

**MARKET VALUE RATIOS, INSTITUTIONAL OWNERSHIP STRUCTURE  
AND STOCK PRICE VOLATILITY OF LISTED COMPANIES IN NAIROBI  
SECURITIES EXCHANGE, KENYA**

**BY**

**JOSEPH ANGOTE WANDA**

**A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS AND  
ECONOMICS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS  
MANAGEMENT (FINANCE)**

**MOI UNIVERSITY**

**2022**

## DECLARATION

### Declaration by Candidate

This thesis is my original work and has not been presented for a degree in any institution. No part of this thesis should be reproduced without prior permission from the author and / or the institution.

Sign: \_\_\_\_\_ Date: \_\_\_\_\_

**Joseph Angote      Wanda**

**SBE/DPHIL/BM /003/17**

### Declaration by the Supervisors

This work has been submitted to Moi University for examination with our approval as the University supervisors.

Sign: \_\_\_\_\_ Date: \_\_\_\_\_

**Dr. Joel Tenai**

Department of Accounting and Finance

School of Business and Economics

Moi University Kenya

Sign: \_\_\_\_\_ Date: \_\_\_\_\_

**Dr. Andrew Kimwolo**

Department of management science

School of Business and Economics

Moi University Kenya

**DEDICATION**

To my dear wife, Eunice, sons; Emmanuel and Angelo, daughters; Rose and Angela and granddaughter; Blessing, who supported me tirelessly and encouraged me during my studies to ensure that this study comes to a successful conclusion.

## ACKNOWLEDGEMENTS

Great thanks and glory be to the LORD, the Almighty for bringing me this far. I also thank Dr. Joel Tenai and Dr. Andrew Kimwolo my supervisors for guiding me throughout the period of writing this thesis. I also appreciate all lecturers of the School of Business and Economics whose crucial guidance and inspiration enabled me to improve my thesis. My appreciation also goes to my fellow classmates especially Dr. Gabriel Simiyu our 2017 class president who encouraged me all through and assisted me in various ways. I am obligated to my research assistant Stephen Otieno Oyugi for his diligence throughout the process of consulting, writing and editing this work to fruition. I also appreciate Nairobi securities exchange for enabling me to obtain the vital data for this study. I am also indebted to my wife Eunice and sons Emmanuel and Angelo, daughters Rose and Angela and granddaughter Blessing for their moral support. Acknowledgement also goes to my Father Lafant Angote Wanda and all my siblings who deserve a bundle of appreciation for their understanding, encouragement and unconditional support. Finally I thank the entire Faculty School of Business and Economics and Moi University for giving me the opportunity to study in their institution.

## ABSTRACT

Stock price volatility is broadly considered to be one of the components that impact the confidence of investors in global money markets. Market value ratios have been found to have a predictive power on ensuing stock prices, which influence information on firm performance and ultimately reduces stock price volatility. The riddle remains unsolved in reference to the factors which have greater effect on stock price volatility. This study examined the association between each of the five selected market value ratios namely; market to book value ratio, book value per share, earnings per share, dividend yield and price earnings ratio on volatility of share price of listed firms on NSE. The study also determined institutional ownership's moderation on the association between market value ratios variables and volatility of share price. The study was guided by Efficient Market Hypothesis Theory, seconded by the theory of Value Relevance, Signalling Theory and Agency Theory. Positivism research philosophy and explanatory research design was adopted by the study to source secondary data from 39 listed firms at NSE from 2008 to 2019. Secondary data used in the study was sourced from the NSE Handbook and published annual reports of the listed firms. The data analysis approaches adopted were descriptive, correlation and panel data regression to evaluate the association between market value ratios variables and stock price volatilities. The findings indicated that control variables firm size and firm growth were significant to affect volatility of share price. R-square was 29%, Market value to book value ( $\beta = -.0161, p = .000 < .05$ ), Earnings per share ( $\beta = -.002, p = .000 < .05$ ), Book value per share ( $\beta = -.0003, p = .000 < .05$ ) Dividend yield ( $\beta = -.476, p = .000 < .05$ ) and institutional ownership structure ( $\beta = -.071, p = .006 < .05$ ) negatively and significantly influenced stock price volatility. Further institutional ownership structure moderated the relationship between Market price to book value ( $\beta = 0.01, \rho = 0.01 < .05, R^2 \Delta = .01$ ), Price earnings ratio ( $\beta = .003, p = 0.00 < .05, R^2 \Delta = .01$ ), Dividend yield ( $\beta = 1.470, p = 0.006 < .05, R^2 \Delta = .01$ ) and volatility of share price. However, there was insignificant moderation of institutional ownership on the association between earnings per share and volatility of share price ( $\beta = 0.00, \rho = 0.497 > 0.05$ ) and an insignificant moderating effect on the relationship between book value per share and volatility of share price ( $\beta = 0.00, \rho = 0.07 > .05$ ). The study concluded that market value ratios influence volatility of share price. Also, institutional ownership structure moderates the relationship between market to book value ratio, price earnings ratio, dividend yield and volatility of share price. The findings of this study comprise the information ingredients that are suggested in the efficient market theory, theory of value relevance, signaling theory and agency theory thus supporting these theories. The study recommended that Central Bank of Kenya should come up with effective policies to curtail the impact they have on the the stock market. Firms listed on NSE should also maintain an acceptable dividend policy to both prospective and existing investors. Management should also formulate a dividend policy that minimizes stock price volatility. Further studies should be carried out on other possible variables and their influence on the stock price volatility. Other studies should also carried out within other time frames and other stock exchanges, or on the association between manipulated market value ratios or irregular or inconsistent dividend policy and stock prices volatility.

## TABLES OF CONTENTS

DECLARATION .....	ii
DEDICATION .....	iii
ACKNOWLEDGEMENTS .....	iv
ABSTRACT .....	v
TABLES OF CONTENTS .....	vi
LIST OF TABLES .....	xi
LIST OF FIGURES .....	xii
ABBREVIATIONS .....	xiii
OPERATIONAL TERMS .....	xiv
<b>CHAPTER ONE</b> .....	<b>1</b>
<b>INTRODUCTION</b> .....	<b>1</b>
1.1 Overview .....	1
1.2 Background .....	1
1.3 Problem Statement .....	9
1.4 Research Objectives .....	11
1.4.1 Broad Objective .....	11
1.4.2 Specific Objectives .....	11
1.4.3 Hypotheses .....	13
1.5 Study Significance .....	14
1.6 Scope of the Study .....	15
<b>CHAPTER TWO</b> .....	<b>17</b>
<b>LITERATURE REVIEW</b> .....	<b>17</b>
2.1 Introduction.....	17
2.2 Conceptualization of Stock Price Volatility .....	17
2.3 Conceptualization of Market Value Ratios.....	20
2.3.1 Market to Book Value Ratio .....	22
2.3.2 Earnings per Share .....	23
2.3.3 Price Earnings Ratio .....	24
2.3.4 Book Value per Share .....	26
2.3.5 Dividend Yield.....	27
2.4 The Concept of Institutional Ownership.....	28
2.5 Theoretic Structure.....	30

2.5.1 EMH (Efficient Market Hypothesis) .....	30
2.5.2 Value Relevance .....	34
2.5.3 Signaling .....	37
2.5.4 Agency .....	41
2.6 Review of Empirical Literature .....	43
2.6.1 Market to Book Value Ratio and Volatility of Share Price .....	43
2.6.2 Earnings per Share and Volatility of Share Price .....	45
2.6.3 Price Earnings Ratio and Volatility of Share Price.....	48
2.6.4 Book Value per Share and Volatility of Share Price .....	50
2.6.5 Dividend Yield and Volatility of Share Price .....	53
2.6.6 Institutional Ownership’s Moderating Effect on Volatility of Share Price .....	56
2.7 Controls.....	59
2.7.1 Size of the Firm.....	59
2.7.2 Growth and Stock Price Volatility.....	62
2.8 Summary and Gaps .....	63
2.9 Conceptual Framework.....	66
<b>CHAPTER THREE .....</b>	<b>68</b>
<b>RESEARCH METHODOLOGY .....</b>	<b>68</b>
3.1 Introduction.....	68
3.2 Study Paradigm.....	68
3.3 Study Design.....	69
3.4 Population Targeted .....	70
3.5 Selection Technique.....	71
3.6 Data Collection and Variables Measurements.....	73
3.7 Operationalization and Measurement of Variables.....	73
3.8 Data Analysis .....	75
3.8.1 Descriptives.....	75
3.8.2 Correlation .....	75
3.9 Test of Stationarity.....	75
3.9.1 Levin-Lin-Chu Panel .....	76
3.9.2 Im-Pesaran-Shin.....	76
3.10 Specification of the Model.....	76
3.11 Regression Model .....	77
3.12 Moderating Effect Model.....	80

3.12.1 Hypothesis Testing.....	82
3.13 Assumptions of Multivariate Linear Regression Tests .....	82
3.13.1 Shapiro Wilk Test for Normality .....	83
3.13.2 Lagrange Multiplier (LM) Test for Serial Autocorrelation .....	83
3.13.3 Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity across Panels .....	84
3.13.4 Multicollinearity Test.....	84
3.13.5 Linearity .....	85
3.14 Ethical Considerations .....	85
<b>CHAPTER FOUR.....</b>	<b>87</b>
<b>DATA ANALYSIS, PRESENTATIONS AND INTERPRETATIONS .....</b>	<b>87</b>
4.1 Introduction.....	87
4.2 Descriptive Analysis .....	87
4.2.1 Stock Price Volatility (SPV).....	88
4.2.2 Market Price Book Value (MPBV).....	89
4.2.3 Earnings per Share (EPS).....	90
4.2.4 Price Earnings Ratio .....	91
4.2.5 Book Value per Share .....	93
4.2.6 Dividend Yield Ratio .....	95
4.2.7 Institutional Ownership.....	96
4.2.8 Control Variables .....	97
4.3 Data Preparation for Inferential Analysis .....	98
4.3.1 Levin-Lin-Chu .....	99
4.3.2 Im-Pesaran-Shin.....	101
4.4 Testing the Assumptions of Multivariate Linear Regression .....	103
4.4.1 Normality .....	104
4.4.2 Multicollinearity .....	104
4.4.3 Heteroscedasticity .....	105
4.4.4 Autocorrelation .....	106
4.4.5 Linearity .....	107
4.5 Pearson Analysis .....	108
4.6 Regression.....	110
4.6.1 Random-Effects .....	110
4.6.2 Fixed-Effects.....	113



4.7 Hausman Test.....	114
4.8 Hypotheses Testing.....	115
4.9 Institutional Ownership Structure Moderating Effect on Volatility of Share Price of Companies Listed on NSE.....	131
4.10 Modgraphs .....	136
4.10.1 Institutional Ownership Structure Effect on Market to Book Value Ratio and Volatility of Share Price .....	136
4.10.2 Institutional Ownership Structure Effect on Price Earnings Ratio and Volatility of share Price.....	137
4.10.3 Institutional Ownership Structure Effect on Dividend Yield and Volatility of Share Price.....	138
4.11 Hypothesis Testing Summary .....	139
<b>CHAPTER FIVE .....</b>	<b>141</b>
<b>SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>141</b>
5.1 Introduction.....	141
5.2 Summary of Findings.....	141
5.2.1 Market to Book Value Ratio and Volatility of Share Price of Companies Listed on NSE .....	141
5.2.2 Earnings per Share and Volatility of Share Price of Companies Listed on NSE.....	142
5.2.3 Price Earnings Ratio and Volatility of Share Price of Companies Listed on NSE.....	142
5.2.4 Book Value per Share and Volatility of Share Price of Companies Listed on NSE.....	143
5.2.5 Dividend Yield and Volatility of Share Price of Companies Listed on NSE	143
5.2.6 Institutional Ownership Structure and Volatility of Share Price of Companies Listed on NSE .....	143
5.2.7 Institutional Ownership Structure's Moderating Effect on Volatility of Share Price of Companies Listed on NSE .....	144
5.3 Conclusion .....	145
5.4 Recommendations.....	147
5.4.1 Policy Recommendations.....	148
5.4.2 Theoretical Recommendations.....	150

5.4.3 Management Recommendations .....	152
5.5 Recommendations for Further Studies.....	153
REFERENCES .....	155
APPENDICES .....	176
Appendix I: List of Companies Included in the Study.....	176
Appendix II: List of Companies Excluded from the Study .....	178
Appendix III: Secondary Data Collection Table .....	180
Appendix IV: NACOSTI Permit .....	182
Appendix V: Analysis Results .....	183
Appendix VI: plagiarism similarity Index .....	211

**LIST OF TABLES**

Table 3.1 Companies Listed in the NSE as of 31st December 2019 .....	72
Table 3.2 Variables Operationalization and Measurement.....	74
Table 4.1 Descriptive Results .....	88
Table 4.2 Levin-Lin-Chu Results .....	100
Table 4.3 Im-Pesaran-Shin Results.....	103
Table 4.4 Shapiro-Wilk W Results .....	104
Table 4.5 Results for Multicollinearity Test .....	105
Table 4.6 Breusch-Pagan / Cook-Weisberg Results .....	106
Table 4.7 Autocorrelation Results .....	107
Table 4.8 Pearson Correlation Coefficients .....	109
Table 4.9 Random-Effects Results .....	112
Table 4.10 Fixed Effects Results .....	113
Table 4.11 Hausman Results.....	115
Table 4.12 Institutional Ownership Structure Moderating Effect on Volatility of Share Price of Companies Listed on NSE.....	135
Table 4.13 Summary of Hypothesized Testing Results.....	140

## LIST OF FIGURES

Figure 1.1 Volatility of Share Price (2008-2021) .....	5
Figure 1.2 NSE All Share Index (2018-2021) .....	10
Figure 2.1 Conceptual Framework .....	67
Figure 4.1 Stock Price Volatility for Firms Listed in NSE.....	89
Figure 4.2 Market price Book Value for Firms Listed in NSE.....	90
Figure 4.3 Earnings per Share for Firms Listed in NSE .....	91
Figure 4.4 Price Earnings Ratio for Firms Listed in NSE .....	92
Figure 4.5 Book Value per Share for Firms Listed in NSE .....	94
Figure 4.6 Dividend Yield Ratio.....	95
Figure 4.7 Institutional Ownership of Stock for Firms Listed in NSE .....	97
Figure 4.8 Linear Relationship between SPV and Residuals of Independent Variables .....	108
Figure 4.9 Institutional Ownership Structure Effect on Market Price to Book Value Ratio and Volatility of Share Price .....	137
Figure 4.10: Institutional Ownership Structure Effect on Price Earnings Ratio and Volatility of Share Price.....	138
Figure 4.11 Institutional Ownership Structure Effect on Dividend Yield and Volatility of Share Price .....	139

**ABBREVIATIONS**

APT	-	Arbitrage Pricing Theory
AU	-	African union
BLUE	-	Best Linear Unbiased Estimators
BVPS	-	Book Value per Share
CAPM	-	Capital Assets Pricing Model
CMA	-	Capital Markets Authorities
DF	-	Dickey-Fuller
DW	-	Durbin Watson
DY	-	Dividend Yield
EMH	-	Efficient Market Hypothesis
EPS	-	Earnings per Share
INS	-	Institutional Ownership
KFSSR	-	Kenya Financial Sector Stability Report
Kes	-	Kenya Shilling
LM	-	Lagrange Multiplier
MPBV	-	Market Price Book Value
NACOSTI	-	National Commission for Science, Technology and Information
NSE	-	Nairobi Securities Exchange
NYSE	-	New York stock exchange
OLS	-	Ordinary Least Square
PE	-	Price earnings
PP	-	Phillips-Perron
UK	-	United Kingdom
R&D	-	Research and Development
SMEs	-	Small and Medium Enterprises
SPV	-	Stock Price Volatility

## OPERATIONAL TERMS

- Book Value per Share:** Is the quantity of equity held by shareholders' as reported in the balance sheet. The book value per share gives information on the company's resource value (Damodaran, 2011).
- Dividend Yield:** Is defined as the payment made by a company to the investors. Dividend yield is therefore the payment made by a company to investors relative to the price of shares (Broberg & Lindh, 2012).
- Earnings per Share:** Is an indication of a company's profitability. To determine EPS, the company's net income is divided by the total outstanding shares (Atidhira, 2017).
- Firm Growth:** Is delineated as a creative destruction process, whereby a company introduces new services and products to the market (Oliveira & Fortunato, 2016). Growth represents the company's ability to achieve high returns which means that dividend expectations also rise, hence resulting to high volatility in the share price.
- Firm Size:** Refers to the company's total assets, labour amount and sales level (Waluyo, 2017). It also refers to the company size as seen from the total company assets (Hasangapon *et al* 2021).

**Institutional Ownership Structure:** Is the quantity of company stock owned by fund management entities for example pension or mutual funds, investment companies, insurance firms, endowments or private foundations that manage funds on others' behalf (Singh & Kansil, 2018).

**Market to Book Value Ratio:** Otherwise also called Price to Book Value ratio, is an evaluation metric for a firm's market value in relation to the book value (Sarwendhi & Samekto, 2014).

**Market Value Ratios:** These are the market value ratios used in the evaluation of a company's share price. It is also the ROI (Return on Investment) to investors at their purchase of shares. Subsequently, market value ratios are used by investors to determine if there's overpricing or underpricing in the shares of a company (Prasad & Shrimal, 2015).

**Price Earnings Ratio:** According to Osundina *et al.* (2016), price earnings ratio is a comparison of a company's stock prices relative to the company's profits. Price earnings ratio gives investors an overview of the value of a company's stock. Price to Earnings Ratio (PE) = Market value per share of common divided by Earnings per share (Ting, *et al* 2019).

**Stock Price Volatility:**

Stock price volatility is a statistical representation of changes in the price of securities over time (Osundina *et al.*, 2016).



## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Overview**

This chapter lays the foundation of this study. It covers the background to the study, problem statement, research objectives, hypotheses, significance, and scope of the study.

#### **1.2 Background**

Stock price volatility is a critical phenomenon facing investors worldwide and emerging markets like Kenya. According to Osundina *et al.* (2016), from a statistical viewpoint, stock price volatility is a measure of the undulation in the price of securities over time. In the capital market, volatility in stock price is given great interest due to the effect it has on the stability of the market and in informing investor strategies. Various factors are attributed to the fluctuation of share prices. Knowledge ability of these factors is instrumental not only to investors but to firms alike, as investors would be in a position to make informed decisions and firms would also be in a position to improve their value on the market. Musallam (2018) argues that primarily, investors' goal is to make investments in stocks that assure them of wealth maximization, which is achieved through high returns of market stock. The returns of market stocks is argued to be a significant factor for investors' decision when choosing investment opportunities. Therefore, for investors to maintain a low risk and high return outcome, there is need for them to have adequate evidence about a business's fiscal position so as to determine the business's performance trajectory. According to Wijaya & Sedana (2020). Financial information is important for investors due to the fact that it can give them direction on whether or not invest in a firm. Share prices are often influenced by various factors among them market value ratios (Nirmala *et al.*, 2011).

Investors world over, are risk averse by nature, and investment volatility is important because it determines the risk level of the type of investments they pursue (Guiso *et al.*, 2018). Stock volatility is often seen as a yardstick for determining the level of risk. The stock's volatility is an indication of changes in the price of stock over time, and it has been argued that the prediction of future stock price is difficult. The price of volatile stock would differ considerably over time, and it is very challenging to make predictions of future value of such stock. Adverse concerns arise, when the variability in stock price reaches an extreme level. Persisting volatility renders firms inadequate in their capacity to efficiently use capital because firms will need to reserve larger cash percentages for purposes of reassuring both lenders and regulators. Further, volatility increases market-making risks and requires market intermediaries to charge more for their liquidity services, hence reduced liquidity of the market. Also, Stock Price Volatility breeds uncertainty, which prejudice effective performance of the financial part as well as the all-inclusive economy (Basak, *et al.*, 2019). Therefore, high volatility is a discouragement for investors because they decide not to hold stock due to the fact that returns expected must be traded off for the exposure to risk, which leads to demand for high-risk premium for volatility risks to be leveraged (Ndwiga, 2016).

According to studies pioneered by Roll (1988) on stock price volatility, a great amount of stock price volatility can be cognizant by market value ratios (Adam *et al.*, 2016). This argument is advanced in a recent study by Bustos & Pomares-Quimbaya (2020), who asserts that market value ratios are straightforwardly included in stock prices and are ultimately relied on by investors in making crucial investment decisions. Worldwide, important findings have been documented relating to certain trends in stock price volatility over time (Zainudin *et al.*, 2018). According to Bhowmik & Wang

(2020), stock price volatility has attracted quite a number of researchers in accounting and finance fields with mixed results.

In the United States Basu (1983) found that the returns on the common stock of New York stock exchange firms appeared to have been related to earnings' yield which is one of the variables of accounting value ratios (Siegel, 2021). Further still in the United States, while investigating whether the earnings level divided by share price at the start of the stock return period is relevant for evaluation of earnings/returns associations, Dang *et al.* (2017) also observed that accounting earnings ratio plays a significant part in elucidating share price volatility and that accounting earnings positively impacts on volatility of share price. Further, Cheng *et al.* (2013) found that earnings levels afford better expounding power for volatility of share price.

In Greece while investigating the association between market value ratios and stock price volatility, Dimitropoulos (2009) demonstrated a negative association between the ratio of working capital to total assets and returns on earnings, and a positive association between ratio of returns on earnings and revenues on total assets to stock price volatility. Also, Hussainey *et al.* (2011) studied the UK market to examine whether the dividend policy had any impact on volatility of share price found that the Debt Equity Ratio significantly affects stock price volatility and also established that size was significantly and negatively associated with stock price volatility.

Hai *et al.* (2015) in a Vietnamese study established the existence of an association between market value ratios and volatility of share price, but this association was slightly weak, suggesting that market value ratios are less useful for decision making by investors in the Vietnam stock market, which contradicts the results of earlier scholars. Further, while carrying out a study on the Vietnamese Stock Exchange to

determine the association between prices of shares and financial information, Dang *et al.* (2018) establish that firm size, earnings per share, book value and cash flow from operating activities are positively associated with share price variations at a 48.1% level.

In Africa, Ikhatua (2013) while endeavoring to determine whether accounting value ratios contribute to volatility of share price in Nigeria's market, concluded that accounting value ratios influence stock volatility. Further in Nigeria, Angahar (2015) found that revenues significantly affected the volatility of share prices in the Nigerian Stock Exchange.

Kenya's Nairobi Securities Exchange (NSE) was established in 1954 in the direction of the Societies Act as a stockbrokers' association. NSE was previously recognized as Nairobi Stock Exchange, a name that was changed in July 2011. According to NSE (2013), the name change was a reflection of NSE's evolution into a service that supported the wider scope of financial mechanisms, considering that stock market behavior have significant influence on investors' and managers' decisions and thus, the overall economy. Performance of the NSE is measured by two indices, which are the 20 Share Index and the All Share Index. Subsequently, the 20 Share Index is a measurement of how the 20 companies with consistent financial results have performed, which is a reflection of the economy, whereas the All Share Index applies the performance of the entire market, or what is called the "market cap" or market capitalization, which is the totality of the shares of a company.

Sessional paper No. 10 of 2012 on Vision 2030 indicated that in the NSE, volatility poses a major challenge in the market. A report by Capital Market Authority (CMA-report 2007), advised that there is need for investors to comprehend the concept on

return and risk and that in as much as prices will rise, they will also fall. The Kenya Financial Sector Stability Report (2010) also reported that in the period from 2008 through 2010, the Nairobi Securities Exchange witnessed price volatility. Also, Financial Sector Regulators Forum of September 2017, indicated slight market liquidity, which led to an increase in risk concentration, whereby in 2016, 64 percent of capitalization in the market was attributed to top five (5) stocks and the period witnessed high volatility in stock prices. NSE (2011) report posits that in the last six months of 2011, the Nairobi Securities Exchange was characterized by extreme volatility. As evidenced by Figure 1.1, the trend continued through to 2021.



**Figure 1.1 Volatility of Share Price (2008-2021)**

*Source: Trading Economics (2020) <https://tradingeconomics.com/kenya/stock-market>*

Investors mostly consider the rate of changes between share prices and destination currencies, information which is instrumental for them in portfolio allocation (Camanho *et al.*, 2018). Ahmed (2018) argues that one among the fiscal techniques used in analysis by investors and fiscal analysts is the use of market value ratios. Further, a study by Arkan (2016) on the significance of market value ratios in predicting share prices, made

the conclusion that investors depend on financial ratios for different sectors in order to make predictions for share price and decision making can rely on fiscal analysis provided by fiscal ratios that guide operational and financial decisions.

Majority of studies that have investigated the volatility of share price from extant literature (Kisaka & Mwasaru, 2012; Kirui, *et al.*, 2014; Onyango, 2018; Aroni, 2011; Olweny *et al.*, 2011; Ouma & Muriu, 2014), have generally concentrated on macro-economic variables and market value ratios as explanatory variables of stock price volatility but market value ratios as a determinant of volatility of stock price has received little attention.

Zeytinoğlu *et al.* (2012) posit that the efficiency of financial markets is significantly determined by the level and scope of information. Consequently, investor profits can be increased with regard to how the scope and level of information impacts the prices of shares. In an efficient market, investors do not benefit by their use of existing market information. As such, investors gather information from financial records, which is the basic source and through the application of appropriate ratios, investors are able to achieve favorable returns. In determining companies' market value, market value ratios are used in a much higher frequency by investors. Investors predict shares' value using market value ratios such as EPS, MPBV, and PER. In an instance where the market value ratio is lower than the stock value, shareholders will make purchase decisions for a company's stock. Hence, market value ratios play a significant role in guiding investors' decisions.

Further, market value ratios are used in the evaluation of present stock prices of stock held by a public firm (Prasad & Shrimal, 2015). Further, the significance of market value ratios to management and investors is due to the fact that these ratios play a key role in

deciding whether shares are over or undervalued or whether they are at market level (Dahlquist & Knight 2022). Investment decisions are made in line with these ratios, specifically with regard to companies' stocks. Also, Al-Manaseer (2020) in a study done in Jordan, found an impact of combined market value ratios on share prices of companies in Jordan's industrial sector. Further, a study by Musallam (2018) found a positively significant association between share prices and EPS, while MBVR had no significant relationship. Since market value ratios are applied in deciding when and where to make an investment, it is therefore important for investors to have knowledge on these ratios.

In the Kenyan context, little research exists addressing the relationship of explicit market value ratios and volatility of share price. In this study, the effect of market value ratios on the volatility of share price of companies listed on the NSE was determined. This study is also reference for interested parties who wish to make stocks investments in companies listed on the Nairobi Securities Exchange.

Fehr (2016) avers that institutional investors have more skills, opportunities, knowledge and resources with which they can influence companies, which is often as a result of their ownership stake in the company's shares. Companies that have a large number of institutional investors tend to be influenced with regard to how they make strategic decisions, due to the fact that the institutional investors monitor their trajectory. Notably, institutional ownership has both positive and negative effects. Considering that large institutions can access better information, have better capacity to assess and evaluate a company's value before making an investment, puts them at an advantage of reaping profits, for example in instances where institutional investors acquire high stakes of companies considered poorly performing and turning them around into

profitability due to high monitoring skills that lead not only to enhanced profitability but also to less earnings management. Further, institutional ownership puts pressure on a company's management due to the fact that they have to comply with the requirements of institutional investors. Alternately, institutional ownership's negative impact occurs when management and institutional investors have developed relationships that renders other investors unprotected. In such a circumstance, institutional investors vote in the same direction as the management so as to protect their investment and achieve higher profit margins, which in the long run hampers the company's performance and reduces its value.

Large proportions of institutional owners can lead to substantial volatility in the share prices, more so if the institutional investors purchase or dispose contemporaneously (ElGhouthi, 2015). Institutional ownership refers to the quantity of a firm's stock owned by entities such as insurance firms, private foundations, pension funds, endowments and investment firms which manage funds on others' behalf (Singh & Kansil, 2018). Subsequently, institutional investors report to principals with regard to how sources of the firm are handled, thus they monitor investments diligently (Amos *et al.*, 2016). Also, institutional owners can counter problems such as agency costs and asymmetric information which characterize dispersed ownership of stocks. The implication is that institutional ownership can enhance a firm's governance which is linked to enhanced efficiency and increased wealth of shareholders (Barrese *et al.*, 2018).

Various studies from extant literature (Rubin & Smith, 2009; Chen *et al.*, 2013; Jafarinejad *et al.*, 2015; Ni, 2017; Barinov, 2017), have linked institutional ownership to stock price volatility. These studies have established that institutional ownership and volatility of share price are correlated and institutional stockholders alleviate the



volatility of share prices. They further conclude that the link between institutional proprietorship and volatility of share prices is negative, because on average institutions are averse to volatility. This study therefore sought to determine the existence of moderation by institutional ownership structure on the correlation between market value ratios and volatility of share price in Kenya's capital market.

### **1.3 Problem Statement**

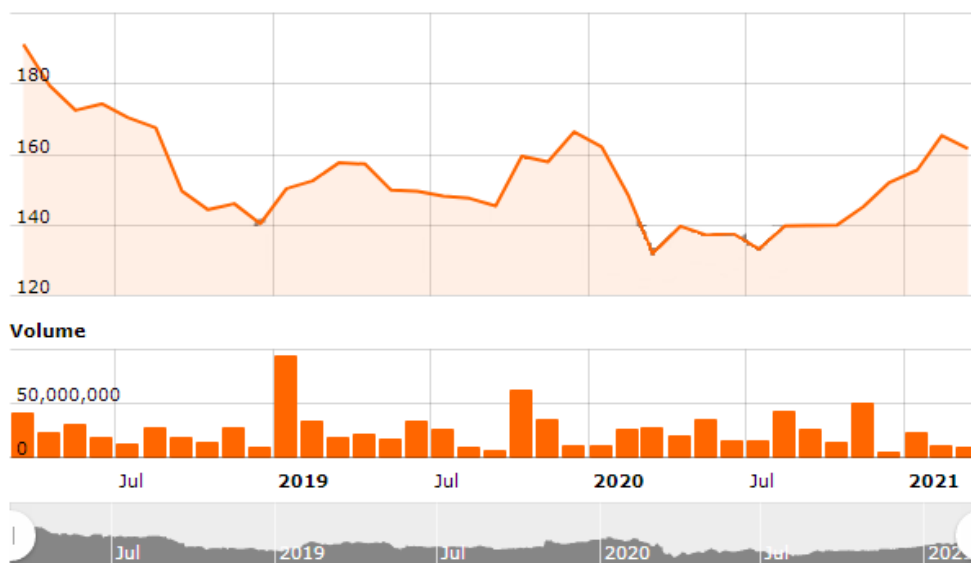
Stock price volatility exposes investors to risk (Tasnia *et al.*, 2020). Stocks are very precarious; therefore, it is very important for investors to know the factors that appropriately explain stock price volatility (Pelcher & Bolton, 2021). Studies pioneered by Fama (1988) and Campbell (1988) posited that market value ratios (among them market value ratios) have a predictive power on ensuing stock prices (McMillan, 2019). This finding has been supported by Parkinson (1980); Baskin (1989); Allen & Rachim (1996); Martens & Van Dijk (2007); Kellard *et al.* (2010); Cochrane (2011); Hussainey *et al.* (2011); McMillan & Wohar (2013) McMillan (2014); Shah & Noreen (2016); Suwanhirunkul & Masih (2018); and Camilleri *et al.* (2019). These studies have shown that market value ratios affect the influence of information on firm performance which ultimately reduces stock price volatility. Subsequently, knowledge of these ratios tends to compensate shareholders through increased/better stock returns by reducing their exposure to investment risks.

However, the riddle remains unsolved in reference to the factors which have greater effect on volatility of share price (Zainudin, *et al.*, 2018). Stock price volatility studies have yielded mixed results over time (Bhowmik & Wang 2020). According to Ndwiga and Muriu (2016) there is very little evidence volatility of share price on the Nairobi Securities Exchange (NSE). Most studies on volatility of share price done in the Kenyan market (Kirui, *et al.*, 2014; Kisaka & Mwasaru, 2012; Aroni, 2011; Onyango, 2018;

Olweny *et al.*, 2011; Ouma & Muriu, 2014) have significantly focused on the correlation between macro-economic components and few on market value ratios, institutional ownership structure and their relationship with stock price volatility.

According to Kachchhy (2015), various factors can affect stock price volatility. Of all the factors, financial ratios (among them market value ratio) are the most important because financial information can specifically decide whether investors invest in the company's stock or not.

This study is motivated by several reports on investment in stocks, among them Capital Markets Authority report of 2007 which indicated that for the last four years (prior to the study period 2008-2019), stock prices appreciated to record levels on the average and the price of quoted stocks more than quadrupled. During this period, many investors gained a lot of returns. Unfortunately, some investors forgot that barely five years prior, the same stocks had hit a record loss. As evidenced in Figure 1.2, the current NSE all share index has witnessed volatility in recent years.



**Figure 1.2 NSE All Share Index (2018-2021)**

Source: Trading Economics (2020) <https://www.african-markets.com/en/stock-markets/nse>

Further, according to Financial Sector Regulators Forum, (September 2018, Issue No. 9), as of December 2017, the Capital Markets Authority of Kenya licensed more firms in various categories suggesting a tremendous growth of activities on the Nairobi securities exchange. This tremendous growth of activities on the NSE may have been due to lack of knowledge on what factors an investor should consider before making an investment decision.

Therefore, these unsolved riddle in reference to the factors which have greater effect on stock price volatility and contradictory results of studies done across different exchanges, located in diverse global socio-economic and political parameters form the research gap. This study sought to fill this gap by establishing how market value ratios affect the volatility of share prices of listed firms on NSE. The study further endeavored to establish institutional ownership structure moderating effect on the correlation between market value ratios and volatility of stock price.

## **1.4 Research Objectives**

### **1.4.1 Broad Objective**

The broad objective was to explore the association between market value ratios and volatility of stock price, and institutional ownership structure's moderating effect on the link between market value ratios and the volatility of stock prices of listed firms on Nairobi Securities Exchange in Kenya.

### **1.4.2 Specific Objectives**

- 1) To find out the effect of market to book value ratio on volatility of stock price of companies listed on NSE in Kenya.

- 2) To establish the effect of earnings per share on volatility of stock price of companies listed on NSE in Kenya.
- 3) To find out the effect of price earnings ratio on volatility of stock price of companies listed on NSE in Kenya.
- 4) To find out the effect of book value per share on volatility of stock price of companies listed on NSE in Kenya.
- 5) To establish the effect of dividend yield on volatility of stock price of companies listed on NSE in Kenya.
- 6) To establish the effect of institutional ownership structure on volatility of stock price of companies listed on NSE in Kenya.
- 7)
  - (i) To find out the moderating effect of institutional ownership structure on the relationship between market to book value ratio and volatility of stock price of companies listed on NSE in Kenya.
  - (ii) To establish the moderating effect of institutional ownership structure on the relationship between earnings per share and volatility of stock price of companies listed on NSE in Kenya.
  - (iii) To find out the moderating effect of institutional ownership structure on the relationship between price earnings ratio and volatility of stock price of companies listed on NSE in Kenya.
  - (iv) To establish the moderating effect of institutional ownership structure on the relationship between book value per share and volatility of stock price of companies listed on NSE in Kenya.

(v) To establish the moderating effect of institutional ownership structure on the relationship between dividend yield and volatility of stock price of companies listed on NSE in Kenya.

### **1.4.3 Hypotheses**

***H<sub>01</sub>***: Market to book value ratio does not significantly affect volatility of stock price of companies listed on NSE in Kenya.

***H<sub>02</sub>***: Earnings per share does not significantly affect volatility of stock price of companies listed on NSE in Kenya.

***H<sub>03</sub>***: Price earnings ratio does not significantly affect volatility of stock price of companies listed on NSE in Kenya.

***H<sub>04</sub>***: Book value per share does not significantly affect volatility of stock price of companies listed on NSE in Kenya.

***H<sub>05</sub>***: Dividend yield does not significantly affect volatility of stock price of companies listed on NSE in Kenya.

***H<sub>06</sub>***: Institutional ownership structure does not significantly affect volatility of stock price of companies listed on NSE in Kenya.

***H<sub>07a</sub>***: Institutional ownership structure does not significantly moderate the relationship between market to book value ratio and volatility of stock price of companies listed on NSE in Kenya.

***H<sub>07b</sub>***: Institutional ownership structure does not significantly moderate the relationship between earnings per share and volatility of stock price of companies listed on NSE in Kenya.

***H<sub>07c</sub>***: Institutional ownership structure does not significantly moderate the relationship between price earnings ratio and volatility of stock price of companies listed on NSE in Kenya.

*H<sub>07a</sub>*: Institutional ownership structure does not significantly moderate the relationship between book value per share and volatility of stock price of companies listed on NSE in Kenya.

*H<sub>07e</sub>*: Institutional ownership structure does not significantly moderate the relationship between dividend yield and volatility of stock price of companies listed on NSE in Kenya.

### **1.5 Study Significance**

This research is of great importance and attention to investors in the stock exchange. Kenya's policy makers and managers would prominently find the study's results on the association between market value ratios and stock price volatility beneficial. The study's findings will also assist individuals whose interests are investing in or financially analyzing Kenya's capital market and individuals who are interested in understanding the patterns of volatility of share price as well as the factors that influence volatility of stock price over time, to enable them to advise their clients appropriately. The Capital Market Authority (CMA) and Nairobi securities Exchange (NSE) will also benefit from the recommendations of this study because they will be in a position to make appropriate adjustments to their policies and operations.

Further, the findings of this study will inform policy development by financial analysts, which will be instrumental for the performance of client portfolios, therefore, achieving higher investment returns. Additionally, considering that the direction and extent of the association is still considered inconclusive, this study contributes empirically by investigating the relationship between MBVR, PER, BVPS, EPS, DYR and volatility of share price. The study has also determined the institutional ownership structure moderation effect on the correlation between market value ratios and volatility of stock price.

Finally, the study's findings will further inform the researchers in the field of finance and accounts field enrich their work and find more insights in their quest to find factors that actually cause stock price volatility in the securities exchanges world over.

### **1.6 Scope of the Study**

The study focused on the direct link between market value ratios and volatility of share price of firms listed on NSE in Kenya. Further, institutional ownership structure moderation effect on the association between market value ratios and volatility of share price of firms listed on NSE in Kenya. Five market value ratios were selected guided by empirical literature namely; MBVR, PER, BVPS, EPS and DYR. The study selected 39 companies out of 66 companies listed on NSE between January 2008 and December 2019 based on inclusion criteria that; included companies were listed on the NSE prior to 2008 and remained listed throughout the study period and also the companies are having all required information required by this study were included in the study otherwise excluded.

The period covered by the study was 12 years; 2008 to 2019. The year 2008 is the onset of the proposed capital markets policy (CMA) and regulatory changes in the Budget 2008/2009. During this time, there was the 2008 worldwide financial crisis that affected economies thus adversely affecting capital markets and share prices (AU Commission, 2009). Also, Kenya held three general elections 2007 (prior to study period), 2012, and 2017 which could have significantly impacted stock returns on Nairobi securities exchange (Musyoki, 2017). Further, Kenya's promulgation of the new Constitution 2010 and NSE's structural policy reviews among various other changes such as the adoption of new technology to facilitate industry efficiency and effectiveness was witnessed in the same period (NSE, 2018). For example, in 2009, the NSE established

the CHU (Complaints Handling Unit) which was tasked with facilitating feedback to queries raised by investors.

Finally, the study focused on four theories: The Efficient Market Hypothesis/theory, Theory of the value relevance, signaling theory and Agency theory. The study adopted positivism paradigm which argues that knowledge can be considered factual and trustworthy only when that knowledge has been gained through measurement and observation. Explanatory research design and the panel approach was adopted due to the cross-sectional and longitudinal nature of the secondary data utilized in the study.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter evaluates the theoretical and empirical literature with regard to market value ratios variables, institutional ownership structure and volatility of stock price. This chapter addresses the concept of the dependent variable, concepts of the independent variables, concept of moderating variable, theoretical framework, empirical framework, chapter summary, control variables and conceptual framework.

#### 2.2 Conceptualization of Stock Price Volatility

Osundina *et al.* (2016) defines stock price volatility as the changes in the price of a share over time. Subsequently, stock price volatility significantly impacts the capital market due to fact that it informs the market stability and the strategies adopted by investors. According to Rupande *et al.* (2019), stock price volatility is considered significant due to a variety of reasons. Foremost, it may be challenging for investors to be in agreeance that the changes in stock price could be explained by information on economic variables such as the sharp fluctuation of the price of assets over short or even lesser time differentials. The result of these sharp fluctuations in the price of assets could lead to decreased assurance in the capital market and result to less capital cash flow in the equity market. Secondly, for individual firms, the firm's volatility is an important factor in the determination of probable bankruptcy. The firm has a higher likelihood of default if the capital structure is highly volatile.

Thirdly, volatility is instrumental in the determination of bid-ask spread. A high stock price volatility leads to a wider spread between the market's bid and price markers. In essence, the market's liquidity is affected by the stock price volatility. Fourthly, the level of volatility affects hedging for example insurance portfolio, which means that

when the volatility is high, the insurance prices also increase. Fifthly, according to economic theory, consumers are characteristically risk averse, which means that when the risk associated with an activity is considered to be high, participation in that activity is considerably low. In the case of investment, investors tend to shy away from making investments in a high risk context. Finally, across time, high volatility may lead to inefficient allocation of capital to cash-equivalent investments by companies. With a larger percentages of cash being allocated to cash-equivalent investments, the company's inadequate cash allocations is detrimental to overall performance (Rupande *et al.*, 2019).

Basically, stock price volatility is a reflection of investors' analysis of information and the feedback received from liquidity merchants. Very high volatility is associated an increase in feedback and lack of surety on the economy's future state. Consequently, risk averse investors will be involved in hedging activities to shield themselves from eventual downswings. Life-threatening volatile hitches threatens the smooth working of money markets in the event that liquidity reduces and the cost of hedging increases. Eventually, vulnerability of the economy increases, which makes it more risky as a result of financial market tensions in a highly volatile situation (A El-Masry & El-Ghouty 2017).

Previous studies by Parkinson (1980); Baskin (1989); Allen & Rachim (1996); Martens & Van Dijk (2007); Hussainey *et al.* (2011); Shah & Noreen (2016); Suwanhirunkul & Masih (2018) and recently, Camilleri *et al.* (2019) have measured stock price volatility as the range of extreme share prices (difference between the highest and lowest prices) divided by their mid-point (average of highest and lowest prices) raised to the second power. To arrive at a volatility measure, a square root is applied, comparable to a

standard deviation. Volatility is high if the price has a wide fluctuation and low, if the variation of share price is low. Research on share price volatility has grown into a subject of interest due to the integration of stock markets across the globe and their subsequent volatility. Additionally, policy makers tend to rely on volatility to make an estimation of vulnerability of the economy and the financial market.

Volatility is perceived negatively as though it is a representation of risk and uncertainty. Nevertheless, volatility could still be perceived positively when an investor purchases at a low price and sells at a high price. According to Khositkulporn (2013), volatility is practically beneficial to investors since it makes the risk quantifiable and is instrumental in enabling investors to identify situations in which stocks are either overpriced or underpriced.

Most researchers have mostly found macroeconomic factors to be explanatory for the volatility of share price (Abbas *et al.*, 2019). For example, Schwert (1989) in analyzing the volatility of the stock market and macroeconomic volatility established that despite stock market volatility being correlated with average leverage, it had a weak prediction of stock volatility. Similarly, Law (2006) and Angabini (2010) centered their study on the Malaysian market and established that during the Asian financial crisis in 1998 and the global financial crisis in 2008 especially on Kuala Lumpur's Composite Index, the stock price volatility was high. The scenarios in these studies could be deduced by investor sentiment and over-reaction, as well as economic variables during highly uncertain periods of crisis. This is corroborated by Zakaria (2012) whose study showed little evidence on how macroeconomic variables affect the volatility of the Malaysian stock market. These findings are however, inconclusive, which leaves the question of whether macroeconomic variables are sufficient in the prediction of volatility.

