# MACRO RISK FACTORS, INVESTOR SENTIMENTS AND PERFORMANCE OF EQUITY MARKET AT NAIROBI SECURITIES EXCHANGE, KENYA

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**D86/CTY/38463/2016**

**A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILMENT OF REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS (FINANCE) KENYATTA UNIVERSITY**

**JUNE 2021**

## DECLARATION

This Thesis is my original work and has not been submitted for award in any other university. No part of this thesis should be produced without the authority of the Author or/and Kenyatta University.

Signature……..Date……...……

**Musembi Michael Makau -** D86/CTY/38463/2016

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We confirm that this thesis was carried out by the candidate under our supervision as the appointed University supervisors.

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## DEDICATION

This research is dedicated to Victoria and Alexander who infused the spirit of hard work and perseverance at a tender age and for providing invaluable support during the thesis period and to God who has seen me this far. I also wish to dedicate this to my immediate family Members Veronica, Bianca, Liam, Albanus and Mary for their patience and support during the long hours of absence while undertaking the research.

## ACKNOWLEDGEMENT

I thank God for the Far He has brought me since this study was started to its conclusion. I acknowledge the support accorded to me by my supervisors, Dr. Eddie Simiyu and Dr. Charity Njoka under whose guidance I was able to conceptualize and conduct the research. I also acknowledge the support accorded to me by Kenyatta University academic staff, support staff and my classmates AKims Malgit and Nathan Wafula from accounting and finance.

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## OPERATIONAL DEFINITION OF TERMS

**Asymmetric Effects** Negative and positive shocks of the same magnitude have different effects on stock prices. The study used Nonlinear autoregressive distributed lag model to determine the asymmetric effect of macro risk factors and investor sentiment on performance of equity market in Nairobi Securities Exchange, Kenya.

**Bank Credit** Total value of financing provided by financial institutions excluding financing extended to the government on a monthly basis. The study determined the effect of total bank credit extended to the private sector (private sector credit) on performance of equity market in Nairobi Securities Exchange, Kenya.

**Blue Chip Equities** Equities of leading, well established capitalized known companies that have a proven record of earnings and pay dividend. This refers to the Nairobi securities exchange 20 share index component companies.

**Concentration Risk** Measure of dominance of large listed companies in terms of market value in the equity market. On average five companies (Equity Bank, Kenya Commercial Bank, East African Breweries, Cooperative Bank And Safaricom) control more than 70 percent of market capitalization in Nairobi securities exchange exposing the market to contagion effects due to cross company linkages.

**Consumer Price Index** Measure of Weighted average prices of consumer goods and services used to measure Inflation rate for this study.

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|---|---|
| **Domestic Savings** | The sum of household savings, public savings (government) and private savings(companies) equivalent to gross national income less national consumption expenditure. This was measured by log of Gross Domestic Savings |
| **Equity Market** | An organized place by professional stockbrokers for the purpose of buying and selling of shares in accordance with fixed rules and regulations. In this study, this will be the equity market in Nairobi securities exchange. |
| **Equity** | A fraction of a corporation owned by an investor entitling the investor to partake in the profits and losses of a corporation. Also known as a share or stock. |
| **Financial Contagion** | Increase in cross company or cross market linkages with shocks in one company felt in other companies or markets. Also called Contagion effects. This arises from high concentration risks in the Kenyan equity market. |
| **Financial Market** | A trading place where investors buy and sell securities such as equities, bonds, currency and derivatives. It includes money markets and capital market. This is represented by the Nairobi Securities Exchange in Kenya. |
| **Foreign Equity Flows** | Foreign capital invested in and out of the equity market by foreign investors through selling and buying of shares. It is equal to net value of shares sold and bought by foreign investors on a monthly basis. Also called foreign investor flows. This was measured by log of net foreign investor flows. |

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| **Foreign Shareholding** | Proportion of shares in listed firms held by investors who are neither Kenyans nor members of the East African Community. |
| **Gross Domestic Savings** | The sum of household savings, public savings (government) and private savings(companies) equivalent to gross national income less national consumption expenditure. This was measured by log of Gross Domestic Savings The sum of public savings and private savings equivalent to the difference between government income less consumption and purchases by the government. |
| **Inflation Rate** | Increase in commodity prices of basic goods and services on a monthly basis measured by log of Consumer price index. |
| **Institutional Ownership** | Ownership stake in a company by large organizations including investment and pension funds, commercial banks and insurance firms. Institutional owners exercise a lot of influence on firm management due to purchase of substantial outstanding shares in a listed company. This will be measured by log of institutional owned shares in Nairobi Securities Exchange (institutional holding). |
| **Investor Sentiments** | Investor misevaluation of assets in the stock market. Trading Volume will be used as proxy for Investor sentiments. The willingness of investors to add liquidity (trading volume) to the market depends on how optimistic or pessimistic the investors feel about the market. |
| **Macro Risk Factors** | Macro risk factors refer to financial, economic and political and market related factors whose fluctuations |

and imbalances cause volatility in the whole stock market. These include foreign equity flows, domestic savings, Inflation rate and private sector credit. (Financial, economic variables and market related factors)

**Market Capitalization** The value of a listed company's shares equivalent to the market price of the company's shares outstanding.

**Nairobi All Share Index** Price weighted index that tracks share price movements of all listed firms in NSE, Kenya.

**Net Foreign Equity Flow** The value of all foreign investors inflows and outflows given by difference between foreign equity inflows and outflows. Also called net foreign investor flows.

**Net Foreign Investor inflows** Net Foreign capital invested into the equity market by foreign investors through buying of shares in Nairobi Securities Exchange.

**Performance Of Equity Market** Changes in market value of issued shares in publicly owned firms. The indicators of performance of equity market include the Nairobi All Share index for stock price movements and Market Capitalization, which measures market value of issued shares. This will be measured by the log of market capitalization.

**Private Sector Credit** Financial resources or Credit provided by lenders such as banks to the private sector as ratio to gross domestic product. Also called domestic credit to private sector. Private Sector Credit is measured by log of Gross credit to private sector in the current study.

