary, 2005). Teets (2002) point to a number of factors that affect earnings; decisions by setters of accounting standards, the choices made by the management concerning accounting methods and judgements and managerial estimates for implementing the selected accounting policies. If earnings issued are of high quality, they reflect the underlying economic reality of the entity, if poor quality the effect is to mislead on the company's past and expected performance (Mano, 2018). Users of financial statements should therefore carefully scrutinize the reported numbers to evaluate their relevance and reliability (Choi, 2008).

Dechow et al. (2010) identifies a three case criteria of EQ related to the characteristics of earnings, how investors respond to those earnings and the extent to which earnings are potentially misstated. Characteristics of earnings relate to the qualities embodied in earnings that make them useful to investors for decisions making. The usefulness of reported earnings is characterized by earnings management, earnings smoothing and earnings predictability (Liceran & Cano, 2017). Investors analyze how accounting earnings are related to stock market returns. Investors' responsiveness to earnings concerns how reported earnings influence equity investors' decisions. Earnings with higher quality are of higher relevance in decision making for the equity investor. Earnings misstatement necessitates revision or restatement of earnings in subsequent periods and indicates issues of concern with EQ (Dechow, et al. 2010).

Several metrics of EQ have been used in research. According to Lyimo (2014) these measures relate to accrual quality, persistence, predictability and evenness of earnings as well as earnings surprise. Accrual quality reflects the difference in reported net earnings and the firms operating cash flows. A large difference indicates poor earnings quality (Anaekenwa & Rafiu, 2018). Mano (2018) measured accrual quality by dividing operating cash by operating profit. A ratio closer to one indicates higher earnings quality due to the difficulty in manipulating cash flows.

Earnings persistence reflects the sustainability of a firms reported earnings. Persistent earnings are sustainable hence of high quality whereas less persistent ones being transitory and lower quality (Francis, Lafond, Olsson and Schipper, 2004). First order time series regression of earnings is used to measure persistence. The gradient of the regression

indicates the persistence of earnings, with a gradient coefficient close to zero indicating lesser persistent earnings (Lyimo, 2014). If reported earnings are predictive of expected earnings, they embody better quality and if they are poor predictor of future earnings they are of poor quality (Penman & Zhang, 2002). Aguguom and Rafiu (2018) measured predictability on the basis of standard error of the residuals in a time series regression of earnings. Higher standard error indicates poor earnings quality and lower standard error indicating higher earnings quality. Abdelghany (2005) measured earnings quality using a ratio of operating assets to total sales. A large ratio being indicative of low quality of earnings and a small ratio indicating superior quality. In this study, earnings quality will be indicated by accrual quality and earnings persistence.

1.1.2 Market Value

Company's value is the discounted value of future cash flow stream from its operations. When investors buy the stock of a company, they are in essence buying the company's future cash earnings distributable as dividends or realized as capital gains when the shares are sold (Damodaran, 2006). Pinto, Henry, Robinson and Stowe (2013) point to various methods of determining company value. They include the dividend discount model which discounts the forecasted dividend stream, the free cash flows model which discounts the free cash flow to the firm or to equity, and residual valuation model that determines value of company by adjusting opening book value for changes in equity over the period. When applied consistently these approaches result in the same value of the company.

Hitchner (2003) posit that the market value of a company whose stocks are traded in a formal securities exchange is by multiplying price per share with the ordinary shares

outstanding. Since market price per share varies constantly, company's market value will also change and can at times be very volatile. Another metric of valuation is Tobin's Q ratio. This ratio approximates the value of firm on the basis of cost of replacing assets. Tobin's Q divides equity at market value by the book value of net assets (Aguguom & Rafiu, 2018). Market-to-book (M/B) ratio is yet another commonly used valuation metric. M/B ratio is an aggregate measure of value that captures firm efficiency, growth and risk. It indicates the value placed by the market on the firm's net assets. It also reflects how well the firm's managers are managing the assets to grow the firm (Ceccagnoli, 2009). Marvadi (2015) observe that Tobin's Q and M/B ratio are corresponding metrics of value generated. This study measured market value by multiplying price per share with the ordinary shares outstanding (Hitchner, 2003).

1.1.3 Earnings Quality and Market Value

Investors buy into the earnings stream of a company. The current level of earnings is a precursor of what earnings are likely to be in the future and investors use the current earnings in a forward-looking manner to value an investment (Damodaran, 2006). It is important that the expected earnings of an entity will be realized over time. The current earnings are indicative of expected earnings only if they are of proper quality and reflect the firms operating fundamentals (Zhang, Lan & Pang, 2013). Firms with less earnings smoothing have superior EQ that enhances the firm's value (Li, Wang & Xu, 2013).

Gaio and Clara (2011) noted that securities market assign higher valuation for companies with a high EQ which is attributed with better market valuation. The valuation is even higher for firms reporting increased EQ and having greater investment opportunities and

frequently raising capital from external markets (Annes, 2016). Choi (2008) aver that holding other factors constant, companies having higher EQ are assigned higher valuation. High EQ entities are rated more favorably in the securities market. Reliable accounting information is thus critical in explaining market value of companies.

1.1.4 Companies listed at the Nairobi Securities Exchange

Nairobi Securities Exchange (NSE) is Kenya's only formal registered securities exchange. Its history traces back to 1920's a time in which the exchange facilitated shares dealing on an agreement basis with no trading floor. The exchange was formally registered in 1953. Since then it has undergone several transformations from trading being conducted over a cup of tea to the open outcry system to the current automated trading system that came into operations in the year 2003. Until the year 2014, NSE existed as a private company with membership comprised of registered stock brokers. In 2014 it become a public company through an initial public offering and listed in the same exchange (NSE, 2020).

Currently there are sixty-three companies listed at the NSE divided into various sectors namely; Agricultural, banking, investment, energy and petroleum, construction, insurance, manufacturing, investment services, tele-coms and automobiles, exchange traded funds and real estate investment trust (NSE, 2020). NSE listed firms publish financial statements in accordance to the regulations of the exchange and in compliance with relevant accounting standards (Too, 2015). Among the objectives of the NSE is to ensure investor protection. To achieve this objective the exchange requires listed companies to periodically inform investors in a timely basis and with transparency all material information likely to affect the company performance (Kakiya & Mugo, 2013).

1.2 Research Problem

Investors and markets value high earnings quality more than low earnings quality. However, research findings in this regard are mixed. Yanthani, Aljaso and Dezie (2019) documented that earnings quality and market value of companies listed in Indonesia were significantly positively correlated. Gaio and Clara (2011) using data from 38 countries documented that firm's value and aggregate metrics of EQ had a positive relation. Hung, Thi and Dung's (2020) study in Vietnam indicated positive influence of EQ on firm valuation. Larson and Robert (2014) noted that forward looking measures of EQ were strongly negatively correlated with firms' value for companies listed in USA. Annes and Domingos (2016) documented that for companies listed at the Lisbon stock market, earnings quality and firm valuation had a negative relationship. Aguguom and Rafiu (2018) in a study of Nigerian companies pointed to negative relation of EQ and market value.

Market value of stocks traded at the NSE like those of other securities exchange, fluctuate from time to time. Muiva and Ogilo (2016) noted that these fluctuations are due to the random arrival of information on company fundamentals. Market capitalization of firms traded at NSE was positively related to exchange rate, rate of inflation and GDP (Ndunda et al, 2020). Ouma and Muriu (2014) noted that market value of companies at NSE was affected by factors such as fluctuating exchange rate, changes in money supply and inflation. Oyuga (2014) utilized event study methodology to evaluate how earnings announcement affected share prices at the NSE. The study documented that earnings announcement higher than expected, resulted in a positive adjustment in stock prices while earnings announcement lower than expected, had a downward adjustment in stock prices.

Chepkwony (2018) used accruals to measure earnings smoothing and found earnings smoothness positively influenced stock return for companies at the NSE. Similarly, Ngunjiri (2017) using discretionary accruals posited that earnings management positively affected the performance of NSE listed companies. These studies considered accruals, a measure commonly used to asses quality of earnings, as a measure of earnings management but did not evaluate the quality of those accruals. In light of the reviewed literature and researcher's best knowledge, the researcher finds limited empirical evidence concerning how EQ and firm value are related for NSE companies. More so, international evidence on this subject is mixed. This contributes to the existing literature and possibly resolves the conflict while providing evidence of the subject using data from NSE. It addresses the research question; how does EQ affect market value of companies traded at NSE?

1.3 Research Objective

This research sought to determine the effect of earnings quality on market value of companies listed at the Nairobi Securities Exchange.

1.4 Value of the Study

Corporate managers will find the result of this research valuable in terms of assessing the effect of EQ on valuation of their entities. It will thus guide the managers to use the power of earnings reporting in the interest of the public. The study will allow investors to evaluate the relevance of reported earnings in making investment decisions. Investors will be able to discern whether the quality of reported earnings can be helpful in predicting future earnings thus guiding optimal resource allocation.

Regulators such as Capital Markets Authority entrusted in ensuring that companies report earnings that reflect the economic reality of companies will obtain useful insights from the research. This will be important for ensuring efficient functioning of capital markets and protection of investors from misleading financial reporting.

The study will contribute to literature in two ways. First, it will evaluate various constructs of earnings quality used in literature in terms of their value relevance in decision making. Secondly, the study contributes to existing empirical evidence on the determinants of market value of companies. The result of the study will form a basis of reference by future researchers with interest in similar lines. The study will also give recommendations for advancing research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter extant literature was appraised. Theoretical framework that supports this study was discussed, followed by a discussion of determinants of market value. The chapter also reviewed empirical evidence related to the study, discusses the conceptual framework then concluded by summarizing the literature.

2.2 Theoretical Framework

The theoretical foundations for this research revolved around efficient market hypothesis (EMH) by Fama (1970), agency theory (Jensen & Meckling, 1976) and signaling theory (Spencer, 1973).

2.2.1 Efficient Market Hypothesis

EMH is concerned with the ability of markets to impound all relevant information that may affect the company's performance to share price. EMH is concerned with the rapidity and precision of markets in assimilating new information into security prices. Information is considered as anything likely to affect the performance of a company and is unknown or unpredictable. Since information gets to market randomly, share prices also follow a stochastic process. The market is efficient if security prices respond precisely and quickly when new information becomes available. As a result, it is not possible for any investor to intelligently pick stocks that outperform the market on a consistent basis (Fama, 1970). Campanella, Mario & D'Angelo (2016) assert that market efficiency does not imply that share prices are correct but rather they are unbiased.

Fama (1970) identify three forms of information processing efficiency, namely; weak, semi-strong and strong form efficiency. If share prices contain all past information on company performance it embodies weak efficiency. In the semi strong from asset prices incorporate all relevant public information, historical and that which is predictable. Efficiency in the strong form suggests that the market impounds into the security price, all publicly available as well as private information. Damodaran (2006) posited that a strong form encompasses semi-strong form while semi strong form encompasses weak efficiency. A semi-strong efficient market possesses earnings information from historical performance and expected performance based on those past earnings. Share prices would then be expected to respond to earnings surprises, which may reflect an assessment of the quality of previous earnings or the inability of historical earnings to estimate expected earnings. While this study did not make an attempt to evaluate the market's ability to interrogate earnings quality, EQ has consequences to market efficiency so that the market is not misled by low quality reporting.

2.2.2 Agency Theory

Agency relationships occur when a principal delegates decision making and execution of activities to an agent. The principal expects the agent to act in their interest. In a corporation, shareholders are the principals who appoint managers as their agents and entrust their wealth on them. The shareholders expect that the managers will act in their best interest and maximize their wealth. A conflict arises between shareholders and managers in which managers actions are not in line with those of the shareholders. The conflict occurs due to alignment of incentive and the information asymmetry that exist between shareholders and managers. The principal agent conflict is fueled by incentive

mechanisms that are punitive on the agent when performing the activities that attempt to maximize the welfare of the principal (Jensen & Meckling, 1976).

Agency theory argues that since managers have the discretion in making accounting and reporting decisions, they have the incentive to overstate financial performance especially when their compensation is linked to reported earnings or assets under management. In doing so managers selfishly enhance their utility instead of that of their employers (Marquardt & Wiedman, 2004). Principals may reduce the excess of agents and lessen the misalignment of interest by incurring agency cost that monitors the actions of the agent. However such monitoring is not perfect and some scope for opportunism will still exist (Hunton, Libby & Mazza, 2006). If managers' compensation is pegged to reported financial performance, it is expected that some earnings manipulation aimed at enhancing executive compensation is likely to occur (Cheng & Warfield, 2005). In execution of their stewardship responsibility, managers may attempt to engage in activity that generate high earnings quality that results in maximization of wealth for the shareholders as reflected by the market value of the company.