According to Spierdijk and Bikker (2017), fundamental variables are insufficient in explaining price deviation amidst the irrationality of traders, who may have an upper hand in explaining the volatility share prices. In this regard, it becomes necessary to explore other factors that can further be considered to be explaining stock price volatility. Nevertheless, conclusion about which factors appropriately explain changes in stock price volatility remains unsatisfactory, and theories haven't unanimously concurred in this field.

According to Kachchhy (2015), many factors can affect stock price volatility. Of all those factors, financial ratios (among them market value ratio) are the most important because financial information is the specific information which can decide whether investors invest in the company's stock or not. This study explored the direct association between market value ratios and volatility of stock price of listed companies on NSE, Kenya. These ratios are discussed below.

### **2.3 Conceptualization of Market Value Ratios**

Market value ratios can be defined as those ratios that help to analyze the economic position of publicly traded firms and is pivotal the identification of stocks that could be undervalued, overvalued or fairly priced. Market value ratios are used in the evaluation of current price of shares of a firm's publicly held stock. Subsequently, Vagner (2003) posits that investors use market value ratios in determining whether shares are underpriced or overpriced. Market value ratios are equally instrumental for management as they are for investors since they are adopted in decision making on share valuation, ensuring that the share price and the market is at par. Dahlquist and Knight (2022), concludes that market value ratios are important for investment decision making in company stocks. According to Kadim *et al.* (2020), a firm's market value can be determined by use of the ratio analysis model method. They suggest examples

of market value ratios as; price/cash flow ratio, market book ratio, dividend yield, price-to-book value ratio and price-to-earnings ratio among other ratios.

According to Brest *et al.* (2018), in stock investment, there are different fiscal metrics that are applied in the evaluation of share prices to guard against a loss in investment. Market value ratios is one of the primary metrics in the analysis of stock prices and comparison of prices between companies in the same scope, as well as against other financial figures and market information. According to Dahlquist and Knight (2022), market value ratios evaluate the finances of public firms traded in the market in order to have an understanding of their fiscal position, to determine whether the shares are valued rightly and to determine the value at which the shares are to be sold or bought. For investors, the decision on whether to sell or buy shares is important, which means that when the sale or purchase is not done at a right value, the investment could be lost. Therefore, the analysis of market value ratios is instrumental not only to investments in the market, but also to the management of the company as well.

Menaje (2012) posits that market value ratios are metrics used in the evaluation of publicly traded firms' shares. Investors majorly use these ratios when checking the valuation of shares in the market, to determine whether the value is high or low. Share undervaluation and overvaluation are pivotal for investors, since it helps them make decisions on whether to go short or long on the shares they potentially want to invest in. For instance, in case of an overpriced share, there is the likelihood future fall in their price, therefore, an investor should short the shares for a while whereas in the case of underpriced shares, the investor should consider going long (Mauboussin & Rappaport, 2021).

Most studies have concentrated on market value ratios in general in investigating the factors/variables that have a link with volatility of share price. However, this study focused on the specific market value ratios since they are what investors rely on in making investment decisions. The study aimed at determining whether an association exists between these market value ratios and volatility of stock price. Specifically, the study focused on the link between market value ratios and volatility of share price. These ratios are; MBVR, PER, BVPS, EPS and DYR. They are explained below.

### **2.3.1 Market to Book Value Ratio**

Market to book value ratio is a comparative analysis between the firm's book value and the stock market price/value. According to Sarwendhi and Samekto (2014), MBVR is the variance between the value of the liability and the value of owned assets. Sarwendhi and Samekto (2014) conclude that the market to book value ratio shows the extent to which the market appreciates the share book value of the company.

According to Goranova *et al.* (2010), market to book value ratio is a positive performance measure because it shows the difference between the company's assets and the value assigned to the assets by the market. This means that the MBVR is a reflection of the premium (or discount) given by the market to the firm on its assets, therefore, the ratio reflects the market's perception on how efficiently and effectively the firm is managed. Goranova *et al.* (2010) conclude that a high premium shows that every additional shilling invested in the company's assets would have an attractive return, whereas a low premium shows that there will be low returns on any investments made on the company's assets.

The MBVR is determined by dividing the current closing price of the stock by the most current quarter's book value per share. The higher the market-to-book ratio, the higher the market's trust to the company's prospects (Mazur *et al.*, 2020).

Market price to book ratio is an evaluation between the share price and the book value provided by the financial market to measure the firm's value or Market price to book ratio is a contrasting between the stock price and the book value provided by the financial market to measure the company's value (Cahyaningrum & Antikasari, 2017). According to Suroso (2022), the higher the market price to book ratio value, the higher the firm is perceived by the investors to be valued contrasted to the funds invested in the firm. The implication is that, high values in market price to book value ratio will positively affect the stock prices and stock returns are eventually expected to rise. Further (Dwialesi & Darmayanti, 2016), and Ristyawan (2019) posit that market price to book value ratio positively impact stock returns and consequently, the volatility of share prices.

This study determined how MBVR affects volatility of stock price of listed companies on NSE, Kenya. Subsequently, the study determined the moderation of institutional ownership structure on the correlation between market value ratios and volatility of share price of listed companies on NSE in Kenya.

### **2.3.2 Earnings per Share**

According to Yang *et al.* (2019), earnings per share is the percentage of a firm's return that is apportioned to every individual share of the stock. Earnings per share or EPS is a key measure, which provides an indication of a firm's profitability and it is calculated by dividing the net profit or loss for the period attributable to equity shareholders by the weighted average number of equity shares outstanding during the period. EPS is also

calculated by taking the net income of the company and dividing it with the total sum of outstanding shares. According to Atidhira (2017), market participants frequently use EPS to determine a company's profitability prior to purchasing its shares.

Oladipupo and Kolawole (2020) posit that earnings per share is a metric often used to establish the profitability of a company per unit of shareholder ownership, therefore, EPS is a key factor of share price. Sugiyanto and Candra (2019) add that few things operate in a vacuum in the investment landscape, and earnings per share and stock prices are not exceptionable. Resultantly, a firm with strong earnings per share has a high possibility of experiencing an increase in the price of its shares. Mishra *et al.* (2020) posits that a high share price forms a positive perception of the firm's products in customers' minds, which results to growth in demand, growth in sales and subsequently an increase in the firm's earnings. Conversely, a lower EPS is detrimental to a firm's share price, which lowers the confidence of consumers on the company's products, reduces sales and ultimately diminishes earnings per share. However, Khan *et al.* (2014) argues that these relationships are not direct, but rather, circular.

This study established the direct effect of earnings per share on volatility of share price of companies listed on NSE, Kenya. The study also determined institutional ownership structure moderating effect on the correlation between EPS and volatility of share price of firms listed on NSE, Kenya.

### **2.3.3 Price Earnings Ratio**

According to Osundina *et al.* (2016), price earnings ratio provides investors with an overview of the value of a company's stocks by comparing the stock prices to the corporate profits. Osundina *et al.* (2016) further states from another perspective, price earnings ratio is the length of time it will take for an investment to be paid back, in



consideration that the business doesn't experience any changes, which would otherwise have an effect on the company's stock price. Bordalo, *et al.* (2020) opines that price earnings ratio is useful in making future predictions as to the rise or fall of a stock price. PER is calculated by dividing market value per share by earnings per share. In the calculation, EPS is extracted from the company's recent four quarters, to form trailing P/E ratios, and is measured by subtracting the company's value of shares at the beginning of the 12-month period from the value at the end of the period, making adjustments for stock splits in case of any. Thus Price earnings ratio formula is;  $PER = \frac{\text{Market value per share of common}}{\text{EPS}}$  (Ting *et al.*, 2019).

According to Nukala and Prasada (2021), price earnings ratio may be considered as a valuation ratio since it is an indication of how the company's equity stock is assessed in the market. The market value of a company's equity is a reflection of the combined influence of both risk and return, therefore valuation ratios are comprehensive in measuring a company's performance. Kumar (2017) concludes that price earnings ratio is a summative measurement which is a reflection of the following factors: prospects for growth, risk features, orientation of shareholders, image of the company and the liquidity degree of the company.

A relatively small PER or capitalization ratio suggests higher than average growth in future earnings (Wildatunjanah & Suparningsih, 2019). According to Jiang and Lee (2012), price-earnings ratio predict stock price by decomposing financial ratios into a cyclical and stochastic component. It is highlighted further that the cyclical components predict an increase in future stock price and the stochastic trend components forecast decrease in future stock returns at long horizons.

This study therefore sought to find out the direct effect of PER on the volatility of share price of companies listed on NSE, Kenya. The study also sought find out institutional ownership structure moderating effect on the relationship between PER and volatility of share price of companies listed on NSE, Kenya.

#### **2.3.4 Book Value per Share**

The BVPS refers to the per share value of a firm's equity on an accrual accounting basis that belongs to the ordinary shareholders of a firm (Hanifah, 2019). Amidu and Abor (2006), indicate that book value reflects a company's past earnings, investment decisions and dividend distribution policy. BVPS is calculated by first calculating the book value, then dividing by the number of common shares. Since the calculation is done with common shares, preferred shareholder equity is subtracted from total equity (Eslamzadeh *et al.*, 2012).

A high book shows a firm's large reserves and its potentiality for a bonus. Inversely, a low book value is an indication of a company's liberal distribution policy of dividends and bonuses and is also an indication that company has a poor trend of profitability (Ballings *et al.*, 2015). According to Sumangala and Bhatt (2013), book value is an important component that has an effect on share market value. Essentially, it is delineated as the value of a company's funds per share. The BVPS is respective of the shares' worth in the firm. Generally, book value is instrumental in the analysis of shares, which means that the book value of a company is studied so that the investment value is known to investors (Palepu *et al.*, 2020).

This study therefore sought to find out the direct effect of BVPS ratio on the volatility of share price of firms listed on NSE, Kenya. The study also sought find out institutional

ownership's moderating effect on the link between BVPS and volatility of share price of firms listed on NSE, Kenya.

### **2.3.5 Dividend Yield**

According to Adaramola *et al.* (2018), a share's dividend is the share distribution in addition to or in exchange of cash dividends which shareholders are paid by the company. The shares payable to shareholders must be within the delineation of the firm's authorized share capital due to the fact that share dividends increase the number of existing ordinary shares. It is provided proportional to the firm's shareholding. The share dividend is a representation of reserve capitalization which changes from temporary to permanent form of ordinary shares. Generally, the term 'dividend' makes reference to the distribution of cash earnings.

Uddin and Chowdhury (2005), posits that when all investment projects having positive net present values have been funded, then shareholders receive dividends. Dividend payout is considered important for various reasons. Foremost, researchers have established that companies use dividends as an approach for fiscal signaling to outsiders on the company's stability and prospects for growth. Secondly, dividends have a significant role in the company's capital structure.

According to Al-Kuwari (2009), averagely, an investor is characteristically risk averse, hence their investment in the capital market is guided solely by the motivation of making a profit. Higher returns on investment and investment capitalization are the primary factors that investors are enticed with. A company's dividend payout ratio is a reflection of the dividend policy that a company has adopted. Due to investors' being risk averse, volatility is pivotal for investors as it measures the scope of risk that

investing in the company exposes them to. When the divided payout ratio increases, the outcome is a positive change in the share price and vice versa.

#### **2.4 The Concept of Institutional Ownership**

Singh and Kansil (2018) define institutional ownership as the number of a firm's available shares owned by insurance companies, private foundations, mutual or pension funds, endowments, investment funds or other large firms whose mandate is funds management on others' behalf. Institutional ownership can also be perceived as the corporate entities who are shareholders in a company. Prior studies have concluded that a familiar practice in firms is institutional shareholding, since by legislation, corporations are allowed to own property and enter into transactions in their corporate names. According to Amos *et al.* (2016), institutional owners are organized. Therefore they have adequate resources to facilitate engagement with managers. However, the institutional investor also has principles to whom they report about the way the firm's resources are handled, hence they monitor investments made in other companies diligently.

Amos *et al.* (2016) adds that when institutional owners become majority shareholders, they pursue agency conflict, a move that shifts from managers versus shareholders to the majority, giving the majority the opportunity to keep attempting to gain more wealth than the minority. Subsequently, the interest of the institutional owners to gain more wealth than the minority shareholders goes against the company's interest, considering that the company's interest comprises both the interests of the minority and majority shareholders. An outcome of such would be the entrenchment effect in a variety of forms which could include a firm reporting false status of its earnings. Further, institutional owners can handle the agency costs issues and asymmetric information that usually result from dispersed stock ownership. According to Barrese *et al.* (2018), this

therefore implies that institutional ownership can enhance company governance which is interrelated with improved efficiency and eventually enhances the wealth of shareholders.

According to Singh and Kansil (2018), institutional ownership is the amount of shares owned by active institutional owners divided by the total amount of outstanding shares in the company. Singh and Kansil (2018) also consider that the monitoring level in a company could be influenced by the amount owned by each institution. Research work done on institutional ownership and volatility of share price indicate that the direction of the relationship is strongly affected by the company's dividend policy (VO, X.V. 2016). It is believed that the lower the volatility resulting from high institutional ownership is as a result of the institutional investor's access to price information, referred to as "institutional preference hypothesis" (Abbas & Badshah, 2017). The theory posits that investors prefer making investments in large components of their portfolio in low risk non-dividend paying shares because most institutions follow the "prudent" man rule, the reason being that they make investments on other peoples' behalf, because the law permits corporations to transact and own property in their corporate names.

Typically, such institutional owners are well-organized and have the necessary resources in place to keep the management teams engaged at all times. According to Amos *et al.* (2016), institutional investors report to principals on the management of company resources, therefore, they adhere to diligence on investments made in other firms. When institutional investors become majority shareholders, they pursue agency conflict, a move that shifts from managers versus shareholders to the majority, giving the majority the opportunity to keep attempting to gain more wealth than the minority.

Subsequently, the interest of the institutional owners to gain more wealth than the minority shareholders goes against the company's interest, considering that the company's interest comprises both the interests of the minority and majority shareholders (Süsi & Jaakson, 2020). This tendency is said to be against the firm's overall interest because the firm's overall interest includes the interests of the majority and minority shareholders.

## **2.5 Theoretic Structure**

### **2.5.1 EMH (Efficient Market Hypothesis)**

The Efficient Market Hypothesis as established by Fama (1965, 1970) expounds the conception that the price of shares in the market reveal all accessible information such that traders are prevented from making atypical returns notwithstanding the level of information they possess. When new information lands, it spreads fast and is instantaneously integrated into the share prices. Subsequently, not all market players have the benefit in conjecturing share price engagements since no one has admittance to evidence that is not obtainable to the whole market. Various investors have a tendency to accept as true that they can handpick stocks with a capacity of outpacing the market through ultimate analysis, an exploration of financial status such as company earnings, dividend payout, asset values and so on, or over and done with technical investigation. (Rossi & Gunardi, 2018).

Earlier studies, such as Samuelson (1965), Fama (1965, 1970) and Roberts (1967), provide evidence supporting the efficiency of the stock market. Fama (1970) posits that the characteristic of an efficient market is that prices always - entirely reflect obtainable information. According to the theory, a perfect market is one where all accessible information on the risk and return of stock is factored into the price. The theory makes

the assumption that stock prices are only influenced by information or news. Subsequently, stock prices move either upwards or downwards, respective to the available and accessible information. Summarily, the prices of stocks are a reflection of new situations in the market (Obalade, 2019).

The EMH hypothesizes three elements of market efficiency, which are, weak form, semi-strong form and strong form. According to the weak form, asset prices include all pertinent past evidence, for instance, previous prices, security dividends, and trading capacity. Alternatively, the semi-strong form posits that all publicly accessible evidence is reflected fully in prices of securities. Information that is publicly available include previous prices, performance of the company, political updates, projections or analysis publicly available and information regarding macroeconomic factors and expectations (Ben, 2018). The strong states that the prices of stocks are a reflection of all information relevant to traders and investors, which includes information known to insiders of a company. Further, the strong form posits that all participants in the market can access freely, the pertinent information needed for decision making on securitis prices and that no investor group has monopoly on access to the information that would lead to enormous profits (Ma, 2017).

The EMH is theoretically founded on three propositions. Firstly, it assumes that investors are rational and in the same way, rationally value securities. Secondly, it assumes that in a case where there is investor irrationality, the trades are random and would cancel out without having an effect on prices. Thirdly, it assumes that rational arbitrageurs reduce the effect of investor irrationality (Cullen, 2014). Subsequenely, EMH theorizes that new information about stocks needs to be incorporated in the share price completely and instantaneously and the prices should remain unmoved so long as

no new information emerges with regard to the company, considering that the company must be equal to the share value. In behavioral finance, this supposition has been criticized where the prices of shares are established to undulate due to the effect of behavioral bias despite the presence of new information in the market. Empirically, evidence of volatility tests have concluded that stock price movements cannot be associated merely to investor rationality, but also involves a component of investor irrationality. Subsequently, Ding (2018) in the exposition of noise trading, emphasizes the attribution of investor irrationality to share price.

Generally, all past information and publicly accessible information is swiftly incorporated into recent prices that technical and fundamental analyses have a likelihood of being unsuccessful. The strong form of EMH establishes that in the case of a strong market, it shows both public and private information, which integrates the semi-strong and weak form of EMH. The strong form EMH also reflects that all information such as merger announcements, dividend and stock splits are well integrated into the current value of shares in the market. In this regard, fundamental and technical analysis may not be applied to corner the market and earn extensive returns (Morelli, 2002; Megaritis *et al.*, 2021).

According to Sinha (2018), the EMH further assumes that majority of profit oriented investors makes investments independently, hence they do not rely on each other; the market is randomly provided with fresh information about securities and the announcement of the information is similarly independent; share prices are adjusted rapidly in reflection of emerging information in the market; and lastly, that the prices of assets evolve randomly. Anagnostidis *et al.* (2016) adds that in the EMH theory, the prices of assets are unpredictable, which gives a suggestion that it is difficult for



investors to corner the market. However, studies have found evidence showing that investors can predict asset prices. Chen (2016), established the predictability of returns and share prices. However, Nyong (2005) in a stock returns study in Brazil, Nigeria and South Africa, rejected the random walk hypothesis which implied the predictability of share prices.

In Kenya, a study by Mwangi (2019), on the Effects of Automated Trading System (ATS) on the Efficiency of NSE, Kenya for the Period 2013 to 2017, concluded that automated trading system was significantly and positively associated with efficiency of Nairobi Securities Exchange which further lead to market efficiency and increase in in the regularity of traders, easy access to information and access to the traders funds. Further there was the increase in the volumes of trading from the automated trading systems. Since according to strong form efficient market theory, all information such as dividends, merger announcements and stock splits are well integrated into the recent market value of shares which are all accessed through the Automated Trading System (ATS). In this respect, fundamental and technical analysis cannot be applied by investors to gain irregular returns (Morelli, 2002; Megaritis *et al.*, 2021). Another study in Kenya by Maringa, *et al.* (2018), on market reaction to dividend announcements: Analysis at Nairobi securities exchange, concluded that concluded that Nairobi securities exchange is generally efficient in semi-strong form with respect to dividend announcements. Also in another Kenyan study by Bamurange, *et al.* (2019), acknowledges the semi strong form of the Nairobi securities exchange. Finally, Timmermann & Granger (2004) posits that most empirical studies have researched efficient market theory in their weak or semi-strong form due to the fact, there is difficulty of measuring the strong form and that it may be an expensive venture to obtain information on the strong form. Based on the above argument, this study adopts the

semi- strong form of efficiency since the semi-strong form upholds that all publicly accessible information is fully reflected in security prices. Publicly accessible information at the Nairobi securities exchange includes Information that is publicly available include previous prices, performance of the company, political updates, projections or analysis publicly available and information regarding macroeconomic factors and expectations (Ahmed & Farah, 2022).

Since information is considered sensitive, there is bound to be an impact on market return and share prices. Nevertheless, the efficient market theory has been criticized by various studies, which have concluded that it fails to examine the relevance of the information. Based on these criticisms, the current study considered the value relevance theory in to provide more insights on the current study.

### **2.5.2 Value Relevance**

The conception of value of relevance of market value ratios is delineated as the capacity of accounting to make a summary of the information essential to stock prices. Therefore, value relevance is considered to be a statistical relationship between fiscal information and stock returns or stock prices (Osundina, *et al.*, 2016; Liu & Liu, 2007).

A primary role of financial statements is the summarization of business events and transactions. Within this concept, the value of relevance of fiscal information and statements is measured by its capacity to capture and make a summary of the information that affects the value of equity. According to Raza *et al.* (2016), the premise for expecting market value ratios to impact the volatility of share prices us due to the relevance of accounting ratio. Research on value relevance is based on the summation that market value rations are important in the determination of the company's value in

the event that the company's cross-sectional variation corresponds with stock price or stock returns cross-sectional variation.

Nevertheless, value relevance as an element of market value ratios as adopted in accounting literature has been defined by American Accounting Association (1966) as such: "For information to satisfy the measure of relevance, it should be associated, albeit usefully, with the desired outcome, or with the action it has been designed to expedite. Subsequently, it requires that the information or the communication of the information influences the result or outcome". Therefore relevance can be summed up as the information's capacity to influence decision making on both existing and potential investors by either confirming or changing their expected results as per the events or actions of investment (Blankespoor *et al.*, 2020).

In order for fiscal information to be considered value relevant, the precondition is for accounting values to be related to the company's current value. In an instance where the company value and accounting numbers do not have an association, market value ratios cannot be reflected as value relevant, therefore, fiscal reports will not have satisfied their key objective. To put it more succinctly, Barth (2001); Barth *et al.* (2022), posits that value relevance research is an investigation of how accounting numbers are associated with equity market values. One of the value relevance researchers, Theil (1968) and Blankespoor *et al.* (2020), defined information as a variation of expectations in an event's outcome. A company's financial statement is considered value relevant if it changes the assessments of investors with regard to the future distribution of profits (Adiputra & Hermawan, 2020).

In this study, the value relevance stream is premised on the notion that when information is considered useful, there will be a change in investors' behavior and

subsequently, the market will experience changes in the prices of stocks. Therefore, the summation is that information is value relevant if the prices of stocks have an association with information released in the market.

According to Mostafa (2016), value relevance can be interpreted in four ways. In the first interpretation, market value ratios are considered as leading stock prices through capturing intrinsic share values. Value of relevance is measured as the profits resulting from the implementation of accounting rules. In the second interpretation, it is surmised that if the origin of components used in valuation models is information from financial statements, the information is considered to be value relevant. The third interpretation is founded on the statistical link between market value and market value ratios whereby the primary objective is the measurement of whether investors implement the information in the setting of share prices. Finally, in the fourth interpretation, value relevance is perceived as a long window whereby the association between market values and market value ratios are examined statistically.

According to Nam and Seong (2019), accounting based measurements give an appropriate explanation of market prices, in the assumption held by efficient market that pricing is a reflection of available information. The conceptualization of market relevance makes reference to the strength of association between market value of equity and accounting components of a company. The key feature in these delineations is that accounting numbers are considered value relevant if there is a strong relationship with the market value of securities. In order to consider financial ratios value relevant, a precondition is that accounting amounts need to correspond to the company's present value because without an association between the company's value and accounting amounts, market value ratios cannot be considered to be value relevant. This is because

financial reports will not have fulfilled their key objective (Morales-Díaz and Zamora-Ramírez (2018).

### **2.5.3 Signaling**

Signaling theory was promulgated by Andrew Michael Spence in 1973. It builds on the notion of asymmetric information. The theory posits that in some economic situations, inequality in information access predominantly upsets the normal market and how goods and services are exchanged. According to Miller and Modigliani (1961) and Hussainey (2011), the assumption is that management and investors have adequate and apt knowledge about the company, which has however been disputed by various researchers, within the argument that managers' information tends to be more detailed than the information obtained by shareholders.

Spence (1973) argues that two parties can find a workaround on the issue of asymmetric information through one party sending a signal that would reveal relevant information to the second party. Subsequently, the second party would deduce the signal and make adjustments to their purchasing and selling behavior. According to Ahmad *et al.* (2018), the advantage of receiving relevant market information is that an investor can put a higher price, which would have otherwise been lower had they not received the information. Signaling theory is applicable in the description of behavior when organizations and individuals access different forms of information. The theory makes reference to information content hypothesis, whereby it is upon the sender to choose how to send the information or communicate, and is also upon the receiver to choose how the signal will be interpreted (Butler *et al.*, 2019).

Corporate announcements are hypothesized to have information content. Rosati *et al.* (2019) posits that companies communicate as a way of revealing themselves. For

instance, the use of cash dividend announcements by managers of the company to signal investors on changes in the company and the effect of these changes in an event of imperfect market conditions. The financing and investment decisions of a company are discretionary to the management of the company. It is surmised that management of the company use earnings as an instrument to signal investors about the company's prospects. Similar to dividends, when the information conveyed through the company's earnings is as useful, the usefulness of the information will be seen in the volatility of stock prices after a public announcement (Chaleeda, *et al.*, 2019).

Melisa (2013) argues that share price reduces with a rise in share number issued by a company. Subsequently, stock splits lead to a rise in the amount of securities issues and reduces the prices of shares. Alternatively, when more debt instruments are issued, it results to an increase in prices. Stock splits are defined as corporate actions which have an effect of the number of securities outstanding of public firms and the market price range. However, the company's market capitalization is not affected, neither is the existing shareholders' wealth. Melisa (2013) concludes that with a stock split, companies raise the share amounts outstanding by a certain number and subsequently, the share price drops corresponding to the rise of amount of shares.

Usually, the stock split ratio is 2:1, meaning that the share number is doubled and the share price is reduced by 50%, to maintain the total market value of shareholders. Melisa (2013) posits that equilibrium is rarely experienced by markets. Therefore, with the cost pegged on information, everyone does not have access to it in the same way and at the same moment. When dividends or earnings are announced by a company, they send signals to investors and should they choose to react to the signal, there will be an effect on the share prices of the firm listed on the market (Melisa, 2013).

Miller and Modigliani (1961) make the assumption that management and investors usually have apt and proper facts about a company, a summation that has been refuted by various researchers due to the fact that a company's management have access to timely and precise information about the company compared to investors who may be considered as outsiders. This creates an information gap between investors and managers. This gap is however, bridged by management through dividends that conveys the company's information to investors. According to Ozo *et al.* (2019), dividends carry pertinent information, precisely informing the investors on the company's prospects. The movement of the price of shares is an indication of the significance of company information carried by dividends.

According to Kumaraswami *et al.* (2019), Ahmad *et al.* (2019) and Nguyen *et al.* (2020), all shareholders have similar information about the company and their understanding and translation of the information could be considered to be similar across their pool. Managers and investors too, have access to the same information, therefore, they both have similar expectations on the company's trajectory. However, in real markets, asymmetric information between the two parties is prevalent and managers seem to have an upper hand on investors with information regarding risk and profitability. Managers access highly valuable information, which is more detailed, whereas investors do not have the same form of inside perspective, hence company management use dividends as a way of providing details about the company to investors.

The signaling theory forms the base of explaining the popularity of dividend policy since companies tend to build a clientele of shareholders who are comfortable with their dividend policies (Faruque *et al.*, 2021). This means that significant change in dividend

policies will affect the share price of the companies. The theory postulates that separation of ownership together with asymmetrical information between investors and managers lets managers employ dividends as an approach of signaling private company information about performance to investors. In the light of the existence of asymmetric information a decrease or an increase in dividends reveals to shareholders, sensitive information about the company (Hoffmann & Marriott, 2019).

According to Puspitaningtyas (2019), signaling posits that looking at the dividend policy of the company offers investors with the opportunity to determine how well a company is performing and how the future prospects of the company are with regard to return on their investment. On the one hand, a rise in dividend pay-out reveals that the company is foregoing its growth trajectory, which leaves it with less money to allocate towards future investment opportunities, or having no reserves for investment altogether. With a low retention, the signal from the company is considered to be negative which also negatively affects the price of securities. On the other hand, the dividend rise could also be considered a strong position for the company, which also leads to a rise in stock value.

The reality on money markets like the Nairobi securities exchange is that asymmetric information between market stakeholders exists especially between listed firm managers and investors. Managers' information regarding the company's future profitability and performance is different (Kumaraswamy *et al.*, 2019). Furthermore, the quality of information accessed by managers is considerably better compared to the information received by investors and as a result they may use dividend policy and any other trick as a means of conveying information to potential and existing investors. Therefore signaling theory support the argument that the management of listed



companies at NSE may use policies like dividend policy to influence share prices and ultimately affecting volatility of share price.

Consequently, the theory posits that there is information asymmetry, however the theory does not address the nature of the conflict. The study therefore employed agency theory to address the gap.

#### **2.5.4 Agency**

Agency theory explores the association between the principals and agents in an organization. In the agency relationship, there are two parties, thus the principal and the agent. The agent takes decisions and acts on the principal's behalf. The theory is pegged on this relationship between the two parties and the concerns that would arise as a result of their differing perspectives on risk and goals of the organization. In the financial landscape, the most highlighted relationship in this context exists between the management and shareholders of a company whereby the management is mandated with decision making acting in the interest of the shareholders on mind. The shareholders are therefore considered to be the company's true owners (Shogren *et al.*, 2017).

The agency theory makes the proposition that the agency relationship happens when one party elects the other party to act on their interest's behalf. In companies, institutional shareholders as the firm's owners make delegations to the managers to make decisions on their behalf. As such, shareholders as the principals, whereas managers are the agents in this relationship. Essentially, the separation between owners and managers creates the relationship between agents and principals. The theory makes the assumption that each party acts on their self-interests and are mainly concerned with utility maximization.

According to Alireza and Ali Tahbaz (2011), institutional shareholders' involvement in controlling and monitoring activities has a likelihood of reducing the issues arising from the agency relationship. Evidence on the role of institutional shareholders has largely supported the theory. Therefore, the performance of a company has been evidenced to improve after purchase of shares by institutional investors.

Institutional shareholders may act in a monitoring role. Therefore, they may reduce the need for procurement of external monitoring mechanisms. Ahmad and Jusoh (2014) argue that institutional investors play an instrumental role in the minimization of agency conflicts. This is done through institutional investors' capacity to monitor the performance of company managers or in some instances, taking control of company management. Ahmad and Jusoh (2014) further added that institutional investors, more so, those who have large ownership are greatly incentivized towards monitoring how the company is managed.

Further, the company's management is considered challenging when institutional shareholders effectively monitor the managers. Evidence shows that institutional investors positively and significantly influence performance of a company. Additionally, it has been showed that large institutional shareholders are directly associated with high turnover of managers. This gives the suggestion that institutional investors play a monitoring function in overseeing firm management (Ahmad & Jusoh, 2014).

A reliable monitoring happens when institutional investors require that their investment be maintained for a long time period and hold adequate shares to mitigate free rider issues. (Döring *et al.*, 2021). Under some conditions, there tends to be a pay-off for institutional shareholders who carry out monitoring activities to oversee company

managers. Similarly, managers who are cooperative receive pay-outs. This level of monitoring is called ‘relationship investing’, and has been argued to lead to optimal benefits for both managers and institutional shareholders. Thus, it needs to be empirically confirmed how the percentage of institutional ownership affects the link between market value ratios and volatility of share price (Jentsch, 2019).

## **2.6 Review of Empirical Literature**

### **2.6.1 Market to Book Value Ratio and Volatility of Share Price**

A firm’s book value is an important component that provides pivotal information on the value of the firm at any point (Sroufe, 2018). The firm’s book value plays a key role to the process of valuation (Palepu *et al.*, 2020). A study carried out by Akhtar, (2021) concluded that price-book value multiple is positively associated with the prediction of a firm’s equity value. Further, a study by Aras and Yilmaz (2018) focusing on 12 countries using a cross-sectional analysis concluded that market-book multiple has a positive association with the prediction of stock returns.

Daniswara and Daryanto (2020) study recommended a forecasting model for the impact of book value on stock prices. In his study, Daniswara and Daryanto (2020) established that price-book value multiple has a positive correlation to the future securities return of companies. Further, the model suggested that various variable combinations are associated with the future viability of a company. Subsequently, price-book value multiple may increase or decrease from all shares, which generates a high or low share return. Therefore, price-book value multiple is instrumental in a company as it enables the prediction of stock returns (Calhoun, 2020).

In a study by Fama and French (2012), investigating cross-sectional data from 1963 to 1990, the findings revealed a strong correlation between price-book value and stock

returns of businesses listed on the New York Stock Exchange (NSE) and American Stock Exchange (ASE). Ballings *et al.* (2015), also established the predictability of a company's performance through equity valuation multiples. Nonetheless, price-book value multiple showed a high relationship for stock return prediction compared to other equity valuation multiples. Geng *et al.* (2015), posit that valuation methods that focus on price-to-book value multiples are appropriate for firms that have small stock returns.

A study by Bianconi & Yoshino (2017) found similar results and concluded that firms with a high market-to-book ratio are much more certain about their prospects for the future, causing their stock prices to be less volatile. According to Thanatawee (2021) the market-to-book ratio is commonly used as a proxy for a company's growth prospects and, in their study, they established that market to book value ratio is significant and positively correlated to volatility of share price. As a result, companies with a high market-to-book ratio, also known as growth stocks, imply that the market rates highly the company and the future of such companies is seen as very bright.

Evidence of studies carried out in Denmark showed that price-book value multiplies more associated to price earnings, which suggest that price-book value multiples give greater predictions of stock valuations for companies (Shittu *et al.*, 2016). In similar scope, Rasheed *et al.* (2018), sought to investigate how accurately equity valuations are predictors of stock returns using price-book, price-cash flow, price earnings and price-sales multiples. In the study, the findings revealed that price-book valuation showed a significantly positive association with stock price returns which summed that price-book valuation was an impeccable forecaster for share prices.

Alternatively, Kusmayadi *et al.* (2018), established at 95% confidence level, a positively significant link between price-to-book value and share return of companies.

The conflicting evidence leaves a gap on the association of price-book value and stock price prediction. Hence the study will make the proposition that market to book value ratio does not significantly affect stock price volatility at Nairobi Securities Exchange in Kenya.

### **2.6.2 Earnings per Share and Volatility of Share Price**

Earnings per share has been used in a variety of studies which established that it has an association with share price. In a study by Tandon and Malhotra (2013), on the association between financial components and share price, the independent variables were dividends per share, EPS and PER. The findings revealed a positively significant association between EPS and share price, and a negative association between dividends per share and price earnings ratio to share price. Emamgholipour *et al.* (2013) investigated the relationship between financial variables and stock return, using PER, MBVR and EPS established that EPS was positively and significantly associated with stock return, whereas there was a negative association between MBVR, PER and stock return.

In a study on the impact of accounting information on share prices in Athens, Glezakos *et al.* (2012) concluded that BVPS and EPS have a positive association with stock prices. Further, Menike and Prabath (2014) investigated the impact of EPS, DPS and BVPS on stock price using multiple and single regressions. The findings revealed a positively significant impact of the variables to stock price of companies.

A study by Din (2017) investigated the predictability of stock return with financial ratios and the findings revealed that financial ratios had a strong power in the prediction of stock returns. In another study, Menike and Prabath (2014) investigated the link between financial components and stock price, using EPS, BVPS and DPS as

independent variables and the findings showed a positively significant link between EPS, BVPS, DPS and stock price of companies.

Mgbame and Ikhatua (2013) carried out a study in Nigeria to determine whether accounting information had value relevance to stock price. The study used EPS, DPS and BVPS. From the study, the findings revealed that there was positive and significant correlation between the variables, meaning that BVPS, EPS and DPS greatly impacted stock price. Olugbenga and Atanda (2014) also investigated the effect of financial information on stock price in the Nigerian context using operation cash flow, BVPS, EPS and DPS. The results from the study indicated that the variables had positive and significant associations with share prices.

Perera and Thrikawala (2010) aimed at establishing the significance of financial information on investment decisions. The study used price on equity, earnings per share and earning yield as independent variables. The application of correlation and regression models revealed that there was a significant and positive relationship between accounting information and share prices. A study by Uniamikogbo (2018), examined the link between accounting information and stock prices, using BVPS and EPS. The study applied a correlation and regression model, and the findings showed that share prices were greatly affected by BVPS and EPS. The study also suggested that a significant and negative relationship exists between BVPS and EPS.

Vijitha and Nimalathan (2014) studied in Sri Lanka on the significance of accounting information on share price and used ROE, EPS, PER and net assets value per share as independent variables. The findings revealed that NAVPS, ROE, EPS and P/E ratio had a significant relationship with stock price. Still in Sri Lanka Wang *et al.* (2013) carried out a study to determine whether there was a relationship between accounting and stock

prices. The study's independent variables were accounts receivable turnover ratio, quick ratio inventory, earnings per share, liquidity ratio, rate of price and price earnings ratio. Regression and correlation analyses were used which established that the association was positive and significant between accounting information and share prices. Similar strong correlations were established between ROE and EPS.

In Turkey, Zeytinoğlu *et al.* (2012) examined the link between financial ratios and share price, using market to book ratio, EPS and price to earnings ratio as the independent variables and using panel regression came to the conclusion that stock price was significantly impacted by EPS. The findings of the study also revealed that MBVR and PER were positively significant. They concluded that Earnings per share subsequently affects the estimation of future value of a firm as well as its equity value. Korkmaz and Karaca (2013) analyzed the factors impacting firm performance. The findings of their study revealed that earnings per share and dividend pay-out ratio led to an increase of share closing price. However, market value and book value did not have a similar outcome on share closing price.

Bayrakdaroglu *et al.* (2017) investigated the correlation between stock prices and company's accounting information. The study used BVPS and EPS as independent variables. Using panel data regression analysis, the findings established that market value ratios greatly impacted the movement of stock price. With these findings, the implication was that accounting information accessed from a firm's income statements and balance sheet play a significant role in the explanation of the company's stock prices.

Recently a study by Ahmed (2018) on the Impact of Dividend per Share and Earnings per Share on Stock Prices in Pakistan revealed that EPS and DPS have a significant and

positive effect on share prices. This study intends to use EPS as one of the independent variables based on the arguments above and also deviate from using stock price as dependent variable but instead use stock price volatility to allow the the problem of the study to be addressed. The study hypothesized that earnings per share does not significantly affect stock price volatility at Nairobi Securities Exchange in Kenya.

### **2.6.3 Price Earnings Ratio and Volatility of Share Price**

Jean (2015) cited in Osudina *et al.* (2016) described price earnings ratio as a measure that makes comparison between stock level prices and corporate profits, which provides investors with an overview of the company's stock value. Further, Jean (2015) posits that price earnings ratio can be described as the length of time it would take for stock to pay back what investors invested in a company, within the consideration that the company experiences no changes, which would otherwise impact the company's share price during a specific time period. Subsequently, Sharif *et al.* (2015) studied a data set of 41 companies in the Bahrain Stock Exchange, focusing on the 2006-2010 period, using a panel data analysis. The results established that DPS, ROE, PER, dividend yield, BVPS and FS components are instrumental in the determination of stock prices in Bahrain's stock market.

Arkan (2016) argues that PER is a valuation ratio, as it reflects the extent to which the capital market assesses the company's stock equity. Considering that the equity value is a reflection of the combination of return and risk. Therefore, valuation ratios are considered to be most inclusive in the measurement of company performance. Arkan (2016) adds that price earnings ratio is a gradation that reflects the company's factors such as corporate image, degree of liquidity and the orientation of shareholders.



Fama and French (1998) attempted to connect price earnings ratio and stock price volatility. They used price earnings ratio and the dividend yield to forecast future stock returns. A specific point of interest is the direction of the correlation between price earnings ratio and the volatility of share price. Earlier studies (Campbell & Cochrane, 1999; Bansal & Yaron, 2004), cited in David and Veronesi (2009) show a negative correlation between volatility of share price and PER.

Despite there being few researches on the effect of PER on the volatility of stock prices, various researchers have arrived to the conclusion that price earnings ratio can be used in the prediction of future decrease or increase of share prices. Koutmos (2010) finds a positive link between price earnings ratio and volatility of share price. Furthermore, he ascertains that price earnings ratio has a tendency to revert to its mean in the long run. David and Veronesi (2009) as quoted in Chun *et.al.* (2020), find that this relationship has strong magnitude and direction variations in time.

However, studies done by Karakus and Bozkurt (2017) and Sevim (2016) on impact of fiscal ratios on share returns established that the association between profitability ratios and stock returns is not statistically significant. Finally, Gautam (2017) carried out a study of Nepalese commercial banks and concluded that earnings price ratio, assets' growth and book to market ratio are instrumental in the determination of stock returns. Furthermore, dividend payment ratio, dividend yield, leverage, assets' growth and book to market ratio are key components in the determination of stock price volatility in Nepalese commercial banks. Thus, the research regarding the direction of price earnings ratio and volatility of stock price is still considerably uncertain. With increasing market volatility, it is notable that the association between the behaviors of price earnings ratio with stock price volatility needs further research.

#### **2.6.4 Book Value per Share and Volatility of Share Price**

According to William, Gordon and Jeffery (2014), a firm will generate revenue, of which a large percentage is paid as interest to creditors and as dividends to shareholders. Any balance is added to the company's accumulative reserved earnings. The total of the accumulative reserved earnings and other amounts under shareholder's equity is the company's book value. The book value reflects the company's past earnings, dividend distribution policy, and investment decisions (Sumangala, & Bhatt 2013). When the book value is high, it shows that a firm has extensive reserves which reveals that the company may be a candidate for bonuses. Alternatively, when the book value is low, it indicates that the firm's dividend distribution and bonus policy is generous, or that the company's trajectory of profitability is poor. According to Sumangala and Bhatt (2013), one of the vital components influencing the securities market value is book value. It is the value of a company's own funds per share. The book value of a company is a reflection of how much each share is worth. In general, book value aids in the fundamental analysis of stocks. As a result, the company's book value is studied to determine the investments' value.

Book value per share is considered an important component that impacts securities' market value as it is the value of the company's own funds per share and it is an expression of each share's worth in the company. The book value reflects the company's past earnings, investment decisions and dividend distribution policy. Therefore, a high book value is an indication that the company has a huge reserve and has potential for bonus, whereas a low book value is an indication that the company has a liberal distribution policy with regard to dividends and bonus. Alternatively, a low book value signifies that the company's trajectory of performance and profitability is poor (Pushpa & Sumangala, 2013). In Tehran, a study by Emamgholipour *et al.* (2013),

on the impact of performance evaluation market ratios and stock return in the Tehran stock market established that a significantly negative association exists between BVPS and volatility of share price.

According to Prasanna (2016), BVPS is hinged on financial accounting. Therefore, it is relatively easy to establish. As a result of this, it has been argued that BVPS is objective in the manner in which it represents the measure of value. Prasanna (2016) posits that upon quick exploration, objectivity in this case is hinged on accounting policies and conventions whose characteristics are arbitrariness and subjectivity. An allied and stronger disapproval against the measure of book value is that the historical data on the company's balance sheet on which book value is based, in most cases, diverge from economic value.

Glezakos *et al.* (2012) investigated the effect of book value and earnings on stock prices and investor decisions. The study sampled 38 firms on Athen's capital market, focusing on the 1996-2008 period. The study's findings revealed that the joint explanatory power of the study's variables with regard to stock prices rises over time. However, the authors posited that there is a diminishing effect of earnings, while the reverse was established in book value and investors push towards analysis of the important business parameters.

Graham (2010) investigated the value relevance of current residual income and BVPS in the South Korean, Thailand, Malaysia, Taiwan and Philippines contexts. The results showed that the components used have a positively significant relationship across all countries. Furthermore, the findings revealed that the model's explanatory power ranges between 24% to 90% in Thailand and Philippines.

Babalola (2012) studied the significance of accounting information. The study applied descriptive statistics complemented with regression models in examining the

relationship in the period 1999-2009. The study sampled 40 companies from different segments of Nigeria's economy. Babalola (2012) concluded that pertinent information influences investors' decision by aiding them in the evaluation of past, present and future outcomes. Nevertheless, the study's finding also revealed that earnings has more significance than book values, which means that earnings have more influence on the firms' corporate values compared to book value.