**Risk** The probability of incurring losses on investment

**Securities Exchange** A physical or virtual meeting place bringing together

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|---|---|
| | traders, dealers, brokers meet for purposes of buying and selling securities for instance shares, bonds and derivatives are bought and sold. |
| **Stock Market Index** | Measure of the general share price level in the stock market computed by Nairobi securities Exchange at the end of a certain period. |
| **Trading Volume** | Total number of shares or contracts traded per month in Nairobi Securities Exchange equity market. Trading volume was used as proxy for investor sentiment in the current study. |
| **Turnover** | Total value of shares traded per month equivalent to the volume of shares traded multiplied by share price at a certain period for Nairobi Securities Exchange equity market. |

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ADF | Augmented Dickey-Fuller Test. |
| APT | Arbitrage Price Theory |
| ARCH | Autoregressive Conditional Heteroskedasticity |
| ARDL | Autoregressive Distributed Lag Model |
| ARDL ECM | Autoregressive Distributed Lag Error Correction Model |
| BRICS | Brazil, Russia, India, China, South Africa |
| CEIC | Census and Economic Information Centre |
| CAPM | Capital Asset Pricing Model |
| CMA | Capital Markets Authority |
| CPI | Consumer Price Index |
| EAC | East African Community |
| ECM | Error Correction Model |
| EMH | Efficient Market Hypothesis |
| G7 | Group of Seven Countries |
| GDP | Gross Domestic Product |
| GOK | Government of Kenya |
| IMF | International Monetary Fund |
| IPO | Initial Public Offer |
| KSH | Kenya Shilling |
| KIPPRA | Kenya Institute of Public Policy Research and Analysis |
| KNBS | Kenya National Bureau of Statistics |
| KU | Kenyatta University |

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|---|---|
| NARDL | Nonlinear Autoregressive Distributed Lag Model |
| NASI | Nairobi All Share Index |
| NSE 20 | Nairobi Securities Exchange 20 Share Index |
| NSE | Nairobi Securities Exchange |
| OECD | Organization for Economic Cooperation and Development |
| OLS | Ordinary Least Square |
| US | United States |
| USD | United States Dollar |
| VAR | Vector Autoregressive |
| VECM | Vector Error Correction Model |

## ABSTRACT

The equity market is envisioned as a significant source of financing for both the corporate sector and government aimed at growing Kenya's gross domestic product by 10 percent annually as per Kenya's vision 2030. However, despite ongoing capital market reforms on corporate governance and conduct of business; Kenya's equity market remains constrained by absence of new listings. In addition, the equity market suffers from high concentration risks whereby top five companies control 70 percent of total market capitalization. This exposes the market to financial contagion effects. Furthermore, the performance of equity market has declined significantly during the period under study with investors loosing an average of KSH.20 billion in 2009, KSH.299 billion in 2011, KSH.262 billion in 2015 and KSH.461 billion in 2018 in market capitalization decline caused by fluctuations in macro risk factors leading to investor wealth decline, loss of investor confidence, low equity market activity and limited investment opportunities. On average, the exchange's contribution to economic growth was lower than one percent against a ten percent target by government's vision 2030. The key aim of the study was to establish the effect of macro risk factors and Investor sentiments on performance of equity market at Nairobi Securities Exchange, Kenya. Specifically, the study determined the effect of foreign equity flows; the effect of domestic savings; the effect of private sector credit; the effect of Inflation rate and the effect of Investor sentiments on performance of equity market in Nairobi Securities Exchange, Kenya and examined moderating effect of institutional ownership on macro risk factors and Investor sentiments on Performance of equity market. The study was based on the capital asset pricing model, fisher's hypothesis, arbitrage-pricing theory, behavioral finance theories (prospect theory and herding theory) and efficient market hypothesis. The study relied on positivism paradigm and explanatory research design. The study relied on monthly secondary data obtained from Central bank of Kenya, Nairobi Securities Exchange, Capital Markets Authority of Kenya and Kenya National Bureau of Statistics between 2008 and 2018. The target population was all 67 listed firms in Nairobi securities exchange as captured by the Nairobi Securities Exchange All Share Index. The instruments of data collection were document review guides. The study used Auto regressive distributed lag model and Nonlinear Auto regressive distributed lag model for data analysis. The findings of the study indicate negative significant relationship between foreign equity flows ($\beta$=0.034, p=0.05), domestic savings ($\beta$=0.003, p=0.05), Inflation rate ($\beta$=0.007, p=0.05) and performance of equity market. Furthermore, the study also reported significant positive relationship between private sector credit ($\beta$=0.000, p=0.05), and Investor sentiments ($\beta$=0.000, p=0.05) and performance of equity market. In addition, institutional ownership ($\beta$=0.000, p=0.05) significantly moderated the relationship between macro risk factors, Investor sentiments and performance of equity market. The findings underscored the importance of the central bank in monitoring Inflation rate and implementing appropriate monetary policies aimed at reducing the high cost of inputs to create a favorable environment for firms to thrive and make profits to increase equity market performance. Since private sector credit positively affects equity market performance, the central bank should reduce the central bank rate so that commercial banks can lend more to private sector. The capital markets authority to work towards reduced taxes and transactions charges to attract foreign equity flows while monitoring changes in Investor sentiments in the market as it significantly affects performance of equity market. The significant institutional ownership-moderating role was emphasized as corporate governance increases investor confidence in the market and ensures firm managers invest in projects that maximize shareholder value.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background To The Study

A securities exchange refers to a market where companies and governments can raise funds for their operations in both the short run and long run. A stock market comprises of a bond market and an equity market (Borowski, 2010). Companies use bonds or shares to generate funds for expansion (Kreinovich & Sriboonchitta, 2018). Equity markets are significant contributors to economic development in an economy. Equity markets provide avenues for firms to raise business capital facilitate investment through savings mobilization, assist companies to grow, boost governance of corporations, expose small investors to available opportunities for investment and raise capital for the government (African Development Bank Group, 2018). Performance of equity market is measured by stock indices and market capitalization. Nairobi Securities Exchange is the only approved stock exchange in Kenya. (Capital Markets Authority, 2018b).