2.2.3 Signaling Theory

Spencer's (1973) seminal work forms the basis of signaling theory. Spencer used the labour market to demonstrate how job applicants engage in behavior that aimed at reducing information asymmetry that hinders employer's selection ability. Prospective employers do not have knowledge concerning the quality of those seeking jobs. Job seekers reduce information asymmetry in the labour market by obtaining education that signals their quality. The signal is deemed effective because low quality candidates are unable to stand

the rigor of acquiring education. Stiglitz (2000) posit that presence of information asymmetry affords a necessary situation for efficiency of signaling. Information asymmetry occurs between those with access to information and those could make improved decisions if they had the information. Stiglitz (2002) raises the following issues relating to signaling; quality of the information and intention of signaling. In Spence (2002) quality concerns the signalers ability to satisfy the needs of the entity interpreting the signal while intent concerns the purpose of the signaler.

Signaling theory provides a framework for explaining behavior when two persons do not have access to the same amount and quality of information relating to a subject. The one with information chooses the manner and timing of revealing the information while the recipient chooses how to interpret that information (Malsch, 2013). Position of managers accords them access to information that is not available to outsiders. Such privilege allows managers the opportunity to release information they deem favorable and attempt to minimize information asymmetry between shareholders and the company. Markets rely on earnings reported by managers to forecast the expected performance of the respective companies. Corporate managers may therefore use earnings release to relay information on their company's quality (Rath & Sun, 2008). The stock market filters the information issued and if it is of reliable quality adjusts stock prices upward, if it is poor quality adjusts stock prices downward (Pham, Chung, Roca & Bao, 2017). Going by the signaling argument, investors are expected to interpret the action taken by corporate managers to evaluate the expected performance of the company. If such action signals strong expected earnings, demand for the company stock increases resulting in higher stock valuation and vice versa.

2.3 Determinants of Market Value

Corporate valuation is an interaction of multiple factors. Several of these factors are discussed hereunder.

2.3.1 Earnings Quality

Earnings quality in existing literature is measured using various constructs such as accrual quality, persistence, smoothness and predictability of earnings. Gaio and Clara (2011) posit that earnings of superior quality are rewarded with higher market valuation. Rene and Andson (2016) documented that persistent earnings are associated with lower valuation errors thus improving valuation accuracy.

Earnings persistence measures earnings quality by indicating how sustainable earnings are Schipper and Vincent (2003). Oei, Ramsey and Mather (2008) evaluated persistence of earnings based on the slope coefficient in a regression of earnings time series. Prapaporn (2008) observe that recurrence of earnings symbolizes persistence.

2.3.2 Firm Revenue

Pandey (2015) noted that revenue growth influences the firms expected future earnings. Increasing sales may be a worthwhile objective but may not necessarily result in higher market valuation unless such growth results in profit margin that exceed the company's required rate of return (William & Michael, 2015). Revenue growth potentially enhances market capitalization of a company if operating cost do not grow as much (Chung, 2010). Bogue and Buffa (2014) explained that market capitalization is influenced by revenue growth as well as duration over which that growth is sustainable in excess of capital cost.

Damodaran (2010) pointed to use of revenue for valuation especially with companies with negative earnings so long as the entities are a going concern. Uday and Ro (2008) pointed that initial revenue and earnings announcements are associated with stock price movements. While earnings and revenue are correlated indicators of financial performance, revenue has a marginal informative content in circumstances when earnings are not as signaling. Chanrda et al (2004) explained the pervasiveness of revenue in valuation of firms operating in uncertain and rapidly changing environment because such firms are likely to have volatile earnings. Jegadeesh and Livnat (2006) posit that revenue is more valued for younger firms in emerging industries.

2.3.3 Firm Size

Aloke, Gu and Jain (2016) argue that size of listed firm is indicated by its stock market capitalization. Market capitalization is a key metric for investors in evaluating how well their investments are performing. Market capitalization is a well-accepted measure to approximating value of any business entity (Ikikii & Nzomi, 2013). Size is also indicated by the total assets as recorded in a firm's balance sheet. This provides a book-based measure of the size of firm (Liow, 2010).

There is quite some evidence on the how firm size affects firms' value. Chung (2010) show the existence of a size premium in which small firms stocks earn abnormal return over an extended period of time. Davis (2012) using economies of scale argument show that large firm with diversified product lines earn a superior return at lower risk. Atiase (2015) argued that large firms are associated with lower stock price volatility resulting in more stable market valuation. Dewi and Wirajaya (2013) noted that large firms tend to be more

profitable, have a wide asset base which when efficiently deployed should result in higher market value for the entity. Yanthani et al (2019) posit that markets value larger firms higher than smaller firms.

2.3.4 Financial Leverage

Hamada (1972) showed equity value to be linearly related to debt equity ratio. Usage of leverage increases financial risk for which equity holders require compensation. Thus firms with high leverage need to generate a superior rate of return consistent with that expected by equity holders for the risk they assume. This implies that as debt level increases, the stock prices change at a higher rate to maintain equilibrium valuation in the market. This shows that change in leverage have a direct relationship to volatility of stock prices.

Amato and Burson (2007) point to the constraints associated with usage of debt due to the cost agency. These constraints generate inflexibility in undertaking certain corporate decisions such as sale of unprofitable assets. This may negatively affect the firm's financial performance. Elleuch and Trabelsi (2009) argue that the balance between debt and equity in a firm's statement of financial position influences the firms ROA and ROE. Lee (2012) posits that in a perfect capital market there would be no room for arbitrage and the net worth of an organization is not affected in anyway by leverage.

2.3.5 Gross Domestic Product

This indicates the productivity of an economy. It is the monetary value of the output of an economy. It is an overall measure of the total output in an economy (Romer, 2009). Demir (2019) argued that fluctuations in the level of GDP was a major driver of variation in

market value of firms at Istanbul exchange. Volatility in GDP was identified as a contributor of unpredictable earnings in an economy which result in volatile stock prices. Kulhanek (2012) hypothesized the existence of a strong connection between economic productivity and stock prices in a given economy. Using data from Central and Eastern Europe, stock prices and GDP growth were shown to have positive long-term relationship and were co-integrated.

Nazir and Nawaz (2010) aver that growth in GDP significantly determined stock market development in Zambia. Share prices increased noticeably in periods when GDP growth was higher than expected. Kaimba (2010) examined the relationship between stock market index and macroeconomic factors. The study documented that GDP growth had an considerable influence on the performance of the stock market. GDP growth was found to result in an appreciation of the NSE-20 share index. Mutulus and Olweny (2018) noted that GDP showed a long-term positive relationship with the stock market index.

2.3.6 Interest Rate

Interest rate has been observed to affect the market value of companies in various studies. Udin (2009) in an investigation of how interest rate affected stock prices in developed and developing countries documented that both the level and changes in interest rates adversely affected share prices. Demir (2019) argued that persistently high interest rates are harmful for economies and result in depressed equity prices. Gathogo in a study of macroeconomic factors that influence market capitalization of listed companies at the NSE noted that interest rate on the 90-day treasury bill; interest rates charged by commercial banks as well as Central Bank of Kenya (CBK) base rate significantly negatively affected market

capitalization. Ndegwa (2016) researched the macro-economic determinants of stock prices. CBK lending rate and stock prices showed an insignificant positive relationship. Trokon (2014) found no significant causality between interest rate levels and shares values.

2.3.7 Exchange Rate

This is price at which a unit of currency is exchanged for bought or sold. Commonly, exchange rate is measured by reference to the amount that a domestic currency is traded against other major currencies such as the USD, Pound Sterling or the Euro (Nshom, 2007). Evidence has indicated some relationship between market value of stocks and rates of exchange. Ibrahim (2003) in a study of the macro-economic determinants of value in Malaysia pointed that equity value was negatively related to rates of exchange. Gathogo (2017) explained that variation on exchange rate was a key determinant of value of companies in Kenya. Weak of Kenya shilling against USD, adversely affected value of shares. However, Ndunda et al (2020) noted that exchange rate variation affected positively the performance of the equity market at NSE.

2.4 Empirical Evidence

Gaio and Clara (2011) used a large sample of 7000 companies spread across 38 countries to examine the relation of earning quality and firm value. The study aimed to examine how earnings quality and firms value interacted. Data was analyzed using panel data regression. A meaningful positive association between EQ and firm valuation was determined. The study concluded that firms in weaker legal environment compensate by assuming stricter earnings quality procedures. It also concluded stock markets attaches a higher valuation to

strong EQ. it recommended for the strengthening of reporting standards that would result in improvement of quality of reporting.

Choi (2008) examined earnings quality and firm value in the Korean Stock Exchange. The study purposed to examine how indicators of earnings quality interacted with market value of companies. The study sampled the manufacturing firms in the Korean Stock market. It used secondary data covering 2003 to 2005. Regression methodology was adopted for data analysis. The study regressed Tobin's Q ratio against measures of EQ, proxied by accrual, persistence and predictability of earnings. The study attributed higher market valuation to better accrual quality, persistent and predictable earnings other factors held constant. The study recommended that Korean firms should enhance transparency in their earnings reporting so as enhance firms' market value.

Hung, Thi and Dung (2020) investigated how EQ impacted the firms' value in the Vietnamese stock market. The study sought to evaluate how EQ affected valuation. The study controlled for effect of firm size, the rate of investment, financial leverage, dividend payment and revenue growth. An exploratory research design was adopted. Generalized least squares methodology was used to measure effects. The study documented that firm value was significantly positively influenced by EQ. Firm size and dividend were positively connected to valuation. However gearing, revenue growth, book to market value were found to be inversely related to market valuation. It recommended establishment of mechanisms to ensure companies prepare financial statements reflective of fair position of the firm.

Annes and Domingos (2016) studied the relationship between EQ and corporate performance of companies at the Lisbon exchange. It sought to evaluate how market valuation of firms related to the EQ. The study adopted a casual research design. 46 firms listed at Lisbon stock exchange from 1987 to 2016 were sampled. It was found that metrics of EQ namely; accruals quality, earnings predictability and earnings evenness negatively impacted the value of firm. Earnings persistence positively impacted market value. The study concluded that the negative impacts could be the result of earnings manipulations by firms. It was recommended that companies should focus on improving the EQ reported.

Yanthani et al (2019) looked at EQ and market in Indonesia Stock market. An exploratory design and census of firms traded over years 1995-2015 was used. Multiple linear regressions were applied in examining influence of EQ on market value while controlling for dividend payment. EQ and equity value were determined to be negatively correlated. The conclusion was that application of accounting standards and amending of capital markets rules will not by design increase the quality of financial reporting.

Anaekenwa and Rafiu (2018) considered how earnings quality affected value of Nigerian companies. This study set out to examine how EQ affected book value of Nigerian companies. The study purposively sampled 51 listed companies. Secondary data sources were used. Pooled ordinary regression analysis was used for data analysis. Earnings quality was determined to positively impact book value. Book value was documented to be positively influenced by quality of accruals and persistence of earnings. It also found that earnings predictability negatively affected book value. The study recommended analysts should take into consideration the earnings reliability and accrual accounting.

Aguguom, Dada and Nwaobia (2019) examined how earnings persistence was connected to company performance in Nigeria. The research aim was to afford evidence from emerging market on value relevance of earnings persistence. Exploratory factor research approach was utilized. The study sampled 55 companies from Nigeria Stock Exchange between 2008 and 2018. Time series modeling was used to measure earnings persistence. The study documented that earnings persistence affected market value in a non-significant negative manner. It was concluded that earnings persistence was not a reliable predictor of EQ. It recommended caution on analysists when evaluating earnings especially when earnings are unstable as this could have negative and misleading implications for valuation.

Aguguom and Rafiu (2018) evaluated the relationship of EQ and financial performance of Nigerian firms. This research sought to determine the sought to determine how quality of earnings was related to market value. The study sampled 68 Nigerian listed companies. The study used secondary data. Multiple linear regression based on pooled panel data analysis was used. Accrual quality, earnings predictability was found to affect market value negatively. Earnings persistence positively and meaningfully determined value. The study recommended to investors, analysts and policy makers to evaluate the regularity of the times series pattern of earnings.

Ngunjiri (2017) looked into the relation of earnings management and performance of Kenya's listed firms. This study sought to establish if earnings management and financial performance were related. Descriptive research approach was adopted. A census study was carried out. OLS was used for analyzing data. Earnings management was established to have a positive relationship with ROA. Firm sizes, market to book value ratio were also

identified as positively influencing performance. A conclusion was made that earnings management positively influenced performance. It was recommended that large firms, and firms with higher market to books value are associated with better financial performance.

Chepkwony (2018) evaluated how earnings management influenced stock returns of NSE quoted companies. It purposed was on investigating how earnings management affected stock performance. Descriptive research design was used. A census of financial companies traded from 2013 to 2017 was carried out. Data was analyzed using multiple linear regression methodology. Stock returns were regressed on discretionary accruals, ratio of market to book and firm size. Earnings management was found to positively affect stock returns with the effect being insignificant. M/B ratio and size negatively impacted stock returns. The study concluded that earnings management did not significantly influence stock returns. It was recommended that management of earnings does not help improve the stock returns of a company significantly.