Olugbenga and Atanda (2014), carried out a study investigating the correlation between equity share investment decisions, dividends, earnings, cash flow and book values. The findings revealed that equity share investment decisions are greatly influenced by dividends, earnings, cash flow and book values. The argument posited by the study was that dividends, earnings, cash flow and book values were statistically significant in the explanation of investor behavior variation. Additionally, the relationship between share investment decisions and book values was investigated, which led to the conclusion that there is a positively significant link between book values and accounting information, summarily leading to the conclusion that the positive association also had a direct influence on the behavior of investors. Since investor decisions are guided by stock prices, it therefore gives the proposition that an association is existent between book value and stock price which could inform further discourse. Another study in Bahrain by Sharif *et al.* (2015) while analyzing factors affecting stock prices reported that BVPS has a significant and positive relationship to the changes in share prices.

While examining the effect of market value ratios on volatility of stock price of selected quoted manufacturing firms in Nigeria, Osundina *et al.* (2016) found that BVPS has a positive and significant relationship with stock price volatility.

### **2.6.5 Dividend Yield and Volatility of Share Price**

The effect of dividend yield on company stock prices is still an unresolved subject (Zainudin *et al.*, 2018). Various researchers have investigated the issue in detail. Baskin (1989) carried out a study on US. Subsequently, the study revealed a strong negative association between DYR and volatility of share price. The outcome showed that companies with high dividend yield have a low risk association. Similar outcomes were also established by Hussainey *et al.* (2011) who studied UK firms in a 1998 to 2007 period.

Allen (1996) obtained comparable findings in the Australian stock market. Allen (1996) revealed that in the context of the Australian stock market, stock price volatility decreased when dividend yield increased. The findings also shows that a company's leverage had a positively significant association with the volatility of share price. Other studies have also been carried out in emerging markets. For example, Nazir *et al.* (2010) carried out a study on 73 companies on the Karachi stock market in the 2003 to 2008 period. The outcome revealed a positively significant link between volatility of share price and DYR. Alternatively, dividend payout ratio had a negative association with volatility of share price. Further, Shah (2016) in a study established a negatively significant link between DYR and dividend payout (dividend policy) with the volatility of share price. Shah (2016) used data that differed from Nazir *et al.* (2010) with Shah (2016) using data from non-financial firms listed on the Karachi stock market in the period 2005 to 2012.

Hamid *et al.* (2017) used data from 2006 to 2014 in a study determining the association between volatility of share price and dividend payout ratio. The results showed a significant and positive relationship between volatility of share price and dividend

payout ratio. Plausibly, the differing results may be due to the differing sectors examined by Hamid *et al.* (2017) who focused on financial firms, Nazir *et al.* (2010) and Shah (2016) whose focus was on non-financial firms, and Ramadan (2013) who studied the relationship between dividend policy and volatility of share price in the context of industrial firms in Jordan in the period 2000 to 2011. In consistency with past research, Ramadan (2013) established that a rise in a company's dividend yield and dividend payout resulted to a reduction in share price volatility. In Iran, Lashgari (2014) established a negatively significant association between dividend policy and volatility of share price of firms in the Tehran stock market.

In the Malaysian context, Hashemijoo *et al.* (2012) investigated the association between dividend policy and volatility of share price in the 2005 to 2010 period. The study focused on 84 consumer product companies listed on the Bursa Malaysia. The findings were consistent with previous research which revealed that volatility of share price is negatively associated with dividend payout and dividend yield. However, there are some conflicting findings in the investigation of the relationship between volatility of share price, dividend yield and dividend policy. For example, Zakaria *et al.* (2012) studied 77 companies in the construction and materials sector on the Bursa Malaysia in the 2005 to 2010 period. The findings established that that volatility of share price of companies listed on the Bursa Malaysia for construction and minerals sector had a positive and significant association with dividend payout and dividend yield. Another study by Hooi *et al.* (2015) employed a dataset of 319 firms from different sectors on Kuala Lumpur's stock market. The outcomes indicated that there was a strong link between volatility of share price, dividend payout and dividend yield, with the relationship being negatively significant.

Nonetheless, studies carried out in early 1980s proposes that differences in dividends only are not enough to account for price deviations (Le Roy & Porter, 1981; Shiller, 1981). Further researchers such as Krainer (2002) give the impression affirming these findings. Da, Jagannathan and Shen (2014) utilizing the Gordon growth model emphasize the capacity of dividend yields to foretell stock activities while warning against relying on a single component. Evidence has emphasized a single dividend proxy for the purpose of conveying whatsoever each of the studies could possibly wish to achieve. According to Muchina (2015), such a standpoint disregards the harmonising feature of the components and the substitution impact of each.

In analysing dividend pay-out, Damodaran (2011) concluded that in the United States, many companies in 2009 paid dividends beyond their earnings. From this finding, Damodaran (2011) surmised that when companies pay dividends to shareholders beyond their earnings, there are two ways in which the company loses value. In the first way, the company creates a shortfall of cash that has to be recovered by the issuance of more shares. The shortfall of cash further results to capital-rationing demarcations that halt or stall the company from investing in value-adding projects. In the second way, Damodaran (2011) posits that the firm's value is destroyed. This is another reason in this study's context that higher dividend pay-out has an inverse relationship to the volatility of share prices. Making an allowance for market efficiency, evidence reveals that in the event of an efficient stock market, stock return volatility ought to be interrelated to the volatility of the components that have an impact on the prices of assets. This puts dividends in perspective.

### **2.6.6 Institutional Ownership's Moderating Effect on Volatility of Share Price**

A key query in the monetary landscape is exploring the association between variations in institutional ownership and stocks volatility (Wen *et al.*, 2020). Earlier research that have tested the association between stock returns and institutional ownership have provided three main conclusions. Firstly, institutional shareholders are “momentum traders” and they tend to be informed by past prices. Secondly, mutual funds as a group of institutions sometimes participate in institutional “herding”. Thirdly, the co-existing association between institutional ownership variations and stock prices is considered to be more stable than the “trend chasing effect” (ElGhouti, 2015).

Another research show the existing association between institutional ownership and volatility of stock prices and how company disclosure practices impact the relationship (Bushee & Noe, 2000). Based on previous studies, the summation is that company's disclosure practices result to an increase in institutional ownership percentages (Palepu & Healy, 2001). Furthermore, as Potter (1992) established, more institutional ownership is followed by high volatility in stock price. This indicates that an indirect association exists between the company's practices of disclosure and the volatility of stock prices by the fact that more institutional owners are attracted by the company. Bushee and Noe (2000) carried out a study that revealed a significantly positive correlation between transient institutional investment and the volatility of share price. Further, evidence suggests that a negative link between quasi-indexer ownership and volatility of share price (Li *et al.*, 2021).

Hassanzadeh *et al.* (2013) carried out a study examining the correlation between institutional ownership and the fluctuation of stock prices in the Iranian context covering the 2006 to 2010 period. The study was carried out on an emerging economy



and used pooled data methodology for estimation. The results showed the association between institutional ownership and volatility of stock price to be positive.

In an alternative study, Chen *et al.* (2013) investigated the influence of ownership structure on firm-level share volatility in the context of China, covering the 1998 to 2008 period. The findings showed that stock ownership by foreign firms increases the stock volatility at firm level, despite having controls for turnover, firm size and leverage and correcting for endogeneity. Further, the results exhibited a significantly positive link between institutional, individual and governmental shareholding and the volatility of stock return.

A study by Alzeaideen and Al-Rawash (2014) could however not give a significant association between individual and institutional shareholders on the one hand, and volatility of share prices on the other hand. The study focused on 51 firms in Jordan in the 2005 to 2009 period. The study employed panel data with two empirical models, specifically ordinary least squares (OLS) and seemingly unrelated regression (SUR).

Other researchers (e.g. Rubin & Smith, 2009) concluded contrarily that more institutional investors lead to increased share price volatility, a conclusion that was also augured to by Cheng *et al.* (2020). A study by Potter (1992), indicated that high institutional ownership leads to high volatility of share price. The summation from Potter (1992) was that the attraction of more institutional investors contributed to an indirect association between a company's practices of disclosure and volatility of share price. Also, the outcome of Lin *et al.* (2018) while investigating the impact of institutional investment on volatility of share return in Macao's casino firms from March 2010 to June 2015 suggested that high institutional ownership structure leads to low volatility of share price in Macao's casino shares.

A recent study by Ali *et al.* (2022) on Leverage, Ownership Structure and Firm Performance found that institutional ownership has negative but statistically significant relationship with firm performance on listed companies on Pakistan stock exchange.

Institutional ownership structure has been used as an independent variable as well as a moderating variable in previous studies for instance; In Nigeria, a study by Kibiya *et al.* (2019), on institutional ownership's moderation on the correlation between intellectual capital and financial performance in Nigeria found that institutional ownership has a significant and positive effect on the relationship, implying that it is a moderating variable. Institutional ownership structure has also been used as a moderating variable in another study by Hsiang *et al.* (2014), on family ownership, institutional ownership and internationalization of SMEs. The interaction of family ownership and institutional ownership was found to be positively related to internationalization, implying that SMEs with high family ownership are more likely to internationalize as institutional ownership increases. Recently, a study by Hassanein, *et al.* (2021), on "How does ownership by corporate managers affect R&D in the UK? The moderating impact of institutional investors" and found that institutional investor's ownership moderates the relationship between ownership by corporate managers and R&D decisions.

The current study used institutional ownership structure as a moderator based on the fact that it has been used as a factor influencing firm performance and also as a moderator variable in some other studies as demonstrated in the above findings. Also, earlier research work by (1980); Baskin (1989); Allen and Rachim (1996); Kellard *et al.* (2010); Cochrane (2011); Hussainey *et al.* (2011); McMillan and Wohar (2013) McMillan (2014); Shah and Noreen (2016); Suwanhirunkul and Masih (2018); and Camilleri *et al.* (2019) have demonstrated that market value ratios (including market

value ratios) affect the influence of information on firm performance which ultimately reduces stock price volatility. Subsequently, knowledge of these ratios tends to compensate shareholders through increased/better stock returns by reducing their exposure to investment risks.

Based on the above findings it is imperative to explore if institutional ownership structure moderates the link between market value ratios and volatility of the moderating effect of share price of companies listed on NSE in Kenya as an emerging market.

## **2.7 Controls**

### **2.7.1 Size of the Firm**

Firm size is a reflection of the company's size as perceived from the company's total assets. A number of researches have concluded on the correlation between firm size and share price (Hirdinis, 2019). Firm size is an estimating variable that is widely used to explain variations in disclosures in the company's annual report. Hashemijoo *et al.* (2012) pronounced that, when the firm is larger in size, the volatility of the share price is low, which could be due to more diversification by large-sized firms and limited access to public information to small firms. Subsequently, the expectation is that larger firms have lesser risk and even lesser volatility in share prices. Furthermore Zakaria *et al.* (2012), established that when a company is larger in size, there is a significant influence in the volatility of the company share price. Therefore, confirming the high negative correlation perceived the size of the firm and subsequent volatility of share price.

Harjoto and Kim (2017), opines that small companies' stock has, averagely a high rate of risk adjusted returns compared to larger companies. Some researchers have

concluded that the negative association between extensive returns and company size are stable across time (Harjoto & Kim, 2017; Hasangapon *et al.*, 2021). Further, Sharif *et al.* (2015) investigated the Bahrain stock market, where panel data of 41 companies was analyzed in the 2006-2010 period with size variable as a control. The results showed that PER, dividend yield, return on equity, DYR, BVPS and FS components were significant in determining share prices in the Bahrain stock market.

Other researchers such as Abbas and Sağsan (2019), Raza and Karim (2016), have concluded that the price of shares was higher and corresponds to equally larger company size. Mixed results although have been found, where some studies find size to negatively influence stock price (D'Amato & Falivena, 2020), and there are those who found no relationship between firm size and stock price (Egbunike & Okerekeoti, 2018; Nasarudin *et al.*, 2019).

Small companies' portfolios with low price earnings showed high returns than large companies with high price (Balemi *et al.*, 2021). A study by Acs and Audretsch, (1990) also concluded that when firm size is measured correctly, small companies don't have high returns compared to large companies. The findings reveal that the influence of firm size on the share price of companies remains secret despite the existence of empirical realities. The findings of Alajekwu and Ezeabasili (2020). As compared to those of the developed markets was that where as in developed markets size and leverage tended to be highly correlated with price volatility, these two variables was not significant in determining share price volatility in the emerging markets. This difference shows that the variables affect price volatility differently in different market settings.

Nazir *et al.* (2010) used fixed and random effects models in a study that established an insignificant and negative association between size and the volatility of stock price. Additionally, the study found similar outcomes in Pakistan. However, in the Pakistan context, size was positively correlated with volatility of share prices. Contradictory results have also been reported. For example, Hussainey *et al.* (2011) studied the United Kingdom market to establish the link between dividend policy and volatility of share price. The findings showed that when a company is large in size, the stock price is less volatile. Alternatively, when a company's leverage is high, the probability of high volatility in share price is equally high.

Sadiq *et al.* (2013) studied the Karachi stock market to investigate stock price volatility in non-financial companies. The study was conducted on 35 companies in the 2001-2011 period. The outcomes showed a positive correlation between asset growth and company size and volatility of share price. Another study by Hashemjoo *et al.* (2012) investigated the correlation between volatility of share prices and components of dividend policy using growth, size, earnings per share and debt as control variables. The outcomes showed a negatively significant relationship between dividend yield, payout ratio, firm size and volatility of share price.

Additionally, Al-Shawawreh (2014) carried out a study in Jordan's stock market focusing on 53 firms in the 2001 to 2013 period, whose outcome showed a positively significant correlation between size and the volatility of share prices. Recently, Haque *et al.* (2018) indicated that firm size has a great impact on a firm's stock price volatility. However, varied results still exist, for example, Lashgari and Ahmadi (2014) whose study showed an insignificant effect of size on the volatility of share price.

### **2.7.2 Growth and Stock Price Volatility**

A company's growth is a key factor in influencing the value of a company. A company that continues growing has favorable prospects overall and investor will certainly respond positively to it, hence increase the value of its shares. Growth is seen as investors as a company's capacity for higher return rates from investments made, therefore, when a company is perceived by investors as having a higher ability for profits, it is expected that the return on investment will be higher, which presents a significant association between share prices and company growth. Dewi et al. (2014) posits that growth is a reflection of the company's assets whereby past growth is a reflection of future prospects, and the growth ratio is an illustration of how the company is able to sustain its position amid the industry or sector it operates in as well as amid the growth of the economy in a country, as such growth affects the ability of the company not only to maintain its margins of profit, but also future business opportunities.

Muchina (2015) defines asset growth as the company's capacity to earn high returns which translates to high expectations in form of dividend, thereby leading to a high volatility of shares. With high rate of opportunities for growth and subsequently, with high growth of the company, the company's risk becomes higher which resultantly induces a higher volatility of share prices. Companies that are in a growth trajectory tend to sustain investment in property and equipment that is instrumental for required growth. Companies in this trajectory usually retain more revenue for projects and intuitively, it is appealing to hold on to the notion that the capacity for new investments to generate revenue is uncertain compared to existing investments. Therefore, investment opportunities are expected to have a significant effect on the volatility of share prices (Alrjoub & Alrabba, 2018).

A study by Zainudin (2018) found that the association between growth in assets and volatility of stock price has a significantly positive relationship at a level of 10 per cent, which gives an indication that with high growth rate and larger opportunities for firm growth, the company's stock riskiness increases. According to Sadiq *et al.* (2013), who studied volatility of share prices in the Karachi stock market and targeted 35 non-financial firms in the 2001 to 2011 period, asset growth has a positive correlation with volatility of stock prices. Alsu (2019) similarly established the impression of specific fiscal components on volatility of share prices. The results established a negatively significant association between leverage, firm growth and volatility of share prices.

## **2.8 Summary and Gaps**

Literature has been reviewed in this chapter on both the independent and dependent variables. The chapter began with conceptualizing stock price volatility and market value ratios, more specifically, PER, DYR, BVPS and EPS. The chapter has also conceptualized institutional ownership and delved into its moderating effect on the correlation between market value ratios and volatility of share price. Additionally, the chapter has also delved into the theories related to the study, such as efficient market hypothesis, theory of value relevance, signaling theory and agency theory. The chapter has looked at empirical literature on previous studies addressing the relationship between the variables.

Most researchers have mostly found macroeconomic factors to be explanatory for the volatility of share price (Megaritis *et al.*, 2021). For example, Schwert (1989) in analyzing the volatility of the stock market and macroeconomic volatility established that despite stock market volatility being correlated with average leverage, it had a weak prediction of stock volatility. Davis (2003) extended the work by Schwert (1989),

analyzing inflation and real output and volatility of stock in 13 industrialized and developed countries.

Similarly, Law (2006) and Angabini (2010) centered their study on the Malaysian market and established that during the Asian financial crisis in 1998 and the global financial crisis in 2008 especially on Kuala Lumpur's Composite Index, the stock price volatility was high. The scenarios in these studies could be deduced by investor sentiment and over-reaction, as well as economic variables during highly uncertain periods of crisis. This is corroborated by Zakaria (2012) whose study showed little evidence on how macroeconomic variables affect the volatility of the Malaysian stock market. These findings are however, inconclusive, which leaves the question of whether macroeconomic variables are sufficient in the prediction of volatility.

According to Spierdijk and Bikker (2017), fundamental variables are insufficient in explaining price deviation amidst the irrationality of traders, who may have an upper hand in explaining the volatility share prices. In this regard, it becomes necessary to explore other factors that can further be considered to be explaining stock price volatility. Nevertheless, conclusion about which factors appropriately explain changes in stock price volatility remains unsatisfactory, and theories haven't unanimously concurred in this field. Spierdijk and Bikker (2017), concludes that measurement definitions remain under debate for most researchers and vary from direct to indirect representations.

The literature reviewed in this section has established myriad inconsistencies in terms of the association between PER, leverage, payout ratio, ROE, EPS and volatility of share prices. Empirical literature reviewed in the current study reveal that the variety of studies that have observed the association between macro-economic components and



volatility of stock prices in the Kenyan context revealed different findings. These inconsistencies reveal that more inquiry is needed so that the findings can be narrowed. Consequently, a variety of macro-economic components need to be included in further research in order to establish the variables that mostly and significantly contribute to volatility of stock price, which is pivotal for policy.

From literature reviewed, the summation is that the substantiation of the link between market value ratios and volatility of share price is inconclusive. After reviewing past research, the conclusion derived is as follows: Foremost, the topic on factors influencing volatility of stock price has caught the attention of various researchers globally. However, the same extent cannot be said about the Kenyan context. In fact, the researches already carried out have not singled out market value ratios as factors affecting stock price volatility, instead, the market value ratios have been lumped in market value ratios. Secondly, despite there being various researches carried out in the past in the last decades, the studies are not yet in agreement on the impact of market to price ratio, book value ratio, price earnings ratio, growth rate, earnings per share and size on volatility of share price. Thirdly, most past researches seem to be silent on any moderation on the direct influence of market value ratios and volatility of share price. Fourthly, majority of researches have been hinged on data sets of years before 2017, which establishes that the data used by past studies is not up to date.

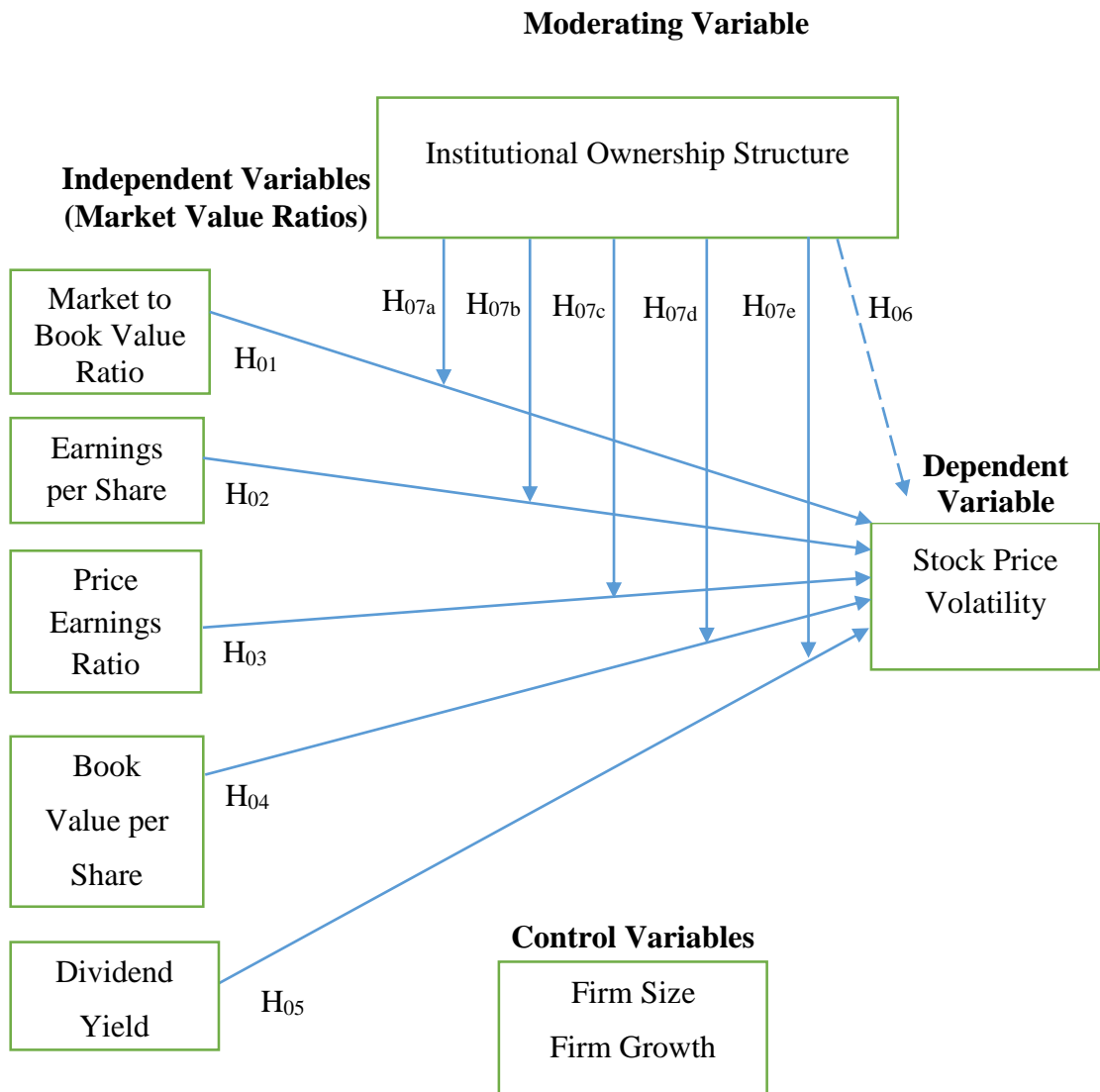
Additionally, various researches have employed different approaches, varying in combinations, which could be used to validate the inconsistent results. This presents a need for further studies to use alternative methods that would ensure consistent results. These contradictions in results are the ones that justify further research. Therefore, the main contributors to the research gap could be the models used, the macroeconomic

and firm specific factors being analyzed (for instance; when using market value ratios, there is need to be specific as the ratios could be market value ratios, profitability ratios, cash flow ratios, gearing or even liquidity ratios), the different combination of the factors analyzed, the moderating factor used, the study's timeframe, and the study's precise objectives.

The contradictions and gaps pointed out above justified this study in examining the influence of market value ratios on volatility of share price and also try to institutional ownership structure moderating effect on the link between market value ratios and volatility of share price in NSE, Kenya. The finding of this study will enable the various stake holders specifically single out market value ratios for consideration before making investment related decisions. Investors should also scrutinize the institutional ownership in the firms they are interested in because institutional ownership may moderate the correlation between market value ratios and volatility of share price on NSE in Kenya.

## **2.9 Conceptual Framework**

Ndegwa, *et al.* (2016) defines a conceptual framework as a graphic presentation of a study's variables, which shows how the dependent, independent and moderating variable are interrelated. The conceptual framework's purpose is to enable the reader to quickly understand the connection between a study's variables. This study adopted the conceptutual framework shown in figure 2.1.



**Figure 2.1 Conceptual Framework**  
Hayes, (2017).

Source: Researcher 2022.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter covers the description of the research philosophy, research design, population of the study, sample size and sampling technique, instruments of data collection, procedures of collection data, model specification and analysis of data.

#### **3.2 Study Paradigm**

According to Blaikie and Priest (2017, 2019), a research paradigm is defined as a comprehensive system of interconnected thinking and practice that defines the essence of an enquiry. Subsequently, research paradigms are categorized distinctly into three, which are positivism, interpretivism and critical postmodernism. Blaikie and Priest (2017, 2019) add that these perspectives form the popular paradigms in organizational, social and management studies. Key features that characterize these paradigms are, the worldview, nature of pursued knowledge and the different ways that knowledge is assessed and produced in each perspective. Paradigms are therefore essential because they give the views and dictates that affect what is to be studied, how it is to be studied, and how the findings are to be interpreted by scholars in a specific discipline. A research paradigm defines the philosophical direction of a researcher.

This study adopted a positivist paradigm. According to Martelli and Greener (2018), the positivist paradigm adheres to the supposition that a trustworthy measurement is only achievable through factual knowledge which has been gained through observation. The researcher's role in positivist studies is restricted to data collection and interpretation through objectivity and the outcomes of the study are quantifiable and observable. Samy and Robertson (2017) conclude that a positivist perspective makes

reference to philosophical standpoints that puts emphasis on scientific methods and empirical data.

The data used in this study was observable, quantifiable and empirical. Moreover, the study was scientific in its approach, based on the methodology to be adopted. In the positivist perspective, the main aim was to examine the explanatory or causal relationships between variables (Park *et al.*, 2019). The results are used in the confirmation or refining of theories which subsequently lead to new questions and hypotheses for future studies.

### **3.3 Study Design**

Rahi (2017) defines research design as a plan that guides the answering of research questions. Conceptually, a research design is the structure that a researcher adopts for their study. It is the conceptual structure within which research is conducted. This study adopted explanatory research design. In explanatory studies, the researcher looks for reasons and causes and gives evidence that either supports or refutes a prediction or an explanation. Cecez-Kecmanovic (2018) posits that explanatory research is primarily applied in the discovery and reporting of correlation between different elements of a phenomenon. Further, Mõttus *et al.* (2020), asserts that in an explanatory study, descriptive findings are explained and accounted. Therefore, whereas descriptive research are focused on the ‘what’ question, explanatory research is focused on the ‘how’ and ‘why’ questions, which implies that explanatory design is hinged on descriptive and exploratory research and is centered on the identification as to why a phenomenon happens.

The study used quantitative data comprising panel data (cross sectional and longitudinal). In quantitative method, the measurement and analysis of data is done

numerically in order for description of the data to be precise. According to Al-Ababneh (2020) quantitative research often involves objectivism, positivism and deductive method. In a quantitative approach, a phenomenon is explained with a process of collecting and analyzing data using statistical methods (Groenland & Dana, 2020). The quantitative approach has an advantage in that the data produced from analysis is quantifiable and generalizable to a large population. Additionally, with the quantitative approach, theories can be tested and validated in explaining the occurrence of a phenomenon with the testing of hypotheses. Finally, quantitative research is the systematic investigation of the data based on statistical and mathematical techniques (Rahman, 2017).

### **3.4 Population Targeted**

Population is the sum of subjects conforming to specifications that comprise the whole cluster or inquiry field upon which the study's results are generalizable (Bell & Waters 2018). Consequently, the population included all listed firms on NSE in the period between January 2008 and December 2019, hence, 66 companies comprised the target population. NSE was settled upon because it is a securities exchange in the emerging market. The year 2008 is the onset of the proposed capital markets policy (CMA) and regulatory changes in the Budget 2008/2009. During this time, the 2008 worldwide fiscal crisis that affected the global economies and affected share prices and capital markets was witnessed (AU Commission, 2009). Also, Kenya held three general elections 2007 (prior to study period), 2012, and 2017 which could have significantly impacted stock returns on Nairobi securities exchange (Amoro, 2019). Further, Kenya's promulgation of the new Constitution 2010 and NSE's structural policy reviews among various other changes such as the adoption of new technology to facilitate industry efficiency and effectiveness was witnessed in the same period (NSE, 2018). For

example, in 2009, the NSE established the CHU (Complaints Handling Unit) which was tasked with facilitating feedback to queries raised by investors.

Furthermore, several reports on investment in stocks among them Capital Markets Authority report of 2007 in Kenya for the last four years (prior to the study period 2008-2019) indicated that on average, stock prices appreciated to a record level and the price of quoted stocks more than quadrupled, which led to many investors making a lot of money. Unfortunately, some investors forgot that barely five years ago the same stocks hit record loss. According to the Financial Sector Regulators Forum, (September 2018, Issue No. 9), as of December 2017, the Capital Markets Authority of Kenya licensed more firms in various categories suggesting a tremendous growth of activities. The study targeted all listed companies on NSE, hence the listed companies on NSE was the unit of analysis.

### **3.5 Selection Technique**

This study adopted inclusion/exclusion. This is a non-probability technique that is based on a population's characteristics and the study's objective (Baltes & Ralph, 2020). This criteria is similar to judgmental, purposive, or subjective (Etikan *et al.*, 2016). Firms that met the inclusion criteria formed the sample, irrespective of the industry, fiscal year-end or any other differing demarcations. Thus, regressions were performed with largest probable samples and least selection bias.

The information used in this study was based on yearly average stock prices and published annual financial statements of all the companies listed on NSE. As of 31st December 2019, there were sixty-five companies listed in NSE.

The inclusion criteria was; companies listed in the NSE prior to 2008 and remained listed throughout the study period and companies having all required information

required by this study as shown in Appendix I. Were included in the study but Companies that did not meet this inclusion criteria were excluded from this study. This criterion enabled the study to focus on the stocks of companies that were active throughout the study period between 2008 and 2019 and was similar to those adopted by (Sharif *et al.*, 2015), and lately used by Mittal and Sharma, (2021). Out of the 66 companies listed on the NSE, 39 companies were sampled and comprised as Table 3.1 shows.

**Table 3.1 Companies Listed in the NSE as of 31st December 2019**

Sector	Total No. of Listed Firms	Total No. Excluded	Total No. Included
1. Agricultural	6	2	4
2. Automotive & Accessories	2	-	2
3. Banking	13	3	10
4. Commercial & Services	11	5	6
5. Construction & Allied	5	-	5
6. Energy & Petroleum	6	3	3
7. Insurance	6	4	2
8. Investment & Investment services	6	5	1
9. Manufacturing & Allied	8	3	5
10. Telecommunication	1	-	1
11. Real estate investment trust	1	1	-
12. Exchange traded funds	1	1	-
<b>Total</b>	<b>66</b>	<b>27</b>	<b>39</b>

**Source: Researcher, 2022**

**Note:** The inclusion criteria is:

- a) Companies listed in the NSE prior to 2008 and remain listed throughout the study period (2008 to 2019).
- b) Companies having all required information required by this study.

\*Companies that did not satisfy the selection criteria were excluded from the study (see Appendix II).



### **3.6 Data Collection and Variables Measurements**

Data on share prices and independent variables (EPS, PER, DYR, MBVR and BVPS) were obtained from Nairobi Securities Market handbook, CMA and published fiscal reports.

### **3.7 Operationalization and Measurement of Variables**

This section identifies the variables in the study that were measured or expressed quantitatively. Table 3.2 depicts the main variables identified and their units of measurement.

**Table 3.2 Variables Operationalization and Measurement**

<b>Variable</b>	<b>Category</b>	<b>Operationalization</b>	<b>Measurement</b>
MBVR	Independent variable	Refers to the ratio of a share's value to book value.	Is measured by division of market capitalization with net assets (Marangu & Jagongo, 2014).
EPS	Independent variable	Is an important financial measure, which indicates the profitability of a company.	Is measured by division of net income by total number of outstanding shares (Atidhira, 2017).
PER	Independent variable	Is the ratio of share price to the earnings per share.	Is calculated by dividing a firm's current stock price by its earnings per share. (Kumar, 2017).
BVPS	Independent variable	Is used by investors (especially value investors) to determine whether a share is fairly valued.	Is measured by dividing the book value of the company by the total number of shares on issue (LumbanGaol <i>et al.</i> , 2021).
DYR	Independent variable	Is the part of the earnings investors are paid by the firm, and the dividend-yield is the amount the company pays out relative to its share price.	Is calculated by dividing the annual dividend per share by the price per share (Broberg & Lindh, 2012).
SPV	Dependent variable	Stock price volatility is the rate at which the price of a security rises and falls or simply it's the variation in stock price.	SPV is measured follows; Parkinson (1980) and Martens and Van Dijk (2007), extreme value method is used because this method is far superior to taking yearly opening and closing prices. Hence it is calculated by subtracting lowest price from highest price i.e. annual range is divided by the average of lowest share price and highest share price, raising it to the second power and applying a square root.
INS	Moderating variable	Is the amount of available shares owned by pension or mutual reserves, insurance firms, endowments, investment companies, private foundations, or any large entities who are mandated with fund management on others' behalf (Singh & Kansil, 2018).	Institutional ownership is measured as the quantity of stock held by active institutional investors divided by the total number of shares outstanding in the company. We also consider that the level of monitoring in a firm could be driven by how much is owned by each institution (Singh & Kansil, 2018).
FS	Control variable	The size of a business unit means the size of a business firm. It is the scale of operation turned out by a single company (Jihadi <i>et al.</i> , 2021).	Size is one measured by means of the natural logarithm of total asset. (Batten & Vo, 2019).
FG	Control variable	Growth in assets represents the ability of the firm to earn higher returns which translates to higher expectations in the form of dividend hence higher share price volatility (Muchina, 2015).	Firm Growth is calculated as book value of asset subtracted from book value of equity added to market value of equity then divided by book value of assets. (Sewpersadh, 2019).

Source: Researcher 2022

### **3.8 Data Analysis**

Quantitative data analysis was used in this study, which comprised of panel data observations on MBVR, EPS, DYR, BVPS, PER, SPV, INS, FS and FG.

#### **3.8.1 Descriptives**

In this study, descriptive statistics was used in describing the relationship between; MBVR, EPS, DYR, BVPS, PER, SPV, INS, FS and FG. Descriptive statistics involved calculation of means, standard deviations, maximum and minimum of the variables of the study. It involved the plotting of various graphs such as line graphs and bar charts to give pictorial view of data of the study variables. Descriptive statistics was also important in this analysis as it was used in the description of the general characteristics of the sample, identification of omitted values and checking for outliers.

#### **3.8.2 Correlation**

This study carried out correlation analysis to determine the correlation strength and direction between the study's variables. This was done by computing Pearson product moment correlation coefficient that applies pairwise correlation techniques. Pearson product moment correlation coefficient ( $r$ ) ranges between +1 and -1. Correlation coefficient of +1 implies perfect positive correlation, -1 shows a perfect negative correlation while 0 implies no correlation.

### **3.9 Test of Stationarity**

According to Likens *et al.* (2019), a stationary time series is one whose statistical elements for instance as mean, variance, and autocorrelation remain constant over time. Stationarity is tested to elude spurious regression where a regression of one on the other variable can have a very high R-square regardless of unrelatedness between the variables. This study performed a panel unit root test. A unit root is a feature of a

process that evolves through time that can cause problems in statistical inference involving time series models. The study used both Levin-Lin-Chu Panel Unit Root Test and Im-Pesaran-Shin Unit Root Test. The adoption of both methods was for the researcher to ascertain robustness.

### **3.9.1 Levin-Lin-Chu Panel**

The Levin-Lin-Chu panel data unit root test was performed on the model. Levin *et al.* (2002) propose a panel unit root test for the null hypothesis of unit root against a homogeneous stationary hypothesis (Kaboro & Mose, 2021).

### **3.9.2 Im-Pesaran-Shin**

Im-Pesaran-Shin, (IPS) is which an extension of the Dickey is-Fuller (DF) test was also performed. The null hypothesis for this test is that all panel contain unit root.

### **3.10 Specification of the Model**

This study employed panel data analysis. This form of analysis comprises observing entitie for instance countries, companies and individuals over a period of time (Torres-Reyna, 2017). Panel data allows for variables that are not measurable or those that are characterized by fluctuation to be controlled. This study used either fixed effects or random effects models. Finally, the Haussman test was used to choose the most appropriate model between the two. In fixed effects, the individual-specific effect is a random variable allowed to be correlated with the explanatory variables.

***Fixed Effects:*** Related effects

*Fixed Effects* Explicitly states the absence of the unrelatedness assumption in Random Effects.

Fixed Effects assumes that the time-varying explanatory variables are not impeccably collinear, that they have non-zero within–variance (i.e. variation over time for a given

individual) and not too many extreme values. Hence,  $x_{it}$  cannot include a constant or any time-invariant variables. Note that only the parameters  $\beta$  but neither  $\alpha$  and  $\gamma$  are identifiable in the fixed effects model.

Salkind (2010) posits that random-effects models are statistical models in which some of the parameters (effects) that define systematic components of the model exhibit some form of random variation. In the random effects model, the individual-specific effect is a random variable that is uncorrelated with the explanatory variables.

***Random Effects:*** Unrelated effects

*Random Effects* Assumes that the individual-specific effect is a random variable that is uncorrelated with the explanatory variables of all past, current and future time periods of the same individual.

Hausmann test was used to explore the appropriateness of the Fixed Effects or the Random Fixed Effects model for the study. The null hypothesis under a Hausmann test is that there is consistency in both the Fixed Effects Model and the Random Effects Model and the difference between them is of a lesser degree. However, under the null hypothesis the Random Effects Model is more efficient. If the null hypothesis is rejected, consistency is established in the Fixed Effects Model, hence more preferable (Sewelén, 2018).

### **3.11 Regression Model**

This study applied Ordinary Least Squares (OLS) multiple panel linear regression analysis to establish the association between the variables. Consequently, multiple regression is used in the prediction of changes in dependent variable relative to changes in the independent variables. Hence, multiple regression equations are a technique that

can provide the researcher with both prediction and explanation (Keith, 2019). According to Varoquaux (2018), for best analytical outcomes, a sample size of between 30 and 100 is required in multiple regression models. In this study, a population of 65 companies listed on NSE was targeted, thus multiple regression was suitable for analyzing the data.

The study adopted the methodology anchored on Adler & Dumas (1984); Jorion (1990) model. The model explains the expected stock prices by postulating a linear relationship amongst the variables. Rasoolimanesh *et al.* (2018) state that if the relationship amongst variables is not linear, then the results of the regression analysis will underestimate the true relationship.

The panel data model adopted in this study was:

$$SPV_{it} = \beta_0 + \beta_{it}X_{it} + \dots + \beta_{kit}X_{kit} + v_{it} + \varepsilon_{it} \dots \dots \dots 3.9$$

$$\text{Where: } i = 1, 2 \dots N, t = 1, 2, 3 \dots T$$

Here  $i$  is the cross section and  $t$  is the time. Since the  $SPV$  variable has diverse values in each time period of each unit, it is expressed with two sub-indices as  $i$  and  $t$ .  $SPV_{it}$  = dependent variable which signify variations in share prices of firm  $i$  at time  $t$ .  $\beta_0$  = the intercept or constant term of company  $i$  at time  $t$ ,  $\beta_{it}$  = the coefficient of the independent variable at time  $t$  which signifies the sensitivity of volatility of share price of firm  $i$  at time  $t$ ,  $X_{it}$  = a vector of independent variables at time  $t$ ,  $v_{it}$  individual specific effects and  $\varepsilon_{it}$  = white noise error term of firm  $i$  at time  $t$ .

Equation 3.9 is a one-factor model which can be equated to or interpreted as the Capital Asset Pricing Model (CAPM) which was originally developed by Harry Markowitz in 1952. The key assumption underlying equation (i) is that stock prices of companies in

Kenya are affected to a greater or lesser extent by a common underlying factor, specifically the sensitivity of let's assume Market price to book ratio, that is, sensitivity to systematic risk as represented by  $\beta t$ .

However, an alternative model to the one-factor (CAPM) is a multiple ( $k$ -factor) model. Multiple  $k$ -factor models can be interpreted as Ross (1976) Arbitrage Pricing Theory (APT) model, which can be seen as an extension and improvement of the CAPM. In the case of  $k$ -factor variables hence, ( $F_1, F_2 \dots F_k$ ) each variable has  $k$  sensitivities ( $\beta_1, \beta_2 \dots \beta_k$ ). The  $k$ -factor model takes the following form:

$$SPV_{it} = \beta_0 + \beta_{1it}F_{1it} + \beta_{2it}F_{2it} + \dots + \beta_{kit}F_{kit} + v_{it} + \varepsilon_{it} \dots \dots \dots 3.10$$

Where:  $SPV_{it}$  = dependent variable which represents volatility of share price of firm  $i$  at time  $t$  hence, ( $t = 1 \dots N$ ),  $\beta_0$  = the expected stock price volatility if all factors have a value of zero; usually referred to as the risk-free rate or the constant;  $\beta_1, \beta_2, \dots, \beta_k$  is the sensitivity of stock price volatility to the particular factor; and  $F_1, F_2, \dots, F_K =$  independent variables that influence volatility of share price.

Therefore, based on the  $k$ -factor model approach, the volatility of share price of listed firms on the NSE is expressed as a function of MBVR, EPS, PER, BVPS and DYR. As a result, the  $k$ -factor model in equation 3.10 takes the following form:

$$SPV = f(MBPV, EPS, PER, BVPS, DYR, INS) \dots \dots \dots 3.11$$

The hierarchical panel regression models can be expressed as:

$$SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + v_{it} + \varepsilon_{it} \dots \dots \dots 3.12a$$

$$SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + v_{it} + \varepsilon_{it} \dots \dots \dots 3.12b$$

$$SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + v_{it} + \varepsilon_{it} \dots \dots \dots 3.12c$$

$$SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + v_{it} + \varepsilon_{it} \dots 3.12d$$

$$SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + \beta_6 BVPS_{it} + v_{it} + \varepsilon_{it} \dots \dots \dots 3.12e$$

$$SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + \beta_6 BVPS_{it} + \beta_7 DYR_{it} + v_{it} + \varepsilon_{it} \dots \dots \dots 3.12f$$

$$SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + \beta_6 BVPS_{it} + \beta_7 DYR_{it} + \beta_8 INS_{it} + v_{it} + \varepsilon_{it} \dots \dots \dots 3.12g$$

### 3.12 Moderating Effect Model

A moderator is a third variable which affects the link between the dependent and independent variables. The effect of moderation is classified into three; the first effect is ‘enhancing’, which is that when the moderator is increased, the the independent variable’s effect on the dependent variable is also increased; ‘buffering’, whereby when the moderator is increased, the independent variable’s effect of the the dependent variable is reduced; or ‘antagonistic’, whereby when the moderator is increased, the independent variable’s effect of the the dependent variable is reversed. The moderator variable, if found to be significant, can cause an amplifying or weakening effect between dependent and independent variable (Memon *et al.*, 2019).

A key element of moderation is the measurement of causal effect of independent variable X on the dependent variable Y for different levels of moderating variable M. Statistically, the effect of X on Y for a fixed value of M is referred as the ‘simple effect’ of independent variable on its dependent variable. The simple regression equation for effect of X on Y is as follows.



$$Y_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon_{it} \dots \dots \dots 3.13$$

Assuming that the regression relation above exists and is statistically significant. When the moderator variable M enters the model, the moderating effect of M is modelled in the regression as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 M_{it} + \beta_3 X_{it} M_{it} + \varepsilon_{it} \dots \dots \dots 3.14$$

The regression coefficient  $\beta_3$  measures the interaction effect between independent variable X and moderating variable M.  $\beta_1$  measures the simple effects of X when the value of M = 0 (no interaction involved). Testing moderation in a model, a researcher needs to test  $\beta_3$  (the coefficient of interaction term XM). If  $\beta_3$  is significant, then it is concluded that the moderator M moderates the relationship between X and Y. If both variable X and M are continuous, researcher, needs to create the mean-centered value for X and M where  $X_i' = (X_i - \text{mean of X})$  and  $M_i' = (M_i - \text{mean of M})$ . Therefore, the new variable X and M has mean of zero. Now  $XM = X_i' M_i'$ . Variable Y does not have to be centered.