Group of seven (G7) countries members; France, Germany, United Kingdom, Japan, Australia, Canada, United States and Italy have reported mixed performance of equity markets characterized by reduction in number of listed companies and initial public offers. In the United States, market capitalization to GDP stood at 104 percent in 2009, rose to 115 percent in 2010, fell to 101 percent in 2011 before rising to 150 percent in 2014 and falling to 138 percent in 2015 before rising to 164 percent in 2017 and falling to 146 percent in 2018 while the equity market index fluctuated between 7000 points and 13500 points between the period 2008 to 2018 (CEIC, 2020). In France, market capitalization to GDP stood at 53 percent in 2008 before rising to 99 percent in 2017 and declining to 87 percent in 2018 while the equity market index also experienced a lot of volatility over the period. For Germany, market capitalization to GDP stood at 31 percent in 2008, 58 percent in 2017 before dropping to 46 percent in 2018. United Kingdom also experienced fluctuation in market capitalization to GDP. Market capitalization stood at 81 percent in 2008, fluctuated between 105 percent to 117 percent between 2008 to

2017. In 2017, United Kingdom's market capitalization to GDP was 117 percent before declining to 93 percent in 2018 (World Bank, 2020). In Japan's stock exchange, market capitalization to GDP stood at 63 percent in 2009, dropped to 52 percent in 2011 before rising to 129 percent in 2017 and declining to 106 percent in 2018 while the stock market index experienced volatility between 2008 to 2018 (CEIC, 2020). Between the period 1995 and 2018, group seven advanced economies lost more than half of their listed companies with capital raised through initial public offers shifting to emerging economies. Specifically, from 1999 to 2001, 90 percent of all capital raised via initial public offers was allocated to advanced economies, which dropped to 53 percent between 2008 to 2018 (World Bank, 2020). Australia's market capitalization to GDP stood at 78 percent in 2008, then rose to 111 percent in 2009 then dropped to 104 percent in 2010, 80 percent in 2011 and then rose to 88 percent in 2012, 97 percent in 2013 , 98 percent in 2014, 99 percent in 2015, 103 percent in 2016 and 107 percent in 2017 before dropping to 94 percent in 2018 indicating average performance in Australia. Australia's equity index rose from 4500 points in 2008 to 6000 points in 2018 indicating a gradual rise in performance (Australia Stock Exchange, 2020; CEIC, 2020). Canada had a market capitalization to GDP of 67 percent as at 2008, which rose to 122 percent in 2009 and 135 percent in 2010 then dropped to 107 percent in 2011 before rising to 113 percent in 2012, 115 percent in 2013 and 116 percent in 2014 then dropped to 103 percent in 2015, then rising to 131 percent in 2016, 142 percent in 2017 and dropping to 113 percent in 2018. Canada's market capitalization performance was average while the equity market index rose from 11000 points in 2008 to 16000 points in 2018 with volatility in between (World Bank, 2020). Italy's market capitalization to GDP stood at 23 percent in 2008 then rose to 29 percent in 2009, declined to 26 percent in 2010 and 20 percent in 2011 before rising to 22 percent in 2012, 28 percent in 2013, 30 percent in 2014, 35 percent in 2015, 31 percent in 2016, 37 percent in 2017 then dropping to 31 percent in 2018 indicating average rise in performance of equity market capitalization. Italy's equity market index experienced volatility within the period of 2008 to 2018 with lows of 13000 points and highs of 24000 points (OECD, 2019; Schiereck, Freytag, Grimm, & Bretschneider, 2018; CEIC, 2020).

Brazil, Russia, India, China and South Africa (BRICS) have also recorded differences in performance of equity market. The equity market in Brazil has been growing but it is still not developed. The market is constrained by high concentration risk, low market capitalization, few initial public offers and low trading volume (Osaseri & Osamwonyi, 2018). Between the period 1990 and 2020, Brazil's market capitalization to GDP rose from 4 percent to 74 percent. In Russia, equity index declined from 2008 to 2018 with volatility ranging between 700 points and 2100 points on average while market capitalization to GDP stood at 62 percent in 2009 and 2010 before dropping sharply to 38 percent in 2011, 37 percent in 2012, 34 percent in 2013, 19 percent in 2014 then rising to 48 percent in 2016 then dropping to 39 percent in 2017 and 34 percent in 2018 (World Bank, 2020; CEIC, 2020). In India, market capitalization to GDP stood at 54 percent in 2008, then rose to 97 percent in 2009 and 2010, declined to 55 percent in 2011 then rose to 69 percent in 2011 then dropped to 61 percent in 2013 before increasing to 76 percent in 2014, 72 percent in 2015, 68 percent in 2016 then rose to 88 percent in 2017 before dropping to 76 percent in 2018 while the equity index fluctuated between 15000 points in 2008 to 3600 points in 2018. On average, equity market performance in India increased between the periods of 2008 to 2018. In China, on average the equity market index in Shanghai Shenzhen 300 stood at 3500 points in 2010 before dropping to around 1000 points in 2014 before rising to 4800 points in 2015, 3500 points in 2016 and 2017 before rising to 4000 points in 2018. Market capitalization to GDP for china stood at 39 percent in 2008, 70 percent in 2009, 66 percent in 2010 before dropping to 45 percent, 43 percent and 41 percent in 2011, 2012 and 2013 respectively (World Bank, 2020) (CEIC, 2020). In 2014, Chinese market capitalization to GDP rose to 57 percent then to 74 percent in 2015, dropped to 66 percent in 2016 before rising to 72 percent in 2017 and declining to 46 percent in 2018. In South Africa, market capitalization to GDP stood at 192 percent in 2008 then rose to 236 percent in 2009 and 244 percent in 2010 before dropping to 228 percent in 2011. In 2012, the South African market capitalization to GDP stood at 258 percent, 300 percent in 2013, 302 percent in 2014 before dropping to 289 percent in 2015. Market capitalization then rose to 311 percent in 2016 and 332 percent in 2017 before declining to 260 percent in 2018 (CEIC, 2020; World Bank, 2020).