Gworo's (2019) research focused on relation between earnings volatility and valuation of NSE companies. The aim was to determine how volatility of earnings affected value. A correlational design was adopted with a sample of 30 companies listed between 2011 and 2015. Secondary data was used. It was determined that earnings volatility positively affected market value of listed companies. Dividend payout indicated a positive effect on the value of companies. Firm with more volatile earnings were documented as having higher market value. It was recommended that managers of listed companies needed to reduce earnings volatility and dividend payout to create positive signals to the stakeholders.

Kakiya, Mugo, Onyuma and Owuor (2013) examined the level of efficiency at the NSE with regard to earnings announcement. The study sought to evaluate how earnings announcement affected efficiency of the stock market. Event study approach was used. Period of the study involved between 2005 and 2011. Earnings announcement had a significant effect on the cumulative average risk adjusted return indicating market inefficiency. The study concluded that the NSE was not semi-strong efficient with regard to earnings announcement. The study recommended to the Capital Markets Authority to issue regulations that minimize inefficiencies in order to enhance investors' confidence.

2.5 Conceptual Framework

Ravich and Carl (2016) affirm that conceptual framework generalizes the thinking of the whole research process and may take graphical form or be narrated. The conceptual framework for this research showed the interaction between indicators of earnings quality and market value with size of firm and financial leverage as control variables.

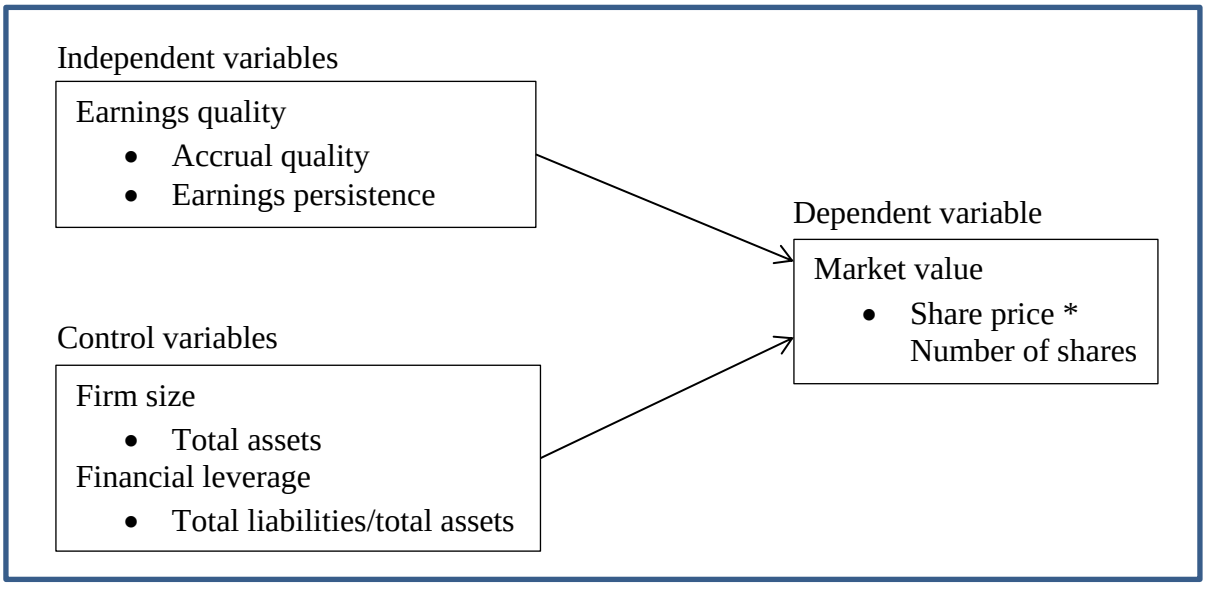


Figure 2.1 Conceptual Framework

Source: Author (2020)

2.6 Summary of Literature Review and Research Gaps

Factors that influence market value of companies have been examined extensively. Among the most commonly determinants cited in literature are firm size, leverage, revenue, earnings dividends and earnings quality have mostly been cited as important factors influencing market value of companies. Firm value has variously been represented using books value, M/B ratio or Tobin's Q. Earnings are an important valuation parameter but only if they are of good quality. Sustainability of earnings determines how good quality those earnings are. Various measures of earnings quality used in literature include; accrual quality, persistence, predictability, smoothness, timeliness of earnings.

Various studies have examined how quality of earnings impact valuation of firms. Some of the studies pointing to a positive effect include; Hung et al (2020), Gaio and Clara (2011) and Choi (2008). On the other hand, studies such as Aguguom and Rafiu (2018), Aguguom et al. (2019) and Annes and Domingos (2016) argued that company value was negatively impacted by earnings quality. Locally, the studies of Chepkony (2018) and Ngunjiri (2017) used discretionary accruals to measure earnings management. The studies however did not measure the quality of those accruals. The aforementioned studies provide conflicting evidence as to how EQ and value are related. Further, within the scope of the reviewed literature, there is a lack of evidence on the effect of EQ on market value for companies reporting at the NSE. This study seeks to delve into the controversy by providing additional evidence in this area based on data obtained at the NSE.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The approach adopted for this study is described in this chapter. First, the research designed was outlined followed by a description of the population of interest. Sample selection is then explained, followed by data sources and data collection. The final section explained how the data was analyzed.

3.2 Research Design

This specifies process by which data was collected and analyzed. It is based on the research objectives to ensure that data collected is appropriate for answering the research questions (Zikmund, 2003). For this study, descriptive research design was used. This design seeks to provide a description of phenomena related to a subject population. It deals with who, what, when, where and how questions in a topic. It is most useful in helping uncover the relationship between variables and is formalized using clearly stated hypothesis or investigative questions (Cooper & Schindler, 2011).

Descriptive research design explains features of a population focusing on the 'what' rather than the 'why' of the research subject (Mugenda & Mugenda, 2008). As stated earlier, this study sought to determine how earnings quality affects market value of companies. To this end, it used descriptive analysis to address the question; how does EQ affect market value of companies at NSE?

3.3 Target Population

Population is universe of items possessing features of interest in an analysis (Mugenda & Mugenda, 2008). The population of interest involved companies traded at NSE between 2009 and 2019. Ending 2019, sixty-three companies were quoted at NSE. It was anticipated that, the duration provided sufficient data for the research to reach valid conclusions.

3.4 Sampling and Sample Size

Sample refers to smaller group of items drawn from a population of interest. Where adequate statistical procedures are followed, a good sample has characteristics similar to the population (Zikmund, 2003). Since the variable of interest is present in each unit of the population, the samples were selected using simple random sampling. In this sampling approach each element has the same probability of selection (Cooper & Schindler, 2011).

Following Cooper and Schindler (2011) the sample size was calculated by:

$n = N(cv^2)/\{cv^2 + (N-1)e^2$

Where n = sample size

N = target population

CV = co-efficient of variation which is taken as 0.5

e = Tolerance at desired level which is taken at 0.05 or at 95% confidence level

Applying the above formula, the sample was calculated;

n = 63 * (0.5)2 / $\{(0.5)^2$ + (63-1)*$0.05^2\}$

n = 63 * 0.25 / {0.25 + (62 * 0.0025)}

n = 16.5 / 0.4125

N = 40, this represent 60% of the target population.

3.5 Data Collection

This research utilized secondary data. This is preexisting data recorded by someone else for other purposes (Kothari, 2004). Secondary data is data in published documents prepared by authors other than the researcher. Data sources used were the published financial reports and the NSE handbook. Data collected included end of year share prices, ordinary shares outstanding, total assets, total liabilities, current liabilities and net income from the year 2009 to 2019.

3.6 Data Analysis

Data analysis techniques allow researchers apply logic in understanding data collaborated. It involves determining patterns and summarizing key outcomes obtained from the investigation. It may involve the use simple frequency distribution, bar graph to more complex approaches such as multivariate analysis (Zikmund, 2003). This study made use of frequency distributions, line graphs, descriptive and inferential statistics. Multiple linear regression was utilized to analyze the variables causal effect.

3.6.1 Analytical Model

Accrual quality and earnings persistence were regressed on market value with size of firm and leverage used as control variables. The regression model used was specified as:

$$MV = \alpha + \beta_1 AQ + \beta_2 EPer + \beta_3 Size + \beta_4 Lev + \varepsilon$$

Where;

MV = Market value

α = Constant

βi = Coefficient of variable i

AQ = Accrual quality

EPer = Earnings persistence

Size = Firm size

Lev = Financial leverage

ε = Error term

3.6.2 Operationalization of Variables

The variables used in the regression model are defined as under.

Table 3.1: Operationalization of Variables

Variable	**Measure**	**Reference**
Market value	Share price * Number of shares	Hitchner (2003)
Accrual quality	$\frac{NOAi,t-NOAi,t-1}{NOAi,t-1}$ Where NOAi,t =Net operating assets of firm i at time t NOAi,t-1= Net operating assets of firm i at time t-1	Gaio and Raposo (2018)
Earnings persistence	The slope coefficient β of the regression; $EPE_t=\alpha+\beta EPS_{t-1}+\varepsilon$	Lyimo (2014)
Firm size	Natural logarithm of total assets	Yanthani et al (2019)
Financial Leverage	$\frac{\text{Total liabilities}}{\text{Total assets}}$	Hamada (1972)

Source: Author (2020)

3.6.3 Diagnostic Tests

Diagnostic tests were carried to examine any violation of regression assumptions. The assumptions of linearity, normality of residuals, serial correlation, heteroscedasticity and multicollinearity were tested. Regression analysis presupposes the dependent and independent variables are linearly related. Linearity was tested using the distance from linearity measure. The study tested the hypothesis that there was significant deviation from linearity. Normality was be tested using a histogram and a P-P plot also Shapiro-Wilk test of normality was used (Cook & Weisberg, 2002). Heteroscedasticity was tested using Beursh-Pagan test (O'Connor, 2000). Serial correlation was checked using Durbin Watson statistic with multicollinearity being tested using variance inflation factor and tolerance limits (Menard, 1995).

3.6.4 Test of Statistical Significance

Usefulness of predictor variables was tested t-test at 5% significance level. Adequacy of the whole regression was tested using F-test. The regression predictive power was determined on the basis of adjusted coefficient of determination.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presented result of data analysis. With a sample of 40 companies over a ten year period, 400 observations were obtained. Diagnostic tests on validity of regression assumptions were first done. Descriptive and correlation analysis were done followed by regression analysis. Finally the findings were discussed.

4.2 Diagnostic Tests Result

This section evaluated whether assumptions of regression analysis are violated. The tests covered linearity, normality, heteroscedasticity, serial correlation and multicollinearity.

4.2.1 Test for Linearity

Regression analysis presupposes linearity of between variables. Linearity was tested using the distance from linearity measure. The study tested the hypothesis that there was deviation from linearity. P-value greater than 0.05 for deviation from linearity would result in rejection of the hypothesis.

Table 4.1: Test for Linearity

			Sum of Squares	df	Mean Square	F	Sig.
Market value * Accrual quality	Between Groups	(Combined)	999.484	317	3.153	.865	.776
		Linearity	14.936	1	14.936	4.100	.048
		Deviation from Linearity	984.548	316	3.116	.855	.793
	Within Groups		200.364	83	2.414		
	Total		1199.848	400			
Market value * Earning persistence	Between Groups	(Combined)	843.629	307	2.748	0.443	.856
		Linearity	26.961	1	26.961	25.355	.062
		Deviation from Linearity	816.668	306	2.668	0.861	.596
	Within Groups		356.218	93	3.830		
	Total		1199.848	400			
Market value * Firm size	Between Groups	(Combined)	1072.503	344	3.118	1.641	.013
		Linearity	335.067	1	335.067	161.00	.000
		Deviation from Linearity	737.436	343	2.356	1.132	.292
	Within Groups		116.543	56	2.081		
	Total		1189.045	400			
Market value * Financial leverage	Between Groups	(Combined)	1049.921	333	3.442	1.538	.017
		Linearity	18.686	1	18.686	8.350	.005
		Deviation from Linearity	1031.236	332	3.106	1.116	.121
	Within Groups		149.926	67	2.238		
	Total		1199.848	400			

Source: Author (2020)

Results of linearity test are indicated in table 4.1. The p-value for the deviation from linearity between market value and accrual quality was 0.793. Since 0.793>0.05, hypothesis of deviation from linearity was rejected. The p-value for the linearity test between market value and earnings persistence was 0.596. This being higher than 0.05, the

hypothesis of deviation from linearity was rejected. Market value and size returned p-value 0.292, as 0.292>0.05, hypothesis of deviation from linearity was rejected. Market value and leverage returned a p-value of 0.121. Because 0.121>0.05, deviation from linearity assumption was rejected. It was concluded that the variables were linearly related to market value.

4.2.2 Normality of Residuals

It is assumed that the residuals follow a normal distribution. To evaluate this assumption, a histogram of residuals and a normal P-P plot were obtained which allowed normality to be evaluated by observation.