Fitting equation 3.15 on the variables in the study, the following equations 3.16-3.20 were used to test for moderation effect of the institutional ownership structure on each of independent and dependent variable.

$$SPV = SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + \beta_6 BVPS_{it} \beta_7 DYR_{it} + \beta_8 INS_{it} + \beta_9 MPBV * INS + \varepsilon \dots \dots \dots 3.15$$

$$SPV = SPV_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + \beta_6 BVPS_{it} \beta_7 DYR_{it} + \beta_8 INS_{it} + \beta_9 MPBV * INS + \beta_{10} EPS * INS + \varepsilon \dots \dots \dots 3.16$$

$$\begin{aligned}
SPV = & \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + \\
& \beta_6 BVPS_{it} \beta_7 DYR_{it} + \beta_8 INS_{it} + \beta_9 MPBV * INS + \beta_{10} EPS * INS + \beta_{11} PER * \\
& INS + \varepsilon \dots\dots\dots 3.17
\end{aligned}$$

$$\begin{aligned}
SPV = & \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + \\
& \beta_6 BVPS_{it} \beta_7 DYR_{it} + \beta_8 INS_{it} + \beta_9 MPBV * INS + \beta_{10} EPS * INS + \beta_{11} PER * \\
& INS + \beta_{11} BVPS * INS + \varepsilon \dots\dots\dots 3.18
\end{aligned}$$

$$\begin{aligned}
SPV = & \beta_0 + \beta_1 FS_{it} + \beta_2 FG_{it} + \beta_3 MPBV_{it} + \beta_4 EPS_{it} + \beta_5 PER_{it} + \\
& \beta_6 BVPS_{it} \beta_7 DYR_{it} + \beta_8 INS_{it} + \beta_9 MPBV * INS + \beta_{10} EPS * INS + \beta_{11} PER * \\
& INS + \beta_{12} BVPS * INS + \beta_{13} DYR * INS + \varepsilon \dots\dots\dots 3.19
\end{aligned}$$

If the interaction between independent variables and moderator variable (in this case institutional ownership structure) is not statistically significant, then institutional ownership is not a moderator variable, it is just an independent variable. If it is statistically significant, then institutional ownership structure will be a moderator variable, and thus moderation is supported.

### 3.12.1 Hypothesis Testing

Hypotheses  $H_{01}$  to  $H_{06}$  were tested using equation 3.12a to 3.12g. The moderating effect (hypotheses  $H_{07a}$  to  $H_{07e}$ ) were tested using equations 3.15 to 3.19.

### 3.13 Assumptions of Multivariate Linear Regression Tests

This study tested the following regression assumptions: Normality, serial correlation, heteroscedasticity and multicollinearity.

### 3.13.1 Shapiro Wilk Test for Normality

Normality test is used in determining whether a data set resembles normal distribution. According to (Gulati & Baber, 2020), a visual representation of the distribution of test results determines whether it conforms to the bell-shaped normal curve. The test is designed to detect evidence that the distribution deviates from a normal curve. The bell-shaped distribution in a normality test is an assumption that the scores on a variable are distributed normally about the mean, subsequently, regression is robust to moderate with violations of normality, provided there are no outliers.

Shapiro-wilk test was used to determine normality. According to the Shapiro-Wilk test, when the p-value is greater than 0.05, the null hypothesis of normal data is accepted. And if the value is less than 0.05, the data has deviated significantly from the normal distribution. Razali and Wah (2011) posit that Shapiro-wilk test is the most powerful normality test, followed by Jarque-Bera test and then Kolmogorov-Smirnov test. Similarly Wijekularathna *et al.* (2019), in a recent study on the power of several normality tests affirmed that Shapiro-wilk test is the most powerful normality test.

### 3.13.2 Lagrange Multiplier (LM) Test for Serial Autocorrelation

Auto correlation refers to correlation between values of a variable and lagged values of that same variable. It is a situation in which a time series data is influenced by its historical values. The delinquent with auto correlation is that it may make a model look better than it actually is). Auto correlation would most likely lead to unacceptable results (Cipra, 2020). This study used the Lagrange Multiplier tests methods to test for autocorrelation. The Lagrange multiplier tests belong to the class of asymptotic (large sample) tests.

These methods are applicable whether there is lagged dependent variable or not. Autocorrelation is said to be present in a variable if the p-values are more than 0.5. The test rejects the null hypothesis that there is no serial correlation up to lag four. Ljung and Box (1978) improved the finite sample performance of Box and Pierce (1970) by introducing a modified statistic based on standardizing the residual autocorrelations (Dalla *et al.*, 2020).

### **3.13.3 Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity across Panels**

In various cross-sectional datasets, each panel's variance is different. Usually, data on countries, states, or other units have variation of scale. The heteroscedastic model is specified by including the panels (heteroscedastic) option (Mosbei, 2021).

Breusch-Pagan and Godfrey test was adopted to test heterogeneity of variance. The null hypothesis is that there is homoscedasticity across panel and it uses the Lagrange Multiplier.

If the probability of the Breusch-Pagan test is greater than 5 percent level of significance. Then the hypothesis is accepted and concluded that there is homogeneity of variance (Homoscedastic).

### **3.13.4 Multicollinearity Test**

Multicollinearity occurs when there is a high degree of inter-correlations among independent variables in a multivariate regression equation (Pesaran, 2015). It is most common with time series and panel data. Multicollinearity can lead to large standard errors especially for OLS estimates (Kalnins, 2018). To avoid large standard errors, this study carried out a multicollinearity test using the variance inflation factor (VIF) method.

The variance inflation factor estimates how much the variance of a regression coefficient is inflated due to multicollinearity in the model. The VIF was calculated by taking an independent variable and regressing it against every independent variable in the model. VIF indicates the magnitude of the inflation in the standard errors associated with Multicollinearity (Lavery *et al.*, 2019). The VIF estimated VIF is given as.

$$VIF = \frac{1}{1-R_i^2} = \frac{1}{Tolerance} \dots\dots\dots 3.20$$

Where  $R_i^2$  is the unadjusted coefficient of determination for the regression of the independent  $i^{th}$  variable and the reciprocal of VIF gives the tolerance factor. When VIF is equal to one then this implies that the independent variables are not correlated with one another. The rule of thumb states that there is evidence of collinearity if the mean VIF is greater than unity or if the largest VIF is greater than 10 (Senaviratna & Cooray, 2019).

### 3.13.5 Linearity

This study used scatter plots to establish the association between variables.

### 3.14 Ethical Considerations

The study adhered to ethical concerns as posited by Tripathy (2013), which included non-identifying information to subjects to whom the data is attributed, acknowledgement of the data's ownership, data relevance and adequacy and evaluation through criteria of the study, thus, accuracy, data collection period, data content and purpose of the data. Further, the study adhered to the ethics of not keeping the data for a period longer than was purposed and ensured that access was limited only to the researcher. Hence, the researcher was responsible for appropriate conduct in analyzing

the data. The researcher obtained a research permit from National Commission for Science, Technology and Innovation (NACOSTI) to proceed with the study.

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATIONS AND INTERPRETATIONS

#### 4.1 Introduction

The main objective was to investigate the link between market value ratios and volatility of share price of firms listed on NSE in Kenya. Further the study examined institutional ownership structure's moderation on the link between market value ratios and volatility of share price volatility of firms listed on NSE in Kenya. Therefore, this section describes the findings in line with the objectives. It first presents descriptive statistics and later inferential statistics. Descriptive statistics are measures of central tendency and measures of dispersion such as the mean, minimum and maximum values, and standard deviations. Descriptive statistics further describes the correlation relationships among the variables and then presents the graphical representation of each of the variables. Data preparation for analysis is done where Unit roots tests are also presented and assumptions for regression are tested. Hausman tests results for model selection, and regression results, tests of hypothesis and discussion are presented. The results are presented in tabular and graphical form.

#### 4.2 Descriptive Analysis

The study described the data using measures of central tendency and dispersion. According to (Cohen *et al.*, 2014), descriptive statistics is important in analysis because it allows the presentation of raw data in a meaningful manner. It gives the general overview of the sample and to simplify large data set in sensible manner (Fernández *et al.*, 2018). Table 4.1 shows the descriptive summary of the sample data. The study period is from 2008 to 2019 which gives a total of 468 observations (there were 39 firms studied each observed for 12 years).

#### 4.2.1 Stock Price Volatility (SPV)

Stock price volatility is a statistical measure changes of a security's price over time (Osundina *et al.*, 2016). Stock price volatility (SPV) had a minimum value of zero and maximum of 1.343 with a mean of .1557 and standard deviation of .1369. The small standard deviation implies over the study period, the stock price volatility oscillated around the mean. Figure 4.1 shows the graphical view of volatility of stock price of companies listed on NSE. The graph indicate firms listed in NSE with low stock price volatilities just to mention a few are Barclays bank, KenGen, Safaricom and TPS LTD. Those with high volatilities are CO-OP Bank, EABL and Sasini PLC.

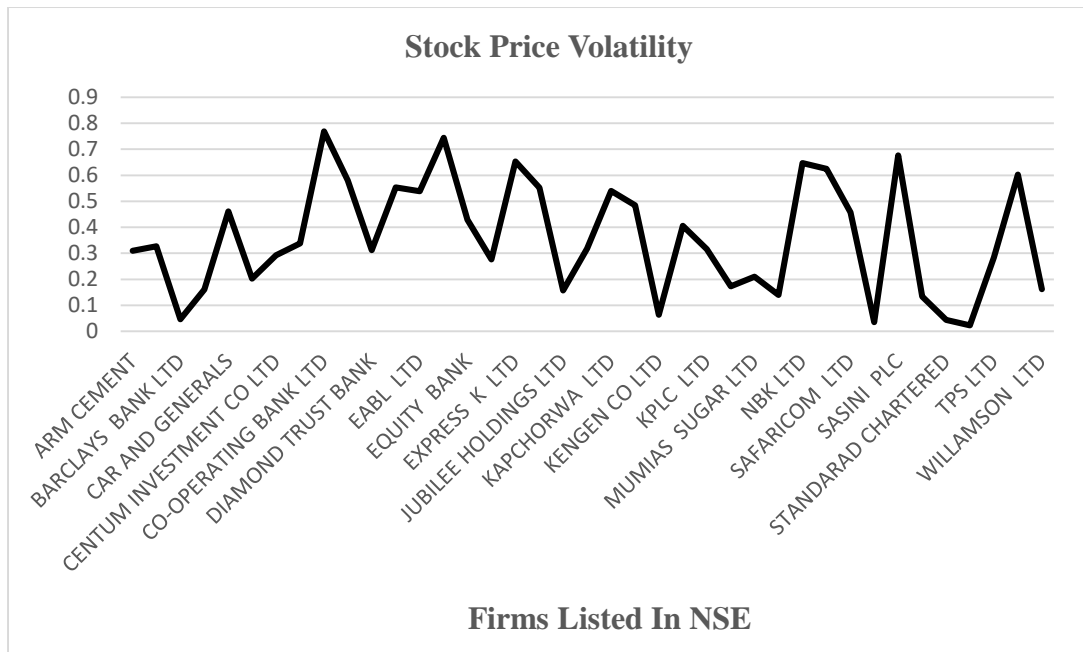
**Table 4.1 Descriptive Results**

<b>Variables</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. dev</b>	<b>Min</b>	<b>Max.</b>
YEAR	468	2013.5	3.4557	2008	2019
FIRM	468	20	11.2667	1	39
FS	468	6.9921	.6683	1.51	8.0672
FG	468	.1235	.2196	-.6103	1.5788
SPV	468	.1557	.1369	0	1.343
MPBV	468	1.3632	1.5681	0	8.53
EPS	468	8.1943	15.1668	-46.79	100
PER	468	10.5116	22.3896	-44.67	390
BVPS	468	76.6560	114.3081	1.23	940.84
DYR	468	.0397	.0513	0	.6
INS	468	.3602	.2243	.0101	.8174

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings Per Share, PER- Price Earnings Ratio, BVPS-Book Value Per Share, DYR-Dividend Yield Ratio and INS-Institutional ownership structure.

**Source:** NSE Data, 2022



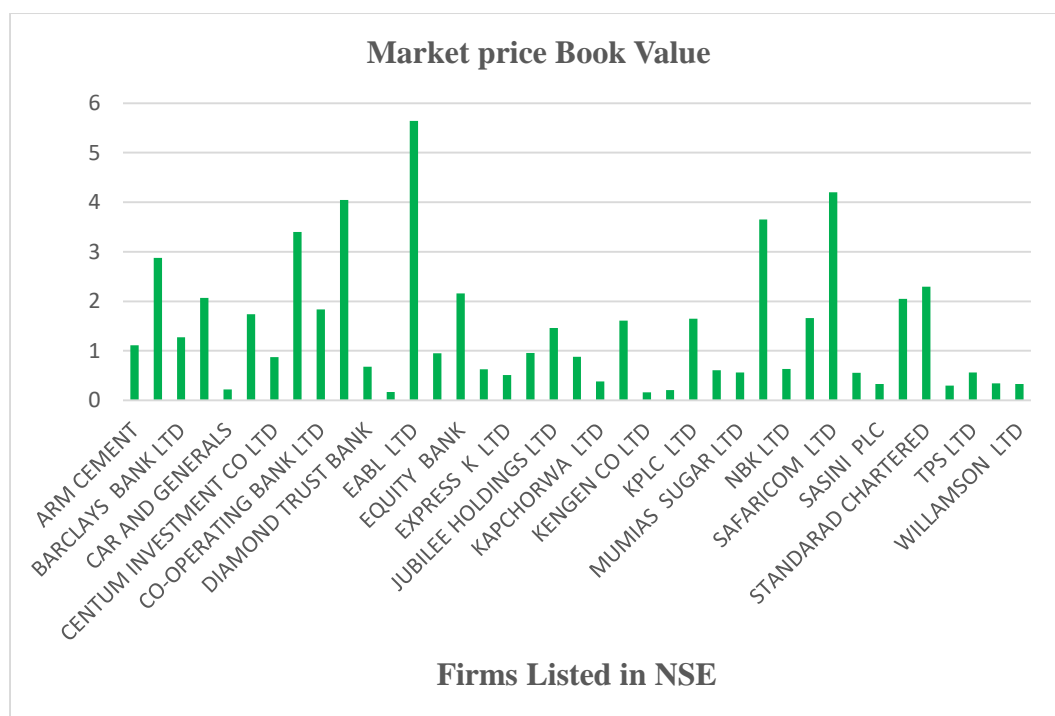


**Figure 4.1 Stock Price Volatility for Firms Listed in NSE**

**Source: Research Data, 2022**

#### **4.2.2 Market Price Book Value (MPBV)**

Market price book value ratio (MPBV) which is the share's market value to book value, calculated by dividing market capitalization to the net assets (Marangu & Jagongo, 2014). Results in Table 4.1 shows the graphical view of MPBV and indicate on average, listed firms in NSE had market price book value of 1.4248 and standard deviation of 2.1113. The minimum and maximum market to book value was 0 and 8.53 respectively. Small average value of 1.4248 which has slightly higher standard deviation implies there are huge deviations from one firm to the other.



**Figure 4.2 Market price Book Value for Firms Listed in NSE**

**Source: Research Data, 2022**

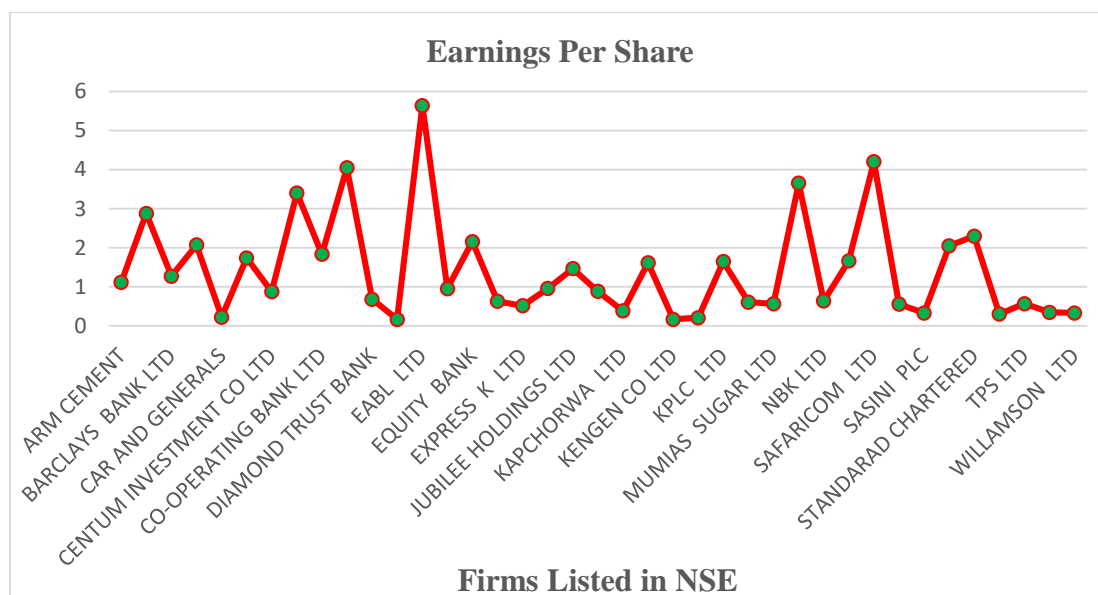
Many of the firms have less market book value than the other. Graphically, Figure 4.2 show firms such as CFC holdings, Crown paints, East Africa Breweries, Nation media and Safaricom have large market price book value. This indicates the mention firms with the largest market book value have an important feature that offers useful information (Palepu *et al.*, 2020), opined that a company's book value is pivotal for the valuation process.

#### **4.2.3 Earnings per Share (EPS)**

Earnings per share (EPS) is an important fiscal measure which indicates the firm's good trajectory in terms of performance. According to Atidhira (2007), it is projected by taking the net income of the firm and dividing it with the sum of outstanding shares. Results as shown in figure 4.3 indicates EPS for the studied 39 firms had a mean of 8.1943 and huge standard deviation of 15.1668 which shows that majority of the firms

have diverse earnings per share. Standard deviation measures how far the data are distributed from the mean.

When standard deviation is small, the variance is small, and values are close the mean. Crown paints, East African Breweries Ltd, Nation Media and Safaricom are some of the listed firms with large earnings per share (see Figure 4.3). These are firms that might experience a rise in the stock price. Subsequently, an increase in a company’s share price gives a positive perception of the company and its merchandise to customers, which leads to an increase in demand, increase in sales and in essence an increase in the company’s profit margins.



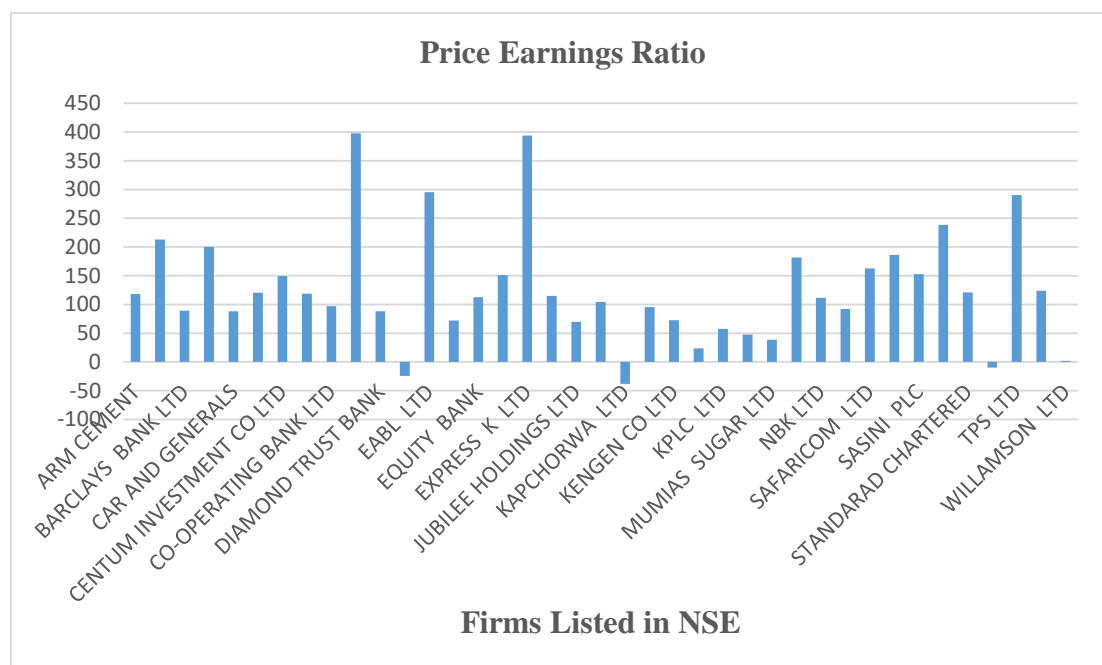
**Figure 4.3 Earnings per Share for Firms Listed in NSE**

**Source: Research Data, 2022**

#### 4.2.4 Price Earnings Ratio

Table 4.1 further indicate price earnings having a minimum negative value -44.67 and positive maximum of 390 price earnings. Standard deviation is also greater than the mean indicating more values are distributed away from the mean. Price earnings ratio may be used in the prediction of rise and fall of stock price. Osundina *et al.* (2016)

opined that a PER can be perceived as the length of time it will take for a stock to pay back investors' investment if the business didn't experience any change, which would alternatively have adversely affected the company's stock price at a particular time. Figure 4.2.4 indicates that varies between firm with some showing negative PER (Diamond trust, Kapchorwa ltd and standard chartered bank), whereas co-operative bank, east African breweries ltd, express Kenya and TPS Serena ltd are among the companies that showed very high EPS. According to Baresa, *et al.* (2013), stock with very high PER may be more favorable to investors than stocks with low PER. The implication is that a higher PER reveals the willingness of investors to pay a higher price at present due to expected future growth hence affecting the price volatility of the stocks.



**Figure 4.4 Price Earnings Ratio for Firms Listed in NSE**

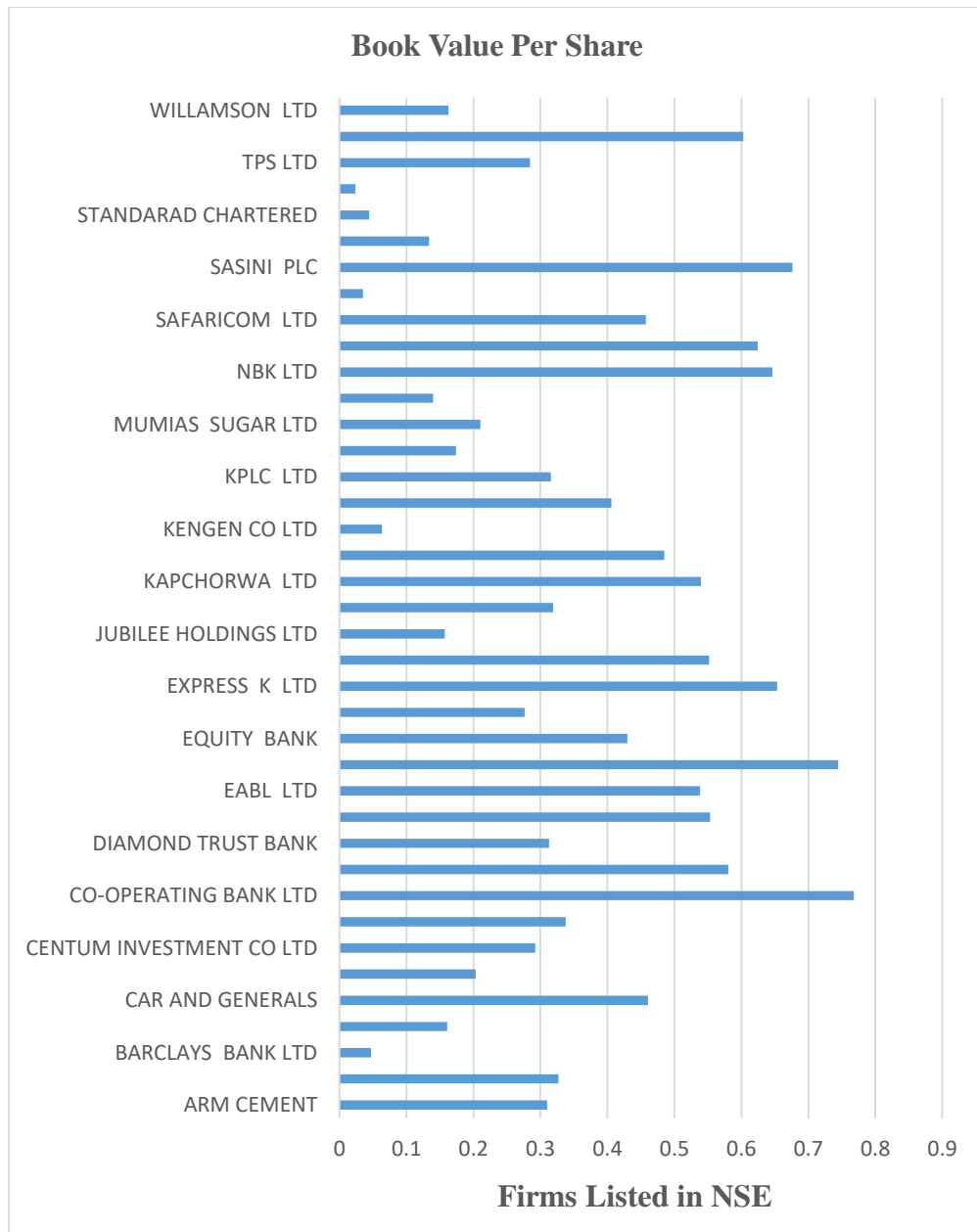
**Source: Research Data, 2022**

Figure 4.4 shows firms with negative PER were EA Portland Cement, Kapchorwa Ltd and Total Kenya whereas Crown paints, East Africa Breweries, Express Kenya Ltd and TPS Ltd had positive and large price earnings. PER is a reflection of a company's

degree of liquidity, shareholder orientation, growth prospects, corporate image and risk characteristics (Kumar, 2017). A relatively small PER or capitalization ratio suggests higher than average growth in future earnings.

#### **4.2.5 Book Value per Share**

Book value per share (BVPS) is a description of the quantity of shareholders' equity reduced by preferred shares and reported in the balance sheet of the company. The BVPS offers information regarding the worth of company resources (Damodaran, 2011). Table 4.1 shows the graphical view BVPS of listed firms on NSE and it indicates that BVPS had a mean of 76.656 and its minimum value of 1.23 and maximum of 940.84.



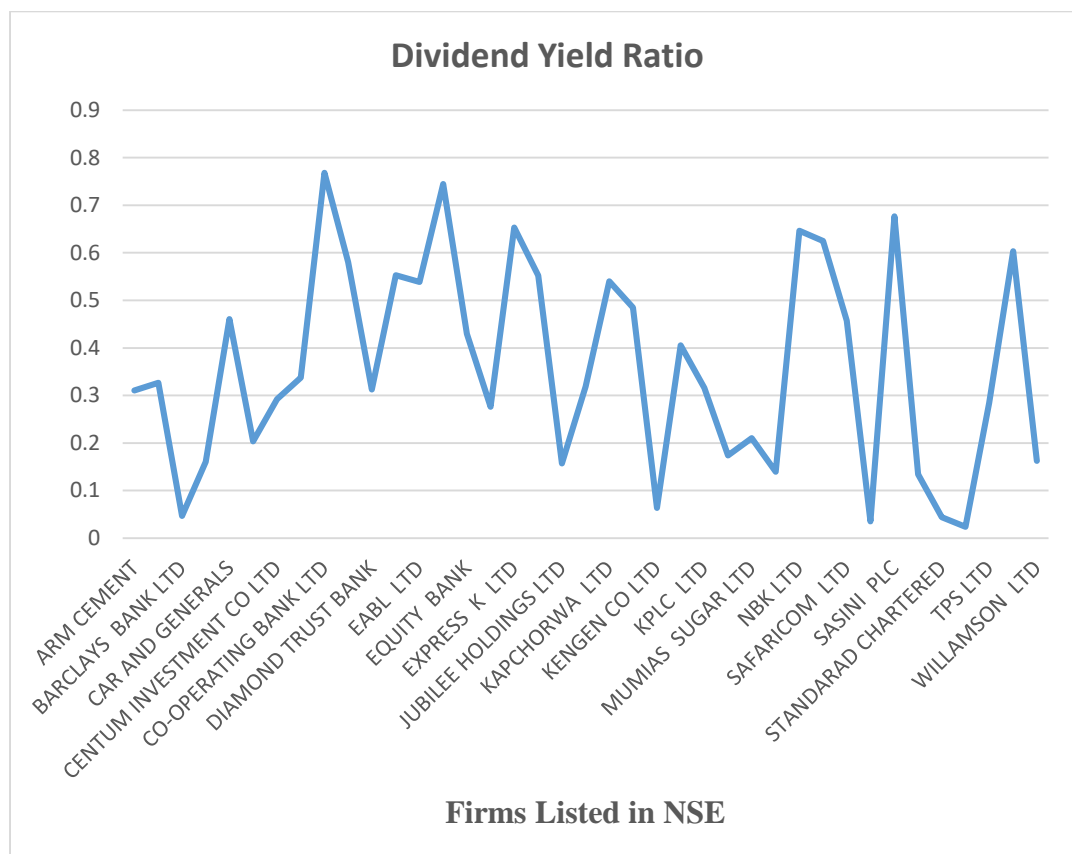
**Figure 4.5 Book Value per Share for Firms Listed in NSE**

**Source: Research Data, 2022**

A high book value is an indication that a firm's reserves are huge. This presents the company as a potential candidate for bonuses. Alternatively, a low book value is an indication that the distribution policy of dividends and bonuse is liberal, or a company's trend of profitability is poor. Companies listed in NSE and have high book value per share as shown in Figure 4.5 are Williamson Ltd, Kapchorwa, Kakuzi, and Jubilee Holdings while those with low book value per share are Safaricom, Eveready Ltd and

East Africa Portland Cement. The book value reflects a company's dividend distribution policy, past earnings, and investment decisions (Sumangala & Bhatt, 2013).

#### 4.2.6 Dividend Yield Ratio



**Figure 4.5 Dividend Yield Ratio**

**Source: Research Data, 2022**

The term dividend regularly refers to a distribution of earnings. Dividend is the portion of earnings investors are paid by the company, and dividend-yield refers to the amount paid by a company relative to the price of its shares (Broberg & Lindh, 2012). Companies with high dividend yield per share are Nation Media Group, Standard Chartered, Barclays bank and Crown Paints. Eveready and Express Kenya had the least dividend yield from the year 2008 and 2019 (see Figure 4.6).

Some of these companies had at least 0 minimum dividend yield while others had maximum of .6 dividend as shown in Table 4.1. Dividend is the portion of earnings

investors are paid by the company, and dividend-yield refers to the amount paid by a company relative to the price of its shares. These shares should be within the authorized share capital of the company due to the fact that the dividend increases the existing amount of shares. Summarily, it is usually provided proportional to the existing shareholding of the company.

These share dividend is a representation of the capitalization of the company's reserves which change from temporary to permanent form of securities. A share dividend is the share distribution in lieu of or in addition to dividends paid to investors by the company. The company distributes dividends to shareholders when investment projects with positive Net Present Values have been financed (Waswa *et al.*, 2014). There are various reasons why the issue of dividend payout is considered important. Consequently, a company uses dividends as a strategy for fiscal signaling to outsiders with regard to its growth prospects, stability and overall profitability.

#### **4.2.7 Institutional Ownership**

The institutional ownership refers to the quantity of a firm's stock that institutions such as private foundations, insurance companies, endowments, investment firms and other similarly large entities who manage funds on others' behalf own (Singh & Kansil, 2018). Table 4.1 present an average of 36.02% (mean of .3602) of the stock in NSE are owned by the institutions. The least amount of institutional ownership is approximately .0101 (1%) and a maximum percent of 81.74 (maximum of .8174). Further, Figure 4.7 indicate firms such as co-operative bank, East African Cables, Express Kenya, National Bank of Kenya, NIC bank and Sasini have more than 60% institutional ownership whereas Barclays, Sameer and Total Kenya have less than 10% of stock being owned by institution. Institutional ownership can be said to be the company's shareholders, albeit corporate entities.





**Figure 4.6 Institutional Ownership of Stock for Firms Listed in NSE**

**Source: Research Data, 2022**

The law permits corporations to transact and own property in their corporate names as registered. Typically, such institutional owners are well-organized and have resources necessary to keep the management teams engaged at all times. The institutional investor, too, reports to principals regarding the management of the resources of their firm, hence, they adhere to due diligence when investing in other companies (Amos *et al.*, 2016). Once institutional shareholders become the majority owners, the agency conflict will shift from agents (managers) versus principals (shareholders) to majority (institutional owners), and the majority will continue to try to transfer wealth to themselves at the expense of the minority (Süsi & Jaakson, 2020). This tendency is said to be against the firm's overall interest because the firm's overall interest includes the interests of the majority and minority shareholders.

#### 4.2.8 Control Variables

This study utilized size and growth as the control variables guided by empirical literature. Firm size refers to the company's total assets, amount of labor and level of

sales and was determined as the natural logarithms of the firm's totality of assets (Waluyo, 2017). While growth represents the company's capacity to achieve higher returns, translating to high dividend expectations and thus high volatility in share price (Muchina, 2015). Table 4.1 shows that Firm size had small standard deviation (.668) and a mean of 6.992. This small standard deviation implies that majority of firms have approximate equal firm size (not much deviation from their means). Similarly, some firms had a negative growth (minimum value of -.6103) with average growth of 12.35 percent (mean value of .1235).

### **4.3 Data Preparation for Inferential Analysis**

First and foremost, before analysis of inferential statistics Stationarity testing is key because all data in data generating process (DGP) exhibit three types of graphs according to the stochastic process that happens by chance that trending, drifting, and trending with drifts and these may cause non-stationarity (Kočenda & Černý, 2015). The next step conducted was testing the presence of unit root for each variable. The test was in guidance of the DGP. Katsiampa *et al.* (2019), stated that unit root is a property usually tested in time varying parameters. A series is said to be stationary if there is no unit root. No unit root implies that mean, variance, and covariance are constant over time periods (Jordan *et al.*, 2020).

Estimating regression models with non-stationary series data lead to interpretation that has no meaningful information about the general population being investigated and this would lead to misleading results. This study used two panel unit root test that is Levin, Lin and Chu (LLC) suggested by Levin, Lin and Chu, (2000), and Im-Pesaran-Shin test also referred as IPS developed by Im-Pesaran-Shin (2003). Judge *et al.* (1985) and Greene (2012) advocate the use of various panel unit root tests to ensure consistency and robustness.

### 4.3.1 Levin-Lin-Chu

Levin-Lin-Chu (LLC) was the first test used. The test considers panels is made up of homogeneous cross-sections, resulting in a test on a pooled data series. According to Levin, Lin, and Chu (2000), using this test significantly increase the test's power. The test has an additional *demean* option. This option removes cross-sectional means from the series to mitigate the effects of cross-sectional correlation. Akaike Information criterion was used in choosing the maximum lags on the individual specific effects and a linear time trend. Levin-Lin-Chu requires that the number of panels in relation to time periods is asymptotically becoming zero.

Panel unit root tests are ordinarily adopted in empirical economics, but there are some uncertainties with regard to interpretation of test results. This explains why rejecting the panel unit root hypothesis should be inferred as substantiation of stationarity in a statistically significant percentage of the units. As a result, in the event of a rejection, and in applications where the panel's time dimension is relatively large, the recommendation is that the test result be supplemented with an estimation of the quantity of cross-section units for which the individual unit root tests are rejected (Pesaran, 2012).

This test is improved from Augmented Dickey Fuller test, which is a conventional approach of time series unit root test. It uses an inverse normal z-statistic from Augmented Dickey Fuller with two lags and assumes the data follows asymptotic normality. The test has null hypothesis that the panel has unit root against alternative panel are stationary.

**Table 4.2 Levin-Lin-Chu Results**

<b>Levin-Lin-Chu Unit Root Test</b>				
$H_0$ : Panels contains unit root				
$H_1$ : panels are stationary				
AR parameter: common				
LR variance: Bartlett kernel: 7.00 lags average (chosen by LLC)				
Number of panels = 39				
Number of periods = 12				
Asymptotic: $N/T \rightarrow 0$				
<b>At Levels</b>				
<b>Individual Intercept Included</b>				
<b>Variables</b>	<b>Unadjusted <math>t</math></b>	<b>Adjusted <math>t^*</math></b>	<b>p-value</b>	<b>Remark</b>
SPV	-16.3251	-9.8497	.000	Stationary
MPBV	-14.1973	-8.5207	.000	Stationary
EPS	-16.5728	-8.4424	.000	Stationary
PER	-16.7666	-10.8887	.000	Stationary
BVPS	-13.4153	-7.6943	.000	Stationary
DYR	-17.5533	-12.2230	.000	Stationary
INS	-13.4027	-7.8923	.000	Stationary
FS	-14.1479	-7.4280	.000	Stationary
FG	-15.5768	-9.8858	.000	Stationary

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings Per Share, PER- Price Earnings Ratio, BVPS-Book Value Per Share, DYR-Dividend Yield Ratio and INS-Institutional

**Source: Research Data, 2022.**

When the probabilities are less than 0.05 critical value, this hypothesis is rejected. From the results of Levin Lin Chu test presented in Table 4.2, the header of the output makes explicit the null and alternative hypotheses. It shows the summary of exact specification of the test and dataset. By default, Bartlett kernel estimates the long run variance of the variables using a maximum of 7 lags since there is no prior expectation on the number of lags to be included. Options allows to include panel-specific means and time trends in the model of the data-generating process (GDP). The asymptotic label indicates the

behavior of the number of panels,  $N$ , and time periods,  $T$ , required for the test statistic to have a well-defined asymptotic distribution.

The unadjusted  $t$  is a conventional  $t$  statistic for testing the null hypothesis. When the model does not include panel-specific means or trends, this test statistic has a standard normal limiting distribution and its  $p$ -value; the unadjusted statistic  $t$  diverges to negative infinity if trends or panel-specific constants are included, so a  $p$ -value is not displayed in those cases. It is observed that all the variable, SPV, MPBV, EPS, PER, BVPS, DYR, INS and the controls variable such as FS and FG were stationary at levels. This is because the probabilities are less than 0.05 significance level. The conclusion was that the null hypothesis rejected, and alternative hypothesis of panels are stationary holds. All the data at their levels are stationary (no unit root present).

#### **4.3.2 Im-Pesaran-Shin**

The second unit root test Im-Pesaran-Shin test sometimes referred as IPS developed by Im-Pesaran-Shin (2003) was employed. The homogeneity hypothesis used in previous test LLC can be however too restrictive since panels can be composed of several cross-sections with different autoregressive coefficients (Barreira & Rodrigues, 2005). The primary supposition is that under the alternative hypothesis the convergence rate across entities can bias panel unit root tests, which imposes homogeneity when there is presence of coefficient heterogeneity in a cross-section data and can result in ambiguous inferences. IPS test offers a substitute to for overcoming such restrictions (Im, Pesaran & Shin, 2003).

The heterogeneity of panel data models used in cross-country analysis introduces a new type of asymmetry in the treatment of the null and alternative hypotheses that is not typically present in univariate time series (or cross-section) models. This is because the

same null hypothesis is imposed across all entities (in this study the firms) but the specification of the substitute hypothesis can vary with firms. In homogeneous panels, this asymmetry is assumed.

Nonetheless, as established by Pesaran and Smith (1995), ignoring heterogeneity (even if it is purely random) can result in erroneous outcomes in dynamic panels. As a result, in cross-sectional analysis where slope heterogeneity is the norm, the asymmetry of the null and substitute hypotheses must be considered. The test therefore used to give a robust and consistency as suggested by Judge *et al.* (1985) and Greene (2012).

Their p-values were less than 5 percent significance level. Jordan *et al.* (2020), expounded that variables showing unit root are varied to any order until they attained stationarity, meaning the variables were integrated after first variance. But in this research all variables are stationary at level implying the mean, variance and covariance are constant over the period of study hence no differencing.

**Table 4.3 Im-Pesaran-Shin Results**

<b>Im-Pesaran-Shin Unit Root Test</b>					
$H_0$ : Panels contains unit root					
$H_1$ : panels are stationary					
AR parameter: common					
LR variance: Bartlett kernel: 7.00 lags average (chosen by IPS)					
Number of panels = 39					
Number of periods = 12					
Asymptotic: $N/T \rightarrow$ Infinity sequentially					
<b>At Levels</b>					
<b>Individual Intercept Included</b>					
<b>Fixed-N exact critical values</b>					
<b>1%                      5%                      10%</b>					
<b>-2.040                      -1.900                      -1.810</b>					
<b>Variables</b>	<b><i>t</i>-bar</b>	<b><i>t</i>-tilde bar</b>	<b><i>z</i> – <i>t</i>-tilde bar</b>	<b>p</b>	<b>Remark</b>
SPV	-6.6039	-4.4778	-13.0917	.0000	Stationary
MPBV	-5.7113	-4.1839	-11.8139	.0000	Stationary
EPS	-6.3408	-4.4145	-12.8166	.0000	Stationary
PER	-6.1262	-4.3130	-12.3765	.0000	Stationary
BVPS	-5.8459	-4.2427	-12.0712	.0000	Stationary
DYR	-6.1374	-4.3349	-12.4717	.0000	Stationary
INS	-5.3147	-4.0299	-11.1480	.0000	Stationary
FS	-5.5905	-4.1418	-11.6336	.0000	Stationary
FG	-6.2112	-4.3289	-12.4455	.0000	Stationary

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings Per Share, PER- Price Earnings Ratio, BVPS-Book Value Per Share, DYR-Dividend Yield Ratio and INS-Institutional

**Source: Research Data, 2022.**

#### **4.4 Testing the Assumptions of Multivariate Linear Regression**

The statistical association or correlation between study variables is described by regression analysis (Guerard, 2013). Statistically, any regression model must make several assumptions; however, if these assumptions are violated, the expected results

are unreliable, biased, inconsistent, and inefficient, resulting in misleading conclusions and recommendations for future scholars. Under the multiple regression model of analysis, the following assumptions were evaluated: Normality, Multicollinearity, Heteroskedasticity and autocorrelation.

#### 4.4.1 Normality

**Table 4.4 Shapiro-Wilk W Results**

Variables	Obs	W	V	Z	Prob>Z
SPV	468	.772	2.373	1.262	.208
MPBV	468	.751	8.971	1.471	.142
EPS	468	.723	7.723	.723	.452
PER	468	.393	2.273	1.604	.110
BVPS	468	.585	1.672	1.696	.091
DYR	468	.619	.674	1.487	.136
INS	468	.957	.539	.245	.810
FS	468	.935	.559	.246	.803
FG	468	.829	.277	.573	.569

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings per Share, PER- Price Earnings Ratio, BVPS-Book Value per Share, DYR-Dividend Yield Ratio and INS-Institutional

**Source: Research Data, 2022.**

To establish whether the sampled data was drawn from a normally distributed population, the Shapiro-Wilk test was used. According to the Shapiro-Wilk test, when the p-value is greater than 0.05, the null hypothesis of normal data is accepted. And if the value is less than 0.05, the data has deviated significantly from the normal distribution. The outcomes in Table 4.4 indicates that the probability of the data on each variable was greater than 5 percent significance level.

#### 4.4.2 Multicollinearity

In regression analysis, a variance inflation factor (VIF) detects multicollinearity. The VIF quantifies how much the variance of a regression coefficient is inflated due to



model collinearity. A value of 1 indicates that there is no correlation between independent variable and any other. VIFs between 1 and 5 indicate a moderate correlation, but it is not severe enough to necessitate corrective action. VIFs greater than 5 indicate critical levels of multicollinearity in which the coefficients are poorly estimated, and the p-values are suspect. The results in Table 4.5 showed that the mean VIF for all variables in the study is 1.12 and each of the independent variables has VIF below 2 indicating that the explanatory variables are identically and independently distributed.