Emerging economies registered disappointing equity market performance with substantial differences in equity market activity across the different markets during the period under study. Latin American and Caribbean region reported lackluster equity market performance with Brazil dominating most of the initial public offers. For example, Countries in Latin America have reported slow growth in their markets (United Nations Conference on Trade and Development , 2017). For example, market capitalization for Latin American countries stood at 42 percent compared to 94 percent for Group seven countries and 146 percent in East Asia (World Bank Group, 2018). More recently, market capitalization of the Latin American and Caribbean region was 2.6 percent of global market capitalization for Peru, Mexico, Argentina, Colombia, Chile and Brazil (OECD, 2017). Mexico experienced volatility in market capitalization to GDP with average lows of 34 percent and highs of 43 percent. Market capitalization to GDP stood at 38 percent in 2009 before dropping to 34 percent in 2018. Mexico's stock index showed gradual increase from an average of 30000 points to 40000 points from 2008 to 2018 with fluctuations in-between (Mexico Stock Exchange, 2020). In Argentina, equity market capitalization declined significantly with market capitalization standing at 107 percent in 2008 then rising to 175 percent in 2009 then falling to 72 percent in 2018 with significant volatility in between. Argentina's equity index showed a gradual rise from an average of 2000 points in 2008 to 35000 points in 2018. Colombia's market capitalization to GDP stood at 57 percent in 2009 then rose to 77 percent in 2010 then dropped to 65 percent in 2011 then rose to 73 percent in 2012 before declining to 35 percent in 2018 while the equity index also showed a gradual decline from 1400 points in 2010 to 1100 points in 2016 before rising to 1500 points in 2018. Chile's equity Market capitalization declined on average with figures in 2009 standing at 132 percent, which rose to 160 percent in 2010 before declining to 93 percent in 2018 with volatility in between. Chile's equity index rose from an average of 3500 points in 2010 to 5500 points in 2018. In Peru, market capitalization to GDP stood 85 percent in 2009 and then rose to 107 percent in 2010 before declining to 69 percent in 2011 and 51 percent in 2015, then rose to 75 percent in 2017 before declining to 65 percent in 2018. On average, market capitalization declined in Peru while the equity index experienced volatility during the period from 2008 to 2018 (CEIC, 2020; World Bank, 2020).The Latin American states were characterized by

capitalization and large trade volumes concentrated on few firms. Delisting and migrations of large companies to other major stock exchanges were reported in Latin America and Eastern Europe (United Nations Industrial Development organisation, 2018). Asian companies raised USD 4 trillion dollars through Asian equity markets. Asian companies form part of the largest users of public equity markets with secondary public offering and initial public offering forming forty seven percent of all equity raised publicly globally. Chinese companies' extensive usage of public equity markets has underpinned the rapid growth in Asian equity markets (United Nations, 2018).

African capital markets have significantly developed since 1989. Currently, 27 stock exchanges serving 32 African countries exist ranging from start-ups in Mozambique and Uganda to more developed markets of South Africa and Nigeria (Schiereck, Freytag, Grimm, & Bretschneider, 2018; Africa Securities Exchange Association, 2020). However, the rapid development of African markets is not synonymous with market maturity. In most African equity markets, trading is limited to a few stocks accounting for most of the total market capitalization. Besides, most markets suffer from disclosure and informational deficiencies for other stocks (Yartey, 2008). Furthermore, most African markets are small and characterized by few companies listed, with low market capitalization. South Africa is the most developed market with a market capitalization of 260 percent to Gross domestic product as of 2018 having increased from 192 percent in 2008. The all share index in South Africa also showed a gradual increase from an average of 25000 points in 2010 to slightly above 50000 points in 2018 (CEIC, 2020; World Bank, 2020). Nigeria's market capitalization to GDP stood at an average of 12 percent in 2009 then rose to 15 percent in 2010 then fell to 10 percent in 2011, 13 percent in 2012, rose to 17 percent in 2013, fell to 13 percent in 2014, fell to 10 percent in 2015 and 9 percent in 2016 before rising to 12 percent in 2017 and declining to 10 percent in 2018. The Nigeria equity index in Nigeria all share index stood at slightly above 20000 points in 2010, rose to above 25000 points in 2011 and dropped to 20000 points in 2012. The index then rose to a high of between 40000 and 45000 points in 2014 and 2015 before declining to an average of 25000 points in 2017 before rising to an average of 45000 points in 2018 (CEIC, 2020; World Bank, 2020; Nigeria Stock Exchange,

2020). In Egypt, Market capitalization to GDP dropped from an average 50 percent in 2008 to average of 20 percent in 2018 with lows of 10 percent during the period while the equity index showed a gradual increase from an average of 7500 points in 2008 to 17500 points in 2018 but with a lot of volatility in-between (World Bank, 2020). For most African states, market capitalization averages 27 percent of Gross domestic product with Kenya having a market capitalization of 28 percent of Gross domestic product as of 2018 (Mahama, 2013). In Uganda, decline in trading and devaluation in the local currency resulted in volatility in performance of equity market while in Tanzania volatility in Inflation rate and foreign equity flows resulted in decline in performance of equity market (African Development Bank Group, 2018).

Performance of equity market is a requirement for a country's economic growth. Kenya's vision 2030 recognized the importance of financial services in achieving the targeted gross domestic product growth of ten percent per year by incorporating the equity market as a one of key pillars for economic growth (Capital Markets Authority, 2018a). The government, through the capital markets authority has developed a master plan for the period between 2014 to 2023 aimed at making Nairobi securities exchange the preferred investment destination in Africa (Government Of Kenya, 2018).