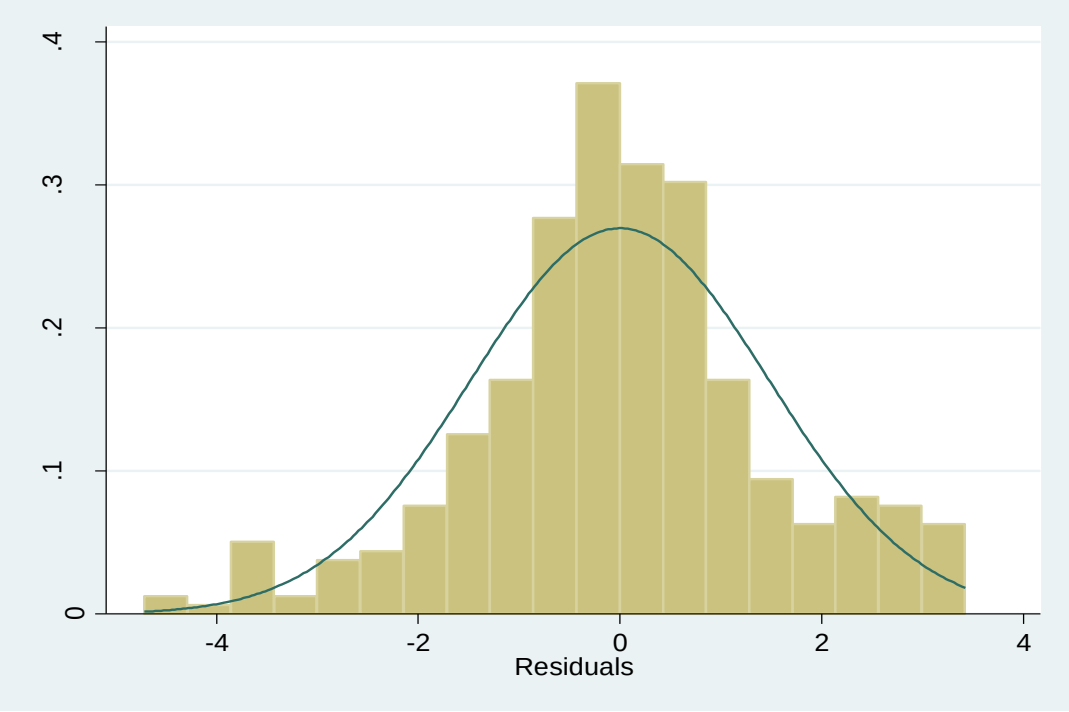


Figure 4.1: Histogram

Source: Author (2020)

Figure 4.1 showed the histogram of residuals. As depicted, the histogram was fairly normally distributed.

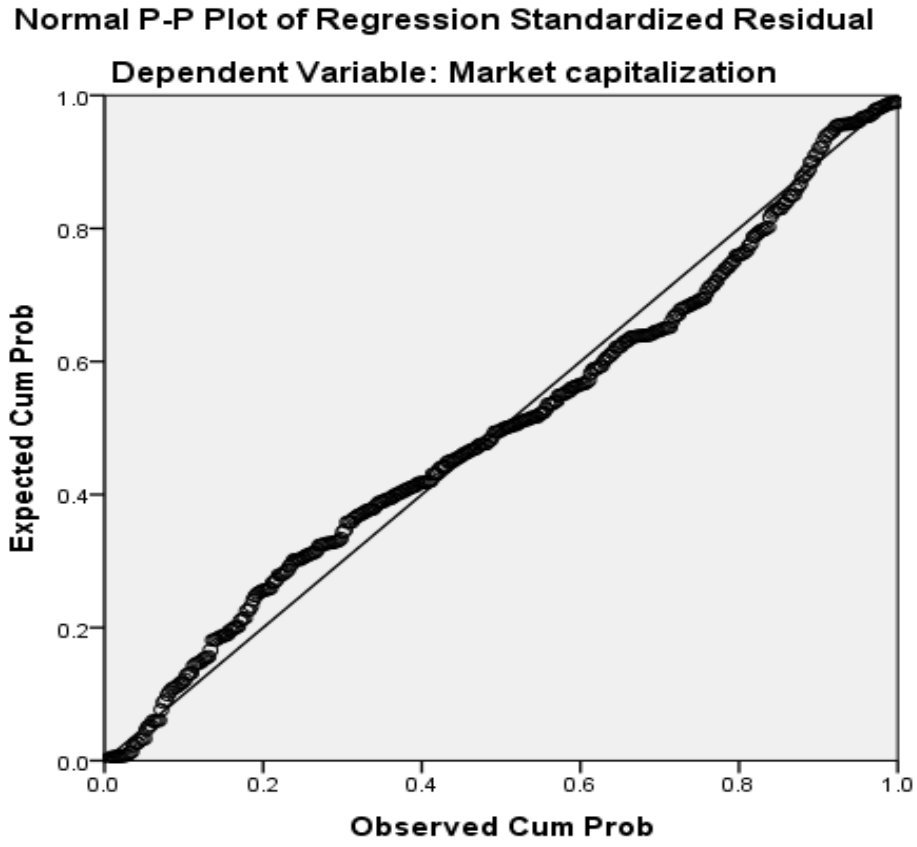


Figure 4.2: Normal P-P Plot

Source: Author (2020)

Figure 4.2 showed the normal P-P plot. The standardized residuals did not deviate much from the 45-degree line. Looking at figure 4.1 and 4.2 suggested that the residuals were fairly normally distributed. To specifically confirm this result, the Shapiro-Wilk test of normality was undertaken. The null hypothesis of normally distributed residuals was taken. A p-value >0.05 from this test would result in a failure to reject the null hypothesis.

Table 4.2: Shapiro-Wilk Normality Test

Variable	Obs	W	V	z	Prob>z
r	400	0.97908	1.208	0.418	0.3562

Source: Author (2020)

Table 4.2 was the outcome of Shapiro-Wilk normality test. The test indicated that the null hypothesis of normally distributed residuals was not to be rejected as the p-value 0.3562>0.05. It was therefore inferred that the residuals were normally distributed.

4.2.3 Test for Heteroscedasticity

To test the assumption that the error term has a constant variance, Breusch-Pagan test was undertaken. It tests hypothesis that residuals have a constant variance. The hypothesis is rejected for p-value < 0.05.

Table 4.3: Breusch-Pagan Test

Ho: Constant variance
Variables: fitted values of market value
Chi2(1) = 0.44
Prob>chi2 = 0.5068

Source: Author (2020)

Test result for heteroscedasticity was reported in table 4.3. Since the p-value 0.5068 > 0.05, the hypothesis that the residuals have a constant variance was not rejected.

4.2.4 Serial Correlation Test

A further assumption that underlies regression analysis is that the residuals were not serially correlated. This assumption was tested using the Durbin-Watson statistic.

Table 4.4 Durbin - Watson Statistic

Model	Durbin-Watson
	2.015[a]

Source: Author (2020)

A Durbin-Watson statistic of 2.015 was obtained from table 4.4. Since the statistic was approximately 2, hypothesis of no serial correlation was supported. This led to the conclusion that the errors were not serially correlated.

4.2.5 Multicollinearity Test

Lastly the data was tested for multicollinearity. Independent variables should not be highly correlated otherwise multicollinearity would occur. The null hypothesis of no multicollinearity was tested. If VIF <10 and tolerance >0.2 multicollinearity was absent.

Table 4.5: Multicollinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
Accrual quality	.964	1.038
Earning persistence	.978	1.023
Firm size	.761	1.314
Financial leverage	.738	1.355

Source: Author (2020)

Table 4.5 depicted that for each variable, the VIF was less than 10 and tolerance higher than 0.2. From this it was concluded that the variables were free from multicollinearity. The analysis above indicated that there were no violations to regression assumptions. It was therefore appropriate to apply the data in a regression analysis.

4.3 Descriptive Statistics

To summarize the data, descriptive statistics were computed. These showed the value of the mean and the spread around the mean as indicated by the minimum, maximum and the standard deviation.

Table 4.6: Descriptive Statistics

Model	N	Minimum	Maximum	Mean	Std. Deviation
Market value	400	18.635	25.233	22.086	1.796
Accrual quality	400	.011	.520	.180	.155
Earning persistence	400	.032	.851	.408	.281
Firm size	400	12.444	18.126	15.494	1.717
Financial leverage	400	.000	.782	.306	.266
Valid N (listwise)	400				

Source: Author (2020)

Table 4.6 was the derived summary descriptive statistics. Market value averaged 22.086 in natural logarithm terms having a standard deviation of 1.796. Accrual quality averaged 0.180 having standard deviation 0.155. Earnings persistence averaged 0.408 and had a standard deviation of 0.281. Firm size averaged 15.494 having standard deviation 1.717. The financial leverage ratio averaged 0.306 having a standard deviation of 0.266.

4.4 Correlation Analysis

Correlation indicates degree of linear relationship of variables. Karl Pearson measure of correlation was used. The significance of the correlation was evaluated at 5% level of significance. Hypothesis of no significant correlation between variables was assessed.

Table 4.7 Correlation Matrix

		Market value	Accrual quality	Earnings persistence	Firm size	Financial leverage
Market value	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	400				
Accrual quality	Pearson Correlation	.112*	1			
	Sig. (2-tailed)	.031				
	N	400	400			
Earning persistence	Pearson Correlation	.150**	-.039	1		
	Sig. (2-tailed)	.004	.447			
	N	400	400	400		
Firm size	Pearson Correlation	.531**	.034	.078	1	
	Sig. (2-tailed)	.000	.508	.132		
	N	400	400	400	400	
Financial leverage	Pearson Correlation	.125*	.165**	-.068	.472**	
	Sig. (2-tailed)	.016	.001	.191	.000	
	N	400	400	400	400	400

Source: Author (2020)

Table 4.7 indicated the correlation coefficients between the variables under consideration. Market value and accrual quality had a correlation of 0.112 and p-value of 0.031. The result established a low positive correlation between market value and EQ. Since 0.031<0.05, the

hypothesis of no significant relationship between market value and earnings quality was rejected in favor of the inference that the correlation was significant. Market value and earnings persistence returned a correlation coefficient of 0.15 and p-value 0.004. This showed a low positive correlation between market value and earnings persistence. As 0.004 < 0.05, the correlation was significant at 5% level of significance. The correlation between market value and size of the firm was determined at 0.531 having a p-value of 0.000. Market value and firm size were moderately positively correlated with the relationship being significant as 0.000<0.05. Lastly, market value and financial leverage showed a correlation of 0.125 with p-value 0.016. This indicated a weak positive correlation between market value and leverage. The relationship was significant as 0.016 < 0.05.

4.5 Regression Analysis

To measure the effect of earnings quality on market value of companies listed at the NSE, market value was regressed on two measures of EQ; accrual quality and earnings persistence, and two control variables; firm size and financial leverage were included.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	.565[a]	.320	.312	1.4866633	2.015

Source: Author (2020)

Table 4.8 indicated summary statistics from regression. Adjusted R square was calculated as 0.312. This meant that variation in explanatory variables explained 31.2% of the variation in the market value. The remaining 68.8% of the variability was explained by

other factors. The variables; accrual quality, earnings persistence, firm size and financial leverage had a moderate explanatory power on market value.

Table 4.9: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	380.124	4	95.031	46.176	.000[b]
Residual	808.921	393	2.058		
Total	1189.045	397			

Source: Author (2020)

In table 4.9 the result of analysis of variance was presented. This result was useful in assessing significance of regression model. It was used in testing whether the independent variables were jointly useful. The result revealed that F (4, 393) = 46.176, with p = 0.000. Since p = 0.000 < 0.05, the independent variables were useful in explaining market value.

Table 4.10: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	12.755	.762		16.730	.000		
Accrual quality	1.056	.512	.091	2.064	.040	.964	1.038
Earning persistence	.541	.278	.085	1.998	.049	.978	1.023
Size	.620	.052	.593	12.010	.000	.761	1.314
Leverage	.945	.339	.140	-2.789	.006	.738	1.355

Source: Author (2020)

Table 4.10 presented the regression coefficients. The regression had a constant of 12.755 with p-value 0.000. The constant of 12.755 was the market value of a company whose measure of accrual quality was zero, zero earnings persistence, zero size and zero leverage. The value of the constant was significant as $p=0.000<0.05$. Accrual quality showed a regression coefficient of 1.056 and p-value 0.04. The slope coefficient for earning persistence was 0.541 with p-value of 0.049. The regression coefficient of firm size was determined as 0.620 and had p-value of 0.000. Financial leverage regression coefficient was obtained as 0.945 with p-value 0.006. Final regression equation for the study was:

$$MV = 12.755 + 1.056AQ + 0.541EP + 0.620Size + 0.945Lev$$

4.6 Discussion of Findings

This study purposed to determine how earnings quality affected market value of companies listed at NSE. To this end, two measure of earnings quality; accrual quality and earnings persistence were regressed on market value. It controlled for Firm size and financial leverage. From table 4.10, accrual quality had a coefficient of 1.056 and an associated p-value of 0.04. Thus, accrual quality showed a positive effect on market value. All else the same, a unit increase in accrual quality would result in 1.056 units increase in market value. The increase would be significant as $p=0.04<0.05$. This concurred with the studies by Aguguom and Rafiu (2018) and Anaekenwa and Rafiu (2018) which indicated that market value was positively influenced by accrual quality for companies listed on Nigerian Stock market. Also, Choi (2008) documented similar findings in the Korean Stock Exchange. The result contradicts Annes and Domingos (2016) which found that accrual quality had a negative influence on market value at the Lisbon Stock Exchange.