**Table 4.5 Results for Multicollinearity Test**

<b>Variable</b>	<b>VIF</b>	<b>TOLEANCE (1/VIF)</b>
MPBV	1.10	.911686
EPS	1.27	.787135
PER	1.05	.954291
BVPS	1.28	.778556
DYR	1.05	.954065
INS	1.09	.915608
FS	1.09	.919439
FG	1.05	.954065
<b>Mean VIF</b>	<b>1.12</b>	

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings Per Share, PER- Price Earnings Ratio, BVPS-Book Value Per Share, DYR-Dividend Yield Ratio and INS-Institutional

**Source: Research Data, 2022.**

#### **4.4.3 Heteroscedasticity**

The variance of the residuals is assumed to be the same for all independent variables. It tests for residual over-dispersion. Heteroscedasticity is often discoursed in parametric analysis as a linear regression postulation. When the variance of residuals varies unequally from a variable to one that predicts it, it is deduced that the variables are heteroskedastic. It is assumed that the regression model's residuals are homoscedastic across all projected dependent variable values. The test determines the ability of the

regression model to predict dependent variable is consistent across all the dependent variable values.

---

**Table 4.6 Breusch-Pagan / Cook-Weisberg Results**

---

Breusch-Pagan / Cook-Weisberg test for

Ho: Constant variance

Variables: fitted values of SPV

Chi2(1) = .092

Prob > Chi2 = .813

---

**Source: Research Data, 2022.**

Homoscedasticity refers to the assumption that errors have the same variance across all levels of independent variables (Osborne & Waters, 2002). This means that the study assumed that errors are distributed consistently across variables. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was used to assess homoscedasticity. Breusch-Pagan / Cook-Weisberg test uses chi-square, and the null hypothesis is that the variance is constant. Result in Table 4.6 indicates a probability of .813 > .05 implying the null hypothesis was not rejected and the conclusion was that residuals have constant variance (homoscedastic).

#### **4.4.4 Autocorrelation**

This study decided to test autocorrelation using the Breusch-Godfrey LM serial correlation test, which is thought to be more accurate (Rois *et al.*, 2012). This is because the existence of systematic correlation between one observation of the error term and the other imply classical econometric assumptions is violated and getting the accurate standard errors of coefficient estimates is difficult. The decision rule is to accept the null hypothesis and from the results in Table 4.7 indicate the probability for Breusch-Pagan LM test is .7212 which is greater than .05 thus the null hypothesis of no autocorrelation is accepted.

**Table 4.7 Autocorrelation Results**


---

**Null hypothesis: No autocorrelation) in residuals**

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	0.356900	741	0.7212
Pesaran scaled LM	21.45095		0.0000

---

Note: non-zero cross-section means detected in data

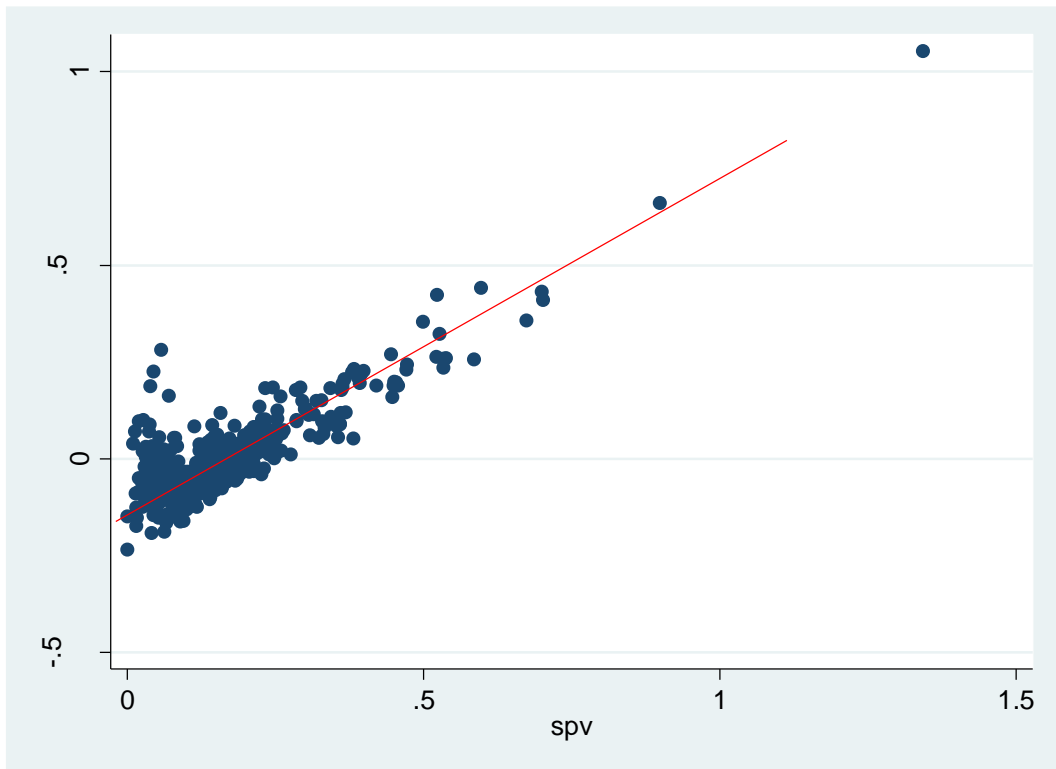
Cross-section means were removed during computation of

---

**Source: Research Data, 2022.**

#### **4.4.5 Linearity**

It is assumed in general linear model that the independent variables have a linear relationship with the dependent variable. Linearity is defined as the rate or amount of change between scores on two variables. It is considered to be constant for the entire range of scores for the variables. Scatter plots were used in examining the association between variables. The following Figure 4.8 shows that the link between the values of the dependent variable and the residuals of the independent variables exhibited a linear relationship.



**Figure 4.8 Linear Relationship between SPV and Residuals of Independent Variables**

**Source: Research Data, 2022**

#### **4.5 Pearson Analysis**

Correlation refers to any statistical relationship, whether causal or not, between two random variables. Correlation, in the broadest sense, refers to any statistical association, but it refers to the degree to which two variables are linearly related. The degree of association is measured by a correlation coefficient ( $\rho$ ). Table 4.8 presents the Pearson correlation analysis.

**Table 4.8 Pearson Correlation Coefficients**

	SPV	MPBV	EPS	PER	BVPS	DYR	INS	FS	FG
SPV	1.000								
MPBV	-.201*	1.000							
EPS	-.364*	.037	1.000						
PER	-.010	.145	-.041	1.000					
BVPS	-.304*	-.132	.425*	-.110	1.000				
DYR	-.199*	.061	.063	-.057	.101*	1.000			
INS	-.003	.032	-.195*	.044	-.182*	-.156*	1.000		
FS	-.157*	.189*	.065	-.082	-.014	-.007	.085	1.000	
FG	-.168*	.010	.120*	-.013	.077	-.067	-.083	.146	1.000

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings per Share, PER- Price Earnings Ratio, BVPS-Book Value per Share, DYR-Dividend Yield Ratio and INS-Institutional

\* Significance at 0.05 level

**Source: Research Data, 2022.**

All the variables have negative correlation with the stock price volatility. For instance, control variables, thus size and growth correlates to stock prices at coefficients  $\rho = -.157$  and  $\rho = -.168$  respectively. MPBV( $\rho = -.201$ ), EPS( $\rho = -.364$ ), and BVPS( $\rho = -.304$ ), have more than 20% correlation with stock price volatility. Price earnings and Institutional ownership structure had less than 10% correlation with stock price volatility.

The correlation between each of the independent variable indicate a weak correlation (all  $\rho$  values are less than 50 percent) with each other and this implies that each of them are identically and independent distributed, a property in statistics that indicates random walk. Correlations analyses are useful because they can indicate a predictive relationship that can be exploited in practice. Further, correlation denotes the association of two quantitative variables. It is assumed that the relationship is linear, meaning that one variable increase or decreases by a fixed amount for every unit increase or decrease in the other. Though the relationship is assumed to be linear, correlation does not show causation, it only indicates the strength and direction of correlation. A technique that shows causation that is frequently used in these situations

is regression, which involves estimating the best straight line to summarize the relationship is discussed in subsequent section.

The negative correlation of each explanatory variables with stock price volatility implies that increased volatility induces regulatory suppliers of agencies of capital to force organizations to allocate a larger percentage of available capital to cash-equivalent investments, to the potential detriment of efficient allocation (Rupande *et al.*, 2019). For instance, a lower earnings per share could diminish share prices which leads to reduced confidence on the part of consumers, reduced sales and diminished earnings per share.

#### **4.6 Regression**

The analysis of the study estimated two panel models: Random effect and fixed effect. In random effect model, specific individual effects are presumed to be uncorrelated with explanatory variables whereas in fixed effect model, the specific individual effects are presumed to be correlated with the explanatory variables. Panel data allows for estimation of relationships with time invariant and unobserved characteristics between two or more entities (listed firms). According to Greene, (2008), the difference between random and fixed effects is whether the unobserved separate characteristics effect represents elements that are interrelated with the independent variables in the model and not whether these effects are stochastic or not.

##### **4.6.1 Random-Effects**

Table 4.9 gives the random effect regression model summary results. Because there was no unit root, regression analysis was computed on the series at their levels (no differencing). Results indicate that the modelled variables fitted the data very well. This is because random effects which use Chi-square test (167.57) is significant (p-value

.000 < 0.05). This is a good indication since it shows a strong association that reveals that the explanatory variables jointly have a significant effect on the volatility of share prices among companies listed on NSE in Kenya.

Further, the value for overall linearity square 0.255 in Random effects showing independent variables explained at least 25.5% of the variation of the dependent variable. This implies that PER, BVPS, EPR, DYR, MPBV, INS, and the control variables, FS and FG explained 25.5 % of total variation of volatility of share price of listed firms on NSE.

Random effect model has some advantage over fixed. When the heterogeneity is constant over time and not correlated with independent variables, random effect models can help in controlling for unobserved heterogeneity. This constant can be removed from longitudinal data by differencing, because taking the first difference removes any time invariant components of the model. The random effects postulation and the fixed effects postulation are two common postulations that can be made about the individual specific effect. The random effects postulation states that unobserved individual heterogeneity is uncorrelated with the independent variables. Result indicates all variables except price earnings negatively and significantly affects stock price volatility as shown by coefficients and their respective probabilities.

**Table 4.9 Random-Effects Results**

Random-effects GLS regression		Number of obs	=	468		
Group variable: year		Number of groups	=	12		
R-sq:		Obs per group:				
Within	=	0.255	Min	=	39	
Between	=	0.364	Avg	=	39	
Overall	=	0.255	max	=	39	
corr(u_i,X)		0 (assumed)	Waldchi2(2)		157.44	
			Prob> chi2		0.000	
Spv	Coef.	Std. Err.	Z	P>z	[95% Conf. Interval]	
SIZE	-0.020	0.009	-2.300	0.022	-0.036	-0.003
GR	-0.074	0.026	-2.890	0.004	-0.124	-0.024
MPBV	-0.016	0.004	-4.410	0.000	-0.023	-0.009
EPS	-0.002	0.000	-5.330	0.000	-0.003	-0.001
PE	0.000	0.000	-0.830	0.405	-0.001	0.000
BVPS	0.000	0.000	-4.550	0.000	0.000	0.000
DYR	-0.432	0.109	-3.970	0.000	-0.645	-0.219
_cons	0.380	0.060	6.390	0.000	0.264	0.497
sigma_u	0.000					
sigma_e	0.119					
Rho	0.000	(fraction of variance due to u_i)				

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings per Share, PER- Price Earnings Ratio, BVPS-Book Value per Share, DYR-Dividend Yield Ratio and INS-Institutional

**Source: Research Data, 2022.**



#### 4.6.2 Fixed-Effects

**Table 4.10 Fixed Effects Results**

Fixed-effects (within) regression		Number of obs	=	468		
Group variable: year		Number of groups	=	12		
R-sq:		Obs	per	group:		
Within	=	0.256	min	=	39	
Between	=	0.1596	Avg	=	39	
Overall	=	0.2533	max	=	39	
corr(u_i,X)		0.011 (assumed)		F(7,449)	22.07	
				Prob> F	0.000	
				[95%		
SPV	Coef.	Std. Err.	t	P>t	Conf.	Interval]
SIZE	-0.023	0.009	-2.620	0.009	-0.040	-0.006
GR	-0.054	0.027	-1.990	0.047	-0.108	-0.001
MPBV	-0.015	0.004	-3.880	0.000	-0.022	-0.007
EPS	-0.002	0.000	-5.340	0.000	-0.003	-0.001
PE	.000	0.000	-0.730	0.468	-0.001	0.000
BVPS	0.000	0.000	-4.530	0.000	0.000	0.000
DYR	-0.474	0.110	-4.290	0.000	-0.691	-0.257
_cons	0.399	0.060	6.620	0.000	0.281	0.518
sigma_u	0.021					
sigma_e	0.119					
Rho	0.030	(Fraction of variance due to u_i)				

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings per Share, PER- Price Earnings Ratio, BVPS-Book Value per Share, DYR-Dividend Yield Ratio and INS-Institutional

**Source: Research Data, 2022.**

In fixed models, the individual specific effect is interrelated with the independent variables. Table 4.10 gives results for fixed effects model. F- test statistic (20.55) in fixed effects model also exhibited a significant model fitness ( $p - \text{value } .000 < 0.05$ ). This is also a good outcome of a strong association that shows that the explanatory variables jointly significantly impact the volatility of shareprice among firms listed on NSE. Further, the value for overall R square of 0.2533 shows the independent variables explained at least 25.33% of the variation of the dependent variable. The implication of this result is that MPBV, BVPS, PER, DYR, EPS, INS, and the control variables FS and FG explained 25.33 percent of total variation of volatility of stock price of firms

listed on NSE respective to the two models. Like in random effect, all the variables have a significantly negative effect on volatility of share price. The findings reveal that only price earnings are insignificant.

#### **4.7 Hausman Test**

In panel studies, both fixed and random models are estimated. As both above models are significant at 5% level of significant, it is very hard to choose which model is appropriate. To handle this problem, Hausman's specification test is estimated to give a decision which model is appropriate model from two possible options. The outcome of this is provided in Table 4.11.

This outcome suggests that most appropriate model is random effect model because  $\text{Chi}2(8) = 9.78, \text{Prob} = 0.1923 > 0.05$  insignificant at 5% level of significance according to the criteria of selecting a model described earlier. The Hausman test is applied in the selection of the regression outcomes (between fixed and random) are appropriate for hypotheses testing. Therefore, random effect panel regression results are suitable, and are used in testing the research hypotheses as discussed in the subsequent section.

**Table 4.11 Hausman Results**

	---- Coefficients ----			
	(b) Fe	(B) Re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Size	-0.023	-0.020	-0.003	0.002
Gr	-0.054	-0.074	0.020	0.009
Mpbv	-0.015	-0.016	0.002	0.001
Eps	-0.002	-0.002	0.000	0.000
Pe	0.000	0.000	0.000	0.000
Bvps	0.000	0.000	0.000	0.000
Dyr	-0.474	-0.432	-0.042	0.019

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

$$\begin{aligned} \chi^2(7) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 9.94 \end{aligned}$$

Prob = 0.1923 > 0.05

(V\_b-V\_B is not positive definite)

**Key:** FS-Firm Size, FG-Firm Growth, SPV-Stock Price Volatilities, MPBV-Market Price Book Value, EPS- Earnings per Share, PER- Price Earnings Ratio, BVPS-Book Value per Share, DYR-Dividend Yield Ratio and INS-Institutional

**Source: Research Data, 2022.**

#### 4.8 Hypotheses Testing

The study tested the hypotheses using multiple regression analysis. This type of analysis is employed to analyze the association on a single dependent variable and several independent variables. Table 4.9 gives the random effect regression model summary results. Because there was no unit root, regression analysis was computed on the series at their levels (no differencing). Results indicate that the modelled variables fitted the data very well. This is because random effects which use Chi-square test (167.57) is significant (p-value .000 < 0.05). This is a good indication since it points to a strong relationship which indicates that explanatory variables (EPS, BVPS, DYR, MPBV, PER, INS, and the control variables FS and FG) significantly and jointly affect the volatility of share price among listed firms on NSE in Kenya.

R-squared is the coefficient of determination and it shows the scale of differences caused by exogenous variables (EPS, BVPS, DYR, MPBV, PER, INS, and the control

variables FS and FG) on the endogenous variable (SPV). The value for overall R-square is 0.255 in Random effects implying that Exogenous Variables explained at least 25.5% of the variation of the Endogenous variable while the remaining 74.5% is caused by other factors outside this model and this captured by the error term. This suggests that EPS, BVPS, DYR, MPBV, PER, INS, and the control variables FS and FG explained 25.5 % of total variation of volatility of share price of companies listed on NSE in Kenya whereas the other 74.5% is explained by some other factors. This finding is similar to Fahim *et al.* (2016) who found that accounting variables considered in their study could only explain 19% of price volatility of the stock market and that there is very weak association between accounting variables with volatility of share price.

The first hypothesis stated that  $H_{01}$ : Market to book value ratio does not significantly affect stock price volatility at NSE in Kenya. The study findings indicated that market to book value ratio negatively influences stock price volatility ( $\beta_1 = -0.016$ ,  $p$  value=0.000 <.05). This implies that, hypothesis  $H_{01}$  stating that market to book value ratio does not significantly affect volatility of share price of firms listed on NSE was rejected. Therefore, the study infers that a rise in market to book value ratio by a unit causes share price volatility to reduce by -0.016 units. The hypothesis is rejected, hence the conclusion is that market price book value significantly affects stock price volatility. The negative effect implies that an increase of market-to-book ratio by one percent will lead to a decrease of stock price volatility by 1.61 percent. This result shows that stocks with higher market value are not likely to be volatile. Thus, market to book value ratio negatively influences stock price volatility.

These outcomes are in alignment with Bianconi and Yoshino (2017) who concluded that companies with a high market-to-book ratio are much more certain about their future prospects, thus causing their stock prices to be less volatile. Similarly, Larcker

(2011) established that market-book value is significantly related to markets forecast. The market-to-book ratio is reflective of growth potential, and a negative (on volatility of stock prices) coefficient indicates that investors focus on companies with higher development trajectories so as to boost their profits in good periods. In their study, Bianconi and Yoshino (2017) found similar results and concluded that companies with a high market-to-book ratio are much more certain about their prospects for the future, causing their stock prices to be less volatile.

According to Thanatawee (2021) the market-to-book ratio is commonly used as a proxy for a company's growth prospects and, in their study, they established that market to book value ratio is significant and positively related to volatility of share price. As a result, companies with a high market-to-book ratio, also known as growth stocks, imply that the market rates highly the company and the future of such companies is seen as very bright. Dung (2018) the market to book ratio is a measure of determining a firm's potential for growth. When a firm has great growth potential, it will communicate corporate information more openly in the market so that investors may assess the firm's capacity which reduces the likelihood of volatile stock prices.

Despite the many supports of the study findings, the study by Wagle (2021) deviates and found that market to book value has a significant and positive effect on volatility of stock prices. A single share's price of a firm's sellable share, which is referred to as the share price is a very sensitive component for companies that are listed in securities Exchange. The stock market reflects the economy, which is critical to the country's industrial and commercial development (Silwal & Napit, 2019). When the stock price is steady, the board of directors and management are happy, the moment it becomes volatile, it becomes a worry to all concerned parties including the shareholders.

Moreover, investors are serious risk avoiders, and the unpredictability of their investments is a big issue for them when deciding which investment option to make after examining the nature of the risk they may face (Hunjra *et al.*, 2014). According to Vutale and Chen (2017), a firm with higher earnings per share is a motivator both for investors and shareholders because it ensures that the firm's going concern is encouraging, which tends to attract many investors since their rate of return is guaranteed.

However, the current findings are contradicting the results of, Thanatawee (2021) who espoused that market to book value ratio is significant and positively associated to volatility of share price. It appears that the relationship between market to book value ratio is examined to a low extent. Thus, the current study contributes new knowledge on the negative link between market to book value ratio and volatility of share price. Also the results that were posted by Kusmayadi *et al.* (2018), established a positive and significant link between market price-to-book and share returns at 95% level of confidence. Further, a study by Daniswara and Daryanto (2020), showed that market price-book value is positively linked with future share return of selected firms. The argument thus, on whether market price-book value multiple can predict stock price volatility of companies is unsettled.

The second hypothesis of the study stated as  $H_{02}$ : Earnings per share does not significantly affect volatility of share price at NSE in Kenya. The random effect regression results showed that EPS significantly and negatively affected the volatility of share price ( $\beta_2 = -0.002$ ,  $p$  value  $< 0.05$ ). Thus, hypothesis  $H_{02}$  stipulating that earnings per share does not significantly affect volatility of share price of listed companies on NSE was rejected. This shows that EPS negatively affects volatility of share price. Therefore, a unit increase in earnings per share causes a reduction in

volatility of share price by - 0.002 units. Earnings per share had a negatively significant effect on volatility of share price. A firm with poor management and volatile stock prices, risks being taken over or even liquidated. Investors choose to put their money into reliable companies instead of those ones that are risky since it reduces their risk.

The current results are consistent with the findings of Sharif & Pillai (2015) who did a similar study in Bahrain stock exchange and suggested that stable stock price is preferable as it increases the confidence of the management and investors. The study results also are in agreement with the findings of Dissanayake and Wickramasinghe (2016) who contended that higher earnings per share lowers the chances of stock prices to be volatile. Similarly Uniamikogbo (2018), demonstrated that earnings per share negatively affects share price volatility. Similarly, the findings are in line with that of Mayuri and Mary (2017) which established that there is a significant and negative link between earnings per share and volatility of share price.

On the contrary, the results disagree with quite a number of results in the extant literature. For instance, studies by Mirfakhr-Al-Dini *et al.* (2011). Glezakos *et al.* (2012) Emamgholipour *et al.* (2013), Mgbame & Ikhatua (2013), Menike and Prabath (2014), Bayrakdaroglu *et al.* (2017) and that of Shah (2016) among other studies, established that EPS is significant and positively related to volatility of share price. This contrast could be as a result of the difference in the data sets used, the differences in the scope and may be the stage of development in the study areas. For instance, most the areas that recorded significantly positive results between EPS and volatility of share price, were from developed markets whereas the current study was conducted in an emerging market.

In general, positive earnings per share information represents well-managed companies, increasing enterprise value for the investor, whereas negative earnings indicate poor management, resulting in lower enterprise value for the investor. As a result, the firm's attained profit plays an important role for both internal and external parties. While earnings indicate overall performance, which is typically expressed as a profit, earnings per share (EPS) reflects the returns that investors or shareholders obtain per share (Darmadji, 2001).

Earnings per share (EPS) is also a financial analysis tool that employs the concept of traditional profit. In financial circles, EPS is one of two analysis tools commonly used to evaluate shares, along with the Price Earnings Ratio. Earnings per share provide company's stock overview for investors about the profit share obtainable in obtained in each period by owning shares. EPS is the net profit per share that a company can achieve when it runs its operations. Earnings per share obtained from earnings available to common stockholders are typically divided by the average number of common shares outstanding.

Nevertheless, the present study contributes new insights on the negative link between earnings per share and volatility of stock price among firms listed on the NSE.

Third objective was to find the effect of price earnings on volatility of share price, the objective was hypothesized as  $H_{03}$ : Price earnings ratio does not significantly affect the volatility of share price at NSE in Kenya. The findings indicated that, price earnings ratio did not significantly affect volatility of share price of firms listed on NSE basing on  $\beta_3 = -0.830$  (p-value = 0.405 which was more than  $\alpha = 0.05$ ) hence the null hypothesis that price earnings ratio does not significantly affect volatility of share price of listed



firms on NSE was accepted. The implication is that, there would be no change in stock price volatility with either an increase or decrease in price earnings ratio.

The findings are in contrast with that of prior studies (Campbell & Cochrane, 1999; Bansal & Yaron, 2004), cited in David and Veronesi (2009) showing a negative link between volatility of stock price and PER. Also, the findings are in divergence with that of Koutmos (2010) which revealed a significantly positive association between PER and volatility of share price of listed firms on NSE in Kenya. Koutmos (2010) finds a positive link between price earnings ratio and volatility of share price. Furthermore, Koutmos (2010) ascertains that price earnings ratio tends to revert to its mean in the long run. David and Veronesi (2009) as quoted in Chun *et.al.* (2020), find that this relationship has strong magnitude and direction variations in time.

The literature points to a mixed association between price earnings ratio and volatility of share price while the present study finds no significant relationship. There is thus a need for further research since the association between price earnings ratio and volatility of share price is scarcely explored.

Fourth objective was to find out the significant effect of BVPS on volatility of share price. Thus, the study hypothesized this objective as  $H_{04}$ : Book value per share does not significantly affect volatility of share price at NSE in Kenya. The findings indicated that book value per share significantly affected volatility of share price of firms listed on NSE ( $\beta_4 = 0.000$ ,  $p \text{ value} < 0.05$ ). Thus, hypothesis  $H_{04}$  stipulating that book value per share does not significantly affect volatility of share price of listed firms on NSE was rejected. This revealed that BVPS negatively volatility of share price of listed companies on NSE in Kenya.

The findings are consistent with the findings, Sumangala and Bhatt (2013) argued that book value is among the important variables that influence the market value of shares. Similarly, Olugbenga and Atanda (2014) revealed that book values have a direct and positive relationship with equity share investment decisions. Also, the findings tally with that of Sharif *et al.* (2015) which established that book value per share is significantly and positively associated with share price changes. Further, Osundina *et al.* (2016) concluded that book value per share is significant and positively linked to stock price volatility. Also, Sharif *et al.* (2015), Osundina *et al.* (2016), Uniamikogbo (2018), while analyzing factors affecting stock prices reported that BVPS is significantly and positively associated with share price volatility. However, in Tehran, Emamgholipour *et al.* (2013) established that BVPS has negative and significant effect on volatility of share prices at NSE in Kenya.

The book value reflects the company's past earnings, dividend distribution policy, and investment decisions (Sumangala, & Bhatt, 2013). When the book value of a firm is high, it is a reflection of the firm's extensive reserves, which means that the firm is a candidate for bonuses. However, when the book value is low, it is a reflection of the firm's policy to dividend distribution or a low trajectory with regards to profits. According to Sumangala and Bhatt (2013), a key factor influencing the market value of shares is book value, which is delineated as the company's value of own funds per share. The firm's book value shows how much each share is worth. In general, book value aids in the fundamental analysis of stocks. As a result, the firm's book value is studied to determine the investment value. The book value reflects the company's past earnings, dividend distribution policy and decisions on investment. Therefore, high book value is an indication that the reserves of the company are expansive and has a potential for bonus, whereas a low book value is an indication that the company has a

liberal bonus and dividend distribution policy or the company's profit trends are poor (Pushpa & Sumangala, 2013).

Investors can use the book value per share (BVPS) metric to establish if a share price is undervalued by comparing it to the firm's market value per share. If a company's BVPS is greater than its market value per share (current stock price), the stock is said to be undervalued. With an increase in the firm's BVPS, investors perceive the company's stock as highly valuable, which causes an increase in the share price and vice versa. Theoretically, BVPS is an amount received by shareholders in an instance of the firm's liquidation, or in an instance of the firm's tangible assets being sold or in the instance of the company's liabilities being paid.

However, because the company's assets would be priced at the market rate, and book value is based on the past prices of assets, market value is considered a better floor price for a company than book value. While BVPS is based on historical costs, market value per share is a forward-looking metric that considers a company's future earning power. An increase in a company's potential profitability or expected growth rate should result in an increase in its market value per share. According to Al-Kuwari (2009), the average investor, who is risk averse, will invest in the stock market for one reason and that is to make a profit. Therefore, profitable earnings are one of the most significant factors that entice investors to capitalize on their investments.

The fifth objective was to evaluate the effect of dividend yield on volatility of share prices of listed firms on NSE in Kenya. The fifth hypothesis stated as  $H_{05}$ : Dividend yield does not significantly affect volatility of share price on NSE in Kenya. Findings indicated that dividend yield negatively influenced volatility of share price of firms listed on NSE ( $\beta_5 = -0.432$ ,  $p \text{ value} = 0.000 < .05$ ). Thus, hypothesis  $H_{05}$  stating that

dividend yield does not significantly affect volatility of share price of firms listed on NSE in Kenya was rejected. This finding revealed that when dividend yield increases by a unit, share price volatility declines by 0.432 units. Dividend yield negatively influenced volatility of share price of listed firms on NSE in Kenya.

The results support the assertion by Baskin (1989) inferring that dividend yields negatively influences volatility of share price. The author confirmed that firms with high dividend yields were associated with lower risk. Similarly, Shah (2016) established a negative and significant link between DYR and volatility of share price. In a similar vein, Ramadan (2013) indicated that when dividend yield increases, the volatility of share price tends to reduce. Other prior studies (Lashgari, 2014; Hashemijoo *et al.*, 2012; Hooi *et al.*, 2015) have also confirmed a negative link between DYR and the volatility of share price.

Interestingly, Hamid (2017) revealed that dividend payout ratio and volatility of share price have a significantly positive association, by using data from 2006 to 2014. The variable findings could be due to the variation of industry examined by Hamid *et al.* (2017), which were explicitly financial institutions, while Nazir *et al.* (2010) and Shah (2016) studied non-financial firms. However, extant literature reveals similar contrasting results; Nazir *et al.* (2010), Zakaria *et al.* (2012), who found that dividend yields are positively and significantly related to stock price volatility. This implies that when dividend yields increase, stock price volatility is likely enhanced and when dividend yield decreases, stock price volatility is expected to decrease.

While high dividend yields are appealing, they may come at the expense of the company's potential growth. Every shilling a company pays in dividends to its shareholders is a shilling that the company is not reinvesting to grow and generate more

capital gains. Even if they do not receive dividends, shareholders can earn higher returns if the value of their stock rises while they hold it because of company growth. It is not recommended that investors evaluate a stock simply based on its dividend yield. Dividend data may be obsolete or based on incorrect information. As their stock price falls, many companies have a very high yield. If a company's stock falls sufficiently, the amount of its dividend may be reduced or eliminated entirely.

Because dividends are paid quarterly, many investors will take the most recent quarterly dividend, multiply it by four, and use the result as the annual dividend to calculate yield. This method will reflect any recent dividend changes, but not all companies pay an even quarterly dividend. Finally, some businesses pay dividends more frequently than once a year. A monthly dividend may result in an incorrect dividend yield calculation. When determining how to calculate dividend yield, an investor should consider the history of dividend payments to determine which method will produce the most accurate results.

Allen and Rachim (1996), also revealed a small positive association between volatility of share price and dividend yield on the Australian market from 1972 to 1985. This relationship differs with the results from this study. Because of this difference in results, there is a need for further studies in the field. If the location of the market plays a role, location of investors and the time period plays a significant role in how dividend yield has influence on volatility of share price. Also, Nazir *et al.* (2010) indicated a positive association between DYR and volatility of share price of businesses listed on Karachi Stock Exchange. Similarly, Hamid (2017) who found a positively significant association between dividend payout ratio and volatility of share prices.

The extant literature point to a mixed association between the variables dividend yield and volatility of share price. Nevertheless, the present research adds new insights on the negative link between DYR and volatility of share price at NSE in Kenya.

Finally, the study also evaluated institutional ownership structure's moderation on volatility of share price of firms listed on NSE in Kenya. Hypothesis six stated as  $H_{06}$ : Institutional ownership structure does not significantly affect stock price volatility at Nairobi Securities Exchange in Kenya. Results indicated that institutional ownership had a negatively significant association with volatility of share price ( $\beta=.0703218$   $p=.006<.05$ ). Thus, the findings led to rejection of the null hypothesis at 5 percent significance level and conclude that institutional ownership structure influence volatility of share price of firms listed on NSE in Kenya.

Stocks with a high level of institutional ownership are frequently regarded favorably. Before purchasing a large block of a company's stock, major corporations frequently hire a team of analysts to conduct detailed and costly financial research. As a result, their decisions have sway over other potential investors. Institutions are hesitant to sell their positions due to the investment made in research. When they do, however, it can be interpreted as a judgment on the stock's value, causing its price to fall.

Because they account for most of the trading, institutional investors have a significant impact on stock prices; their buying can send a stock price up, while their selling can send a stock price down. Although the institutional ownership's effect on share prices is likely to be short-term, it can have an effect. In the long run, institutional buying drives stock prices. When a stock becomes popular among institutions, they begin to build positions in it. The higher a stock rises in price; the more institutions feel obligated to include it in their portfolios.

Because their purchases can cause a stock's price to rise, institutions may try to avoid overpaying for stocks by spreading their purchases out over days or weeks, snatching up all the stock available at prices they like. Institutional ownership frequently buys when a stock experiences a small decline. Their purchases act as a floor for a stock's price, limiting its downside. When an institution holds a large position in a stock, it can also support the price by purchasing additional shares to keep the stock from falling. Stock prices are frequently influenced by institutional ownership in the short term. An institution may be talking up a stock in which it has a large position to drive up the price and generate additional demand so that it can sell; a downgrade may be intended to drive down the share price in order for the institution to buy cheaper.

Results further supports Chen and Hong (2006) who demonstrate that institutional investor are knowledgeable traders. According to Strebler (1983), increased institutional trading reduces rather than increases stock volatility. Yang (2002) discovers that foreign institutional investor trading stabilizes Taiwanese market prices. Many empirical studies, including those by Faugère and Shawky (2003), Nagel (2005), and Bohl and Brzeszczynski (2006) have supported this negative relationship.

The quantity of stock owned by insurance companies, pension or mutual funds, endowments, private foundations, investment firms of other entities whose business is handling funds on others' behalf is delineated as institutional ownership (Singh & Kansil, 2018). The shareholders of a company who are corporate entities are examples of institutional ownership. Previous research concluded that institutional shareholding is a common practice in corporations. Since the law allows corporations to own properties and enter transactions in their corporate names as registered. Institutional owners are organized and have necessary resources in place to keep management

engaged. The institutional investor too reports to principals, with regard to how their firms' resources are handled, hence they monitor their investments diligently (Amos *et al.*, 2016).

They frequently buy when a stock experiences a small decline. Their purchases act as a floor for a stock's price, limiting its downside. When an institution holds a large position in a stock, it can also support the price by purchasing additional shares to keep the stock from falling. Stock prices are frequently influenced by institutional ownership in the short term. An institution may be talking up a stock in which it has a large position to drive up the price and generate additional demand so that it can sell; a downgrade may be intended to drive down the share price for the institution to buy cheaper.

Institutional investors are powerful decision-makers with a large stake in companies, which serves as an effective monitoring mechanism (Zhong *et al.*, 2017). The presence of such large stockholders can influence corporate management behavior and protect investments through their monitoring sources, and they rely on experts for professional analysis (Zhong *et al.*, 2017). In addition, institutional investors have more incentives to engage in monitoring activities than stockholders because of the high costs they may incur because of earning management (Hadani *et al.*, 2011). Furthermore, they have less incentive to engage in earnings manipulation (Alzoubi, 2016).

Furthermore, ownership may imply that no further significant institutional investments will be made in the security, potentially limiting the stock's upside potential. Based on the operations of the associated company, there may be discussions about the security's worth. With a sizable portion of shares locked up in institutional ownership, there may be few opportunities for additional investment. Institutional investors may be drawn to stocks with higher volatility, believing that higher-risk stocks will outperform



(Gompers & Metrick, 2001; Brands, Gallagher & Looi, 2006; Ferreira & Matos, 2008). With the growing number and size of institutional investors, they tend to trade in large quantities. Furthermore, they may invest in stock blocks or be the primary shareholders of a given company. As a result, their transactions may have a significant impact on stock prices (Campbell, Lettau, & Xu, 2001; Bennett, Sias & Starks, 2003).

An analysis of the evidence on institutional ownership and share prices presents some concerns for private investor who wish to apply institutional behaviour as a pattern for purchasing shares. Current studies have examined the effects of changing firm ownership profiles on share prices, the scope to which impending firm earnings are reflected by share prices, and the effects of trading on share prices (Ovtcharova, 2003; Jiambalvo, 2002; Gompers, 2001). With the resources at their disposal, institutions may be able to acquire and control nearly all outstanding shares of a security, including borrowed shares used by short sellers to bet against the stock. This type of ownership may result in high point ownership, with little room for new retail investors or significant trading activity. Because of the inherent nature of risk aversion, investors value stock volatility as the reflection of risk that investors are faced with. Positive changes in stock prices are typically caused by an increase in the profitability (Al-Kuwari, 2009). The institutional investor too reports to principals, about the way their firms' resources are handled, hence they will monitor their investments in other firms with due diligence (Amos *et al.*, 2016).

Institutional investors should not only be aware of which firms own a given stock; they should also be able to predict the likelihood of other firms acquiring shares, as well as understand the reasons why a current owner might liquidate its position. Stocks' value can be created and destroyed by institutional owners. As a result, it is critical for

investors to monitor and react to the movements of the largest players in each stock. When institutions acquire stock, they sometimes do it by gradually buying up shares.

Considering that many institutional investors purchase stock in large blocks, they know that issuing a large order could lead to the market spiraling upward, which leaves them to pay much more for the investment. Nonetheless, buying gradually could also lead to a slow price increase that is not based on the share value, but is hinged on institutional investors' activity, hence could revert when the purchasing ceases. The ownership of a company can signal what's going on with its stock. While this is not as concrete as ratings and ratios, it can be a great first screening tool for investors.

The results align with findings by Osagie, Osho and Sutton (2005), that institutional owners concerned with short-term results, and it explains sharp fluctuations in market prices from day to day. Shares held by mutual funds present higher turnover and volatility than stocks held by other category of investors. In another study, Bushee (2001) identified a class of investors known as transients, who place a strong emphasis on short-term, current-period earnings. These managers tend to trade based on herding, which results in the sharp rise and fall of daily market figures. Other evidence, on the other hand, supports a different view of institutional investors as erudite managers who implement information and analysis when focusing on impending returns.

Evidence suggests that current stock prices are a reflection of information on impending earnings after controlling for current earnings. A study by Jiambalvo, Rajgopal, and Vandatachalam (2002) established that institutional investors include non-earnings information, such as expansion plans and long-term sales contracts when calculating a company's impending earnings. This means that current stock prices of firms with high institutional ownership are a combination of a reaction to past information and a

calculation of future value based on current information. Their research also found that as the percentage of institutional ownership increases, so does price leads earnings. This is supported by indications that pension fund managers are willing to buy and hold stock in companies with higher expenses.

#### **4.9 Institutional Ownership Structure Moderating Effect on Volatility of Share Price of Companies Listed on NSE**

The seventh objective was to determine institutional ownership structure's moderation on the link between market value ratios and volatility of share price of firms listed on NSE in Kenya. Moderation exists when three conditions are fulfilled. First, the variance amount accounted for with term of interaction should be significantly higher than the variance accounted for without interaction. Secondly, the interaction term's coefficient should not be equal to zero. This represents the simple slope for the interaction which is the basis of the examination of the simple slopes when probing the nature of interaction. Third and last, the models either without or with interaction should be significant (Hayes, 2013).

To test institutional ownership structure moderation on the relationship between market value ratios and volatility of share price, this study employed hierarchical regression analysis. Hierarchical moderated regression analysis was carried following the steps outlined by Baron and Kenny (1986) to establish the effect of moderation of institutional ownership structure on the link between market value ratios and volatility of share price as proposed in hypotheses  $H_{07a}$ : Institutional ownership structure does not significantly moderate the relationship between MBVR and volatility of share price of companies listed on NSE in Kenya.

***H<sub>07b</sub>***: Institutional ownership structure does not significantly moderate the relationship between earnings per share and volatility of stock price of companies listed on Nairobi Securities Exchange in Kenya.

***H<sub>07c</sub>***: Institutional ownership structure does not significantly moderate the relationship between price earnings ratio and volatility of stock price of companies listed on Nairobi Securities Exchange in Kenya.

***H<sub>07d</sub>***: Institutional ownership structure does not significantly moderate the relationship between book value per share and volatility of stock price of companies listed on Nairobi Securities Exchange in Kenya.

***H<sub>07e</sub>***: Institutional ownership structure does not significantly moderate the relationship between dividend yield and volatility of stock price of companies listed on Nairobi Securities Exchange in Kenya.

The moderating effects were tested in a series of hierarchical blocks. In model 1 the two control variables; Firm size and Firm growth were entered. In model 2 all independent variables were entered whereas in model 3, the moderator variable was added. In the subsequent models the interaction terms were added sequentially in models 4 to 8. Table 4.12 presents findings on institutional ownership's moderating effect.

The findings on the moderating effect of institutional ownership indicated that institutional ownership positively and significantly moderates the association between market price to book value ratio volatility of share price of firms listed on NSE in Kenya ( $\beta = 0.01$ ,  $p < .05$ ). With the introduction of institutional ownership structure, the outcome of market price to book value ratio on volatility of share price increases. However, institutional ownership's moderation effect on the association between

market to book value ratio and volatility of share price is weak since the beta value is small. Implying that, there is a 1% change in the outcome of market to book value ratio on volatility of share price with the incorporation of institutional ownership structure as shown by change in R squared ( $R^2\Delta .01$ ). The findings align with that of Potter (1992) which indicated that more institutional ownership is accompanied by high stock returns volatility. The implication from Potter (1992) was that the attraction of more institutional investors contributed to an indirect relationship between the disclosure practices and stock returns volatility. However, the results are in contradiction with Lin *et al.* (2018) and their conclusion that higher institutional ownership structure is conducive to reducing the volatility of share price on Macao casino stocks.

Further, the beta value ( $\beta = 0.003, p < .05$ ) in Table 4.12 shows that institutional ownership structure's moderation effect on the association between price earnings ratio and volatility of share price of firms listed on NSE in Kenya was significantly positive. The moderating effect also revealed a change in R squared of 1% ( $R^2\Delta .01$ ). It implied that institutional ownership structure alters the trend of the association from insignificant to significant. Therefore, it means that at higher levels of institutional ownership, price earnings ratio has a positively significant association with volatility of share price. Consistent with the results, Hassanzadeh *et al.* (2013) supports a positive link between institutional ownership and fluctuations of share price. Similarly, Rubin and Smith (2009) elucidated that more institutional holdings lead to a higher volatility of share price.

Besides, institutional ownership positively and significantly moderates the association between dividend yield and volatility of share price of companies listed on NSE ( $\beta = 1.470, p < .05$ ), implying that institutional ownership structure strengthens the

association between dividend yield and volatility of share price. The findings also revealed a change in R-square of 1% ( $R^2\Delta$  of .01), which indicate that institutional ownership moderates the association between dividend yield and volatility of share price of firms listed on NSE by 1%. The results agree with that of Chen *et al.* (2013) which found a positive link between domestic shareholdings (individual, institutional, and governmental) and firm-level volatility of share returns.

Conversely, the results revealed an insignificant moderating outcome of institutional ownership on the association between earnings per share and volatility of share price of firms listed on NSE in Kenya ( $\beta = 0.00$ ,  $\rho > .05$ ). Also, institutional ownership structure does not significantly moderate the link between book value per share and stock price volatility of companies listed on NSE ( $\beta = 0.00$ ,  $\rho > .05$ ). The findings confirm that of Rawash (2014) which revealed an insignificant link between institutional ownership and volatility of share price among Jordanian companies between 2005 and 2009.