However, despite being in existence since 1954, the Nairobi securities exchange has remained constrained with low market capitalization and high concentration risks whereby a few large companies dominate trading. On Average, the top 5 companies; Safaricom, Equity bank, Cooperative bank, East African Breweries and Kenya Commercial Bank control 70 percent of market capitalization in the Kenyan exchange exposing the market to financial contagion effects (Ngugi, Maana, & Amanja, 2013;Wanja, 2017). The Equity market also suffers from low number of listings with the last initial public offer being in 2014. There have been only 10 initial public offers and 11 offers by introduction for the period 2006 to 2018. In addition, the NSE has experienced a drop in the key performance indices such as the NSE 20 and NASI between 2008 and 2018 (Capital Markets Authority, 2018a).

In summary, global markets, especially in-group of seven countries like the USA reported growth in performance of equity markets as indicated by average market capitalization of 94 percent to GDP. However, group of seven countries also reported decline in number of listed companies and initial public offers. BRICS reported mixed performance of equity market with statistics indicating that Brazil, India, China and South Africa reported increase in market capitalization to GDP. Emerging economies especially in Latin America reported disappointing performance of equity markets characterized by low market capitalization to GDP and high concentration risks. African equity markets though developing are not mature as captured by low number of listed companies with trading concentrated on a few firms. Average market capitalization to GDP for Africa stands at 27 percent against 146 percent for East Asia economies. Kenya's performance of equity market lags behind the African average. The market suffers from high concentration risks, low market capitalization and trading is limited to a few firms.

### 1.1.1 Macro Risk Factors

Macro risk factors refer to financial, economic, political and market related factors whose fluctuations and imbalances cause volatility in the whole stock market in general (Joarder, Rezaul, & Ruhul, 2006; Madura, 2014; Gregoriou, Hoppe, & Wehn, 2010). Macro risk is associated with financial factors, economic factors and political factors that affect the whole stock market as a whole and as such are unpredictable, unexpected and un-diversifiable (Gupta, 2003; Larrabee & Voss, 2012). According to Kürschner (2008) macro risk refers to factors that affect all firms and cannot be eliminated through diversification.

The most important risks in securities analysis are stock specific risk also called unsystematic risk or diversifiable risk and macro risk also called systematic risk or market risk (Sharifzadeh, 2010; Investments, Gilliland, & Teufel, 2011; Koch, 2009; Smith, 1991; Gupta, 2003). Stock specific risk can be eliminated by investors holding diversified portfolios as it only affects specific firms and is non-market related and as such stock specific risk is not of much concern as far as stock pricing is concerned (Koch, 2009; Cline, 2009; Apte, 2008).

According to Madura (2014) and Joarder, Rezaul and Ruhul (2006) factors that affect stock prices can be categorized into economic factors, market related factors, political and firm specific factors. Gregoriou, Hoppe and Wehn (2010) associate stock market fluctuations to undiversifiable financial factors, economic factors and political factors. Kevin (2009) equates Macro risk factors to variables in the external environment of a business whose changes cause volatility in the asset values, cash flows and liabilities of all firms in the market (Sharifzadeh, 2010).

According to Alexander (2008) expected returns on a portfolio are dependent on several macro risk factors which include broad market indices, industry and style factors, economic factors such as interest rates, Inflation rate andstatistical factors. The value of stocks and bonds vary continously with changes in economic, finacial and market related variables. These uncertainities are called macro risks, systematic risks or macroeconomic environment risks (Kürschner, 2008; Shen & Yu, 2013).

Macro risk factors stability is a significant driver of performance of equity markets. Positive developments in private sector investment, increase in foreign investor activity and increased activity within the banking industry are leading contributors of performance in the equity market (Kenya Institute for Public Policy Research and Analysis , 2018). Macro risk factors include foreign equity flows, domestic savings, private sector credit and Inflation rate (Vasigh, Fleming, & Mackay, 2010; Rawal, 2015; Huang, Yang, Yang, & Sheng, 2014). It is also essential to evaluate effects of Investor sentiments to factor irrational investors and their investment effects in the stock market (Burghardt, 2011). According to Baker and Wurgler (2007) irrational investors have the ability to influence performance of equity market due to bias in investment decisions which leads to investors mimicking other investors in the market forcing equity prices to deviate from their true prices and other investors forced to trade on the inefficient prices. Performance of equity markets and resultant economic growth relies on the stability of the macro risk factors. High foreign equity flows, high domestic savings, growth in private sector credit and Inflation rate are paramount to macroeconomic stability (African Development Bank Group, 2018). Foreign equity flows were measured by net foreign investor flows, gross domestic savings to private sector measured domestic savings; private sector credit was measured by

gross domestic credit to private sector while inflation was measured by consumer price index.

#### 1.1.1.1 Foreign Equity Flows

Foreign equity flows refers to influx of foreign capital into an equity market by foreign investors in such of high returns (Ebele, 2016).According to Anayochukwu (2012), equity markets benefit from enhanced efficiency and liquidity when investment levels increase due to influx of foreign capital inflows into developing countries, which ultimately leads to economic growth. Foreign equity flows occurs when foreign investors seeking high return rates on investment buy shares in a foreign country's equity market thus funds flow into the host country. These investors are not interested in legal control or management of the companies they invest in (Gachanja & Kosimbei, 2018).

Thomas and Winkler (2014) specify various benefits of foreign equity flows to the domestic market. First, foreign equity flows can make the host market liquid and efficient. Secondly, introduction of innovative advanced securities for example, derivatives linked to equity by foreign investors can stimulate capital market development of the host country thus promoting economic growth. Conversely, investment of foreign equity flows in speculative investments such as stock markets and real estate have destabilization effects on stock markets when sudden reversals of foreign equity flows occur. This occurs when investors flee from stock markets in herds affecting bond and stock prices (Auernheimer, 2010). Repatriation of redemption proceeds into the investors' home currency also affects the host currency's exchange rates. Central bank attempts to stabilize the foreign exchange market leads to decline in liquidity in the money markets leading to output and employment losses (Subbarao, 2010).

Ryakala (2017) opines that foreign equity flows can be considered hot capital in search of high financial profits and stability in the marketplace environment. This means that foreign equity flows can move at short notice from one stock market to another. Even with stable home domestic stock market conditions, more favourable changes in stock markets elsewhere leads to capital flight significantly affecting

stock prices in the host market at the slightest hint of changes in political environment, economic conditions and market conditions. Foreign portfolio investors in emerging markets have also been known to engage in buying shares when the market is booming and selling when the market is declining resulting to decline in stock prices (Griffith-Jones, Gottschalk, & Cailloux, 2011).