The result in table 4.10 showed earnings persistence coefficient 0.541 having p-value 0.049. Earnings persistence positively affected companies' market value. Holding other factors constant, increasing earnings persistence by one unit increases market value 0.541 units. This effect would be significant given the $p=0.049<0.05$. This is in concurrence with Choi (2008) that persistent earnings attributed better market value at Korean Stock Exchange. Similar results were documented in Annes and Domingos (2016) at Lisbon Stock Exchange.

Firm size showed coefficient 0.620 having p-value 0.000 as shown in table 4.10. Firm size positively affected market value of companies at NSE. All else remaining constant, increasing firm size by one unit increases market value 0.620 units. Since $p=0.000<0.05$, the effect was significant. This result supports the findings by Hung et al (2002) that size of the firm was positively related to market value.

From table 4.10, financial leverage showed coefficient 0.945 and p-value 0.006. Leverage indicated a positive effect on companies' market value. A unit increase in leverage would be associated with 0.945 units increase in market value all else being constant. The increase would be significant given the $p=0.006$ is less than 0.05. The result contradicts those in Hung et al (2002) which found that financial leverage inversely affected value in the Vietnamese market.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarized major findings of the study, conclusions and recommendations are offered. Limitations of study are also discussed and suggestions for further research.

5.2 Summary of Findings

This research aimed at determining how earnings quality affected market value of companies at NSE. Earnings quality was measured using accrual quality and earnings persistence. The study controlled for firm size and financial leverage. Data were summarized using descriptive statistics. Correlation and regression techniques measured relationships. From the descriptive statistics, the mean market value of the sample companies was 22.086 and had a standard deviation of 1.796. Mean measure of accrual quality was 0.180 and had a standard deviation of 0.155. Earning persistence measure averaged 0.408 and had standard deviation of 0.281. The average firm size was determined as 15.494 with a standard deviation of 1.717. Financial leverage had a mean of 0.306 and a standard deviation of 0.266.

Correlation analysis indicated that market value and accrual quality were positively correlation, the correlation was weak. The correlation was significant at 5% level of significance. Market value and earnings persistence showed weak positive relationship, with correlation being significant at 5% level. Market value and firm size showed a moderate positive correlation which was significant at 5% level. The correlation between

market value and financial leverage was positive but weak. The correlation was also significant at the 5% level of significance.

Regression analysis revealed that accrual quality positively affected market value of companies at NSE. The effect was significant at the 5% level. Earnings persistence indicated a positive influence on market value of companies. This effect was significant at 5% level. Market value was found to be positively influenced by firm size. The influence was significant at 5% level. Lastly, financial leverage indicated positive influence on companies' market value. The effect was significant at 5% level.

Analysis of variance indicated that accrual quality, earning persistence, firm size and financial leverage were collectively significant predictors of market value based on 5% significance level. Adjusted coefficient of determination was 0.312. The explanatory variables accounted for 31.2% of the variability in companies' market value at NSE. This indicated a moderate level of explanatory power.

5.3 Conclusion

From the findings, it was concluded that enhancing the accrual quality would result in improving the market value of NSE traded companies. Companies with higher quality of accruals obtained better market valuation. The improvement in market value would be economically meaningful. The study also concluded that earnings persistence would increase the market value of companies listed at the NSE. Since the enhancing effects of earnings persistence on market value was significant, it was noted that companies with more persistent earnings would be attributed better market value. Further conclusion was

that market value of companies increased significantly with increase in size of firm. Bigger firms would command higher market values relative to smaller ones. In addition, it was concluded that financial leverage increased the market value of companies listed at the NSE. Companies with higher leverage would obtain significantly higher market value.

The study concluded that variability in accrual quality, earnings persistence, firm size and financial leverage explained 31.2% of the variability in companies' market value at NSE. Thus, the variables had a moderate explanatory power. Also, it was concluded the four variables jointly were significant predictors of companies' market value at NSE.

5.4 Recommendations

From findings that accrual quality, earnings persistence, firm size and financial leverage significantly positively affected market value of NSE listed firms, it was recommended that corporate managers entrusted with maximizing shareholders wealth should focus on enhancing the quality of accruals that result from the accounting choices made by the company. By ensuring that accruals in the financial statements are of high quality, the managers would be able to enhance the value that the market attributes to the company. Furthermore, managers should ensure that the earnings of the company are persistent. The study identified that persistent earnings are positively valued by the market. Therefore, by achieving earnings persistence, the company would be able to increase its market value. In addition, the study recommended that managers needed to take actions that profitably increase the amount of total assets used by the company. It is expected that in so doing the market value would increase significantly. Finally, study recommended that corporate managers needed to review the levels of financial leverage of their firms with a view to

increase since as identified in this study, financial leverage had the effect of significantly enhancing the market value of companies.

In making investment decisions, investors and investment analysts should recognize the importance of accrual quality in companies for which they are considering investing in. Investors and investment analysts are concerned with selecting investments stocks that enhance the value of their portfolios or those of their clients. The study recommended that investors needed to include in their investments, companies whose accruals quality are considered higher or improving. Considering accrual quality as a factor in valuation may be useful in identify mispricing stocks for either buy or sell decisions. Also, they should focus on companies whose earnings are persistent as those companies are likely to command better valuation in the market. Likewise, earnings persistence may be a useful pointer to market mispricing, which would guide investment decision making. Firm size should also be a key consideration in the investment decision making process as larger firm are likely to be better valued than smaller firms. Finding smaller firms that are highly valued relative to smaller ones in the same industry would be an indicator of potential mispricing.

5.5 Limitations of the Study

Two measured of earnings quality related to accrual quality and earnings persistence. Other metrics of earnings quality related to predictability, smoothness and earnings surprise were not factored in. Furthermore, the study did not separate companies with high earnings quality and those with poor earnings quality. Instead the firms were aggregated and the result therefore reflected averages of high and low earnings quality. Also, the study did not

attempt to identify the existence of earnings manipulation but rather assumed earnings were fairly calculated and reported. The study measured financial leverage at book value; this measure may not very well capture the effect of financial distress that may occur beyond certain levels of leverage.

5.6 Suggestions for Further Research

Only two measures of earnings quality that measured accrual quality, and earnings persistence were relied upon. Further research may consider other measures of earnings quality such as those that focus on earnings predictability, smoothness and surprise. Accrual quality was measured using balance sheet accruals. Further researches may be conducted using measures of accrual quality related to the income statement and operating cash flows. This research can be extended by separating firms into sub-samples of higher earnings quality and lower earnings quality, and examining them separately. While the study indicated a positive effect of financial leverage on market value and recommended an increase on borrowing, borrowing has limit due to financial distress issue. Further studies may consider evaluating limits to borrowing.

REFERENCES

Abdelghany, K. (2005). Measuring the quality of earnings. *Managerial Auditing Journal, 20*(9), 1001-1015.

Aguguom, T. and Rafiu, O. (2018). Earnings quality and firms financial performance: A missing link in the listed firms in Nigeria. *International Journal of Accounting & Finance, 7*(2), 32-54.

Ahmad, M. and Abdul, A. (2016). Factors influencing firm value as measured by the Tobin's *Q*: Empirical evidence from the Saudi Stock Exchange. *International Journal of Applied Business and Management, 15*(6), 333-360.

Anaekenwa, T. A. and Rafiu, O. S. (2018). Earnings quality and firms book value: An Empirical evidence from the listed firms in Nigeria. *Journal of Internet Banking and Commerce, 23*(3), 1 – 22.

Annes, M.C. and Domingos, I. (2016). The relation between earnings quality and corporate performance for the firms listed in the Lisbon stock exchange. *Journal of International Business Studies, 34*(1), 5-18.

Adom, D. Hussein, E., and Agyem, J. (2018). Theoretical and conceptual framework: Mandatory ingredients of a quality research. *International Journal of Scientific Research, 7*(1), 438-441.

Atiase, R. K. (1985). Market implication of pre-disclosure information; size and exchange effects. *Journal of Accounting Research*, 168-176.

Aloke, G., Gu, Z and Jain, P. (2016). Sustained earnings and revenue growth, earnings quality, and earnings response coefficients. *International Research Journal of Applied and Basic Sciences, 4* (3), 696-703.

Aguguom, A. T, Dada, S.O, Nwaobia, A. N. (2019). Earnings persistence and firm performance: Implications of analysts' accurate forecast ability from the emerging market of Nigeria. *International Journal of Accounting Research, 7*(197), 1-8.

Dechow, P. M., Ge, W. and Schrand C. (2010). Understanding earnings quality. A review of the proxies, their determinants and their consequences, *Journal of Accounting and Economics*, 50 (23), 344-401.

Bogue, M. C. and Buffa, E. (2014). *Corporate strategic analysis*, New York, The Free Press.

Bellovary, J. L., D. E. Giacomino, and M. D. Akers. (2005). Earnings quality: It's time to measure and report. The CPA Journal, 75 (11), 32-37.

Ceccagnoli, M. (2009). Appropriability, preemption, and firm performance. *Strategic Management Journal* 30(1), 81-98.

Chandra, U., C. E. Wasley, and G. B. Waymire. (2004). Income conservatism in the U.S. technology sector. *Working paper,* University of Rochester.

Cheng, Q. and T. D. Warfield. (2005). Equity incentives and earnings management. *The Accounting Review, 80,* (5), 441-476.

Choi, J. H. (2008). An empirical study on the relationship between earnings quality and firm value. *Asia-Pacific Journal of Financial Studies, 37*(5), 813-839.

Chung, K. & Pruitt, S. (1994). A simple approximation of Tobin's Q. *Financial Management, 23*(3), 70-74.

Chung, R. S. (2010). The effect of the firm's capital structure on the systematic risk of common stocks. *The Journal of Finance, 6,* (25), 435-443.

Chepkwony, J.C. (2018). Effect of earnings management on stock returns of financial companies listed at the Nairobi Securities Exchange. *Unpublished Msc Project*, University of Nairobi.

Cooper, R.D. & Schindler, P.S. (2011).*Business research methods*. New Delhi: Tata McGraw-Hill.

Cook, R. D., & Weisberg, S. (2002). *Residuals and influence in regression*. New York: Chapman & Hall.

Curwin, J. & Slater, R. (2008). *Quantitative methods for decisions,* 6th Edition. South Western: South Western Cengage, Learning.

Chan, C. K., Jegadeesh, N. and Lakonishok, J. (2006) Earnings quality and stock returns. *Journal of Business, 79*(3) 1041-82.

Campanella, F., Mario, M. and D'Angelo, E. (2016). Efficient market hypothesis and fundamental analysis: An empirical test in the European securities market. *Review of Economics and Finance, 1*(16), 27-42.

Davis, A. (2012). The value relevance of revenue for internet firms: Does reporting grossed-up or barter revenue make a difference? *Journal of Accounting Research, 40*(2), 445-477.

Damodaran, A. (2010). *Damodaran on valuation: Security analysis for investment and corporate finance.* 2nd Ed. John Wiley& Sons, Inc. Hoboken, New Jersey.

Dempster, G. (2008). Determining earnings quality: A multi-factor model approach. Journal of the Academy of Business and Economics, *8* (1), 152-156.

Dechow, P., Ge, W. and Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics*, 50 (3), 344–401.

Dechow, P. and C. Schrand (2004), Earnings quality. *CFA Journal*, *4*(12), 1-15.

Demir, C. (2019). Macroeconomic determinants of stock market fluctuations: The case of BIST-100. *Economies*, *7*(8), 1-14.

Fama, E. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance, 25*(12), 383-417.

Francis, J. and Olsson, P. (2006). Earnings quality. *Foundation and Trends in Accounting, 1*(4), 259-340.

Francis, J, Lafond, R., Olsson, M, P, and Schipper, K. (2004) Cost of capital and earnings attribute. *The Accounting Review*, *79*(4) 969-1010.

Gaio, C. and Raposo, C. (2018) Earnings quality and firm valuation: International evidence. Accounting and Finance, 23(51), 467-499.

Gaio, C. and Clara, R. (2011). Earnings quality and firm valuation, international evidence. *Accounting and Finance*, *51*(2), 467 - 499.