Table 4.12 Institutional Ownership Structure Moderating Effect on Volatility of Share Price of Companies Listed on NSE

Spv	Model 1 Coef.(Std. Err.)	Model 2 Coef.(Std. Err.)	Model 3 Coef.(Std. Err.)	Model 4 Coef.(Std. Err.)	Model 5 Coef.(Std. Err.)	Model 6 Coef.(Std. Err.)	Model 7 Coef.(Std. Err.)	Model 8 Coef.(Std. Err.)
_cons	0.36(.07)**	0.38(.06)**	0.39(.01)*	0.40(.06)**	0.40(.06)**	0.42(.06)**	0.43(.06)**	0.47(.06)**
SIZE	-0.03(.01)**	-0.02(0.01)*	-0.02(.01)*	-0.02(.01)*	-0.02(.01)*	-0.02(.01)*	-0.02(.01)*	-0.02(.01)*
GR	-0.09(.03)**	-0.07(.03)*	-0.08(.03)**	-0.08(.03)**	-0.08(.03)**	-0.08(.03)**	-0.08(.03)*	-0.09(.03)
MPBV		-0.02(.00)**	-0.02(.00)**	-0.02(.00)**	-0.02(.00)**	-0.02(.00)**	-0.02(.00)**	-0.02(.00)**
EPS		-0.00(.00)	-0.00(.00)**	-0.00(.00)**	-0.00(.00)**	-0.00(.00)**	-0.00(.00)**	-0.00(.00)**
PE		0.(.00)	-0.00(.00)	-0.00(.00)	-0.00(.00)	-0.00(.00)*	-0.00(.00)*	-0.00(.00)**
BVPS		0.00(.00)**	-0.00(.00)**	-0.00(.00)**	-0.00(.00)**	-0.00(.00)	-0.00(.00)	-0.00(.00)
DYR		-0.43(.11)**	-0.48(.11)**	-0.49(.11)**	-0.49(.11)**	-0.51(.11)**	-0.50(.11)**	-0.89(.021)**
Ins			-0.07(.03)*	-0.09(.03)**	-0.10(.03)**	-0.13(.03)**	-0.10(.04)*	-0.15(.04)**
mpbvins				0.01(.01)*	0.01(.01)*	0.01(.01)*	0.01(.01)*	0.008(.01)*
Epsins					0.00(.497)	0.00(.00)	0.00(.00)	0.003(.00)
Peins						0.003(.00)*	0.003(.00)*	0.003(.00)*
bvpsins							-0.00(.070)	-0.001(.00)
Dyrins								1.470(0.006)*
sigma_u	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
sigma_e	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Rho	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-sq:								
Within	0.04	0.26	0.27	0.27	0.27	0.28	0.29	0.30
Between	0.48	0.36	0.36	0.31	0.31	0.23	0.24	0.15
Overall	0.05	0.26	0.27	0.27	0.27	0.28	0.29	0.29
R-sqΔ		.21	0.01	0.01	0.00	0.01	0.00	0.01
Waldchi2(2)	22.48	157.44	167.57	172.79	172.93	178.80	181.76	188.22
Prob> chi2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hausman								
chi2(2)	2.63	9.94	9.78	11.04	12.13	6.21	2.43	13.99
Prob>chi2	0.27	0.19	0.28	0.27	0.21	0.86	1.00	0.23

Key: \* Significance at 0.05 level    \*\* Significance at 0.01 level

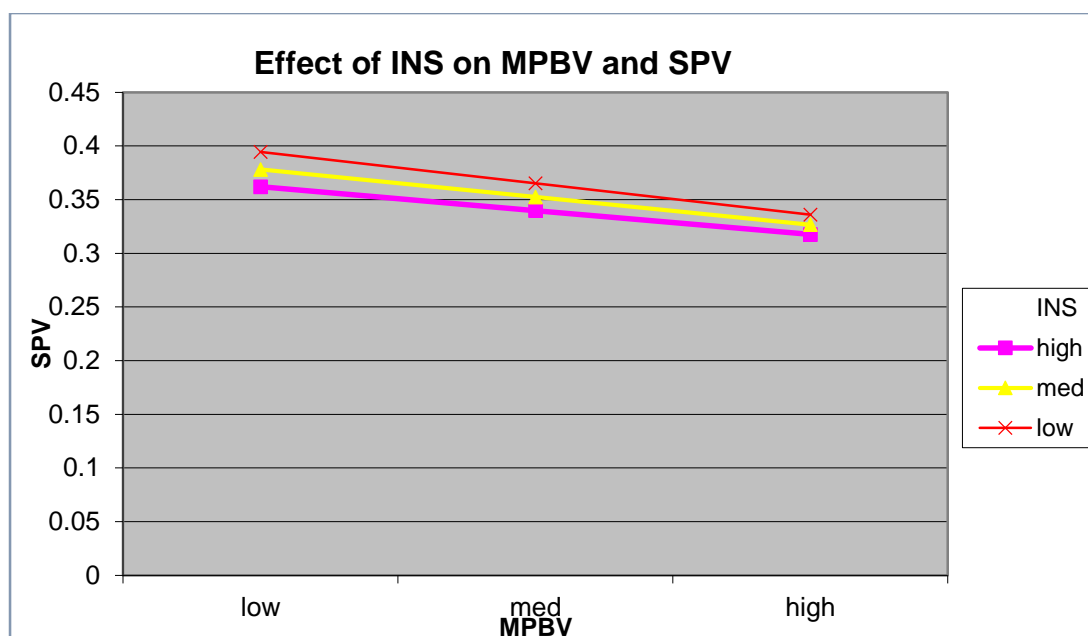
#### **4.10 Modgraphs**

Moderated results are presented on a moderation graph as Aiken and West (1991), suggested of the inadequacy to surmise that an interaction exists without determining the interaction's nature at various moderator levels. When an interaction is established, it should be probed so as to comprehend the circumstances that the relationship between the moderator and the endogenous variable exists (Cheung *et al.*, 2021). The magnitude of institutional ownership's moderating effect on the association between MBVR and volatility of share price, price earnings ratio and volatility of share price, dividend yield and volatility of share price, are demonstrated below.

##### **4.10.1 Institutional Ownership Structure Effect on Market to Book Value Ratio and Volatility of Share Price**

Figure 4.9 highlights institutional ownership's moderating effect on the association between MBVR and volatility of share price. Based on Table 4.12 institutional ownership's moderating effect on the relationship between MBVR and volatility of share price was significant. However, the moderation was buffering indicating that with increasing the institutional ownership structure, there is decreasing effect of MBVR on volatility of share price. From Figure 4.9, there is a steeper slope between MBVR and volatility of share price due to the moderating effect of volatility of share price. Thus, the null hypothesis 7a was not supported instead it was rejected, hence accepted that institutional ownership structure does significantly moderate the link between MBVR and volatility of share prices of firms listed on NSE in Kenya.

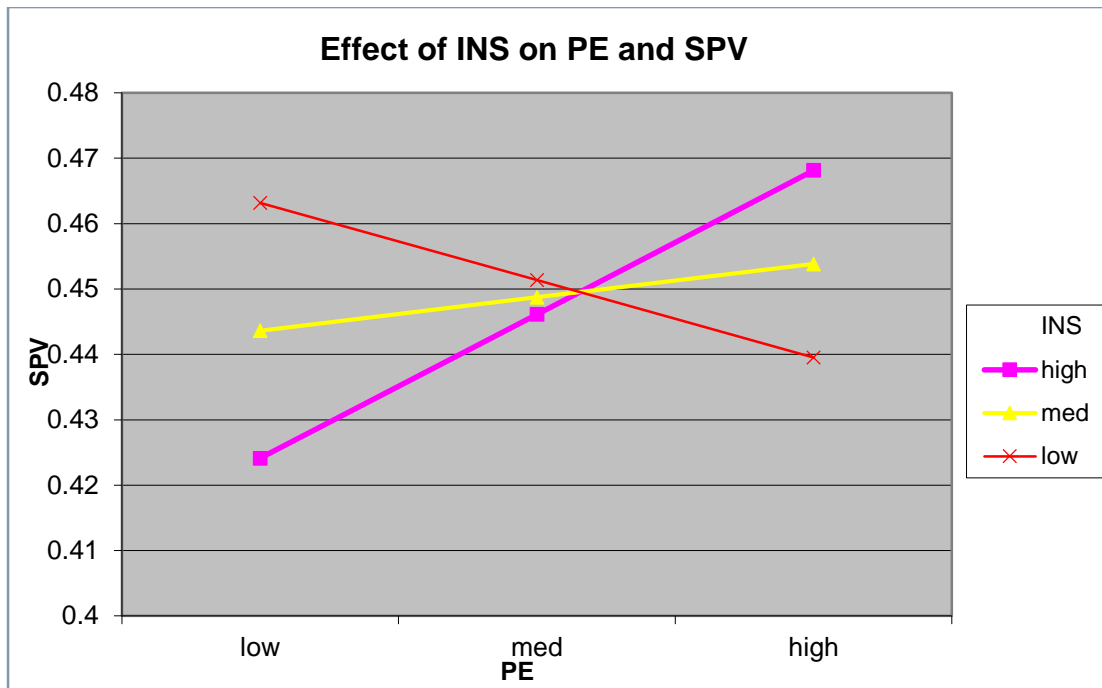




**Figure 4.9 Institutional Ownership Structure Effect on Market Price to Book Value Ratio and Volatility of Share Price**

#### **4.10.2 Institutional Ownership Structure Effect on Price Earnings Ratio and Volatility of share Price**

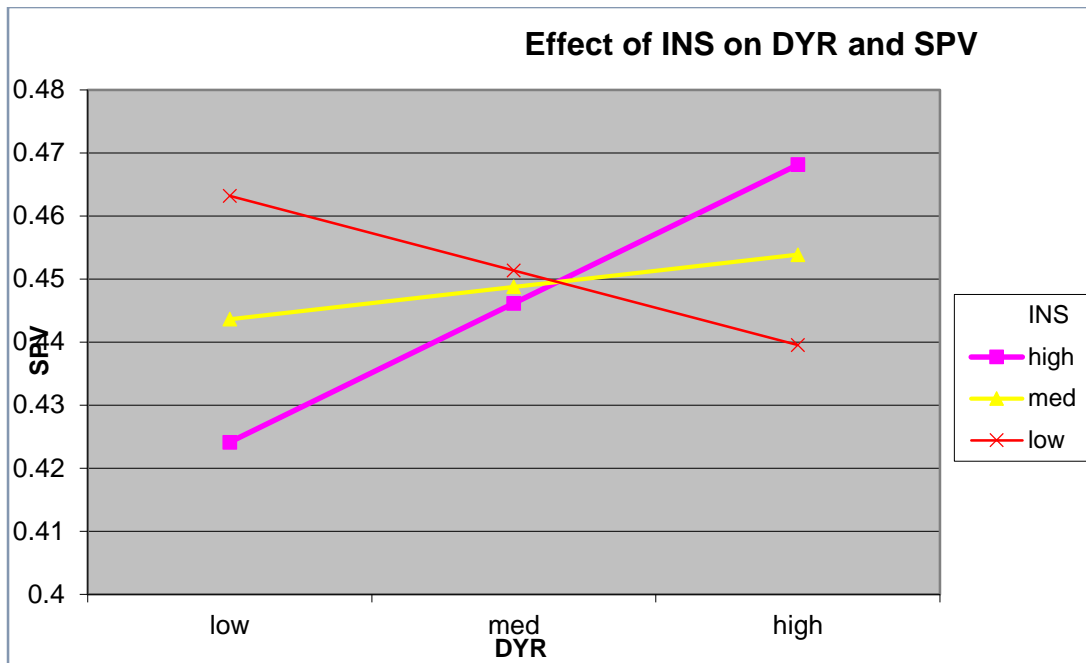
Institutional ownership's moderating effect on the association between PER and volatility of share price was found to be significant, hence further presentation was done grammatically using Modgraphs in Figure 4.10. Figure 4.10 show antagonistic moderated effect of institutional ownership structure on link between PER and volatility of share price, implying that with increasing the institutional ownership structure, there is reverse effect on the association between PER and volatility of share price. Thus, it implies that the introduction of institutional ownership structure changes the trend of the association to significant from insignificant. Therefore, it means that at higher levels of institutional ownership, PER positively and significantly affects the volatility of share price of listed firms on NSE in Kenya.



**Figure 4.10: Institutional Ownership Structure Effect on Price Earnings Ratio and Volatility of Share Price**

#### **4.10.3 Institutional Ownership Structure Effect on Dividend Yield and Volatility of Share Price**

Institutional ownership's moderating effect on the association between DYR and volatility of share price was found to be significant, hence further presentation was done using Moderation graphs in Figure 4.11. Figure 4.11 show antagonistic moderated outcome of institutional ownership structure on link between DYR and volatility of share price, implying that with increasing the institutional ownership structure, there is reverse in the outcome of DYR on volatility of share price. The beta value changes from negative to positive with the introduction of institutional ownership structure in the correlation between DYR and volatility of share price.



**Figure 4.11 Institutional Ownership Structure Effect on Dividend Yield and Volatility of Share Price**

Institutional ownership's moderation on the link between EPS and volatility of share price of listed firms on NSE was insignificant ( $\beta = 0.00, \rho > .05$ ). Also, institutional ownership structure does not significantly moderate the correlation between BVPS and volatility of share price of firms listed on NSE ( $\beta = 0.00, \rho > .05$ ). These results made it unnecessary to draw the moderation graphs to probe the type of relationship.

#### 4.11 Hypothesis Testing Summary

Table 4.12 below presents a summation of the tested hypothesis findings. It reveals the beta values for the tested hypotheses and the corresponding p-values. The table below provides the decision as to whether the hypothesis is rejected or accepted based on the criteria that all results whose corresponding significant values are less than or equal to 0.05 are accepted while those with significant values greater than 0.05 are rejected.

**Table 4.13 Summary of Hypothesized Testing Results**

Hypotheses	Beta values	P values	Decision
<i>H<sub>01</sub></i> : Market to book value ratio does not significantly affect volatility of stock price of companies listed on NSE in Kenya.	-0.016	0.000	Reject
<i>H<sub>02</sub></i> : Earnings per share does not significantly affect volatility of stock price of companies listed on on NSE in Kenya.	-0.002	0.000	Reject
<i>H<sub>03</sub></i> : Price earnings ratio does not significantly affect volatility of stock price of companies listed on on NSE in Kenya.	0.000	0.405	Fail to Reject
<i>H<sub>04</sub></i> : Book value per share does not significantly affect volatility of stock price of companies listed on on NSE in Kenya.	0.000	0.000	Reject
<i>H<sub>05</sub></i> : Dividend yield does not significantly affect volatility of stock price of companies listed on on NSE in Kenya.	-0.432	0.000	Reject
<i>H<sub>06</sub></i> : Institutional ownership structure does not significantly affect volatility of stock price of companies listed on on NSE in Kenya.	-0.07	0.000	Reject
<i>H<sub>07a</sub></i> : Institutional ownership structure does not significantly moderate the relationship between market to book value ratio and volatility of stock price of companies listed on on NSE in Kenya.	0.01(R-sq=.01)	p<0.05	Reject
<i>H<sub>07b</sub></i> : Institutional ownership structure does not significantly moderate the relationship between earnings per share and volatility of stock price of companies listed on on NSE in Kenya.	0.000(R-sq=.001)	p>0.05	Fail to Reject
<i>H<sub>07c</sub></i> : Institutional ownership structure does not significantly moderate the relationship between price earnings ratio and volatility of stock price of companies listed on on NSE in Kenya.	0.003(R-sq=.01)	p<0.05	Reject
<i>H<sub>07d</sub></i> : Institutional ownership structure does not significantly moderate the relationship between book value per share and volatility of stock price of companies listed on on NSE in Kenya.	0.000(R-sq=.001)	p>0.05	Fail to Reject
<i>H<sub>07e</sub></i> : Institutional ownership structure does not significantly moderate the relationship between dividend yield and volatility of stock price of companies listed on on NSE in Kenya.	1.470(0.006)*	p<0.05	Reject

Source; (Field Data, 2022)

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

The comprehensive summary of the current study is depicted in this chapter. The first section is a summary of the findings. The second section captures the conclusion. The study's recommendations and implications are discussed in the third section. The final section provides the research's future recommendations.

#### 5.2 Summary of Findings

The present study's purpose was to provide evidence on the correlation between market value ratios and volatility of share price, and institutional ownership's moderating effect on the association between market value ratios and volatility of share price of firms listed on NSE in Kenya. Besides, other variables that act as control such as size of the firm, growth and stock price volatility were applied in this research. To carry out this study, companies listed on NSE between January 2008 and December 2019 were examined.

##### 5.2.1 Market to Book Value Ratio and Volatility of Share Price of Companies Listed on NSE

The study's first objective was to determine the effect of MBVR on volatility of share price of listed firms on NSE. The descriptive findings indicated that market price book value had a minimum value of zero and maximum of 8.53 with a mean of 1.42 and standard deviation of 2.111. Besides, the regression analysis revealed that market to book value ratio negatively influences stock price volatility ( $\beta_1 = -0.016$ ,  $p < .05$ ). The null hypothesis  $H_{01}$  stating that market to book value ratio does not significantly affect volatility of share price of firms listed on NSE was rejected in favor of the alternative

hypothesis that market to book value ratio significantly affect share price volatility of firms listed on NSE in Kenya.

### **5.2.2 Earnings per Share and Volatility of Share Price of Companies Listed on NSE**

The study's second objective was to establish the effect of EPR on volatility of share price of listed companies on NSE. Regarding the descriptive results, earnings per share for the studied 39 firms had a mean of 8.1943 and huge standard deviation of 15.1668. The inferential statistics showed that earnings per share had significantly and negatively affected the volatility of share price ( $\beta_2 = -0.002$ ,  $p \text{ value} < 0.05$ ). Therefore, the null hypothesis ( $H_{02}$ ) no significant effect of EPS on volatility of share price of firms listed on NSE was rejected and instead the alternate hypothesis that earnings per share ratio significantly affect volatility of share price of firms listed on NSE was accepted.

### **5.2.3 Price Earnings Ratio and Volatility of Share Price of Companies Listed on NSE**

The study's third objective was to determine the effect of price earnings ratio on volatility of share price of firms listed on NSE. The descriptive findings indicated that price earnings had a minimum negative value -44.67 and positive maximum of 390 price earnings. On the other hand, the regression findings revealed that price earnings ratio had no significant effect on volatility of share price of companies listed on NSE ( $\beta_3 = -0.830$ ,  $p > 0.05$ ) thus the null hypothesis that price earnings ratio has no significant effect on volatility of share price of firms listed on NSE was accepted and the alternative hypothesis that PER significantly affect volatility of share price of firms listed on NSE was rejected.

#### **5.2.4 Book Value per Share and Volatility of Share Price of Companies Listed on NSE**

The study's fourth objective was to evaluate the effect of BVPS on volatility of share price of firms listed on NSE in Kenya. The descriptive findings indicated that the BVPS had a mean of 76.656 and its minimum value of 1.23 and maximum of 940.84. Regarding regression, the findings indicated that BVPS had a significant effect on volatility of share price of firms listed on NSE ( $\beta_4 = 0.000$ ,  $p$  value  $< 0.05$ ). Thus, hypothesis  $H_{04}$  that book value per share ratio does not significantly affect volatility of share price of firms listed on NSE was rejected and instead the substitute hypothesis that book value per share ratio significantly affect volatility of share price of firms listed on NSE was accepted instead.

#### **5.2.5 Dividend Yield and Volatility of Share Price of Companies Listed on NSE**

The study's fifth objective sought to evaluate the effect of DYR on volatility of share price of listed firms on NSE. The descriptive results indicated that companies had at least 0 minimum dividend yield while others had maximum of 0.6 dividend. On the other hand, the regression findings indicated that dividend yield negatively influenced volatility of share price of firms listed on NSE ( $\beta_5 = -0.432$ ,  $p < .05$ ). Thus, hypothesis  $H_{05}$  stating that dividend yield does not significantly affect volatility of share price of firms listed on NSE was rejected in favor of alternative hypothesis that dividend yield has no significant effect share price volatility of listed firms on NSE in Kenya.

#### **5.2.6 Institutional Ownership Structure and Volatility of Share Price of Companies Listed on NSE**

The study's sixth objective was to evaluate the effect of institutional ownership structure on volatility of share price of firms listed on NSE. The descriptive results indicated that an average of 36.02% (mean of 0.3602) of the stock in Nairobi Securities

Exchange are owned by the institutions with a standard deviation of 0.2243. The least amount of institutional ownership structure is approximately 0.0101 (1%) and a maximum percent of 81.74 (maximum of .8174). On the other hand, the regression findings indicated that institutional ownership structure negatively influenced volatility of share price of firms listed on NSE ( $\beta = -0.071, p = 0.006 < 0.05$ ) Thus, hypothesis  $H_{06}$  stating that institutional ownership structure does not significantly affect volatility of share price of firms listed on NSE was rejected in favor of alternative hypothesis that institutional ownership structure does not significantly affect volatility of share price of firms listed on NSE in Kenya.

### **5.2.7 Institutional Ownership Structure's Moderating Effect on Volatility of Share Price of Companies Listed on NSE**

The study's findings revealed institutional ownership's moderating effect on the association between market to book value ratio and volatility of share price was significant ( $\beta=0.01, p <.05, R^2\Delta =.01$ ). Hence, the null hypothesis that institutional ownership structure does not significantly moderate the correlation between MBVR and volatility of share price of firms listed on NSE was rejected and instead the alternative hypothesis that institutional ownership structure significantly moderate the correlation between MBVR and volatility of share price of firms listed on NSE was accepted.

Further, the findings revealed that institutional ownership's moderation on the correlation between price earnings ratio and volatility of share price was significant ( $\beta=0.003, p <.05, R^2\Delta =.01$ ). Therefore, the null hypothesis that institutional ownership structure does not significantly moderate the correlation between PER and volatility of share price of firms listed on NSE was rejected and instead the alternative hypothesis



that institutional ownership structure significantly moderates the correlation between PER and volatility of share price of firms listed on NSE in Kenya was accepted.

Finally, there was significant moderation of institutional ownership structure on the association between DYR and volatility of share price of listed firms on NSE in Kenya ( $\beta=1.470$ ,  $p < .05$ ,  $R^2\Delta = .01$ ). Therefore, the null hypothesis that institutional ownership structure does not significantly moderate the correlation between DYR and volatility of share price of listed firms on NSE in Kenya was rejected and instead the alternative hypothesis that institutional ownership structure significantly moderate the correlation between DYR and volatility of share price of listed firms on NSE in Kenya was accepted.

However, institutional ownership structure did not moderate the relationship between earnings per share ( $\beta= 0.00$ ,  $R^2\Delta = .00$ ), book value per share ( $\beta= 0.00$ ,  $R^2\Delta = .00$ ) and volatility of share price of firms listed on NSE in Kenya.

### **5.3 Conclusion**

The study's evidence gives the impression that market to book value ratio negatively influences stock price volatility. The implication is that, companies with high book values have huge reserves hence contributing to lower share price variation. Besides, the MBVR portrays how the market views the management of the firm thus increasing investors' confidence over the companies' soundness. However, when moderated with institutional ownership structure, market to book value ratio positively affects stock price volatility.

Further, earnings per share negatively contributed to volatility of share price of firms listed on NSE. It shows that the behavior of the stock price strongly responds to earnings information. It is, therefore, an indication that earnings per share conveys key insights

about the companies' future prospects. In this context, it means that, the more the earnings per share, the lower will be its stock price volatility. However, in the presence of institutional ownership as a moderator, earnings per share does not influence volatility of share price of firms listed on NSE.

Price earnings ratio did not significantly affect volatility of share price of firms listed on NSE. It means that price earnings ratio does not considerably influence how underlying risk is perceived, hence investors' perception is not changed by price earnings ratio. However, when moderated with institutional ownership, there is a positive association between PER and volatility of share price. It affirms that with an increase in the shareholding of companies in Nairobi Securities Exchange, there is availability of more information to the investors regarding price earnings ratio, thus contributing to stock price volatility.

Additionally, the findings showed that book value per share positively influences volatility of share price of firms listed on NSE. The implication is that, decisions made by investors is influenced by the information provided by book value per share, which is instrumental in enabling investors to make evaluations of past, present and future trends in the behavior of stock. As a result, if the listed companies are to reduce stock price volatility, they would have to retain earnings, acquire more financial assets or review their capital structure. However, when moderated with institutional ownership, there is no significant link between BVPS and volatility of share price.

The study also found a negative correlation between DYR and volatility of share price of firms listed on NSE. The implication is that, higher dividend yield contributes to lower share price variation. Besides, the more these companies pay their profits as dividends, the the volatility of share price is lowered. However, when moderated with

institutional ownership structure, DYR has a positive effect on volatility of share price. It means that institutional ownership changes the amounts of dividends distributed by companies which ultimately affects stock price volatility.

The study concludes that MBVR, EPS, PER, BVPS and DYR influence stock price volatility. Also, institutional ownership structure moderates the relationship between MBVR, PER, DYR and stock price volatility. Market value ratios exhibit very weak relationship (as shown by very small betas) with volatility of share price except dividend yield which is strongly associated with volatility of share price.

Finally, since this study found very low betas for market value ratios except the beta for dividend yield, and that only 29% of volatility of share price of firms listed on NSE was explained by market value ratios, it is recommended that investors pay more attention to other factors affecting stock price volatility alongside dividend yield ratio while investing in shares.

#### **5.4 Recommendations**

The results of the study sheds light on how MBVR, EPS, PER, BVPS and DYR influence the volatility of stock price. Thus, investors can take into account these factors before making investments decisions. For the management, they have foreknowledge on how they could formulate policies to ensure that market value ratios convey to investors an accurate depiction of the companies' financial position.

Further, institutional investors such as banking institutions, pension funds and insurance firms can also look at market value ratios before establishing their models of shares portfolios of companies listed on NSE. In addition, the study enriches the extant limited literature on the influence of market value ratios on volatility of share price and the interactions with institutional ownership. Finally, the study offers practical implications

for Kenyan regulatory authorities, companies and capital markets authority of Kenya on the policies to protect investors against the negative influence of manipulated book values.

From the outcome of the study, some policy implications, theoretical implications and knowledge implications to the managements of the firms listed on NSE in Kenya. The implications are discussed in subsequent sections.

#### **5.4.1 Policy Recommendations**

Share price volatility significantly influences stock market performance, therefore the study endorses for policy institutions like the CMA (Capital Markets Authority) of Kenya to institute effective policies for the purpose of reducing high share volatility.

The study also recommends for Central Bank of Kenya to come up with effective policies such as policy on interest rates to curtail the impact they have on the economy and on the stock market, which would be instrumental in enhancing Kenya's stock market.

The findings of this research contribute significantly to the concept earnings pricing model. Under certain conditions, the stock price can be expressed as an average weighted book value, price risk, and earnings. As far as the findings are concerned, a lot of knowledge has been contributed because the study has provided comprehensive empirical research on the effect of EPS, MBVR, BVPS, DYR, PER and institutional ownership on stock price variants of firms listed on NSE in Kenya. These findings are handy to the policy makers.

The issue of dividend yield is significant for several reasons. Dividends can be used as a financial signaling mechanism to outsiders about the firm's stability and growth

prospects. Dividends are an important aspect of a company's capital structure. The dividend yield ratio of any given company reflects the dividend policy of that company. Because of the inherent nature of risk aversion, investors hold investment volatility in high regard since it is a metric of the risk level. Positive changes in stock prices are usually caused by an increase in the dividend yield ratio, and vice versa.

Institutional ownership of stock can act as direct or moderating factor to stock price volatilities. Listed firms therefore need to delimit institutions owning large stock because once institutional shareholders become the majority owners, there will be a shift in agency conflict from shareholders versus managers to institutional owners, hence majority will still continue to transfer wealth at the minority's expense. This tendency is said to be against the firm's overall interest because the firm's overall interest includes the interests of the minority and majority shareholders.

The Market-to-Book ratio has been prominently discussed in previous empirical literature in accounting and finance. The capacity of the market to book ratio to make predictions of future share returns and accounting rates of return has been a recurring theme in this study. Market-to-Book and Price-to-Earnings ratios interaction can be applied in the prediction of a company's future return on equity. Therefore, this study provides a better understanding about the beneficial role of market value ratios and institutional ownership to policy makers and investors in general. Also, basing on the findings, managers of firms listed on NSE can apply dividend yield as a tool in the management of stock price volatility. They can attain this by increasing dividends and finding alternative means of financing their operations instead of retaining earnings. Also, they could increase dividend payment as a way of attracting risk-averse investors. In the same way, the payment of large dividends is likely to narrow the fluctuation of

share price by initiating signals of perceived low risk to the market. The management could also formulate a dividend policy that minimizes stock price volatility.

Finally, the study thus recommends for the government should stabilize the economy and establish policies which enhance growth of the economy and enhances stock market performance.

#### **5.4.2 Theoretical Recommendations**

The study complements the efficient market theory by adopting the semi-strong form and confirming that information available to the public on BVPS, MBVR, DYR and EPS significantly affect volatility of share price of firms listed on NSE. Based on the study's results, it is desirable to make comparisons of companies' market to book ratios in similar industries. This is because market-to-book value ratio assists a company in determining whether its asset value is comparable to its market value. Investors use the price to book value ratio to determine whether the asset value and the stock price is comparable. Market Price Book Value ratio is an appealing measure of efficiency due to the fact that it gives the variance between the company's current net assets and the market valuation. All these mentioned facts comprises the information ingredients that is suggested in the efficient market theory. This implies the study supports Efficient Market Hypothesis

Similarly, the theory of value relevance is supported by the fact that the premise for expecting market value ratios to influence stock volatility is that the accounting ratio is value relevant. Value relevance research is based on the idea that market value ratios are significant in determining a firm's value in the case that its cross-sectional variation corresponds with the cross-sectional variation in stock returns.

The signaling theory assumes that management and investors are perfectly knowledgeable about a company, but many scholars have disputed this premise, as managers tend to have more detailed and apt information especially on the market value ratios approximately than the outside investors. Unless the investors endeavor to calculate or obtain the information from the published statements of the firms, the information on these ratios will remain with the management only. This fact implies that the findings on these market value ratio supports the signaling theory on information asymmetry for some information remains with the management and not the investors and potential investors.

From the results, institutional investors play a monitoring role. What this means is that institutional investors may reduce capital market's need of implementing external monitoring. Subsequently, the role of institutional investors is minimization of agency conflict, which can be achieved by monitoring the performance of management or taking control of the company. The study also suggest that institutional shareholders who have a larger ownership percentage have a higher incentive of monitoring the company's management, therefore supporting agency theory.

However, the study recommends that other than Agency theory adopted in this study, future research should incorporate other theories which may be suited in explaining the link between market value ratios, institutional ownership structure and volatility of share price. Also, the results indicating that DYR negatively influences volatility of share price support the signaling theory. This is because a higher dividend may be an implication of corporate stability. In that way, investors would associate high dividend stock with lower risk and less volatility in the price of shares. In a nutshell, the findings comprise the information ingredients that is suggested in the efficient market theory,

theory of value relevance, signaling theory and agency theory thus supporting these theories.

### **5.4.3 Management Recommendations**

The management of listed firms in Nairobi Securities Exchange should compare Market to Book ratios between companies a similar industry. This is because market-to-book value ratio assists a firm in determining whether its asset value is comparable to its market value. The price-to-book value ratio is applied by investors in the determination of whether the share price of a company is appropriately valued. Market Price Book Value is an appealing measure of efficiency because it indicates the variance between the firm's current net assets vis a vis market valuation.

The company's management should also form a positive perception of the minds of customers to the company through enhancement of earnings per share. This is due to the fact that a firm with higher earnings per share may experience a rise in prices of its stocks. With the rise in share price, demand also increases, the company experiences sales increase and the company achieves an increase in earnings. Alternatively, when the earnings per share are low, it leads to low prices of shares, which negatively affects the consumers; confidence, affects sales and reduces the earnings per share.

Firms listed on capital markets should reflect their past earnings and performance trajectory by reviewing the book value of the company. Dividend distribution and decisions on investment hinge on the book value of the company. With a high book value, it is an indication that the company has significant reserves and has potentiality for a bonus. Alternatively, low book value is an indication of either the company's generous dividend and policy of distributing bonus or alternatively, the company's poor performance trajectory.



The issue of dividend yield is significant for several reasons. Dividends can be used as a financial signaling mechanism to outsiders about the firm's stability and growth prospects. Dividends significantly influence the capital structure of a company. The dividend yield ratio of any given company reflects the dividend policy of that company. Because of the inherent nature of risk aversion, investors value investment volatility as a measurement of risk. Positive changes in stock prices are usually caused by an increase in the dividend yield ratio, and vice versa. It is therefore recommended that the listed firms at Nairobi securities exchange need to maintain an acceptable dividend policy to both prospective and existing investors.

The study has provided evidence that Institutional stock ownership can act as direct or moderating factor to stock price volatilities. Listed firms therefore need to delimit institutions owning large stock because once institutional shareholders become the majority owners, the agency conflict shifts from management versus shareholders to institutional owners, and the majority still attempt to transfer wealth at the minority's expense. This trend is said to be against the firm's overall interest because the firm's overall interest includes the interests of the minority and majority shareholders.

Finally, managers should ensure that corporate disclosure on market value ratios and ownership structure is timely, transparent and informative for investors to gain confidence on market value ratios and ownership structure information that the management presents to them to aid them in investment decision making.

### **5.5 Recommendations for Further Studies**

Future studies regarding the present topic could examine if macroeconomic variables and other possible variables influence the volatility of share price of listed firms on NSE in Kenya due to low explanatory ability of the independent variables utilized in

the current study. Also, future scholars could conduct studies within other time frames to ascertain if the present study findings would be altered within a different period. As well, a related study can be performed on other stock exchanges to observe if similar findings are obtained. In addition, a study on how manipulated market value ratios influences stock price volatility could also be explored. Also, another interesting topic of investigation could be the impact of an irregular or inconsistent dividend policy on stock prices volatility.

## REFERENCES

- Adler, M., & Dumas, B. (1984). Exposure to currency risk: definition and measurement. *Financial management*, 41-50.
- Al-Ababneh, M. M. (2020). Linking ontology, epistemology and research methodology. *Science & Philosophy*, 8(1), 75-91.
- A El-Masry, A., & A El-Ghouty, A. (2017). Effect of Ownership Structure on Firm Stock Return Performance: Evidence from the Egyptian Stock Market.
- Al-Kuwari, D. (2009). Determinants of the dividend policy of companies listed on emerging stock exchanges: the case of the Gulf Cooperation Council (GCC) countries. *Global Economy & Finance Journal*, 2(2), 38-63.
- Al-Manaseer, S. R. (2020). Impact of Market Ratios on the Stock Prices: Evidence from Jordan. *International Business Research*, 13(4), 1-92.
- Alajekwu, U. B., & Ezeabasili, V. N. (2020). Dividend policy and stock market price volatility in the Nigerian stock market. *British Journal of Management and Marketing Studies*, 3(4), 37-52.
- Abbas, J., & Sağsan, M. (2019). Impact of knowledge management practices on green innovation and corporate sustainable development: A structural analysis. *Journal of cleaner production*, 229, 611-620.
- Abbas, G., Hammoudeh, S., Shahzad, S. J. H., Wang, S., & Wei, Y. (2019). Return and volatility connectedness between stock markets and macroeconomic factors in the G-7 countries. *Journal of Systems Science and Systems Engineering*, 28(1), 1-36.
- Abbas, M., & Badshah, I. (2017). Institutional investment and stock returns volatility at Pakistan stock exchange (PSX). *FWU Journal of Social Sciences*, 11(1), 219.
- Acs, Z. J., & Audretsch, D. B. (1990). *Innovation and small firms*. Mit Press.
- Adam, K., Marcet, A., & Nicolini, J. P. (2016). Stock market volatility and learning. *The Journal of finance*, 71(1), 33-82.
- Adaramola, A. O., Adefemi, O. A., Akosile, M. O., & Obalade, G. O. (2018). Effect of Dividend and Earnings on Stock Price Movement in Nigerian Banking Sector. *Acta Universitatis Danubius. Œconomica*, 14(5).
- Adiputra, I. G., & Hermawan, A. (2020). The effect of corporate social responsibility, firm size, dividend policy and liquidity on firm value: Evidence from manufacturing companies in Indonesia. *International Journal of Innovation, Creativity and Change*, 11(6), 325-338.
- Ahmad, A.C., & Jusoh, M.A. (2014). Institutional ownership and market-based performance indicators: Utilizing generalized least square estimation technique. *Procedia-Social and Behavioral Sciences*, 164, 477-485.
- Ahmed, I. (2018). Impact of Dividend per Share and Earnings per Share on Stock Prices: A Case Study from Pakistan (Textile Sector). *IJSSHE-International Journal of Social Sciences, Humanities and Education Volume*, 2(2).

- Ahmad, M. A., Alrjoub, A. M. S., & Alrabba, H. M. (2018). The effect of dividend policy on stock price volatility: empirical evidence from Amman stock exchange. *Academy of Accounting and Financial Studies Journal*, 22(2), 1-8.
- Ahmed, M. I., & Farah, Q. F. (2022). On the macroeconomic effects of news about innovations of information technology. *Journal of Macroeconomics*, 71, 103389.
- Akhtar, T. (2021). Market multiples and stock returns among emerging and developed financial markets. *Borsa Istanbul Review*, 21(1), 44-56.
- Ali, J., Tahira, Y., Amir, M., Ullah, F., Tahir, M., Shah, W. ... & Tariq, S. (2022). Leverage, Ownership Structure and Firm Performance. *Journal of Financial Risk Management*, 11(1), 41-65.
- Alireza, F., and Ali Tanbaz, H. (2011). The examination of the effect of ownership structure on firm performance in listed firm of Tehran Stock Exchange based on the type of industry. *International Journal of Business and Management*, 6(3), 249-266.
- Al-Manaseer, S.R. (2020). Impact of Market Ratios on the Stock Prices: Evidence from Jordan. *International Business Research*, 13(4), 1-92.
- Alrjoub, A.M.S., & Alrabba, H.M. (2018). The effect of dividend policy on stock price volatility: empirical evidence from Amman stock exchange. *Academy of Accounting and Financial Studies Journal*, 22(2).
- Al-Shawawreh, F.K. (2014). The impact of dividend policy on share price volatility: Empirical evidence from Jordanian stock market. *European Journal of Business and Management*, 6(38), 133–143.
- Alsu, E., & Yiğituşağı, M. (2019) relationship between financial performance and the volatility of stock prices: an econometric application on bist manufacturing industry index. *Gülslahiye İİBF Uluslararası E-Dergi*, 3(3), 88-105.
- Alwi, Iskandar Z, 2008. Capital Market: Theory and Application, Pancur Siwah Foundation, Jakarta, Indonesia
- Alzeaideen, K.A., & Al\_Rawash, S.Z. (2014). The effect of ownership structure on share price volatility of listed companies in Amman Stock Exchange. *Research Journal of Finance and Accounting*, 5(6), 192-201.
- Alzoubi, E.S.S. (2016) Ownership structure and earnings management: evidence from Jordan. *International Journal of Accounting and Information Management*. 24 (2), pp. 135–161
- Amidu, M., & Abor, J. (2006). Determinants of dividend payout ratios in Ghana. *The journal of risk finance*.
- Amos, B., Ibrahim, G., Nasidi, M., & Ibrahim, K.Y. (2016). The Impact of Institutional Ownership Structure on Earnings Quality of Listed Food/Beverages and Tobacco Firms in Nigeria. *Researchers World*, 7(1), 20.
- Amoro, D. N. (2019). The effect of macroeconomic factors and political events on the performance of Nairobi securities exchange in Kenya. *Eur. J. Econ. L. & Pol.*, 6, 27.

- Angabini, A., & Wasiuzzaman, S. (2010). Modeling the effects of the global financial crisis on the Malaysian market. *International Journal of Trade, Economics and Finance*, 1(4), 387.
- Angahar, P.A., & Malizu, J. (2015). The Relationship between Market value ratios and Stock Market Returns on the Nigerian Stock Exchange. *Management and Administrative Sciences Review*, 4(1), 76-86.
- Aras, G., Tezcan, N., & Furtuna, O. K. (2018). Multidimensional comprehensive corporate sustainability performance evaluation model: Evidence from an emerging market banking sector. *Journal of cleaner production*, 185, 600-609.
- Arkan, T. (2016). The importance of financial ratios in predicting stock price trends: A case study in emerging markets. *Finanse, Rynki Finansowe, Ubezpieczenia*, (79), 13-26.
- Aroni, J.M. (2011). Factors influencing stock prices for firms listed in the Nairobi Securities Exchange. *International Journal of Business and Social Science*, 2(20).
- Artatik, Sri. (2007). The Influence of Earnings Per Share (EPS) and Price Earnings Ratio (PER) on Stock Return of the Public Listed Manufacturing Companies in Indonesian Stock Market (BEI), Thesis, Semarang, Indonesia: State University of Semarang
- Astivia, O.L.O., & Zumbo, B.D. (2019). Heteroskedasticity in Multiple Regression Analysis: What it is, How to detect it and How to solve it with Applications in R and SPSS? *Practical Assessment, Research, and Evaluation*, 24(1), 1.
- Atidhira, A.T., & Yustina, A.I. (2017). The influence of return on asset, debt to equity ratio, earnings per share, and company size on share return in property and real estate companies. *JAAF (Journal of Applied Accounting and Finance)*, 1(2), 128-146.
- Avdalovic, S. M., & Milenković, I. (2017). Impact of company performances on the stock price: An empirical analysis on select companies in Serbia. *Economics of Agriculture*, 64(2), 561-570.
- Balemi, N., Füss, R., & Weigand, A. (2021). COVID-19's impact on real estate markets: review and outlook. *Financial Markets and Portfolio Management*, 35(4), 495-513.
- Ballings, M., Van den Poel, D., Hespels, N., & Gryp, R. (2015). Evaluating multiple classifiers for stock price direction prediction. *Expert systems with Applications*, 42(20), 7046-7056.
- Baltagi, B. H. (2008). *Econometric analysis of panel data* (Vol. 4). Chichester: John Wiley & sons.
- Baltes, S., & Ralph, P. (2020). Sampling in software engineering research: A critical review and guidelines. *arXiv preprint arXiv:2002.07764*.
- Bamurange, P., Githui, T., & Omurwa, J. (2019). Influence of Selected Macroeconomic Factors on Stock Market Performance in Kenya. *Journal of Finance and Accounting*, 3(2), 1-24.

- Baresa, S., Bogdan, S., & Ivanovic, Z. (2013). Strategy of stock valuation by fundamental analysis. *UTMS Journal of Economics*, 4(1), 45-51.
- Barinov, A. (2017). Institutional ownership and aggregate volatility risk. *Journal of Empirical Finance*, 40, 20-38.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.
- Barrese, J., Pooser, D., & Wang, P. (2018). Institutional Ownership in Financial Services: Performance and Risk. Available at SSRN 3174755.
- Barth, M.E., Beaver, W.H., & Landsman, W.R. (1998). Relative valuation roles of equity book value and net income as a function of financial health. *Journal of Accounting & Economics*, 25(1), 1-34.
- Barth, M. E., Li, K., & McClure, C. (2022). Evolution in value relevance of accounting information.
- Basak, S., Kar, S., Saha, S., Khaidem, L., & Dey, S. R. (2019). Predicting the direction of stock market prices using tree-based classifiers. *The North American Journal of Economics and Finance*, 47, 552-567.
- Batten, J., & Vo, X. V. (2019). Determinants of bank profitability—Evidence from Vietnam. *Emerging Markets Finance and Trade*, 55(6), 1417-1428.
- Bayrakdaroglu, A., Mirgen, C., & Kuyu, E. (2017). Relationship between profitability ratios and stock prices: an empirical analysis on BIST-100. *Press Academia Procedia*, 6(1), 1-10.
- Bell, J., & Waters, S. (2018). *Ebook: doing your research project: a guide for first-time researchers*. McGraw-hill education (UK).
- Bhowmik, R., & Wang, S. (2020). Stock market volatility and return analysis: A systematic literature review. *Entropy*, 22(5), 522.
- Bianconi, M., & Yoshino, J. A. (2017). Valuation of the worldwide commodities sector: The role of market-to-book and return on equity. *Studies in Economics and Finance*.
- Blaikie, N. & Priest, J. (2019). *Designing social research: The logic of anticipation*. John Wiley & Sons.
- Blaikie, N., & Priest, J. (2017). *Social research: Paradigms in action*. John Wiley & Sons.
- Blankespoor, E., deHaan, E., & Marinovic, I. (2020). Disclosure processing costs, investors' information choice, and equity market outcomes: A review. *Journal of Accounting and Economics*, 70(2-3), 101344.
- Bordalo, P., Gennaioli, N., La Porta, R., & Shleifer, A. (2020). *Expectations of fundamentals and stock market puzzles* (No. w27283). National Bureau of Economic Research.