The Kenyan government has implemented several reforms in the country in a bid to promote the effectiveness of the capital market. These reforms include; the formation of a regulator of capital markets in 1990, revoking the act on controlling economic growth in 1995, revision of the act on capital markets to allow investors trade in government securities, introduction of the central depository system in 2004 and demutualization in 2012 (Nyangoro, 2013). The Kenyan government has successfully liberalized its market to allow international financial institutions to invest locally. The government has encouraged establishment local branches, subsidiaries and buying of shares though recalling of the act requiring foreign companies to maintain seventy-five percent local ownership (Capital Markets Authority, 2018a). Net foreign investor flows are used to measure foreign equity flows (Bayar, 2016). Figure 1.1 shows the trend in foreign equity flows in the NSE between 2008 and 2018.

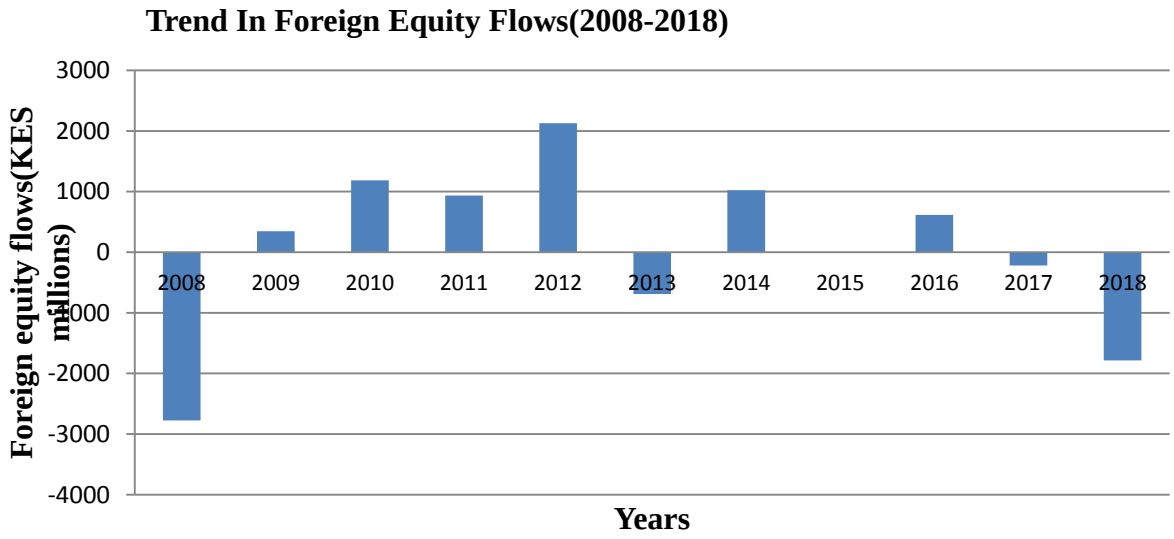


**Figure 1.1 Trend in Foreign Equity Flows (2008-2018)**

**Source: Researcher 2020**

In figure 1.1, the trend in foreign equity flows indicates a volatility in foreign equity flows for the period 2008 to 2018 due to capital flight. Foreign equity flows were negative in 2008, 2013 and 2017. This negative trend and uneven fluctuations in foreign equity flows is explained by the fact that foreign equity flows represents hot money in the market in search of high returns hence foreign investors invested and divested out of the market depending on the prevailing social, political and macroeconomic stability conditions of the country.

#### 1.1.1.2 Domestic Savings

Turkey's Ministry of Development and World Bank (2011) argue that low savings rate affects a country's growth prospects due to a positive correlation between savings, investment and growth. Low savings rate also increases a country's reliance on foreign financing which increases external current account deficit hampering growth sustainability (Princeton University, 2012). Reliance on foreign financing also exposes a country to risk of capital reversal and its asscociated impacts on growth.

Owiredu, Oppong and Asomaning (2016) contend that low domestic savings denies firms the much required funds for expansion which in turn affects share prices downwards since financial institutions lack adequate funds to channel to firms. According to the Capital Markets Authority (2018), domestic savings play a crucial role in development of equity markets. Institutional investors facilitate mobilization of domestic savings via collective investment vehicles offering affordable capital market instruments for investment by retail investors with professional managers.

Ebele (2016) posits that mobilization of savings is a key factor in performance of equity market and economic development attributable to its significance in the improvement of the economic structure. Fast savings buildup in addition to enhanced resource distribution can promote economic expansion in the end through equity market (Darskuviene, 2010). The equity market mobilizes domestic savings to provide lasting funds to those segments of the economy with deficits by providing avenues for buying and selling of various securities by the public (International

Finance Corporation, 2017). In order to get fund owners best returns for the funds provided, the funds are efficiently allocated. Lack or insufficient funding to industries stifles performance of equity market more so when demand is rising calling for increased productivity and production (Mishra, Sankar, Ranjan, & Pallavi, 2011).

Commercial banks channel savings as the first stage towards financial sector development with firms being cheap capital seekers while savers look for higher returns. Commercial banks channel some of the savings while the rest are invested in the stock market (Kalra, 2010). For policy instruments to function effectively in the end, it is essential to increase the rate of domestic savings. Satisfactory market movement calls for commitment of capital for the long term. Raising the levels of private and public savings is paramount for obtaining a surplus in the gap between savings and investments. Various policy instruments can be used to raise the level of public savings such as the government operating a surplus in its budget, managing inflation, reducing unemployment, utilizing tools of monetary policy and government associated firms' savings (Egoro & Obah, 2017 ). Gross domestic savings was used to measure domestic savings (CEIC, 2020).