Grant, C. & Osanloo, A. (2014). Understanding, selecting, and integrating a theoretical framework in dissertation research: Creating the blueprint for 'house'. *Administrative Issues Journal, 5*(16), 12 - 22.

Gworo, C. O. (2019) Earnings volatility and market value of companies listed at the Nairobi Securities Exchange market. *The Strategic Journal of Business and Change Management, 6*(1), 17 - 26.

Hamada, R. S. (1972). The effect of the firm's capital structure on the systematic risk of common stocks. *The Journal of Finance, 6*(2), 435-443.

Hitchner, J. R. (2013). *Financial valuation: applications and models.* John Wiley & Sons, Inc. Hoboken.

Hitchner, J. R. (2003). *Financial valuation: applications and models.* John Wiley & Sons, Inc. Hoboken.

Hung, N, D. Thi, T. and Dung, M. (2020). The impact of earnings quality on firm value: The case of Vietnam. *Journal of Asian Finance, Economics and Business, 7*(3), 63-72.

Hunton, J. E., R. Libby, and C. L. Mazza. (2006). Financial reporting transparency and earnings management. *The Accounting Review, 81*(2), 135-157.

Jegadeesh, N., and J. Livnat. 2006. Revenue surprises and stock returns. *Journal of Accounting and Economics* 41 (12), 147–171.

Jensen, M.C, and Meckling, W.H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 15*(6),305-360.

Kaimba, A. K. (2010). Relationship between Nairobi Securities Exchange 20 share index and selected macro-economic variables. *Unpublished MBA Project*, University of Nairobi.

Kakiya, G, Mugo, R., Onyuma, S. and Owuor, G. (2013). Do earnings announcement have an effect on the level of efficiency at the Nairobi Securities Exchange? *Research Journal of Finance and Accounting, 14*(16), 148-168.

Kalui, F. and Garang, C. (2018). The relationship between earning announcement and stock prices at the Nairobi Securities Exchange. *International Journal of Economics, Commerce and Management,* 6(5), 166-178.

Kothari, C.R. (2004). *Research methodology: methods and techniques,* 2nd edition.New Age International, New Delhi.

Kulhanek, L. (2012). The Relationship between stock markets and gross domestic product in the Central and Eastern Europe. *International Journal of Business and Management, 4*(12), 8-19.

Elleuch, J. & Trabelsi, L. (2009). Fundamental analysis strategy and the prediction of stock returns. *International Research Journal of Finance & Economics, 30,* 95-107.

Gathogo, P. M. (2017). Effect of macroeconomic variables on market capitalization of firms listed at the Nairobi Stock Exchange. *European Journal of Business and Social Sciences, 6*(6), 182-194.

Larson, C. and Robert, J. (2011). How does earnings quality affect the equity market? An alternative measure and a new perspective. *Journal of Financial Intermediation, 13*(5), 458–495.

Lin, F.-L. (2010). A panel threshold model of institutional ownership and firm value in Taiwan. *International Research Journal of Finance and Economics, 42*(1), 54-62.

Lyimo, G. (2014). Assessing the measures of quality of earnings: evidence from. India. *European Journal of Accounting Auditing and Finance Research, 2* (6), 17-28.

Li, J., Wang, F. and Xu, C. (2013). Earnings quality, venture capital and firm value. *Computer modeling and new technologies, 17*(5), 242-247.

Liceran, G. A. and Cano, R. M. (2017). A review on the multidimensional analysis of earnings quality. *EAA Annual Congress*, Valencia, 1–28.

Malsch, B. (2013). Politicizing the expertise of the accounting industry in the realm of corporate social responsibility. *Accounting, Organizations and Society, 38*(2), 149-168.

Marquardt, C. A. and C. I. Wiedman. (2004). How are earnings managed? An examination of specific accruals. *Contemporary Accounting Research 21*(10), 459-491.

Mano M. (2018). Earnings Quality. *Business Perspectives Journal, 2*(6), 58-66.

Menard, S. (1995). *Applied logistic regression analysis*. Sage university paper series on quantitative applications in the social sciences, Thousand Oaks, CA: Sage.

Mugenda, M. O. & Mugenda A. G. (2008).*Research methods: quantitative and qualitative approaches*. Nairobi: ACTS Press.

Mutulus, V. and Olweny, T. (2018). The effect of fiscal policy on the performance of the Nairobi Securities Exchange in Kenya. *International Journal of Economics, Commerce and Management, 6*(6), 294-312.

Nazir, M. and Nawaz, M. (2010). Relationship between economic growth and stock market development. *African Journal of Business Management, 4*(16), 3473-3479.

Ndunda, A., King'ori, R. and Ariemba, J. (2020). Effect of macro-economic factors on the performance of the equity market of Nairobi Securities Exchange. *International Journal of Business and Commerce, 5*(9), 22-33.

Ndegwa, E. N. (2016). The effect of macroeconomic variables on stock market return at the Nairobi Securities Exchange. *Unpublished MBA Project,* University of Nairobi.

Nelson MW, Skinner DJ. (2013). How should we think about earnings quality? A discussion of earnings quality: Evidence from the field. *Journal of Accounting and Economics*. 56:34-41.

Ngujiri, G. G. (2017). The effect of earnings management on financial performance of quoted companies in Kenya. Unpublished MBA Project University of Nairobi.

Ngugi, N. J. (2018). A historical perspective of the Nairobi Securities Exchange. *International Journal of Management, 4*(8), 23-28.

Njogu, P.M (2017). Factors influencing stock prices for firms listed at Nairobi securities exchange after initial public offerings in Kenya. *Business Management Journal, 22*(5), 6-14

Nshom, A. M. (2007). The Association of Exchange rates and Stock returns. International *Journal of Economics, Commerce and Management, 4*(9), 12-17.

Oei R, Ramsay A, Mather P. (2008). Earnings persistence, accruals and management share ownership. *Accounting and Finance. 48*:475-502.

O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instrumentation, and Computers, 32*(5), 396–402.

Oyuga, C. N. (2014). Effects of earnings announcement on the share price for firms listed at the Nairobi securities. *Unpublished MBA Project,* University of Nairobi.

Pandey, I. M., (2015). What drives the shareholder value?. *Journal of Accounting and Finance, 1* (14), 105-120.

Petresen, J. (2010). Qualitative characteristics of financial statements. *Accounting Journal, 45*(9), 8-14.

Penman, S. H. & Zhang, X. J. (2002). Accounting conservatism, the quality of earnings, and stock returns. *The Accounting Review*, *77* (2) 237-264.

Pinto, J., Henry, E., Robinson, T. and Stowe, J. (2013). *Equity valuation* 2nd edition. John Wiley and sons.

Prapaporn K. (2008). The effect of accounting-based earnings attributes on CEO compensation. *American Economic Review, 79* (1), 14-31.

Pham, H., Chung, R., Roca, E. and Bao, B. (2017). Discretionary accruals: signaling or earnings management in Australia?. *Accounting and Finance, 4*(12), 1-31.

Ravitch, S. M. & Carl, N. M. (2016). *Qualitative research: bridging the conceptual, theoretical and methodological*. Los Angeles, U.S.A. SAGE Publications, Inc.

Rath, S. & Sun, L. (2008). The development of earnings management research. *International Review of Business Research Papers, 4*(2), 265-277.

Rene, C. and AThe role of earnings persistence in valuation accuracy and the time horizon. *The Accounting Review, 56*(1), 71-86.

Schipper K, Vincent L (2003) Earnings quality. *Accounting Horizons, 17*(5), 97-110.

Spence, M. 1973. Job market signaling. *Quarterly Journal of Economics,* 87(5),355-374.

Spence, M. 2002. Signaling in retrospect and the informational structure of markets. *American Economic Review, 92*(15), 434-459.

Stiglitz, J. E. 2000. The contributions of the economics of information to twentieth century economics. *Quarterly Journal of Economics, 115*(15), 1441-1478.

Stiglitz, J. E. 2002. Information and the change in the paradigm in economics. *American Economic Review, 92*(2), 460-501.

Teets, R, W. (2002) Quality of earnings: An introduction to the issue in accounting education. *Issue in Accounting Education, 17*(1) 335-360.

Tobin. J. (1969). A general equilibrium approach to monetary theory. *Journal of Money, Credit, and Banking, 1*(1), 15–29.

Too, A. (2015). The effect of publication of financial statements on stock returns of commercial banks listed on the Nairobi Securities Exchange. *Unpublished MBA Project,* University of Nairobi.

Trokon, W. (2014). The casual relationship between stock price and interest rates. *Unpublished MBA Project,* University of Nairobi.

Udin, G.S. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries. *International Journal of Business and Management, 4*(3), 43-53.

Uday, C. and Ro, B. (2008). The role of revenue in firm valuation. *Accounting Horizon, 22*(2), 199-222.

William, C. and Michael, E. (2015). The impact of sales and income growth on profitability and market value measures in actual and simulated industries. *Developments In Business Simulation & Experiential Exercises, 22*(5), 56-63.

Woolridge, R. and Gray, G. (2003). The *new corporate finance capital markets and valuation: an introductory text.* Kendall / Hunt Publishing Company.

Yanthani, H., Aljaso, V. and Dezie, W. (2019). Earnings quality and market values of Indonesian listed firms. *Australian Accounting Review, 29*(1), 95-111.

Zikmund, W.G. (2003). *Business research methods.* 7th Edition, Thomson/ South-Western.

Zhang B,L. and Pang H. (2013). Empirical study on PE's influence of firm value for small and medium-sized, second board market enterprise-based on Tobin Q value. *Macroeconomics, 15*(3)15-23.

APPENDICES

Appendix I: Companies Listed at the NSE

AGRICULTURAL 1.Eaagads Ltd Ord 2. Kakuzi Plc Ord. 3.Kapchorua Tea Co. Ltd 4. The Limuru Tea Co. Plc 5. Sasini Plc Ord 1.00 6. Williamson Tea Kenya Ltd	**INVESTMENT** 32.Centum Investment Co Plc 33.Home Afrika Ltd 34.Kurwitu Ventures Ltd 35.Olympia Capital Holdings ltd 36.Trans-Century Plc
BANKING 7.ABSA Bank Kenya Plc 8.BK Group Plc 9.Diamond Trust Bank Kenya Ltd 10.Equity Group Holdings Plc 11.HF Group Plc Ord 12.I&M Holdings Plc Ord 13.KCB Group Plc Ord 14.National Bank of Kenya Ltd 15.NIC Group Plc 16.Stanbic Holdings Plc 17.Standard Chartered Bank Kenya Ltd 18.The Co-operative Bank of Kenya Ltd	**COMMERCIAL AND SERVICES** 37.Deacons (East Africa) Plc 38.Eveready East Africa Ltd 39.Express Kenya Ltd 40.Kenya Airways Ltd 41.Longhorn Publishers Plc 42.Nairobi Business Ventures Ltd 43.Nation Media Group Ltd 44.Sameer Africa Plc 45.Standard Group Plc 46.TPS Eastern Africa Ltd 47.Uchumi Supermarket Plc 48.WPP Scangroup Plc
ENERGY & PETROLEUM 19.KenGen Co. Plc 20.Kenya Power & Lighting Co Ltd 21.Total Kenya Ltd 22.Umeme Ltd	**CONSTRUCTION & ALLIED** 49.ARM Cement Plc 50.Bamburi Cement Ltd 51.Crown Paints Kenya Plc 52.E.A.Cables Ltd 53.E.A.Portland Cement Co. Ltd
INSURANCE 23.Britam Holdings Plc 24.CIC Insurance Group Ltd 25.Jubilee Holdings Ltd 26.Kenya Re Insurance Corporation Ltd 27.Liberty Kenya Holdings Ltd 28. Sanlam Kenya Plc	**MANUFACTURING & ALLIED** 54.B.O.C Kenya Plc 55.British American Tobacco Kenya Plc 56.Carbacid Investments Ltd 57.East African Breweries Ltd 58.Flame Tree Group Holdings Ltd 59.Kenya Orchards Ltd 60.Mumias Sugar Co. Ltd 61.Unga Group Ltd
INVESTMENT SERVICES 29.Nairobi Securities Exchange Plc	**EXCHANGE TRADED FUNDS** 62.New gold ETF
TELECOMMUNICATION 30.Safaricom Plc	**REAL ESTATE INVESTMENT TRUST** 63.STANLIB FAHARI I-REIT
AUTOMOBILES & ACCESSORIES 31.Car & General (K) Ltd Ord 5.00	