- Brands, S., Gallagher, D. R., & Looi, A. (2006). Active investment manager portfolios and preferences for stock characteristics. *Accounting & Finance*, 46(2), 169-190.
- Bråte, I. L. N., Hurley, R., Iversen, K., Beyer, J., Thomas, K. V., Steindal, C. C., ... & Lusher, A. (2018). *Mytilus* spp. as sentinels for monitoring microplastic pollution in Norwegian coastal waters: A qualitative and quantitative study. *Environmental Pollution*, 243, 383-393.
- Brest, P., Gilson, R. J., & Wolfson, M. A. (2018). Essay: How investors can (and can't) create social value. *J. Corp. L.*, 44, 205.
- Broberg, M., & Lindh, K. (2012). Dividend-yield, an indicator for successful trading? A study of dividend-yield's impact on total stock return on the Swedish stock market.
- Bushee, B. J., & Noe, C. F. (2000). Corporate disclosure practices, institutional investors, and stock return volatility. *Journal of accounting research*, 171-202.
- Bushee, B. J. (2001). Do institutional investors prefer near-term earnings over long-run value? *Contemporary Accounting Research*, 18(2), 207-246.
- Bustos, O., & Pomares-Quimbaya, A. (2020). Stock market movement forecast: A systematic review. *Expert Systems with Applications*, 156, 113464.
- Butler, F.C., Evans, R., & Lamb, N.H. (2019). Non-Required CEO Disclosures and Stock Price Volatility: An Ethical Dilemma. *Business and Professional Ethics Journal*, 38(3), 255-273.
- Cahyaningrum, Y. W., & Antikasari, T. W. (2017). The Influence of Earning Per Share, Price to Book Value, Return on Asset, and Return on Equity to Stock Price in Finance Company. *Jurnal Economia*, 13(2), 191-200.
- Calhoun, G. (2020). *Price and Value: A Guide to Equity Market Valuation Metrics*. A press.
- Camanho, N., Hau, H., & Rey, H. (2018). *Global portfolio rebalancing and exchange rates* (No. w24320). National Bureau of Economic Research.
- Campbell, J.Y. & Shiller, R.J. (1988). The dividend-price ratio and expectations of future dividends and discount factors. *Review of Financial Studies* 1, 195-228.
- Cecez-Kecmanovic, D., & Kennan, M. A. (2018). The methodological landscape Information systems and knowledge. *Research Methods*, 127.
- Chaleeda, M., Islam, A., Ahmad, T. S. T., & Ghazalat, A. N. M. (2019). The effects of corporate financing decisions on firm value in Bursa Malaysia. *International Journal of Economics and Finance*, 11(3), 127-135.
- Cheng, C.S., Lee, B.S., & Yang, S. (2013). The value relevance of earnings levels in the return-earnings relation. *International Journal of Accounting and Information Management*, 21(4), 260-284.
- Cheng, H., Huang, D., & Luo, Y. (2020). Corporate disclosure quality and institutional investors' holdings during market downturns\*. *Journal of Corporate Finance*, 60, 101523.

- Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2021). Testing moderation in business and psychological studies with latent moderated structural equations. *Journal of Business and Psychology*, 36(6), 1009-1033.
- Chiah, M., Gharghori, P., & Zhong, A. (2020). Has Idiosyncratic Volatility Increased? Not in Recent Times. *Not in Recent Times (September 26, 2020)*. *Critical Finance Review, Forthcoming*.
- Chun, D., Cho, H., & Ryu, D. (2020). Economic indicators and stock market volatility in an emerging economy. *Economic Systems*.
- Cipra, T. (2020). *Autocorrelation Methods in Regression Models*. In Time Series in Economics and Finance (pp. 175-195). Springer, Cham.
- Cochrane, J. (2011). Discount rates: American finance association presidential address. *Journal of Finance*, 66, 1047-1108.
- Cohen, P., West, S. G., & Aiken, L. S. (2014). *Applied multiple regression/correlation analysis for the behavioral sciences*. Psychology press.
- D'Amato, A., & Falivena, C. (2020). Corporate social responsibility and firm value: Do firm size and age matter? Empirical evidence from European listed companies. *Corporate Social Responsibility and Environmental Management*, 27(2), 909-924.
- Dalla, V., Giraitis, L., & Phillips, P. C. (2020). Robust tests for white noise and cross-correlation. *Econometric Theory*, 1-29.
- Dang, N.H., Hoang, T.V.H., & Tran, M.D. (2017). The Relationship between Market value ratios in the Financial Statements and the Stock Returns of Listed Firms in Vietnam Stock Exchange. *International Journal of Economics and Finance*, 9(10), 1-10.
- Dang, N.H., Tran, M.D., & Nguyen, T.L.A. (2018). Investigation of the Impact of Financial Information on Stock Prices: The Case of Vietnam. *Academy of Accounting & Financial Studies Journal*, 22(2).
- Darmadji, Tjiptono and Hendy M. Fakhruddin. 2001. Capital Market in Indonesia.
- David, A. & Veronesi, P. (2009). What Ties Return Volatilities to Price Valuations and Fundamentals? No 15563, NBER *Working Papers*, National Bureau of Economic Research, Inc. <<http://EconPapers.repec.org/RePEc:nbr:nberwo:15563>>
- Damodaran, A. (2011). *The little book of valuation: how to value a company, pick a stock and profit* (Vol. 34). John Wiley & Sons.
- Daniswara, H. P., & Daryanto, W. M. (2020). Earnings per Share (EPS), Price Book Value (PBV), Return on Asset (ROA), Return on Equity (ROE), and Indeks Harga Saham Gabungan (IHSG) Effect on Stock Return. *South East Asia Journal of Contemporary Business, Economics and Law*, 20(1), 11-27.
- Dimitropoulos, P.E., & Asteriou, D. (2009). The value relevance of financial statements and their impact on stock prices: Evidence from Greece. *Managerial Auditing Journal*, 24(3), 248-265.



- Din, W.U. (2017). *Stock return predictability with financial ratios: Evidence from PSX 100 index companies*. Available at SSRN 3077890.
- Dissanayake, S., & Wickramasinghe, M. (2016). Earnings Fluctuation on Share Price Volatility. *Account and Financial Management Journal*, 1(5).
- Döring, S., Drobetz, W., El Ghouli, S., Guedhami, O., & Schröder, H. (2021). Institutional investment horizons and firm valuation around the world. *Journal of International Business Studies*, 52(2), 212-244.
- Dung, P. T. (2018). *Foreign ownership and stock return volatility of industrial firms in Ho Chi Minh stock exchange* (Doctoral dissertation, International University-HCMC).
- Dynamic Institutional Preferences”, *The Review of Financial Studies*, Vol.16, n° 4, pp.1203-1238.
- Dwialesi, J. B., & Darmayanti, N. P. A. (2016). Pengaruh faktor-faktor fundamental terhadap return saham indeks kompas 100. *E-Jurnal Manajemen Unud*, 5(9), 5369-5397.
- Egbunike, C. F., & Okerekeoti, C. U. (2018). Macroeconomic factors, firm characteristics and financial performance: A study of selected quoted manufacturing firms in Nigeria. *Asian Journal of Accounting Research*.
- ElGhouti, A. (2015). Effect of ownership structure on firm stock returns and financial performance: evidence from the Egyptian stock market.
- Emamgholipour, M., Pouraghajan, A., Tabari, N.A.Y., Haghparast, M., & Shirsavar, A.A.A. (2013). The effects of performance evaluation market ratios on the stock return: Evidence from the Tehran stock exchange. *International Research Journal of Applied and Basic Sciences*, 4(3), 696-703.
- Erkan, A. L. S. U., & Yiğituşağı, M. (2019). Relationship between Financial Performance and the Volatility of Stock Prices: An Econometric Application on BIST Manufacturing Industry Index. *GÜ İslahiye İİBF Uluslararası E-Dergi*, 3(3), 88-105.
- Eslamzadeh, S. M., Vaez, S. A., & Ahmadi, A. R. (2012). The Effect of the Quality of Information Disclosure on Profit Information content and the Book Value of the Equity of Firms listed on Tehran Stock Exchange. *Life Science Journal*, 9(4).
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.
- Ezazi, M., Sadeghisharif, S. J., Alipour, M., & Amjadi, H. (2011). The effect of ownership structure on share price volatility of listed companies in Tehran Stock Exchange: Empirical evidence of Iran. *International journal of business and social science*, 2(5), 163-169.
- Fadhliyah, Alfi. (2008). *The Analysis of the Influence of Equity Book Value and Earnings Per Share on Stock Price of the Listed Companies in Indonesian Stock Exchange for the period of 2002 – 2006*. Thesis. Jakarta: University of Indonesia.

- Fahim, S. R. S. N., Kheradyar, S., & Atabakhsh, R. (2016). Accounting variables ability to explain the price volatility in the stock market. *International journal*.
- Fama, E.F. & French, K.R. (1988). Dividend yields and expected stock returns. *Journal of Financial Economics*, 22, 3-25.
- Faruque, M. O., Siddiquee, M. J. A., Parvin, S., Rounok, N., & Islam, M. A. (2021). Impact of dividend policy on share prices: a study on pharmaceutical companies listed in dhaka stock exchange. *Journal of Science and Technology*, 100(107), 1994-0386.
- Fehr, E. (2016). *Institutional ownership and performance: An Overview in emerging and developed countries*. Accessed from [https://theses.uhn.nl/bitstream/handle/123456789/3886/Fehr%2C\\_Erik\\_1.pdf?sequence=1](https://theses.uhn.nl/bitstream/handle/123456789/3886/Fehr%2C_Erik_1.pdf?sequence=1)
- Fernández, A., García, S., Galar, M., Prati, R. C., Krawczyk, B., & Herrera, F. (2018). *Learning from imbalanced data sets* (Vol. 10, pp. 978-3). Berlin: Springer.
- Ferreira, M.A., and P., Matos, 2008, “The colors of investors’ Money: The role of
- Gautam, R. (2017). Impact of firm specific variables on stock price volatility and stock returns of Nepalese commercial Banks. *SAARJ Journal on Banking & Insurance Research*, 6(6), 10-27.
- Geng, R., Bose, I., & Chen, X. (2015). Prediction of financial distress: An empirical study of listed Chinese companies using data mining. *European Journal of Operational Research*, 241(1), 236-247.
- Glezakos, M., Mylonakis, J., & Kafouros, C. (2012). The impact of accounting information on stock prices: Evidence from the Athens Stock Exchange. *International Journal of Economics and Finance*, 4(2), 56-68.
- Gompers, P. A., & Metrick, A. (2001). Institutional investors and equity prices. *The quarterly journal of Economics*, 116(1), 229-259.
- Gompers, P.A., and A., Metrick, 2001, “Institutional Investors and Equity Prices”.
- Goranova, M., & Ryan, L. V. (2014). Shareholder activism: A multidisciplinary review. *Journal of Management*, 40(5), 1230-1268.
- Guerard, J. B. (2013). Regression analysis and forecasting models. In *Introduction to Financial Forecasting in Investment Analysis* (pp. 19-45). Springer, New York, NY.
- Guiso, L., Sapienza, P., & Zingales, L. (2018). Time varying risk aversion. *Journal of Financial Economics*, 128(3), 403-421.
- Gulati, C., & Baber, P. (2020). Basics of statistics. In *An SPSS Guide for Tourism, Hospitality and Events Researchers* (pp. 106-123). Routledge.
- Groenland, E., & Dana, L. P. (2020). *Qualitative methodologies and data collection methods: Toward increased rigour in management research*.

- Hadani, M., Goranova, M. and Khan, R. (2011) Institutional investors, shareholder activism, and earnings management. *Journal of Business Research*. 64 (12), pp. 1352–1360.
- Hai, T.T.T., Diem, N.N., & Binh, H.Q. (2015). The relationship between market value ratios reported in financial statements and stock returns-empirical evidence from Vietnam. *International Journal of Accounting and Financial Reporting*, 5(1), 229-238.
- Hamid, K., Usman Khurram, M., & Ghaffar, W. (2017). Juxtaposition of micro and macro dynamics of dividend policy on stock price volatility in financial sector of Pakistan:(comparative analysis through common, fixed, random and GMM effect). *Journal of Accounting, Finance and Auditing Studies*, 3(1), 64-79.
- Hanifah, A. (2019). The effect of earning per share (EPS), price earnings ratio (PER) and price book value (PBV) against the stock price of telecommunications sector company included in the Indonesian Islamic Stock Index (ISSI). *KnE Social Sciences*, 711-726.
- Haque, R., Jahiruddin, A.T.M., & Mishu, F. (2019). Dividend policy and share price volatility: A study on Dhaka Stock Exchange. *Australian Academy of Accounting and Finance Review*, 4(3), 89-99.
- Hasangapon, M., Iskandar, D., Purnama, E. D., & Tampubolon, L. D. (2021). The Effect of Firm Size and Total Assets Turnover (Tato) on Firm Value Mediated by Profitability in Wholesale and Retail Sector Companies. *Primanomics: Jurnal Ekonomi & Bisnis*, 19(3), 49-63.
- Hashemijoo, M., Ardekani, A.M., & Younesi, N. (2012). The impact of dividend policy on share price volatility in the Malaysian Stock Market. *Journal of Business Studies Quarterly*, 4(1), 111- 129.
- Hassanein, A., Marzouk, M., & Azzam, M. E. A. (2021). How does ownership by corporate managers affect R&D in the UK? The moderating impact of institutional investors. *International Journal of Productivity and Performance Management*.
- Hassanzadeh, R.B., Nahandi, Y.B., Behbahanizadeh, S.S, & Lalepour, M. (2013). Studying how dividends policy affects the relationship between institutional ownership and stock return fluctuations. *Life Science Journal*, 10 (1), 342-348.
- Harjoto, M., Jo, H., & Kim, Y. (2017). Is institutional ownership related to corporate social responsibility? The nonlinear relation and its implication for stock return volatility. *Journal of Business Ethics*, 146(1), 77-109.
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. Retrieved from <http://www.afhayes.com/public/process2012>.
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford publications.
- Hirdinis, M. (2019). Capital structure and firm size on firm value moderated by profitability.

- Hoffmann, J., & Marriott, N. (2019). Do Dividend Yields Affect a Stock Price's Volatility? Does the Miller & Modigliani Theorem apply to the Euronext and London Stock Exchange?
- Hooi, S. E., Albaity, M., & Ibrahimy, A. I. (2015). Dividend policy and share price volatility. *Investment management and financial innovations*, (12, № 1 (contin. 1)), 226-234.
- Hsiang-lan Chen, Wen-tsung Hsu & Chiao-yi Chang (2014). Family Ownership, Institutional Ownership, and Internationalization of SMEs, *Journal of Small Business Management*, 52:4, 771-789, DOI: 10.1111/jsbm.12031
- Hunjra, A. I., Ijaz, M., Chani, D., Irfan, M., & Mustafa, U. (2014). Impact of dividend policy, earning per share, return on equity, profit after tax on stock prices. *Hunjra, AI, Ijaz, M. S, Chani, MI, Hassan, S. and Mustafa, U. (2014). Impact of Dividend Policy, Earning per Share, Return on Equity, Profit after Tax on Stock Prices. International Journal of Economics and Empirical Research*, 2(3), 109-115.
- Hussainey, K., Mgbame, C.O. & Chijoke-Mgbame, A.M. (2011). Dividend policy and share price volatility: UK evidence, *Journal of Risk Finance*, 12 (1), pp. 57-68.
- Ikhatua, O.J. (2013). Market value ratios and stock volatility in the Nigerian Capital Market: A GARCH analysis approach. *International Review of Management and Business Research*, 2(1), 265.
- Jafarinejad, M., Jory, S.R., & Ngo, T.N. (2015). The effects of institutional ownership on the value and risk of diversified firms. *International Review of Financial Analysis*, 40, 207-219.
- Jankensgård, H., & Vilhelmsson, A. (2015). Ownership Determinants of Stock Return Volatility. Available at SSRN, 2599488.
- Jentsch, V. (2019). Board composition, ownership structure and firm value: Empirical evidence from Switzerland. *European Business Organization Law Review*, 20(2), 203-254.
- Jiambalvo, J., Rajgopal, S., & Venkatachalam, M. (2002). Institutional ownership and the extent to which stock prices reflect future earnings. *Contemporary accounting research*, 19(1), 117-145.
- Jiambalvo, J., Rajgopal, S., & Venkatachalam, M. (2002). Institutional ownership and the extent to which stock prices reflect future earnings. *Contemporary accounting research*, 19(1), 117-145.
- Jiang, X. & Lee, B.S. (2012). Do decomposed financial ratios predict stock returns and fundamentals better? *Financial Review* 47(3): 531-564.
- Jihadi, m., vilantika, e., hashemi, s. m., arifin, z., bachtiar, y., & sholichah, f. (2021). The effect of liquidity, leverage, and profitability on firm value: Empirical evidence from Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(3), 423-431.
- Jordan, D. G., Winer, E. S., & Salem, T. (2020). The current status of temporal network analysis for clinical science: Considerations as the paradigm shifts? *Journal of clinical psychology*, 76(9), 1591-1612.

- Jorion, P. (1990). The exchange-rate exposure of US multinationals. *Journal of business*, 331-345.
- Julie Dahlquist, Rainford Knight (2022). Principles of Finance. Houston, Texas. <https://openstax.org/books/principles-finance/pages/1-why-it-matters>
- Kaboro, J., & Mose, N. (2021). Impact of macroeconomic variables on exchange rate uncertain. *Financial Internet Quarterly'e-Finanse'*, 17(3).
- Kachchhy, U. (2015). Market value ratios and Stock Price Reaction of Listed Companies - Empirical Evidence from All Listed Companies from NSE in Power Generation and Distribution Sector. *PARIPEX - Indian Journal of Research*. Volume: 4 | Issue: 5.
- Katsiampa, P., Corbet, S., & Lucey, B. (2019). Volatility spillover effects in leading cryptocurrencies: A BEKK-MGARCH analysis. *Finance Research Letters*, 29, 68-74.
- Kadim, A., Sunardi, N., & Husain, T. (2020). The modeling firm's value based on financial ratios, intellectual capital and dividend policy. *Accounting*, 6(5), 859-870.
- Kalnins, A. (2018). Multicollinearity: How common factors cause Type 1 errors in multivariate regression. *Strategic Management Journal*, 39(8), 2362-2385.
- Karakus, R., & Bozkurt, I. (2017). *The Effect of Financial Ratios and Macroeconomic Factors on Firm Value: An Empirical Analysis in Borsa Istanbul*. In Article on RSEP International Conferences on Social Issues and Economic Studies, Prague, Czechia.
- Keith, T. Z. (2019). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling*. Routledge.
- Kellard, N.M., Nankervis, J.C. & Papadimitriou, F.I. (2010). Predicting the equity premium with dividend ratios: Reconciling the evidence. *Journal of Empirical Finance*, 17, 539-551.
- Khan, T.R., Islam, M., Choudhury, T.T., & Adnan, A.M. (2014). *How earning per share (EPS) effects on share price and firm value*.
- Khositkulporn, P. (2013). *The factors affecting stock market volatility and contagion: Thailand and South-East Asia evidence* (Doctoral dissertation, Victoria University).
- Kibiya, I. U., Aminu, B. S., & Abubakar, K. S. (2019). The Moderating Effect of Institutional Ownership on Intellectual Capital and Financial Performance of Listed Conglomerates. *SEISENSE Journal of Management*, 2(5), 20–28. <https://doi.org/10.33215/sjom.v2i5.151>
- Kirui, E. Wawire, N.H.W, & Onono, P.O. (2014). Macroeconomic variables, volatility and stock market returns: A case of Nairobi Securities Exchange, Kenya. *International Journal of Economics and Finance*, 6(8), 214.
- Kisaka, S.E. & Mwasaru, A. (2012). The causal relationship between exchange rates and stock prices in Kenya. *Research Journal of Finance and Accounting*, 3(7), 121-130.

- Kočenda, E., & Černý, A. (2015). *Elements of time series econometrics: An applied approach*. Charles University in Prague, Karolinum Press.
- Korkmaz, & Karaca, S.S. (2013). The Factors Affecting Firm Performance: The Case of Turkey. *Ege Akademik Bakış Dergisi*, 13(2), 169-180.
- Koutmos, D. (2010). The P/E Multiple and Market Volatility Revisited, *International Research Journal of Finance and Economics*, 43, 7-16.
- Krainer, J., & LeRoy, S. F. (2002). Equilibrium valuation of illiquid assets. *Economic Theory*, 19(2), 223-242.
- Kumar, P. (2017). Impact of earning per share and price earnings ratio on market price of share: a study of auto sector in India. *International Journal of Research*, 5(2).
- Kumaraswamy, S., Ebrahim, R. H., & Mohammad, W. M. W. (2019). Dividend policy and stock price volatility in Indian capital market. *Entrepreneurship and Sustainability Issues*, 7(2), 862.
- Kusmayadi, D., Rahman, R., & Abdullah, Y. (2018). Analysis of the Effect of Net Profit Margin, Price to Book Value, and Debt to Equity Ratio on Stock Return. *International Journal of Recent Scientific Research*, 9(7), 28091-28095.
- Larcker, D. F., Ormazabal, G., & Taylor, D. J. (2011). The market reaction to corporate governance regulation. *Journal of financial economics*, 101(2), 431-448.
- Lashgari, D., & Ahmadi, M. (2014). The impact of dividend policy on stock price volatility in the Tehran Stock Exchange. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 3(10), 273-283.
- Lavery, M. R., Acharya, P., Sivo, S. A., & Xu, L. (2019). Number of predictors and multicollinearity: What are their effects on error and bias in regression? *Communications in Statistics-Simulation and Computation*, 48(1), 27-38.
- Law, S. H., & Ngah, W. A. S. W. (2008). Does stock market liberalization cause higher volatility in the bursa malaysia? *International Journal of Business and Society*, 9(1), 19.
- Lee, S. U., & Kang, J. (2015). Technological diversification through corporate venture capital investments: Creating various options to strengthen dynamic capabilities. *Industry and Innovation*, 22(5), 349-374.
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of econometrics*, 108(1), 1-24.
- Li, Y., Liu, J., Wang, H., & Wang, P. (2021). Stock market liberalization, foreign institutional investors, and informational efficiency of stock prices: Evidence from an emerging market. *International Journal of Finance & Economics*, 26(4), 5451-5471.
- Likens, A. D., Amazeen, P. G., West, S. G., & Gibbons, C. T. (2019). Statistical properties of Multiscale Regression Analysis: Simulation and application to human postural control. *Physica A: Statistical Mechanics and Its Applications*, 532, 121580.

- Lin, Y., Fu, X., Gu, X., & Song, H. (2018). Institutional ownership and return volatility in the casino industry. *International Journal of Tourism Research*, 20(2), 204-214.
- Liu, J. & Liu, C. (2007). Value relevance of market value ratios in different stock market segments: the case of Chinese 297 A-, B-, and H-shares. *Journal of International Accounting Research*, 6(2):55-81.
- LumbanGaol, G. A., Firmansyah, A., & Irawati, A. D. (2021). Intellectual Capital, Corporate Social Responsibility, and Firm Value in Indonesia's Banking Industries. *Jurnal Riset Akuntansi Terpadu*, 14(1).
- Marangu, K., & Jagongo, A. (2014). Price to book value ratio and financial statement variables (An empirical study of companies quoted at Nairobi securities exchange, Kenya). *Global Journal of Commerce & Management Perspective*, 3(6), 50-56.
- Martelli, J., & Greener, S. (2018). An introduction to business research methods. Ventus Publishing.
- Mauboussin, M., & Rappaport, A. (2021). 1 The Case for Expectations Investing. In *Expectations Investing* (pp. 1-18). Columbia University Press.
- Maringa, E. K., Riro, G. K., & Kiarie, D. (2018). Market reaction to dividend announcements: Analysis at Nairobi securities exchange. *International Journal of Finance and Accounting*, 3(1), 48-65.
- Martens, M., & Van Dijk, D. (2007). Measuring volatility with the realized range. *Journal of Econometrics*, 138(1), 181-207.
- Mazur, M., Dang, M., & VO, T. A. T. (2020). Dividend policy and the COVID-19 crisis.
- McMillan, D.G. & Wohar, M.E., (2013). *A panel analysis of the stock return dividend yield relation: predicting returns and dividend growth*. Manchester School, 81, 386-400
- McMillan, D.G. (2014). Modelling time-variation in the stock return-dividend yield predictive equation. *Financial Markets, Institutions and Instruments*, 23, 273-302.
- McMillan, D.G. (2019). Stock return predictability: Using the cyclical component of the price ratio. *Research in International Business and Finance*, 48, 228-242.
- Megaritis, A., Vlastakis, N., & Triantafyllou, A. (2021). Stock market volatility and jumps in times of uncertainty. *Journal of International Money and Finance*, 113, 102355.
- Melisa, L.A. (2013). *Value relevance of market value ratios: Evidence from Sri Lanka*. Proceedings of the Third International Symposium, SEUSL: Oluvil, Sri Lanka.
- Memon, M.A., Cheah, J.H., Ramayah, T., Ting, H., Chuah, F., & Cham, T.H. (2019). Moderation analysis: issues and guidelines. *Journal of Applied Structural Equation Modeling*, 3(1), i-xi.

- Menaje, P. M. (2012). Impact of selected financial variables on share price of publicly listed firms in the Philippines. *American international journal of Contemporary Research*, 2(9), 98-104.
- Menike, M.G.P.D., & Prabath, U.S. (2014). The impact of accounting variables on stock price: evidence from the Colombo Stock Exchange, Sri Lanka. *International Journal of Business and Management*, 9(5), 125.
- Miller, M.H. & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *The Journal of Business*, 34, 411-433. An empirical exploration of idiosyncratic risk”, *Journal of Finance*, Vol.56, pp. 1-43.
- Mirfakhr-Al-Dini, S. H., Dehavi, H. D., Zarezadeh, E., Armesh, H., Manafi, M., & Zraezadehand, S. (2011). Fitting the relationship between financial variables and stock price through fuzzy regression case study: Iran Khodro Company. *International Journal of Business and Social Science*, 2(11).
- Mishra, D. P., Atav, G., & Dalman, M. D. (2020). Do buzz and evidence really matter in product preannouncements? An empirical test of two competing theories. *Journal of Consumer Marketing*.
- Mittal, S., & Sharma, D. (2021). The impact of COVID-19 on stock returns of the Indian healthcare and pharmaceutical sector. *Australasian Accounting, Business and Finance Journal*, 15(1), 5-21.
- Möttus, R., Wood, D., Condon, D. M., Back, M. D., Baumert, A., Costantini, G., & Zimmermann, J. (2020). Descriptive, predictive and explanatory personality research: Different goals, different approaches, but a shared need to move beyond the Big Few traits. *European Journal of Personality*, 34(6), 1175-1201.
- Morales-Díaz, J., & Zamora-Ramírez, C. (2018). The impact of IFRS 16 on key financial ratios: A new methodological approach. *Accounting in Europe*, 15(1), 105-133.
- Morelli, D. (2002). The relationship between conditional stock market volatility and conditional macroeconomic volatility: Empirical evidence based on UK data. *International Review of Financial Analysis*, 11(1), 101-110.
- Mosbei, T. (2021). *The effect of exchange rate volatility and selected macroeconomic variables on Intra-East Africa Community Regional Trade* (Doctoral dissertation, Moi University).
- Mostafa, W. (2016). The value relevance of earnings, cash flows and book values in Egypt. *Management Research Review*.
- Muchina, S. (2015). Determinants Of Share Price Volatility Of Companies Listed On Nairobi Securities Exchange In Kenya (Unpublished Doctoral Thesis). *Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya*.
- Musallam, S. R. (2018). Exploring the relationship between financial ratios and market stock returns. *Eurasian Journal of Business and Economics*, 11(21), 101-116.
- Musyoki, J. M. (2017). *Effect of exchange rate volatility on stock market returns at the Nairobi Securities Exchange* (Doctoral dissertation, University of Nairobi).



- Mwangi, P. N. (2019). Effects of Automated Trading System (ATS) On the Efficiency of Nairobi Securities Exchange (NSE), Kenya for the Period 2013 To 2017.
- Nasarudin, I., Suhendra, S., & Anggraini, L. (2019). The Determinant of Stock Price: Evidence on Food and Beverage Companies in Indonesia. *Etikonomi*, 18(1), 143-154.
- Naufa, A. M., Lantara, I. W. N., & Lau, W. Y. (2019). The impact of foreign ownership on return volatility, volume, and stock risks: Evidence from ASEAN countries. *Economic Analysis and Policy*, 64, 221-235.
- Nam, K., & Seong, N. (2019). Financial news-based stock movement prediction using causality analysis of influence in the Korean stock market. *Decision Support Systems*, 117, 100-112.
- Namazi, M., & Namazi, N. R. (2016). Conceptual analysis of moderator and mediator variables in business research. *Procedia Economics and Finance*, 36, 540-554.
- Nazir, M.S., Nawaz, M.M., Anwar, W. & Ahmed, F. (2010). Determinants of stock price volatility in Karachi stock exchange: The mediating role of corporate dividend policy, *International Research Journal of Finance and Economics*, 55, pp. 100-107.
- Ndegwa, J.W., Gakobo, T.W., & Onyuma, S. (2016). Factors influencing performance of insurance industry in Kenya: A case of small and medium insurance companies in Nairobi County. *International Academic Journal of Human Resource and Business Administration*, 2(2), 1-21.
- Ndwiga, D., & Muriu, P.W. (2016). Stock Returns and Volatility In an Emerging Equity Market. Evidence from Kenya. *European Scientific Journal*, ESJ, 12(4), 79.
- Nguyen, T., Nguyen, H., Tran, Q., & Le, Q. (2020). Dividend policy and share price volatility: empirical evidence from Vietnam. *Accounting*, 6(2), 67-78.
- Ni, W. (2017). Research on ownership structure and stock price fluctuation. In *2017 7th International Conference on Education, Management, Computer and Society (EMCS 2017)* (pp. 438-442). Atlantis Press.
- Nirmala, P. S., Sanju, P. S., & Ramachandran, M. (2011). Determinants of share prices in India. *Journal of emerging trends in economics and management sciences*, 2(2), 124-130.
- Nairobi Securities Exchange (2013). History of organization. Retrieved from <https://www.nse.co.ke/about-nse/history-of-organisation>
- Nukala, V. B., & Prasada Rao, S. S. (2021). Role of debt-to-equity ratio in project investment valuation, assessing risk and return in capital markets. *Future Business Journal*, 7(1), 1-23.
- Obalade, A.A. (2019). Adaptive market hypothesis and calendar anomalies in selected African stock markets, *Doctoral dissertation*.
- Oladipupo Olaoye, F., & Daniel Kolawole, A. (2020). Financial Information and Stock Price Changes: A Case of Systematically Important Banks (SIBs) in Nigeria. *African Journal of Business & Economic Research*, 15(2).

- Oliveira, B., & Fortunato, A. (2016). Firm growth and R&D: Evidence from the Portuguese manufacturing industry. *Journal of Evolutionary Economics*, 27(3), 613–627.
- Olugbenga, A. A., & Atanda, O. A. (2014). Value relevance of financial accounting information of quoted companies in Nigeria: A trend analysis. *Research journal of finance and accounting*, 5(8), 86-93.
- Olweny, T., & Omondi, K. (2011). The effect of macro-economic factors on stock return volatility in the Nairobi Securities Exchange, Kenya. *Economics and Finance review*, 1(10), 34-48.
- Onyango, A.O. (2018). *Exchange rate volatility and stock prices of companies listed on Nairobi securities exchange*.
- Osagie, J., Osho, G. S., & Sutton, C. (2005). The impacts of institutional stock ownership on stock returns and performance: a financial market perspective. *Journal of Business & Economics Research (JBER)*, 3(3).
- Osborne, J. W., & Waters, E. (2002). Multiple Regression Assumptions. ERIC Digest.
- Osundina, J.A., Jayeoba, O.O., & Olayinka, I.M. (2016). Impact of market value ratios on stock price volatility (a study of selected quoted manufacturing companies in Nigeria). *International Journal of Business and Management Invention*, 5(11), 41-54.
- Ouma, W.N. & Muriu, P. (2014). The impact of macroeconomic variables on stock market returns in Kenya. *International Journal of Business and Commerce*, 3(11).
- Ovtcharova, G. (2003). Institutional ownership and long-term stock returns. Available at SSRN 410560.
- Palepu, K. G., Healy, P. M., Wright, S., Bradbury, M., & Coulton, J. (2020). *Business analysis and valuation: Using financial statements*. Cengage AU.
- Park, Y.S., Konge, L., & Artino, A.R. (2019). *The Positivism Paradigm of Research. Academic Medicine*, 1. doi:10.1097/acm.0000000000003093
- Pelcher, L., & Bolton, J. (2021). Dividend Policy, Stock Price Volatility And Wealth Maximization For AltX Listed Companies In Developing Economies. *Journal of Global Business & Technology*, 17(1).
- Perera, R.A.A.S., & Thrikawala, S.S. (2010). An empirical study of the relevance of accounting information on investor's decisions. *ICBI*, University of Kelaniya, Sri Lanka.
- Pesaran, M. H. (2012). On the interpretation of panel unit root tests. *Economics Letters*, 116(3), 545-546.
- Pivato, S., Misani, N., & Tencati, A. (2008). The impact of corporate social responsibility on consumer trust: the case of organic food. *Business ethics: A European review*, 17(1), 3-12.

- Potter, G. (1992). Accounting earnings announcements, institutional investor concentration, and common stock returns. *Journal of Accounting Research*, 30(1), 146-155.
- Prasad, H., & Shrimal, K. (2015). An Empirical Study on Effect of Profitability and Market Value Ratios on Market Capitalization of Infrastructural Companies in India. *GJRA-Global Journal for Research Analyses*, 4(5), 95-97. preferences for stock characteristics”, *Accounting and Finance*, 46, pp.169-190. *Quarterly Journal of Economics*, pp.229-259.
- Puspitaningtyas, Z. (2019). Empirical evidence of market reactions based on signaling theory in Indonesia Stock Exchange. *Investment Management and Financial Innovations*, 16(2), 66-77.
- Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, 6(2), 1-5.
- Rahman, M.S. (2017). The Advantages and Disadvantages of Using Qualitative and Quantitative Approaches and Methods in Language “Testing and Assessment” Research: A Literature Review. *Journal of Education and Learning*, 6(1), 102–112.
- Rasoolimanesh, S.M., Ali, F., & Jaafar, M. (2018). Modeling residents’ perceptions of tourism development: Linear versus non-linear models. *Journal of Destination Marketing & Management*, 10, 1-9.
- Rasheed, A., Khalid Sohail, M., Din, S. U., & Ijaz, M. (2018). How do investment banks price initial public offerings? an empirical analysis of emerging market. *International Journal of Financial Studies*, 6(3), 77.
- Raza, S. A., & Karim, M. Z. A. (2016). Do liquidity and financial leverage constrain the impact of firm size and dividend payouts on share price in emerging economy? *Journal of Finance and Economics Research*, 1(2), 73-88
- Razali, N. M., & Wah, Y. B. (2011). Power comparisons of shapiro-wilk, kolmogorov-smirnov, lilliefors and anderson-darling tests. *Journal of statistical modeling and analytics*, 2(1), 21-33.
- Ristyawan, M. R. (2019). Pengaruh Return on Equity (ROE), Debt to Assets Ratio (DAR), Price to Book Value (PBV) Dan Net Profit Margin (NPM) Terhadap Return Saham Perusahaan Sektor Perkebunan Yang Terdaftar Di Bursa Efek Indonesia Periode 2011-2017. *Jurnal Ekonomi Bisnis dan Kewirausahaan (JEBIK)*, 8(1), 1-17.
- Rois, R., Basak, T., Rahman, M. M., & Majumder, A. K. (2012). Modified Breusch-Godfrey Test for Restricted Higher Order Autocorrelation in Dynamic Linear Model-A Distance Based Approach. *International Journal of Business and Management*, 7(17), 88.
- Rosati, P., Deeney, P., Cummins, M., Van der Werff, L., & Lynn, T. (2019). Social media and stock price reaction to data breach announcements: Evidence from US listed companies. *Research in International Business and Finance*, 47, 458-469.

- Ross, S. A. (1978). The current status of the capital asset pricing model (CAPM). *The Journal of Finance*, 33(3), 885-901.
- Rossi, M., & Gunardi, A. (2018). Efficient market hypothesis and stock market anomalies: Empirical evidence in four European countries. *Journal of Applied Business Research (JABR)*, 34(1), 183-192.
- Rubin, A., & Smith, D. R. (2009). Institutional ownership, volatility and dividends. *Journal of Banking & Finance*, 33(4), 627-639.
- Rupande, L., Muguto, H. T., & Muzindutsi, P. F. (2019). Investor sentiment and stock return volatility: Evidence from the Johannesburg Stock Exchange. *Cogent Economics & Finance*, 7(1), 1600233.
- Sadiq, M., Ahmad, S., Anjum, M.J., Suliman, M., Abrar, S.U. & Khan, S.U.R. (2013). Stock price volatility in relation to dividend policy: A case study of Karachi Stock Market. *Middle-East Journal of Scientific Research*, 13(3), 426-431.
- Salkind, N. J. (Ed.). (2010). *Encyclopedia of research design* (Vol. 1). Sage.
- Samy, M., & Robertson, F. (2017). *From positivism to social constructivism: an emerging trend for CSR researchers*. In Handbook of research methods in corporate social responsibility. Edward Elgar Publishing.
- Sarwendhi, R. A., & Samekto, A. (2014). The effect of market-to-book ratio, asset structure, and earnings after tax on the level of leverage in non-financial companies listed in Indonesia Stock Exchange 2007-2012. *The Indonesian Accounting Review*, 4(2), 149-156.
- Schwert, G.W. (1989). Why does stock market volatility change over time? *The journal of finance*, 44(5), 1115-1153.
- Senaviratna, N. A. M. R., & Cooray, T. M. J. A. (2019). Diagnosing multicollinearity of logistic regression model. *Asian Journal of Probability and Statistics*, 5(2), 1-9.
- Sewelén, J. (2018). *Determinants of Stock Price Volatility: A quantitative study on the Swedish stock market between 2004-2016*.
- Sewpersadh, N. S. (2019). An examination of CEO power with board vigilance as a catalyst for firm growth in South Africa. *Measuring Business Excellence*.
- Shah, S. A., & Noreen, U. (2016). Stock price volatility and role of dividend policy: Empirical evidence from Pakistan. *International Journal of Economics and Financial Issues*, 6(2).
- Sharif, T., Purohit, H., & Pillai, R. (2015). Analysis of factors affecting share prices: The case of Bahrain stock exchange. *International Journal of Economics and Finance*, 7(3), 207-216.
- Shiller, R. J. (1981). Alternative tests of rational expectations models: The case of the term structure. *Journal of Econometrics*, 16(1), 71-87.
- Shittu, I., Che Ahmad, A., & Ishak, Z. (2016). Price to book value, price to sales multiples and stock price; evidence from Nigerian listed firms. *Journal of Advanced Research in Business and Management Studies*, 3(1), 85-93.

- Shogren, K.A., Wehmeyer, M.L., & Palmer, S.B. (2017). Causal agency theory. In *Development of self-determination through the life-course* (pp. 55-67). Springer, Dordrecht.
- Siegel, J. J. (2021). *Stocks for the long run: The definitive guide to financial market returns & long-term investment strategies*. McGraw-Hill Education.
- Silwal, P. P., & Napit, S. (2019). Fundamentals of Stock Price in Nepalese commercial banks. *International Research Journal of Management Science*, 4, 83-98.
- Singh, A. & Kansil, R. (2018). Institutional ownership and firm performance: evidence from Indian panel data. *International Journal of Business and Emerging Markets*. 10. 250. 10.1504/IJBEM.2018.10013055.
- Spence, M.A. (1973). Job Market Signaling. *Quarterly Journal of Economics*, 87(3), 355 - 374.
- Spierdijk, L., & Bikker, J. A. (2017). Mean reversion in stock prices: Implications for long-term investors 1. In *Pension Fund Economics and Finance* (pp. 119-139). Routledge.
- Sroufe, R. (2018). *Integrated management: How sustainability creates value for any business*. Emerald Group Publishing.
- Subrata, Yuda. 2010. The Influence of Earning Per Share and Dividend Per Share on Stock Price of Publicly Listed Manufacturing Companies in Indonesian Stock Market. . Unpublished Paper of University of North Sumatra. Medan: Indonesia
- Sugiyanto, S., & Candra, A. (2019). Good Corporate Governance, Conservatism Accounting, Real Earnings Management, And Information Asymmetry On Share Return. *Jiafe (Jurnal Ilmiah Akuntansi Fakultas Ekonomi)*, 4(1), 9-18.
- Sumangala, J. K., & Bhatt, P. (2013). Impact of book value on market value of an equity share: An empirical study in Indian capital market. *Indian Journal of Applied Research*, 3(2), 49-51.
- Suroso, S. (2022). Can the Use of Financial Ratios Increase Stock Returns for Manufacturing Companies? *ATESTASI: Jurnal Ilmiah Akuntansi*, 5(1), 137-151.
- Süsi, V., & Jaakson, K. (2020). Corporate governance and corporate social responsibility interface: a case study of private equity. *Corporate Governance: The International Journal of Business in Society*.
- Suwanhirunkul, P., & Masih, M. (2018). *Effect of dividend policy on stock price volatility in the Dow Jones US index and the Dow Jones Islamic US index: Evidence from GMM and quantile regression*.
- Tandon, K., & Malhotra, N. (2013). Determinants of stock prices: Empirical evidence from NSE 100 companies. *International Journal of Research in Management & Technology*, 3(3), 2249-9563.
- Tasnia, M., AlHabshi, S. M. S. J., & Rosman, R. (2020). The impact of corporate social responsibility on stock price volatility of the US banks: A moderating role of tax. *Journal of Financial Reporting and Accounting*.

- Thanatawee, Y. (2021). The impact of foreign ownership on stock price volatility: Evidence from Thailand. *Journal of Asian Finance, Economics and Business*, 8(1), 007-014.
- Timmermann, A., & Granger, C. W. (2004). Efficient market hypothesis and forecasting. *International Journal of forecasting*, 20(1), 15-27.
- Ting, I. W. K., Azizan, N. A., Bhaskaran, R. K., & Sukumaran, S. K. (2019). Corporate social performance and firm performance: Comparative study among developed and emerging market firms. *Sustainability*, 12(1), 26.
- Torres-Reyna, O. (2017). Panel Data Analysis Fixed and Random Effects using Stata (v. 4.2) 2007. URL: <https://dss.princeton.edu/training/Panel101.pdf>.
- Tripathy J. P. (2013). Secondary Data Analysis: Ethical Issues and Challenges. *Iranian journal of public health*, 42(12), 1478–1479.
- Uddin, M. H., & Chowdhury, G. M. (2005). Effect of dividend announcement on shareholders' value: Evidence from Dhaka Stock Exchange. *Journal of business research*, 7(1), 61-72.
- Uniamikogbo, E. (2018). *Influence of accounting information on stock price volatility in Nigeria*.
- Varoquaux, G. (2018). Cross-validation failure: small sample sizes lead to large error bars. *Neuroimage*, 180, 68-77.
- Vijitha, P., & Nimalathasan, B. (2014). Value relevance of accounting information and share price: A study of listed manufacturing companies in Sri Lanka. *Merit Research Journal of Business and Management*, 2(1), 1-6.
- VO, X. V. (2016). Does institutional ownership increase stock return volatility? Evidence from Vietnam. *International Review of Financial Analysis*, 45, 54-61.
- Vutale, A. V., & Chen, B. The Effects of Dividend Policy on Market Share Price of the Listed Companies at the Nairobi Securities Exchange (NSE) in Kenya.
- Wagle, S. (2021). Determinant of Stock Market Prices in Nepal: A Case of Commercial Banks. *SDMIMD Journal of Management*, 12(2), 1-9.
- Waluyo, W. (2017). Firm size, firm age, and firm growth on corporate social responsibility in Indonesia: The case of real estate companies. *European Research Studies Journal*. Volume XX, Issue 4A, pp. 360 – 369.
- Waswa, C. W., Ndede, F. W., & Jagongo, A. O. (2014). Dividend payout by agricultural firms in Kenya [An empirical analysis of firms listed on the Nairobi security exchange]. *International Journal of Business and Social Science*, 5(11).
- Wen, F., Xu, L., Chen, B., Xia, X., & Li, J. (2020). Heterogeneous institutional investors, short selling and stock price crash risk: evidence from China. *Emerging Markets Finance and Trade*, 56(12), 2812-2825.
- Wijaya, D. P., & Sedana, I. B. P. (2020). Effects of quick ratio, return on assets and exchange rates on stock returns. *Am. J. Humanities Soc. Sci. Res*, 4, 323-329.