According to the world bank (2018), there has been a reduction in gross world savings which shrank from 25.03 percent to 24.45 percent between 2014 and 2017. The sub saharan region savings stood below 15 percent compared to above 30 percent for Nations in East Asia. Countries like Botswana experienced decline in their savings between the period 2008 to 2009 from 29 percent to 20 percent. During the period, Gross domestic product also declined from 3 percent to negative seven percent indicating that decline in savings negatively affects economic growth (Jagadeesh, 2015).

In kenya, gross savings declined from approximately 15 percent in 2008 to 9 percent in 2013 then rose to 11 percent in 2015 only to decline in 2017 to 10 percent(World Bank,2018). Channelling domestic savings into investments through increase in total new issues, boosts the levels of economic activity and this is reflected in increased performance of equity market (Solomon, 2013). Yartey (2008) emphasized that equity market improvement is done through physical savings allocation and capital

accumulation to those areas in need of capital leading to economic efficiency and growth. Economic growth is facilitated by domestic savings by boosting the equity market. Figure 1.2 indicates the trend in domestic savings for the period between 2008 to 2018.

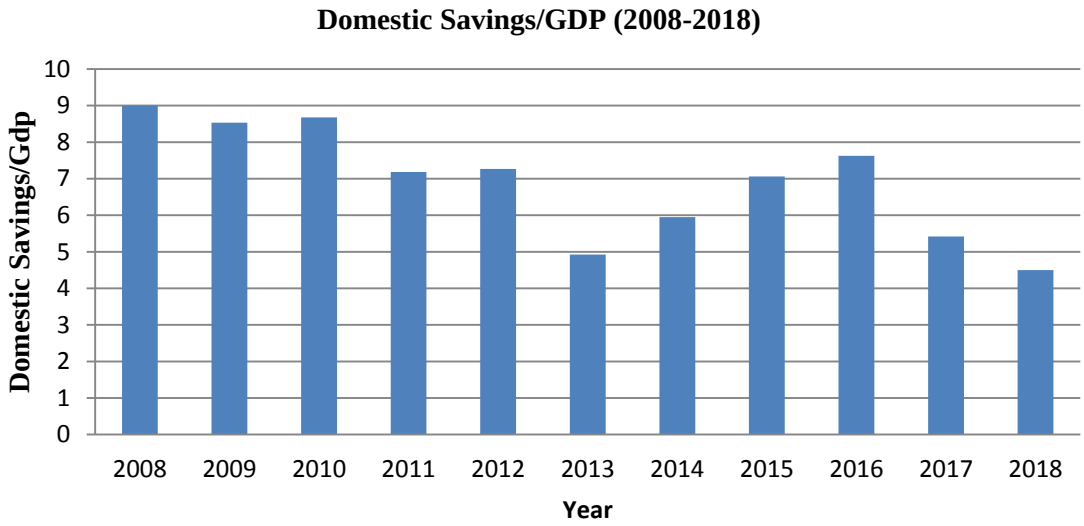


**Figure 1.2 Trend in Domestic Savings (2008-2018)**

**Source: Researcher, 2020**

Figure 1.2 indicates volatility in domestic savings for the period between 2008 to 2018. Vision 2030's target of domestic savings/Gross domestic product equivalent to 30 percent has not been met. Volatility in domestic savings indicates that fewer funds were allocated for investment and this stifled performance of equity market.

### 1.1.1.3 Private Sector Credit

Private sector credit refers to the provision of finances to the private sector by financial institutions such as commercial banks (Mhadhbi, Terzi, & Bouchrika, 2017). One of the best measures of Private Sector Credit is gross credit available to private sector, which includes gross credit to a variety of segments within an economy with the exception of the government (Olowofeso, Adeleke, & Udoji, 2015).

The central bank of Kenya (2018) opines that decline in credit to private sector implies that firms receive inadequate funding leading to slowdown in expansion and ultimately affecting share prices and the equity market in general. According to Kioko (2015), credit availability significantly and positively affects national output and opportunities for employment whereas slow credit growth reduces economic growth through enhanced productivity and capacity for growth thus ultimately affecting the performance of equity market. Gross Domestic credit to private sector was used to measure private sector credit (Bayar, 2016).

Kenya's private sector access to credit has declined significantly due to various shocks in the private sector since 2014. Credit growth to the private sector was at its peak at 25 percent in 2014 but declined to 1.6 percent in 2017, which is lowest for past decade. The manufacturing sector has been negatively affected by the decline in credit to private sector with statistics indicating a drop from an average of 291 billion Kenya shillings to 277 billion Kenya shillings for the period between 2015 to 2016 (Kenya Association of Manufacturers, 2018).

Policy changes by the government have also hampered credit growth to private sector. For example, the recently repealed law on capping of interest rates had adverse effects on credit growth (Kenya Institute for Public Policy Research and Analysis , 2018). Capping of interest rates had the effect of reducing credit to the private sector with commercial banks opting to invest in treasury bills and bonds to minimize risk (Capital Markets Authority, 2018a). This had a crowding out effect whereby commercial banks lending to the government reduces credit available for the private sector stifling growth and expansion for the corporate sectors that adversely affects performance of equity market in Kenya (Finacial Sector Regulators , 2018). Figure 1.3 indicates the trend in private sector credit in Kenya.