Appendix II: Raw Data

No.	Market Value	Accrual Quality	Earnings Persistence	Firm Size	Financial leverage
1	18.6351	0.042235	0.679259	15.0882	0.186629
2	18.6351	0.030717	0.679259	15.1184	0.18894
3	18.6351	0.141257	0.850478	14.6817	0.004887
4	18.6351	0.136667	0.679259	15.3519	0.172434
5	18.6351	0.111095	0.679259	15.2238	0.174368
6	18.6351	0.103611	0.679259	15.4505	0.157371
7	18.6351	0.520193	0.456595	16.2243	0.613864
8	18.6351	0.265157	0.456595	16.4595	0.611149
9	18.6351	0.152492	0.456595	15.0656	0.716342
10	18.6351	0.520193	0.456595	15.6977	0.602721
11	18.6351	0.245	0.850478	15.3614	0.071911
12	18.6351	0.520193	0.850478	15.1423	0.050715
13	18.6351	0.120483	0.850478	15.4752	0.068102
14	18.6351	0.122461	0.096356	13.1749	0.234524
15	18.6351	0.520193	0.096356	13.5041	0.781868
16	18.6351	0.181172	0.314706	18.0732	0.619976
17	18.6351	0.203507	0.314706	18.1264	0.661975
18	18.6351	0.01075	0.125656	14.1705	0.084838
19	18.6351	0.064931	0.20927	12.7192	0.406536
20	18.7043	0.252917	0.20927	12.4443	0.781868
21	18.7282	0.01075	0.125656	14.1711	0.088267
22	18.7433	0.04423	0.20927	12.674	0.378352
23	18.7433	0.520193	0.20927	12.7864	0.565442
24	18.8654	0.520193	0.125656	13.8806	0.518846
25	18.8864	0.016958	0.20927	12.7522	0.652155
26	18.8864	0.233072	0.20927	12.4869	0.781868
27	18.963	0.01075	0.125656	14.1738	0.142866
28	19.0085	0.520193	0.620688	14.4356	0.172204
29	19.2541	0.100019	0.20927	12.7693	0.487141
30	19.337	0.01075	0.125656	12.4443	0.10532
31	19.3968	0.111912	0.620688	14.8228	0.02933
32	19.3968	0.324603	0.620688	14.7167	0.074463
33	19.3991	0.111921	0.300136	13.776	0.282937
34	19.4365	0.025684	0.20927	13.5693	0.508336
35	19.4503	0.01075	0.125656	12.4443	0.10532
36	19.468	0.01075	0.20927	13.5953	0.485954

37	19.4834	0.01075	0.116833	12.4443	0.233835
38	19.5069	0.319759	0.096356	12.7896	0.220586
39	19.7016	0.423857	0.274364	12.4443	0.17283
40	19.7016	0.520193	0.274364	12.4443	0.188853
41	19.7687	0.520193	0.147475		0
42	19.7687	0.520193	0.147475		0
43	19.7907	0.269147	0.096356	13.028	0.231833
44	19.812	0.262703	0.274364	12.4443	0.194046
45	19.8304	0.323604	0.096356	13.1132	0.781868
46	19.8354	0.43606	0.582757	14.4379	0.187388
47	19.8976	0.520193	0.620688	12.4443	0
48	19.9245	0.194226	0.300136	14.0749	0.246671
49	19.9265	0.01168	0.679259	15.0468	0.200252
50	19.9318	0.132768	0.850478	14.8403	0.227451
51	19.9318	0.336782	0.850478	14.7156	0.218171
52	19.9318	0.195679	0.850478	14.4254	0.150011
53	19.9318	0.138928	0.850478	14.2466	0.143959
54	19.9753	0.16194	0.300136	14.225	0.247255
55	19.9955	0.127107	0.096356	13.2328	0.781868
56	20.0025	0.166026	0.295788	13.9495	0.079533
57	20.0471	0.034022	0.300136	14.4408	0.236043
58	20.0616	0.520193	0.274364	12.6427	0.217305
59	20.0995	0.200069	0.300136	14.4073	0.236065
60	20.1194	0.520193	0.116833	13.2513	0.153609
61	20.1412	0.340832	0.116833	12.7376	0.217658
62	20.1559	0.094102	0.096356	13.1179	0.204635
63	20.1632	0.129093	0.300136	13.8974	0.245627
64	20.201	0.018355	0.295788	13.7481	0.104685
65	20.2177	0.144778	0.591875	12.4443	0.089864
66	20.2422	0.133808	0.300136	14.5664	0.224845
67	20.2422	0.172479	0.300136	14.5638	0.209055
68	20.2422	0.149284	0.300136	14.4047	0.214719
69	20.7511395	0.069163095	0.229438485	15.204846	0.09600162
70	20.756667	0.28440294	0.117417165	12.9832935	0.116806125
71	20.7794805	0.08654256	0.229438485	15.3832335	0.10250397
72	20.8327455	0.0361599	0.09683778	13.124697	0.1601166
73	20.835258	0.070495725	0.29726694	14.0873865	0.0388935
74	20.859579	0.46067391	0.14697723	12.927516	0
75	20.8634985	0.522793965	0.117417165	13.5026775	0.04293963

76	20.0261325	0.0117384	0.682655295	15.122034	0.20125326
77	20.031459	0.13343184	0.85473039	14.9145015	0.228588255
78	20.031459	0.33846591	0.85473039	14.789178	0.219261855
79	20.031459	0.196657395	0.85473039	14.497527	0.150761055
80	20.031459	0.13962264	0.85473039	14.317833	0.144678795
81	20.0751765	0.1627497	0.30163668	14.296125	0.248491275
82	20.0954775	0.127742535	0.09683778	13.298964	0.78577734
83	20.2489	0.22267	0.679259	15.0586	0.164968
84	20.3066	0.020806	0.116833	13.7016	0.085366
85	20.3772	0.083388	0.116833	13.5156	0.066022
86	20.3772	0.23008	0.116833	13.7226	0.066626
87	20.3927	0.125023	0.850478	14.9581	0.201175
88	20.445	0.099473	0.228297	15.2241	0.084387
89	20.445	0.078217	0.228297	15.0627	0.096003
90	20.4573	0.281278	0.096356	12.7876	0.389366
91	20.474	0.016961	0.140314	14.4431	0.018772
92	20.474	0.520193	0.140314	14.4262	0.003573
93	20.4879	0.396796	0.147475	18.1264	0.781868
94	20.5656	0.048944	0.295788	13.7959	0.079762
95	20.575	0.121726	0.850478	15.3338	0.264329
96	20.6479	0.068819	0.228297	15.1292	0.095524
97	20.6534	0.282988	0.116833	12.9187	0.116225
98	20.6761	0.086112	0.228297	15.3067	0.101994
99	20.7178	0.136134	0.146246	12.6843	0.07104
100	20.7178	0.356875	0.146246	12.4859	0
101	20.7178	0.043607	0.146246	12.5567	0
102	20.7178	0.275133	0.146246	12.9273	0.023335
103	20.7265	0.125572	0.146246	12.9815	0
104	20.7291	0.03598	0.096356	13.0594	0.15932
105	20.7316	0.070145	0.295788	14.0173	0.0387
106	20.7558	0.458382	0.146246	12.8632	0
107	20.7597	0.520193	0.116833	13.4355	0.042726
108	20.7661	0.520193	0.140314	18.1264	4.60E-06
109	20.78	0.520193	0.620688	12.4443	0
110	20.8653	0.034197	0.140314	14.66	0
111	20.8743	0.019217	0.850478	15.2189	0.20409
112	20.9056	0.126844	0.274364	12.4443	0.156319
113	20.9241	0.059523	0.218455	18.0052	0.781868
114	20.9306	0.037657	0.140314	14.6263	0

115	20.945	0.086048	0.218455	18.0878	0.781868
116	20.9754	0.520193	0.218455	17.9474	0.781868
117	21.0223	0.048536	0.031539	14.8062	0.229086
118	21.0324	0.091617	0.679259	14.7157	0.288361
119	21.0408	0.520193	0.147475	18.1264	0.595528
120	21.0423	0.01075	0.146246	13.7597	0
121	21.045	0.273665	0.77109	13.992	0.388386
122	21.0452	0.179607	0.157464	15.8425	0.254128
123	21.0581	0.068835	0.140314	14.6408	0
124	21.0704	0.191192	0.77109	14.3301	0.395545
125	21.0707	0.458381	0.218455	17.3342	0.781868
126	21.0834	0.217131	0.140314	14.8565	0.053784
127	21.146004	0.522793965	0.148212375	18.217032	0.59850564
128	21.1475115	0.01080375	0.14697723	13.8284985	0
129	21.150225	0.275033325	0.77494545	14.06196	0.39032793
130	21.150426	0.180505035	0.15825132	15.9217125	0.25539864
131	21.405093	0.028231455	0.031696695	14.757219	0.229416375
132	21.406098	0.125738565	0.29726694	14.205876	0.010893195
133	21.412932	0.124819995	0.14697723	12.9131445	0
134	21.4482075	0.021027615	0.031696695	14.7293805	0.287776725
135	21.1916	0.152356	0.679259	14.8575	0.220257
136	21.1939	0.014385	0.541298	14.3399	0
137	21.1958	0.01075	0.850478	15.1999	0.243249
138	21.2056	0.22034	0.582757	15.4917	0.200945
139	21.231	0.033672	0.287437	16.2849	0.590423
140	21.2361	0.039736	0.140314	14.8159	0.067277
141	21.2438	0.520193	0.093681	15.7713	0.781868
142	21.2741	0.425113	0.314706	18.1264	0.673138
143	21.2986	0.028091	0.031539	14.6838	0.228275
144	21.2996	0.125113	0.295788	14.1352	0.010839
145	21.3064	0.124199	0.146246	12.8489	0
146	21.3415	0.020923	0.031539	14.6561	0.286345
147	21.3571	0.263979	0.850478	15.1923	0.285173
148	21.3717	0.520193	0.093681	16.5865	0.526766
149	21.3834	0.520193	0.582757	15.2926	0.207691
150	21.3874	0.079748	0.541298	14.1983	0.007843
151	21.3918	0.10696	0.314706	18.1264	0.675606
152	21.3924	0.160578	0.541298	14.1215	0.021695
153	21.4093	0.445499	0.147475	18.1264	0.712802

154	21.4122	0.018934	0.541298	14.3544	0
155	21.4234	0.164756	0.582757	15.6442	0.205744
156	21.4254	0.078923	0.031539	16.2591	0.781868
157	21.4601	0.046229	0.541298	14.2926	0.000164
158	21.4693	0.520193	0.146246	13.7617	0
159	21.477	0.139441	0.031539	14.8143	0.252924
160	21.4933	0.260314	0.031539	15.8542	0.781868
161	21.5038	0.05013	0.140314	14.5894	0
162	21.5511	0.107836	0.031539	14.7588	0.268963
163	21.609	0.231842	0.850478	13.6586	0.056805
164	21.6155	0.424719	0.541298	14.5522	0.006233
165	21.6155	0.163658	0.541298	14.3735	0
166	21.6384	0.06096	0.157464	15.9363	0.229155
167	21.67	0.01075	0.541298	14.2966	0.059594
168	21.6717	0.080496	0.850478	14.921	0.247277
169	21.6891	0.104559	0.582757	15.9294	0.173036
170	21.6917	0.01771	0.295788	14.1173	0.003642
171	21.7055	0.064238	0.77109	13.3768	0.220949
172	21.7102	0.137783	0.77109	14.5474	0.397597
173	21.7342	0.039524	0.157464	15.9992	0.238373
174	21.7473	0.169471	0.031539	14.5824	0.414107
175	21.7671	0.060291	0.031539	14.8729	0.233001
176	21.776	0.30939	0.073451	17.6636	0.685468
177	21.7978	0.073338	0.541298	14.2985	0.053726
178	21.809	0.273303	0.77109	13.5815	0.212944
179	21.8184	0.157507	0.295788	14.4082	0.136389
180	21.825	0.33624	0.228297	15.5965	0.109538
181	21.825	0.106308	0.228297	15.6613	0.160169
182	21.8299	0.16551	0.031539	14.6252	0.170003
183	21.8329	0.01075	0.157464	15.9345	0.233111
184	21.8329	0.125169	0.157464	15.9604	0.24014
185	21.8409	0.120556	0.287437	16.2518	0.501087
186	21.8535	0.083951	0.591875	12.4443	0.0743
187	21.8576	0.172024	0.591875	12.4443	0.133934
188	21.8764	0.38944	0.031539	16.1831	0.781868
189	21.8848	0.068251	0.850478	14.0343	0.066133
190	21.8848	0.102622	0.850478	14.1707	0.068739
191	21.8877	0.520193	0.157464	16.4824	0.157958
192	21.8879	0.128654	0.582757	15.8299	0.187031