- Wijekularathna, D. K., Manage, A. B., & Scariano, S. M. (2019). Power analysis of several normality tests: A Monte Carlo simulation study. *Communications in Statistics-Simulation and Computation*, 1-17.
- Wildatunjanah, E. S., & Suparningsih, B. (2019). The effect of Debt to Equity Ratio and Price Earnings Ratio on stock price with moderating as BI Rate variable in retail sector companies listed in Indonesia Stock Exchange (IDX). *East African Scholars Journal of Economics, Business and Management*, 2(6), 307-317.
- Yang, M., Bento, P., & Akbar, A. (2019). Does CSR influence firm performance indicators? Evidence from Chinese pharmaceutical enterprises. *Sustainability*, 11(20), 5656.
- Yildiz, Y., & Karan, M. B. (2019). Momentum or market? Determinants of large stock price changes in an emerging market. *Applied Economics*, 51(7), 731-742.
- Zakaria, Z., Muhammad, J., & Zulkifli, A. H. (2012). The impact of dividend policy on the share price volatility: Malaysian construction and material companies. *International Journal of Economics and Management Sciences*, 2(5), 1-8.
- Zainudin, R., Mahdzan, N. S., & Yet, C. H. (2018). Dividend policy and stock price volatility of industrial products firms in Malaysia. *International Journal of Emerging Markets*.
- Zeytinoğlu, E., Akarim, Y. D., & Çelik, S. (2012). The impact of market-based ratios on stock returns: The evidence from insurance sector in Turkey. *International Research Journal of Finance and Economics*, 84, 41-48.
- Zhong, L., Chourou, L. and Ni, Y. (2017) on the association between strategic institutional ownership and earnings quality: Does investor protection strength matter? *Journal of Accounting and Public Policy*. (xxxx), pp. 1–22.

## APPENDICES

## Appendix I: List of Companies Included in the Study

<b>AGRICULTURAL</b>
Kakuzi Plc Ord.5.00
Kapchorua Tea Co. Ltd Ord Ord 5.00 AIM
Sasini Plc Ord 1.00
Williamson Tea Kenya Ltd Ord 5.00 AIM
<b>AUTOMOBILES &amp; ACCESSORIES</b>
Car & General (K) Ltd Ord 5.00
Sameer Africa Plc Ord 5.00
<b>BANKING</b>
ABSA Bank Kenya Plc Ord 0.50
Diamond Trust Bank Kenya Ltd Ord 4.00
Equity Group Holdings Plc Ord 0.50
HF Group Plc Ord 5.00
KCB Group Plc Ord 1.00
National Bank of Kenya Ltd Ord 5.00
NIC Group Plc Ord 5.00
Standard Chartered Bank Kenya Ltd Ord 5.00
The Co-operative Bank of Kenya Ltd Ord 1.00
CFC Holding Ltd.
<b>COMMERCIAL AND SERVICES</b>
Eveready East Africa Ltd Ord.1.00
Express Kenya Ltd Ord 5.00 AIMS
Kenya Airways Ltd Ord 5.00
Nation Media Group Ltd Ord. 2.50
TPS Eastern Africa Ltd Ord 1.00
WPP Scangroup Plc Ord 1.00
<b>CONSTRUCTION &amp; ALLIED</b>
ARM Cement Plc Ord 1.00
Bamburi Cement Ltd Ord 5.00
Crown Paints Kenya Plc Ord 5.00
E.A.Cables Ltd Ord 0.50
E.A.Portland Cement Co. Ltd Ord 5.00



<b>ENERGY &amp; PETROLEUM</b>
KenGen Co. Plc Ord. 2.50
Kenya Power & Lighting Co Ltd Ord 2.50
Total Kenya Ltd Ord 5.00
<b>INSURANCE</b>
Jubilee Holdings Ltd Ord 5.00
Kenya Re Insurance Corporation Ltd Ord 2.50
<b>INVESTMENT</b>
Centum Investment Co Plc Ord 0.50
<b>MANUFACTURING &amp; ALLIED</b>
British American Tobacco Kenya Plc Ord 10.00
Carbacid Investments Ltd Ord 1.00
East African Breweries Ltd Ord 2.00
Mumias Sugar Co. Ltd Ord 2.00
Unga Group Ltd Ord 5.00
<b>TELECOMMUNICATION</b>
Safaricom Plc Ord 0.05

**Note:** Companies that have been highlighted are the ones that were used in the study i.e. those that have met the sampling inclusion exclusion criteria.

The inclusion criteria was: companies listed in the NSE prior to 2008 and remain listed throughout the study period and companies having all required information required by this study.

**Source: Reseacher 2022.**

## Appendix II: List of Companies Excluded from the Study

Companies that did not meet the selection criteria were excluded from this study.

<b>AGRICULTURAL</b>
The Limuru Tea Co. Plc Ord 20.00AIMS
<b>BANKING</b>
BK Group Plc Ord 0.80
I&M Holdings Plc Ord 1.00
Stanbic Holdings Plc ord.5.00
<b>COMMERCIAL AND SERVICES</b>
Deacons (East Africa) Plc Ord 2.50AIMS
Longhorn Publishers Plc Ord 1.00AIMS
Nairobi Business Ventures Ltd Ord. 1.00 GEMS
Standard Group Plc Ord 5.00
Uchumi Supermarket Plc Ord 5.00
<b>ENERGY &amp; PETROLEUM</b>
Kenya Power & Lighting Co Ltd 4%
Kenya Power & Lighting Co Ltd 7%
Umeme Ltd Ord 0.50
<b>INSURANCE</b>
Britam Holdings Plc Ord 0.10
CIC Insurance Group Ltd ord.1.00
Liberty Kenya Holdings Ltd Ord.1.00
Sanlam Kenya Plc Ord 5.00
<b>INVESTMENT</b>
Home Afrika Ltd Ord 1.00
Kurwitu Ventures Ltd Ord 100.00
Olympia Capital Holdings ltd Ord 5.00
Trans-Century Plc Ord 0.50AIMS
<b>INVESTMENT SERVICES</b>
Nairobi Securities Exchange Plc Ord 4.00

<b>MANUFACTURING &amp; ALLIED</b>
B.O.C Kenya Plc Ord 5.00
Flame Tree Group Holdings Ltd Ord 0.825
Kenya Orchards Ltd Ord 5.00 AIM
<b>REAL ESTATE INVESTMENT TRUST</b>
Stanlib Fahari I-Reit
<b>EXCHANGE TRADED FUNDS</b>
New Gold ETF



$$SPV = \left( \frac{Hp - Lp}{\left(\frac{Hp + Lp}{2}\right) \times \left(\frac{Hp + Lp}{2}\right)} \right)^{1/2}$$

$$MBV = \frac{\text{Market Caitalization}}{\text{Net Assets}}$$

$$EPS = \frac{\text{Net Income Preferred Dividends}}{\text{Number of Shares Outstanding}}$$

$$PER = \frac{\text{Market Caitalization}}{\text{Earnings}}$$

$$BVS = \frac{\text{Book Value of the Comany}}{\text{Total Number of Shares on Issue}}$$

$$DYR = \frac{\text{Dividend per Share}}{\text{Price per Share}}$$

$$IOS = \frac{\text{Number of Institutional Shareholding}}{\text{Total number of Shares Outstanding}}$$

SIZ = Natural log of total assets

GRW

$$= \frac{(\text{Book Value of Asset} - \text{Book Value of Equity}) + \text{Market Value of Eqioty}}{\text{Book Value of Assets}}$$

**Source; Author 2021**



## Appendix V: Analysis Results

UNIT ROOTS TEST

LEVIN LIN CHU

. xtunitroot llc spv

Levin-Lin-Chu unit-root test for spv

-----  
 Ho: Panels contain unit roots                      Number of panels =        12  
 Ha: Panels are stationary                            Number of periods =      39

AR parameter: Common                                Asymptotics: N/T -> 0  
 Panel means: Included  
 Time trend: Not included

ADF regressions: 1 lag  
 LR variance: Bartlett kernel, 10.00 lags average (chosen by LLC)

-----  
 --  

	Statistic	p-value
Unadjusted t	-16.3251	
Adjusted t*	-9.8497	0.0000

 -----  
 --

. xtunitroot llc pe

Levin-Lin-Chu unit-root test for pe

-----  
 Ho: Panels contain unit roots                      Number of panels =        12  
 Ha: Panels are stationary                            Number of periods =      39

AR parameter: Common                                Asymptotics: N/T -> 0  
 Panel means: Included  
 Time trend: Not included

ADF regressions: 1 lag  
 LR variance: Bartlett kernel, 10.00 lags average (chosen by LLC)

-----  
 --  

	Statistic	p-value
Unadjusted t	-14.1973	
Adjusted t*	-8.5207	0.0000

 -----  
 --

. xtunitroot llc mpbv

Levin-Lin-Chu unit-root test for mpbv

-----  
 Ho: Panels contain unit roots                      Number of panels =        12  
 Ha: Panels are stationary                            Number of periods =      39

AR parameter: Common                                Asymptotics: N/T -> 0  
 Panel means: Included  
 Time trend: Not included

```

ADF regressions: 1 lag
LR variance:      Bartlett kernel, 10.00 lags average (chosen by LLC)
-----
--
                Statistic      p-value
-----
--
Unadjusted t      -16.5728
Adjusted t*       -8.4424      0.0000
-----
--

. xtunitroot llc  eps

Levin-Lin-Chu unit-root test for eps
-----
Ho: Panels contain unit roots      Number of panels =      12
Ha: Panels are stationary          Number of periods =     39

AR parameter: Common                Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance:      Bartlett kernel, 10.00 lags average (chosen by LLC)
-----
--
                Statistic      p-value
-----
--
Unadjusted t      -16.7666
Adjusted t*       -10.8887      0.0000
-----
--

. xtunitroot llc  bvps

Levin-Lin-Chu unit-root test for bvps
-----
Ho: Panels contain unit roots      Number of panels =      12
Ha: Panels are stationary          Number of periods =     39

AR parameter: Common                Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance:      Bartlett kernel, 10.00 lags average (chosen by LLC)
-----
--
                Statistic      p-value
-----
--
Unadjusted t      -13.4153
Adjusted t*       -7.6943      0.0000
-----
--

. xtunitroot llc  dyr

Levin-Lin-Chu unit-root test for dyr
-----
Ho: Panels contain unit roots      Number of panels =      12
Ha: Panels are stationary          Number of periods =     39

AR parameter: Common                Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

```



```

ADF regressions: 1 lag
LR variance:      Bartlett kernel, 10.00 lags average (chosen by LLC)
-----
--
                Statistic      p-value
-----
--
Unadjusted t      -17.5533
Adjusted t*       -12.2230          0.0000
-----
--

. xtunitroot llc    ins

Levin-Lin-Chu unit-root test for INS
-----
Ho: Panels contain unit roots          Number of panels =    12
Ha: Panels are stationary              Number of periods =   39

AR parameter: Common                  Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:      Bartlett kernel, 10.00 lags average (chosen by LLC)
-----
--
                Statistic      p-value
-----
--
Unadjusted t      -13.4027
Adjusted t*       -7.8923          0.0000
-----
--

. xtunitroot llc    size

Levin-Lin-Chu unit-root test for size
-----
Ho: Panels contain unit roots          Number of panels =    12
Ha: Panels are stationary              Number of periods =   39

AR parameter: Common                  Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:      Bartlett kernel, 10.00 lags average (chosen by LLC)
-----
--
                Statistic      p-value
-----
--
Unadjusted t      -14.1479
Adjusted t*       -7.4280          0.0000
-----
--

. xtunitroot llc    gr

Levin-Lin-Chu unit-root test for gr
-----
Ho: Panels contain unit roots          Number of panels =    12
Ha: Panels are stationary              Number of periods =   39

AR parameter: Common                  Asymptotics: N/T -> 0
Panel means:  Included

```





```

-----
--
. xtunitroot ips          dyr

Im-Pesaran-Shin unit-root test for dyr
-----
Ho: All panels contain unit roots      Number of panels =    12
Ha: Some panels are stationary         Number of periods =   39

AR parameter: Panel-specific           Asymptotics: T, N -> Infinity
Panel means:   Included                 sequentially
Time trend:   Not included

ADF regressions: No lags included
-----
--

```

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%
t-bar	-6.1374		-2.040	-1.900	-1.810
t-tilde-bar	-4.3349				
Z-t-tilde-bar	-12.4717	0.0000			

```

-----
--
. xtunitroot ips          ins

Im-Pesaran-Shin unit-root test for INS
-----
Ho: All panels contain unit roots      Number of panels =    12
Ha: Some panels are stationary         Number of periods =   39

AR parameter: Panel-specific           Asymptotics: T, N -> Infinity
Panel means:   Included                 sequentially
Time trend:   Not included

ADF regressions: No lags included
-----
--

```

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%
t-bar	-5.3147		-2.040	-1.900	-1.810
t-tilde-bar	-4.0299				
Z-t-tilde-bar	-11.1480	0.0000			

```

-----
--

```



**ASSUMPTIONS**  
**NORMALITY**

swilk spv mpbv eps pe bvps dyr ins size gr

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z
Prob>z				
-----+-----				
spv	468	0.77166	2.373	0.2076
mpbv	468	0.75084	8.971	0.1416
eps	468	0.72323	7.723	0.4516
pe	468	0.39336	2.273	0.1096
bvps	468	0.58456	1.672	0.0910
dyr	468	0.61926	0.674	0.1362
ins	468	0.95728	.539	0.8104
size	468	0.93513	.559	0.8026
gr	468	0.82875	.277	0.5686

**HETEROSKEDASTICITY**

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of spv

chi2(1) = 0.092

Prob > chi2 = 0.813

**MULTICOLLINEAR**

. vif

Variable	VIF	1/VIF
-----+-----		
bvps	1.28	0.778556
eps	1.27	0.787135
mpbv	1.10	0.911686
ins	1.09	0.915608
size	1.09	0.919439
gr	1.05	0.952616
dyr	1.05	0.954065
pe	1.05	0.954291
-----+-----		
Mean VIF	1.12	







```

Random-effects GLS regression           Number of obs   =   468
Group variable: year                   Number of groups =   12
R-sq: within = 0.2545                  Obs per group: min =   39
      between = 0.3635                    avg =   39.0
      overall = 0.2550                    max =   39

```

```

Wald chi2(7) = 157.44
corr(u_i, X) = 0 (assumed)             Prob > chi2 = 0.0000

```

```

-----+-----
      spv |   Coef.  Std. Err.   z   P>|z|   [95% Conf. Interval]
-----+-----
      size | -.0196308 .0085495  -2.30  0.022  -.0363875  -.0028742
         gr | -.0739559 .0256007  -2.89  0.004  -.1241323  -.0237796
      mpbv | -.016239 .0036787  -4.41  0.000  -.0234492  -.0090289
         eps | -.0021627 .0004058  -5.33  0.000  -.002958  -.0013674
         pe | -.0002096 .0002518  -0.83  0.405  -.000703  .0002838
      bvps | -.0002476 .0000544  -4.55  0.000  -.0003543  -.000141
         dyr | -.431923 .1087867  -3.97  0.000  -.6451409  -.2187051
      _cons | .3802527 .059533  6.39  0.000  .2635702  .4969352
-----+-----
      sigma_u |      0
      sigma_e | .11888818
         rho |      0 (fraction of variance due to u_i)
-----+-----

```

```
. estimate store re
```

```
. xtreg spv size gr mpbv eps pe bvps dyr, fe
```

```

Fixed-effects (within) regression       Number of obs   =   468
Group variable: year                   Number of groups =   12

R-sq: within = 0.2560                  Obs per group: min =   39
      between = 0.1596                    avg =   39.0
      overall = 0.2533                    max =   39

```

```

F(7,449) = 22.07
corr(u_i, Xb) = 0.0110                 Prob > F = 0.0000

```

```

-----+-----
      spv |   Coef.  Std. Err.   t   P>|t|   [95% Conf. Interval]
-----+-----
      size | -.0228136   .0086998  -2.62  0.009   -.039911  -.0057161
         gr | -.0541229   .0271633  -1.99  0.047   -.1075058  -.00074
      mpbv | -.0145126   .0037449  -3.88  0.000   -.0218723  -.007153
         eps | -.0021844   .0004092  -5.34  0.000   -.0029886  -.0013803
         pe | -.0001853   .0002551  -0.73  0.468   -.0006867   .0003161
      bvps | -.0002491   .000055   -4.53  0.000   -.0003571  -.000141
         dyr | -.4741111   .1104656  -4.29  0.000   -.691205  -.2570172
      _cons | .3994132   .0603644   6.62  0.000   .2807814   .518045
-----+-----
      sigma_u | .02086107
      sigma_e | .11888818
         rho | .02986937 (fraction of variance due to u_i)
-----+-----

```

F test that all u\_i=0: F(11, 449) = 1.10 Prob > F = 0.3564

. estimate store fe

. hausman fe re

```

-----+-----
      ---- Coefficients ----
      |   (b)      (B)      (b-B)  sqrt(diag(V_b-V_B))
      |   fe      re      Difference  S.E.
-----+-----
      size | -.0228136  -.0196308  -.0031827  .0016105
         gr | -.0541229  -.0739559   .019833   .0090801
      mpbv | -.0145126  -.016239   .0017264   .0007008
         eps | -.0021844  -.0021627  -.0000217   .0000527
         pe | -.0001853  -.0002096   .0000243   .0000412
      bvps | -.0002491  -.0002476  -1.45e-06   7.88e-06
         dyr | -.4741111  -.431923   -.0421881   .0191865
-----+-----

```

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

```

      chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
              = 9.94
      Prob>chi2 = 0.1923
      (V_b-V_B is not positive definite)

```

. xtreg spv size gr mpbv eps pe bvps dyr ins, fe



```

-----+-----
      spv |   Coef.  Std. Err.   z  P>|z|  [95% Conf. Interval]
-----+-----
      size | -.01715  .0085333  -2.01  0.044  -.033875  -.000425
         gr | -.080022 .0255061  -3.14  0.002  -.1300131 -.0300309
      mpbv | -.0161275 .003652  -4.42  0.000  -.0232854 -.0089696
         eps | -.0023126 .0004064  -5.69  0.000  -.003109  -.0015161
         pe | -.0001917 .00025  -0.77  0.443  -.0006817 .0002983
      bvps | -.0002608 .0000542  -4.81  0.000  -.0003671 -.0001546
         dyr | -.4760869 .1091429  -4.36  0.000  -.690003  -.2621708
         ins | -.0711689 .0254818  -2.79  0.005  -.1211124 -.0212255
      _cons | .3929481 .0592723   6.63  0.000  .2767766 .5091196
-----+-----
      sigma_u |      0
      sigma_e | .11802327
         rho |      0 (fraction of variance due to u_i)
-----+-----

```

```

. estimate store re
. hausman fe re

```

```

-----+-----
      ---- Coefficients ----
      |   (b)      (B)      (b-B)  sqrt(diag(V_b-V_B))
      |   fe      re      Difference   S.E.
-----+-----
      size | -.0201337  -.01715  -.0029836  .0016482
         gr | -.061278  -.080022  .0187439  .0091277
      mpbv | -.0144865  -.0161275  .001641  .0006953
         eps | -.0023304  -.0023126  -.0000179  .0000517
         pe | -.0001655  -.0001917  .0000262  .0000411
      bvps | -.0002613  -.0002608  -4.58e-07  7.66e-06
         dyr | -.5188222  -.4760869  -.0427353  .0194024
         ins | -.0703218  -.0711689  .0008472  .0009652
-----+-----

```

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

Test: Ho: difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(8) &= (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B}) \\ &= 9.78 \end{aligned}$$

$$\text{Prob}>\text{chi2} = 0.2808$$

( $\mathbf{V}_b-\mathbf{V}_B$  is not positive definite)

```

. xtreg spv size gr mpbv eps pe bvps dyr ins mpbvins, re

```

```

Random-effects GLS regression           Number of obs   =   468
Group variable: year                   Number of groups =   12

R-sq: within = 0.2741                  Obs per group: min =   39
      between = 0.3095                    avg =   39.0
      overall = 0.2739                    max =   39

                                Wald chi2(9)   =  172.79
corr(u_i, X) = 0 (assumed)            Prob > chi2   =  0.0000

```

```

-----+-----
      spv |   Coef.  Std. Err.   z  P>|z|  [95% Conf. Interval]
-----+-----
      size | -.0170463  .0085049  -2.00  0.045  -.0337155  -.000377
         gr | -.0796374  .0254214  -3.13  0.002  -.1294624  -.0298124
      mpbv | -.0211546  .0044072  -4.80  0.000  -.0297925  -.0125166
         eps | -.0022744  .0004054  -5.61  0.000  -.0030691  -.0014798
         pe | -.0001875  .0002492  -0.75  0.452  -.0006759  .0003009
      bvps | -.0002653  .0000541  -4.91  0.000  -.0003712  -.0001593
         dyr | -.4918846  .109057   -4.51  0.000  -.7056324  -.2781367
         ins | -.0882294  .0267601  -3.30  0.001  -.1406781  -.0357806
      mpbvins | .0116946  .005781   2.02  0.043  .0003641  .0230251
      _cons | .3994305  .0591605   6.75  0.000  .2834781  .5153829
-----+-----
      sigma_u |      0
      sigma_e | .11757491
         rho |      0 (fraction of variance due to u_i)
-----+-----

```

```

. estimate store re
. xtreg spv size gr mpbv eps pe bvps dyr ins mpbvins, fe

```

```

Fixed-effects (within) regression           Number of obs   =   468
Group variable: year                   Number of groups =   12

R-sq: within = 0.2756                  Obs per group: min =   39
      between = 0.1462                    avg =   39.0
      overall = 0.2723                    max =   39

                                F(9,447)     =  18.89
corr(u_i, Xb) = 0.0058                Prob > F      =  0.0000

```

spv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
size	-.0202237	.0086581	-2.34	0.020	-.0372394	-.003208
gr	-.0603872	.0269906	-2.24	0.026	-.1134314	-.007343
mpbv	-.0197434	.0044681	-4.42	0.000	-.0285244	-.0109624
eps	-.00229	.0004085	-5.61	0.000	-.0030929	-.0014871
pe	-.0001628	.0002524	-0.64	0.519	-.0006588	.0003332
bvps	-.0002672	.0000546	-4.89	0.000	-.0003746	-.0001599
dyr	-.5336884	.1106589	-4.82	0.000	-.7511647	-.316212
ins	-.0880599	.0267667	-3.29	0.001	-.140664	-.0354557
mpbvins	.0122915	.0058443	2.10	0.036	.0008058	.0237772
_cons	.4186404	.0599565	6.98	0.000	.3008088	.5364719
-----						
sigma_u	.02090369					
sigma_e	.11757491					
rho	.0306409 (fraction of variance due to u_i)					

F test that all u\_i=0: F(11, 447) = 1.14 Prob > F = 0.3298

. estimate store fe

. hausman fe re

---- Coefficients ----				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
size	-.0202237	-.0170463	-.0031774	.0016218
gr	-.0603872	-.0796374	.0192502	.009069
mpbv	-.0197434	-.0211546	.0014112	.000735
eps	-.00229	-.0022744	-.0000156	.0000502
pe	-.0001628	-.0001875	.0000247	.0000402
bvps	-.0002672	-.0002653	-1.97e-06	7.67e-06
dyr	-.5336884	-.4918846	-.0418038	.0187606
ins	-.0880599	-.0882294	.0001695	.0005963
mpbvins	.0122915	.0116946	.0005969	.0008581

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(9) &= (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B}) \\ &= 11.04 \end{aligned}$$

$$\text{Prob}>\text{chi2} = 0.2726$$

( $\mathbf{V}_b-\mathbf{V}_B$  is not positive definite)

. xtreg spv size gr mpbv eps pe bvps dyr ins mpbvins epsins, re

Random-effects GLS regression                      Number of obs    =    468  
Group variable: year                                  Number of groups =    12

R-sq: within = 0.2747                                  Obs per group: min =    39  
          between = 0.3105    avg =    39.0  
          overall = 0.2745    max =    39

Wald chi2(10)    = 172.93  
corr(u\_i, X) = 0 (assumed)                      Prob > chi2    = 0.0000

spv	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
size	-.0166377	.0085367	-1.95	0.051	-.0333692	.0000939
gr	-.0800017	.0254456	-3.14	0.002	-.1298741	-.0301292
mpbv	-.0211044	.004411	-4.78	0.000	-.0297497	-.0124591
eps	-.0026195	.0006932	-3.78	0.000	-.0039781	-.0012608
pe	-.0001809	.0002496	-0.72	0.469	-.0006701	.0003082
bvps	-.0002648	.0000541	-4.89	0.000	-.0003709	-.0001587
dyr	-.4942546	.1091996	-4.53	0.000	-.7082818	-.2802273
ins	-.0960131	.0296289	-3.24	0.001	-.1540848	-.0379415
mpbvins	.0116375	.0057856	2.01	0.044	.0002979	.0229772
epsins	.001383	.0022531	0.61	0.539	-.003033	.0057991
_cons	.399037	.0592042	6.74	0.000	.2829989	.5150752
sigma_u	0					
sigma_e	.1176664					
rho	0 (fraction of variance due to u_i)					

. estimate store re

. xtreg spv size gr mpbv eps pe bvps dyr ins mpbvins epsins, fe

```

Fixed-effects (within) regression      Number of obs   =   468
Group variable: year                  Number of groups =   12

R-sq: within = 0.2761                 Obs per group: min =   39
      between = 0.1527                   avg =   39.0
      overall = 0.2729                   max =   39

                                F(10,446)   =   17.01
corr(u_i, Xb) = 0.0063                Prob > F    =   0.0000

```

```

-----+-----
      spv |   Coef.  Std. Err.   t   P>|t|   [95% Conf. Interval]
-----+-----
      size | -.0198274  .0086945  -2.28  0.023  -.0369147  -.0027401
         gr | -.0609897  .0270336  -2.26  0.025  -.1141188  -.0078606
      mpbv | -.019728   .0044716  -4.41  0.000  -.0285161  -.0109399
         eps | -.0026006  .0006952  -3.74  0.000  -.003967   -.0012343
         pe | -.0001578  .0002528  -0.62  0.533  -.0006546  .0003389
      bvps | -.000267   .0000547  -4.89  0.000  -.0003745  -.0001596
         dyr | -.5354202  .1107894  -4.83  0.000  -.7531542  -.3176861
         ins | -.0951501  .0297039  -3.20  0.001  -.1535272  -.036773
      mpbvins | .0122611  .0058491   2.10  0.037  .0007659   .0237564
      epsins | .0012537  .0022696   0.55  0.581  -.0032067  .005714
      _cons | .4181708  .0600091   6.97  0.000  .300235    .5361065
-----+-----
      sigma_u | .02082983
      sigma_e | .1176664
         rho | .03038544 (fraction of variance due to u_i)
-----+-----
F test that all u_i=0:   F(11, 446) =   1.13      Prob > F = 0.3362

```

```

. estimate store fe
. hausman fe re

```

Note: the rank of the differenced variance matrix (9) does not equal the number of coefficients being tested (10); be sure this is what you expect, or there may be problems computing the test. Examine the output of your estimators for anything unexpected and possibly consider scaling your variables so that the coefficients are on a similar scale.



```

---- Coefficients ----
      |   (b)      (B)      (b-B)  sqrt(diag(V_b-V_B))
      |   fe      re      Difference  S.E.
-----+-----
size | -.0198274  -.0166377  -.0031897  .0016493
gr   | -.0609897  -.0800017  .0190119   .0091289
mpbv | -.019728   -.0211044  .0013764   .0007341
eps  | -.0026006  -.0026195  .0000188   .0000529
pe   | -.0001578  -.0001809  .0000231   .00004
bvps | -.000267   -.0002648  -2.23e-06  7.68e-06
dyr  | -.5354202  -.4942546  -.0411656  .0187013
ins  | -.0951501  -.0960131  .000863    .0021096
mpbvins | .0122611  .0116375  .0006236   .0008593
epsins | .0012537  .001383   -.0001294  .0002726
-----+-----

```

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(9) &= (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B}) \\ &= 12.13 \end{aligned}$$

$$\text{Prob}>\text{chi2} = 0.2063$$

( $\mathbf{V}_b-\mathbf{V}_B$  is not positive definite)

Random-effects GLS regression                      Number of obs    =    468  
 Group variable: year                                Number of groups =    12

R-sq: within = 0.2908                                Obs per group: min =    39  
           between = 0.2711                                                     avg =    39.0  
           overall = 0.2900                                                     max =    39

  Wald chi2(11)    =    186.26  
 corr(u\_i, X) = 0 (assumed)                        Prob > chi2     =    0.0000

```
-----+-----
      spv |   Coef.  Std. Err.   z  P>|z|  [95% Conf. Interval]
-----+-----
      size | -.0223077 .0086192  -2.59  0.010  -.0392011  -.0054143
         gr | -.0841225 .0252441  -3.33  0.001  -.1336  -.034645
      mpbv | -.0394314 .0088333  -4.46  0.000  -.0567443  -.0221185
         eps | -.0022561 .0006961  -3.24  0.001  -.0036203  -.0008918
         pe | -.0017023 .0008639  -1.97  0.049  -.0033955  -9.15e-06
      bvps | -.0002908 .0000543  -5.36  0.000  -.0003971  -.0001844
         dyr | -.4586295 .1085228  -4.23  0.000  -.6713302  -.2459287
         ins | -.1698793 .0370919  -4.58  0.000  -.242578  -.0971806
 mpbv_ins | .0612439 .0202426   3.03  0.002   .0215691  .1009186
 eps_ins | .0005967 .0022442   0.27  0.790  -.0038019  .0049954
 pe_ins | .0025938 .0014419   1.80  0.072  -.0002323  .0054199
   _cons | .4713424 .062272  7.57  0.000   .3492915  .5933933
-----+-----
sigma_u |      0
sigma_e | .11648167
      rho |      0 (fraction of variance due to u_i)
-----+-----
```

```

Fixed-effects (within) regression      Number of obs   =   468
Group variable: year                  Number of groups =   12

R-sq:  within = 0.2922                Obs per group:  min =   39
      between = 0.1447                    avg =   39.0
      overall = 0.2885                    max =   39

corr(u_i, Xb) = -0.0004                F(11,445)      =   16.70
                                          Prob > F       =   0.0000

```

```

-----+-----
      spv |   Coef.  Std. Err.   t  P>|t|  [95% Conf. Interval]
-----+-----
      size | -.0252575  .0087729  -2.88  0.004  -.0424989  -.0080161
        gr | -.0665121  .0268048  -2.48  0.013  -.119192  -.0138323
      mpbv | -.0374966  .0089436  -4.19  0.000  -.0550736  -.0199196
        eps | -.0022426  .0006975  -3.22  0.001  -.0036134  -.0008718
        pe | -.0018556  .0008754  -2.12  0.035  -.0035759  -.0001352
      bvps | -.0002935  .0000548  -5.36  0.000  -.0004011  -.0001859
        dyr | -.5028731  .1102234  -4.56  0.000  -.7194963  -.28625
        ins | -.1707496  .0373065  -4.58  0.000  -.2440685  -.0974307
      mpbv_ins | .0604951  .0204344   2.96  0.003   .0203351   .100655
      eps_ins | .0004836  .0022583   0.21  0.831  -.0039547   .0049219
      pe_ins | .0028925  .0014593   1.98  0.048   .0000246   .0057605
        _cons | .4903766  .0630414   7.78  0.000   .3664808   .6142724
-----+-----
      sigma_u | .02088735
      sigma_e | .11648167
        rho | .03115346 (fraction of variance due to u_i)
-----+-----
F test that all u_i=0:  F(11, 445) =   1.16      Prob > F = 0.3097

```

---- Coefficients ----

	(b) re	(B) fe	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.	
size	-.0223077	-.0252575	.0029498	.	.
gr	-.0841225	-.0665121	-.0176104	.	.
mpbv	-.0394314	-.0374966	-.0019348	.	.
eps	-.0022561	-.0022426	-.0000135	.	.
pe	-.0017023	-.0018556	.0001533	.	.
bvps	-.0002908	-.0002935	2.76e-06	.	.
dyr	-.4586295	-.5028731	.0442437	.	.
ins	-.1698793	-.1707496	.0008703	.	.
mpbv_ins	.0612439	.0604951	.0007488	.	.
eps_ins	.0005967	.0004836	.0001131	.	.
pe_ins	.0025938	.0028925	-.0002987	.	.

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

$$\chi^2(10) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 3.43$$

$$\text{Prob} > \chi^2 = 0.9695$$

(V\_b-V\_B is not positive definite)

Random-effects GLS regression                      Number of obs    =    468  
 Group variable: year                                Number of groups =    12  
 R-sq: within = 0.2930                              Obs per group: min =    39  
           between = 0.2765    avg =    39.0  
           overall = 0.2922    max =    39  
    Wald chi2(12)    =    187.85  
 corr(u\_i, X) = 0 (assumed)                        Prob > chi2       =    0.0000

```
-----+-----
      spv |   Coef.  Std. Err.   z  P>|z|  [95% Conf. Interval]
-----+-----
      size | -.0242513   .008769   -2.77  0.006  -.0414382  -.0070643
         gr | -.0837225   .0252349   -3.32  0.001  -.133182   -.0342631
      mpbv | -.0381386   .008896    -4.29  0.000  -.0555744  -.0207028
         eps | -.0025838   .0007483   -3.45  0.001  -.0040505  -.001117
         pe | -.0016255   .0008659   -1.88  0.060  -.0033227   .0000716
      bvps | -.000191    .0000999   -1.91  0.056  -.0003868  4.77e-06
         dyr | -.4562041   .1084928   -4.20  0.000  -.668846   -.2435622
         ins | -.1503569   .040548    -3.71  0.000  -.2298294  -.0708843
      mpbv_ins | .0579465   .0204226    2.84  0.005   .0179189   .097974
      eps_ins | .0018896   .0024929    0.76  0.448  -.0029963   .0067756
      pe_ins | .0024445   .0014467    1.69  0.091  -.000391   .00528
      bvps_ins | -.0004022   .0003382   -1.19  0.234  -.0010651   .0002608
      _cons | .4787572   .0625554    7.65  0.000   .3561509   .6013635
-----+-----
      sigma_u |           0
      sigma_e | .11643953
         rho |           0 (fraction of variance due to u_i)
-----+-----
```

Fixed-effects (within) regression      Number of obs = 468  
 Group variable: year                    Number of groups = 12  
 R-sq: within = 0.2943                    Obs per group: min = 39  
           between = 0.1519                    avg = 39.0  
           overall = 0.2907                    max = 39

  F(12,444) = 15.43  
 corr(u\_i, Xb) = 0.0005                    Prob > F = 0.0000

```
-----+-----
      spv |   Coef.  Std. Err.   t  P>|t|   [95% Conf. Interval]
-----+-----
      size | -.0271497  .0089228  -3.04  0.002  -.0446858  -.0096136
         gr | -.0662597  .026796  -2.47  0.014  -.1189225  -.0135969
      mpbv | -.0362918  .0090016  -4.03  0.000  -.0539827  -.0186008
         eps | -.0025626  .0007507  -3.41  0.001  -.004038  -.0010872
         pe | -.0017761  .0008778  -2.02  0.044  -.0035012  -.000051
      bvps | -.0001974  .0000999  -1.97  0.049  -.0003938  -9.33e-07
         dyr | -.4994884  .1102229  -4.53  0.000  -.7161118  -.2828651
         ins | -.1519207  .0407296  -3.73  0.000  -.2319675  -.0718738
 mpbv_ins | .0573875  .020605   2.79  0.006  .0168921  .097883
 eps_ins  | .001756  .0025141   0.70  0.485  -.003185  .006697
 pe_ins   | .0027377  .001465   1.87  0.062  -.0001414  .0056169
 bvps_ins | -.0003895  .0003387  -1.15  0.251  -.0010551  .0002762
   _cons  | .4976474  .063335   7.86  0.000  .3731738  .6221211
-----+-----
```

```
sigma_u | .02079903
sigma_e | .11643953
   rho  | .03092037 (fraction of variance due to u_i)
-----+-----
```

F test that all u\_i=0:    F(11, 444) = 1.16                    Prob > F = 0.3155

---- Coefficients ----

	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
size	-.0271497	-.0242513	-.0028984	.0016492
gr	-.0662597	-.0837225	.0174628	.0090127
mpbv	-.0362918	-.0381386	.0018469	.0013749
eps	-.0025626	-.0025838	.0000212	.0000598
pe	-.0017761	-.0016255	-.0001506	.0001438
bvps	-.0001974	-.000191	-6.34e-06	3.14e-06
dyr	-.4994884	-.4562041	-.0432843	.0194525
ins	-.1519207	-.1503569	-.0015638	.0038427
mpbv_ins	.0573875	.0579465	-.0005589	.0027358
eps_ins	.001756	.0018896	-.0001337	.0003259
pe_ins	.0027377	.0024445	.0002932	.0002306
bvps_ins	-.0003895	-.0004022	.0000127	.0000179

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

$$\chi^2(12) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 31.30$$

$$\text{Prob}>\chi^2 = 0.0018$$

(V\_b-V\_B is not positive definite)

Random-effects GLS regression                      Number of obs    =    468  
 Group variable: year                                Number of groups =    12  
 R-sq: within = 0.3044                                Obs per group: min =    39  
           between = 0.1833                                avg =    39.0  
           overall = 0.3013                                max =    39  
   Wald chi2(13)    = 195.82  
 corr(u\_i, X) = 0 (assumed)                        Prob > chi2      = 0.0000

```
-----+-----
```

spv	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Size	-.0272687	.0088093	-3.10	0.002	-.0445347	-.0100027
gr	-.0888886	.0251884	-3.53	0.000	-.1382544	-.0395176
mpbv	-.0362125	.0088833	-4.08	0.000	-.0536235	-.0188014
eps	-.002592	.0007443	-3.48	0.000	-.0040509	-.0011332
Pe	-.0018117	.0008646	-2.10	0.036	-.0035063	-.000117
bvps	-.0001469	.000101	-1.45	0.146	-.0003448	.000051
dyr	-.8748347	.2028964	-4.31	0.000	-1.272504	-.477165
INS	-.1969314	.0446308	-4.41	0.000	-.2844061	-.1094566
mpbv_ins	.0539267	.0203796	2.65	0.008	.0139834	.09387
eps_ins	.0018375	.0024796	0.74	0.459	-.0030223	.0066974
pe_ins	.0027839	.0014457	1.93	0.054	-.0000495	.0056174
bvps_ins	-.0006062	.0003467	-1.75	0.080	-.0012857	.0000733
dy_ins	1.55915	.6399327	2.44	0.015	.3049051	2.813395
_cons	.5158697	.0640562	8.05	0.000	.3903218	.6414176

```
-----+-----
```

sigma_u	0
sigma_e	.115569
rho	0 (fraction of variance due to u_i)

```
-----+-----
```



R-sq: within = 0.3064  
 Between = 0.0454  
 Overall = 0.2991

Obs per group: min = 39  
 avg = 39.0  
 max = 39

corr(u\_i, Xb) = -0.0192

F (13,443) = 15.05  
 Prob > F = 0.0000

spv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Size	-.0314197	.0089885	-3.50	0.001	-.0490852	-.0137543
gr	-.0686015	.0266091	-2.58	0.010	-.1208972	-.0163058
mpbv	-.0333613	.0089964	-3.71	0.000	-.0510421	-.0156804
Eps	-.0025777	.0007451	-3.46	0.001	-.0040421	-.0011132
Pe	-.0020303	.000876	-2.32	0.021	-.0037519	-.0003087
bvps	-.0001477	.0001008	-1.47	0.143	-.0003458	.0000503
dyr	-.9867253	.2067441	-4.77	0.000	-1.393046	-.5804041
ins	-.2050563	.0447236	-4.58	0.000	-.2929531	-.1171595
mpbv_ins	.0516758	.0205541	2.51	0.012	.0112801	.0920714
eps_ins	.0016946	.0024954	0.68	0.497	-.0032097	.0065989
pe_ins	.0031804	.0014627	2.17	0.030	.0003056	.0060551
bvps_ins	-.0006304	.0003472	-1.82	0.070	-.0013127	.0000519
dy_ins	1.82687	.657759	2.78	0.006	.5341542	3.119586
_cons	.5451945	.0651509	8.37	0.000	.4171513	.6732377
-----						
sigma_u	.02240663					
sigma_e	.115569					
rho	.03622802 (fraction of variance due to u_i)					
-----						
F test that all u_i=0:	F (11, 443) =	1.33	Prob > F =	0.2039		

---- Coefficients ----

	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
size	-.0271497	-.0272687	.000119	.0014182
gr	-.0662597	-.088886	.0226263	.0091418
mpbv	-.0362918	-.0362125	-.0000793	.0014542
eps	-.0025626	-.002592	.0000294	.0000978
pe	-.0017761	-.0018117	.0000356	.0001513
bvps	-.0001974	-.0001469	-.0000505	.
dyr	-.4994884	-.8748347	.3753463	.
ins	-.1519207	-.1969314	.0450107	.
mpbv_ins	.0573875	.0539267	.0034608	.0030395
eps_ins	.001756	.0018375	-.0000816	.0004152
pe_ins	.0027377	.0027839	-.0000462	.0002372
bvps_ins	-.0003895	-.0006062	.0002167	.

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

$$\chi^2(11) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 2.10$$

$$\text{Prob}>\chi^2 = 0.9981$$

(V\_b-V\_B is not positive definite)

## Appendix VI: plagiarism similarity Index

### JOSEPH ANGOTE WANDA - MARKET VALUE RATIOS, INSTITUTIONAL OWNERSHIP STRUCTURE AND STOCK PRICE VOLATILITY OF LISTED COMPANIES IN NAIROBI SECURITIES EXCHANGE, KENYA

#### ORIGINALITY REPORT

**18%**

SIMILARITY INDEX

**15%**

INTERNET SOURCES

**9%**

PUBLICATIONS

**8%**

STUDENT PAPERS

#### PRIMARY SOURCES

<b>1</b>	<a href="http://ir.mu.ac.ke:8080">ir.mu.ac.ke:8080</a> Internet Source	<b>3%</b>
<b>2</b>	<a href="http://www.researchgate.net">www.researchgate.net</a> Internet Source	<b>2%</b>
<b>3</b>	<a href="http://uis.brage.unit.no">uis.brage.unit.no</a> Internet Source	<b>1%</b>
<b>4</b>	<a href="http://etd.uum.edu.my">etd.uum.edu.my</a> Internet Source	<b>1%</b>
<b>5</b>	<a href="http://ir.kabarak.ac.ke">ir.kabarak.ac.ke</a> Internet Source	<b>1%</b>
<b>6</b>	Submitted to Higher Education Commission Pakistan Student Paper	<b>1%</b>
<b>7</b>	<a href="http://www.icanig.org">www.icanig.org</a> Internet Source	<b>&lt;1%</b>
<b>8</b>	<a href="http://vital.seals.ac.za:8080">vital.seals.ac.za:8080</a> Internet Source	<b>&lt;1%</b>