193	21.8879	0.044287	0.582757	15.9676	0.189854
194	21.8919	0.182599	0.287437	16.9458	0.215614
195	21.9069	0.520193	0.620688	14.025	0.400385
196	21.9143	0.358309	0.77109	13.6794	0.279817
197	21.9381	0.054453	0.031539	14.6354	0.323556
198	21.9424	0.13095	0.620688	15.0781	0.05018
199	21.9623	0.127475	0.381701	17.1257	0.781868
200	21.976	0.118334	0.591875	12.4443	0.108592
201	21.9872	0.035642	0.228297	15.5603	0.172486
202	21.9872	0.052887	0.228297	15.7128	0.145648
203	22.0029	0.466078	0.093681	15.7474	0.120381
204	22.0393	0.157508	0.157464	16.311	0.081097
205	22.0409	0.100073	0.698666	16.5057	0.36425
206	22.0508	0.070743	0.591875	12.4443	0.082336
207	22.0684	0.430756	0.031539	16.6173	0.781868
208	22.0995	0.049183	0.031539	17.1634	0.781868
209	22.1086	0.048128	0.031539	17.2104	0.781868
210	22.1344	0.099972	0.77109	14.2236	0.32724
211	22.1344	0.237952	0.77109	13.3622	0.276758
212	22.1377	0.095449	0.850478	14.1076	0.058913
213	22.1382	0.033673	0.157464	16.3441	0.093668
214	22.1587	0.067986	0.850478	13.9913	0.067669
215	22.1678	0.124231	0.77109	13.9213	0.266047
216	22.1696	0.099371	0.591875	12.4443	0.112678
217	22.1702	0.332609	0.287437	16.1691	0.420135
218	22.174	0.096272	0.850478	13.9262	0.067715
219	22.1916	0.155613	0.295788	14.2619	0.134322
220	22.1959	0.314591	0.093681	16.3749	0.176837
221	22.2003	0.107623	0.850478	16.765	0.396407
222	22.2393	0.017145	0.698666	16.4103	0.290881
223	22.2829	0.136004	0.591875	12.4443	0.090527
224	22.2833	0.141445	0.620688	14.9551	0.063992
225	22.2843	0.094455	0.698666	15.6086	0.323522
226	22.3362	0.026629	0.850478	15.1252	0.278885
227	22.3379	0.01075	0.582757	15.9243	0.200922
228	22.3452	0.12355	0.591875	12.4443	0.092758
229	22.3483	0.319758	0.582757	15.9217	0.19407
230	22.3617	0.291717	0.850478	12.8937	0.030741
231	22.3671	0.520193	0.287437	16.7781	0.286223

232	22.3671	0.174904	0.850478	16.9825	0.781868
233	22.3671	0.10681	0.287437	16.3661	0.446689
234	22.3911	0.10366	0.591875	12.4443	0.105043
235	22.4097	0.02014	0.287437	16.2646	0.602559
236	22.4526	0.27466	0.153728	15.5836	0
237	22.4628	0.135394	0.295788	14.5352	0.144181
238	22.5017	0.020281	0.698666	16.5258	0.390384
239	22.503	0.01075	0.698666	16.2525	0.284724
240	22.518	0.03066	0.287437	16.138	0.441109
241	22.5222	0.01075	0.157464	16.3406	0.094156
242	22.5836	0.129976	0.093681	16.7526	0.291106
243	22.5857	0.05047	0.097367	17.7985	0.571075
244	22.6005	0.062952	0.381701	17.4296	0.781868
245	22.604	0.025859	0.698666	16.3933	0.209283
246	22.6149	0.149347	0.850478	16.6628	0.386721
247	22.6305	0.162527	0.097367	18.1264	0.781868
248	22.6514	0.01075	0.850478	15.9918	0.000529
249	22.672	0.097693	0.850478	16.5236	0.393364
250	22.6755	0.011194	0.381701	17.3686	0.781868
251	22.6971	0.017899	0.850478	16.0095	0.000655
252	22.6973	0.047545	0.287437	16.3174	0.45066
253	22.7192	0.110872	0.380092	16.1322	0.03192
254	22.7368	0.245675	0.850478	16.9847	0.385691
255	22.7716	0.148295	0.381701	17.264	0.781868
256	22.8076	0.081748	0.274364	12.7212	0.222351
257	22.8215	0.121905	0.698666	16.2593	0.301281
258	22.8382	0.181837	0.698666	16.4195	0.219109
259	22.8562	0.23943	0.850478	17.4541	0.781868
260	22.8659	0.011053	0.274364	12.4486	0.190625
261	22.8726	0.340782	0.153728	15.8768	0
262	22.8797	0.284334	0.031539	16.8675	0.781868
263	22.8797	0.10203	0.031539	17.1154	0.781868
264	22.8848	0.155017	0.153728	16.2171	0.09057
265	22.9181	0.118862	0.097367	18.1264	0.781868
266	22.9324	0.293011	0.850478	17.2395	0.781868
267	22.9334	0.134201	0.097367	17.8092	0.683433
268	22.9403	0.275317	0.093681	16.434	0.268014
269	22.9568	0.085835	0.093681	16.8919	0.27472
270	22.9912	0.161441	0.850478	17.1344	0.38492

271	23.0197	0.080589	0.456595	17.1087	0.722248
272	23.041	0.520193	0.698666	16.1443	0.269726
273	23.0614	0.246524	0.850478	17.6745	0.781868
274	23.0695	0.040358	0.381701	17.3574	0.781868
275	23.1156	0.346145	0.093681	16.8095	0.287434
276	23.1207	0.520193	0.825346	15.9888	0.530127
277	23.1524	0.457482	0.147475	16.339	0.781868
278	23.1524	0.397084	0.073451	17.394	0.651807
279	23.1539	0.01075	0.850478	15.9891	0.021133
280	23.1674	0.16268	0.031539	17.0182	0.781868
281	23.2114	0.164539	0.850478	17.2867	0.378652
282	23.2305	0.194603	0.097367	18.1264	0.781868
283	23.2407	0.037385	0.274364	12.6831	0.218928
284	23.2454	0.055381	0.381701	17.3179	0.781868
285	23.2473	0.308809	0.825346	17.0544	0.18385
286	23.2624	0.110103	0.850478	17.5705	0.363366
287	23.2845	0.031603	0.380092	15.8458	0.037518
288	23.2858	0.520193	0.456595	17.929	0.781868
289	23.2887	0.216799	0.153728	16.073	0
290	23.2991	0.235617	0.153728	16.4287	0
291	23.3117	0.520193	0.153728	16.9482	0
292	23.3557	0.01075	0.380092	15.8147	0.097065
293	23.3715	0.151018	0.380092	15.9864	0.024046
294	23.3904	0.090672	0.638295	18.1264	0.505119
295	23.3904	0.023047	0.638295	18.1264	0.056267
296	23.4073	0.146746	0.380092	16.3942	0.116059
297	23.4075	0.137475	0.456595	17.2375	0.75067
298	23.411	0.117482	0.850478	17.3978	0.389977
299	23.4123	0.133241	0.380092	16.2573	0.024736
300	23.4238	0.073003	0.097367	17.8503	0.5906
301	23.465	0.079534	0.314706	18.1264	0.737377
302	23.4738	0.204923	0.825346	16.5941	0.620864
303	23.48	0.07065	0.850478	17.466	0.373068
304	23.5093	0.051913	0.456595	17.0312	0.685778
305	23.5463	0.080345	0.031539	15.3848	0.018593
306	23.5759	0.042342	0.850478	15.9953	0.034086
307	23.5823	0.200199	0.274364	12.4598	0.231672
308	23.5874	0.042556	0.031539	15.9809	0.001743
309	23.6025	0.052878	0.749467	14.2521	0.248806

310	23.6207	0.520193	0.825346	16.4077	0.63118
311	23.6291	0.520193	0.850478	15.9538	0.042238
312	23.6441	0.18156	0.097367	18.1264	0.667507
313	23.6521	0.33868	0.097367	18.0902	0.565667
314	23.6627	0.01075	0.638295	18.1264	0.526275
315	23.6793	0.088588	0.314706	18.1264	0.7341
316	23.6857	0.2898	0.850478	17.929	0.781868
317	23.6877	0.077419	0.073451	18.1264	0.781868
318	23.7019	0.081397	0.093681	16.5123	0.275371
319	23.7161	0.442847	0.380092	15.8093	0.122236
320	23.7356	0.422341	0.638295	18.1264	0.557574
321	23.7488	0.128558	0.380092	16.2566	0.023595
322	23.7523	0.520193	0.825346	17.2711	0.468215
323	23.773	0.012578	0.46507	13.1407	0.438877
324	23.773	0.457906	0.46507	13.5177	0.577476
325	23.7982	0.164835	0.825346	17.4237	0.246732
326	23.8033	0.027024	0.46507	14.3068	0.622099
327	23.8084	0.060323	0.031539	15.9187	0.003162
328	23.8108	0.231266	0.46507	14.3342	0.628592
329	23.8111	0.160951	0.380092	16.1357	0.030681
330	23.8142	0.159219	0.031539	15.6537	0.025933
331	23.8161	0.270527	0.825346	16.8335	0.651813
332	23.8545	0.063945	0.228297	15.6467	0.122176
333	23.8569	0.139751	0.153728	17.6179	0
334	23.8997	0.520193	0.638295	18.1264	0.659082
335	23.926	0.194267	0.749467	14.5076	0.237559
336	23.9465	0.520193	0.456595	16.9806	0.695765
337	23.9501	0.071525	0.073451	18.1264	0.772331
338	23.9834	0.178373	0.314706	18.1264	0.574416
339	23.9905	0.128899	0.031539	15.506	0
340	24.0174	0.218221	0.850478	18.1264	0.778821
341	24.0191	0.132225	0.749467	14.4577	0.269898
342	24.0384	0.520193	0.46507	14.1262	0.630756
343	24.0446	0.02901	0.097367	17.7798	0.620883
344	24.066	0.08354	0.314706	18.1264	0.564891
345	24.0861	0.183904	0.073451	18.1264	0.771068
346	24.0902	0.105665	0.850478	18.1264	0.752589
347	24.1174	0.042756	0.638295	18.1264	0.536396
348	24.1886	0.03702	0.638295	18.1264	0.38373

349	24.1978	0.099416	0.850478	18.1264	0.763474
350	24.229	0.520193	0.638295	16.6546	0.781868
351	24.2752	0.186989	0.031539	15.8252	0.01839
352	24.3015	0.323629	0.314706	18.1264	0.738829
353	24.3071	0.031679	0.031539	16.0244	0.016682
354	24.3113	0.158995	0.850478	18.1264	0.759634
355	24.3501	0.397727	0.638295	18.1264	0.508828
356	24.4334	0.135212	0.825346	16.7819	0.514941
357	24.467	0.39707	0.153728	17.4871	0
358	24.467	0.226881	0.153728	17.1527	0
359	24.5204	0.09821	0.825346	16.9272	0.633828
360	24.5381	0.09918	0.359348	15.2579	0.148953
361	24.6212	0.084888	0.749467	14.5215	0.222045
362	24.6219	0.116222	0.031539	15.9351	0.010135
363	24.6268	0.059824	0.031539	15.9932	0.00656
364	24.6443	0.078812	0.359348	15.4175	0.145513
365	24.7597	0.193044	0.359348	15.6444	0.229203
366	24.785	0.019254	0.359348	15.1882	0.116846
367	24.7863	0.520193	0.073451	18.0984	0.704078
368	24.8092	0.118482	0.749467	14.7837	0.258036
369	24.8746	0.01075	0.359348	15.3483	0.134489
370	24.9028	0.157087	0.359348	15.5854	0.15022
371	24.9302	0.268333	0.359348	15.4576	0.143392
372	24.9409	0.048807	0.359348	15.2544	0.163145
373	25.054	0.258871	0.749467	15.0366	0.301909
374	25.0569	0.027701	0.359348	15.523	0.148953
375	25.0864	0.091221	0.749467	14.9872	0.26715
376	25.2231	0.084841	0.749467	14.8952	0.265901
377	25.233	0.254407	0.749467	15.0266	0.221531
378	25.233	0.064938	0.248782	14.7962	0.10616
379	25.233	0.13841	0.736892	17.8395	0.08538
380	25.233	0.057022	0.736892	18.1264	0.144774
381	25.233	0.056515	0.248782	14.8176	0.102655
382	25.233	0.134225	0.736892	18.1264	0.154043
383	25.233	0.281756	0.248782	15.7972	0.213318
384	25.233	0.056149	0.248782	16.9676	0.728482
385	25.233	0.184775	0.248782	17.3027	0.731704
386	25.233	0.257131	0.736892	18.0683	0.113879
387	25.233	0.186518	0.248782	17.1712	0.682373

388	25.233	0.137936	0.248782	17.0852	0.742952
389	25.233	0.094696	0.736892	18.1264	0.13006
390	25.233	0.10224	0.248782	16.9471	0.607454
391	25.233	0.030745	0.248782	16.9732	0.755779
392	25.233	0.135503	0.736892	18.1264	0.004684
393	25.233	0.011009	0.736892	18.1264	0.004633
394	25.233	0.102137	0.736892	18.1264	0
395	25.233	0.079235	0.736892	18.1264	0
396	25.3592	0.09516948	0.74057646	18.217032	0.1307103
397	25.3592	0.1027512	0.25002591	17.0318355	0.61049127
398	25.3592	0.030898725	0.25002591	17.058066	0.759557895
399	25.3592	0.136180515	0.74057646	18.217032	0.00470742
400	25.3592	0.011064045	0.74057646	18.217032	0.004656165