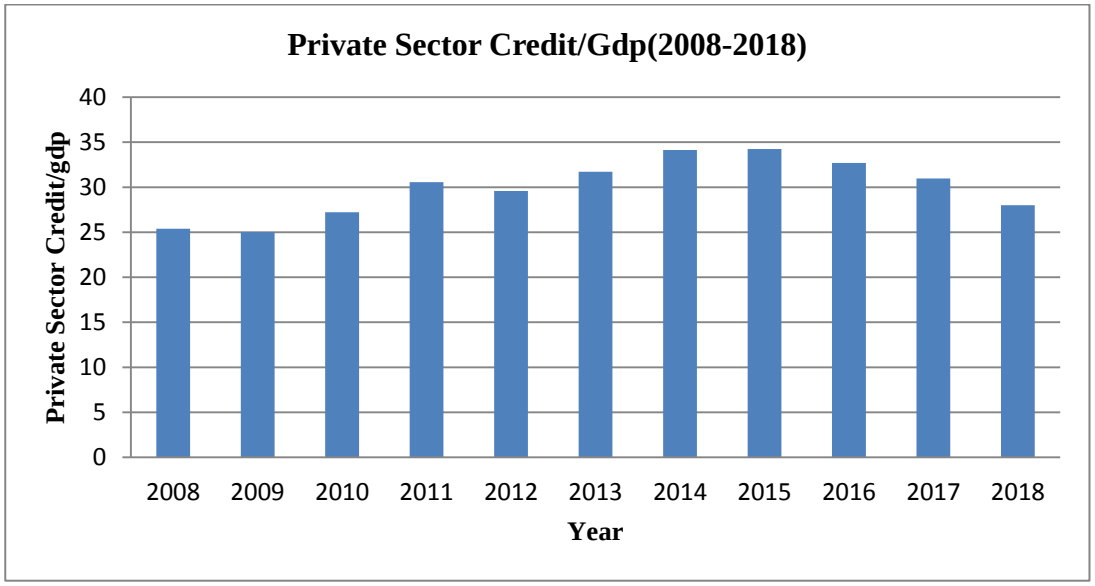


**Figure 1.3: Trend in Private Sector Credit (2008-2018)**

**Source: Researcher, 2020**

Figure 1.3 indicates volatility in private sector credit growth for the period between 2008 to 2018. The decline in private sector credit means that firms did not receive adequate funds hence the slow pace in terms of expansion and the consequent decline in performance of equity market.

### 1.1.1.4 Inflation Rate

According to Vena (2014), Inflation rate refers to the increase in commodity prices annually as often measured by retail prices. Consumer price indices are produced every month by the government and Inflation rate is calculated over the previous 12 months as the increase in the index (Humpage, 2008). Mousa, Al-safi and Hasoneh (2012) define Inflation Rates the permanent rise in aggregate price levels resulting in rising living costs due to purchasing power decline. The stock market and the whole economy are affected by rising commodity prices since Inflation rate influences the macroeconomic environment including economic growth, interest rates and unemployment. Consumer price indices measure Inflation rate at consumer price level (Oner, 2018).

On the other hand, Peyavali (2013) argues that Inflation rate negatively affects stock prices as depicted in financial theory. This is because a rise in Inflation rate signifies

poor economic performance. To avoid losses, investors dispose off their stocks thus flooding the market with stocks causing decline in stock prices due to excess market supply. Generally, Inflation rate levels have been rising over the years preempting extensive research on the effects of Inflation rate on securities (Subeniotis, Papadopoulos, Tampakoudis, & Tampakoudi, 2011).Consumer price index was used to measure inflation (Central Bank of Kenya, 2018).

However, according to Fisher's hypothesis stock prices are influenced positively by inflation. This is because during times of high inflation, investors substitute financial assets for real assets to hedge against adverse inflationary effects. Onundu (2016) contends that studies on Inflation rate and performance of equity market have differed over the years depending on location and methodology applied. The present study evaluates the effect of Inflation rate on performance of equity market in NSE, Kenya. Figure 1.4 indicates the trend in Inflation rate in Kenya.

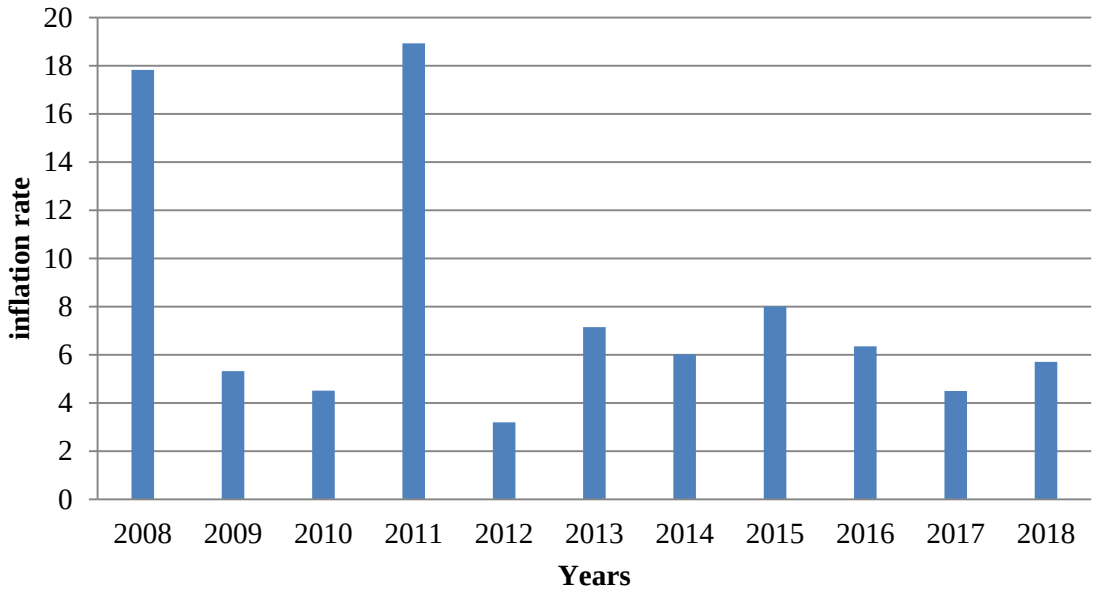


**Figure 1.4: Trend In Inflation rate (2008-2018)**

**Source: Researcher, 2020**

Figure 1.4 indicates high volatility in Inflation rate between 2008 and 2018. High Inflation rate has the effect of increasing the cost of doing business due to high input costs that has a depressing effect on performance of equity market. In addition,

during periods of high inflation, investors increase their consumption allocation and this reduces the amount of funds available for investment and consequently demand for stocks declines in the stock market affecting equity market performance negatively.

### 1.1.2 Investor Sentiments

Investor sentiments refer to investors' misevaluation of assets (Baker & Stein, 2004). Burghardt (2011) equates Investor sentiments to noise in financial markets. Ferrer (2017) terms Investor sentiments as the element of investor's expectations about asset returns that is not justified by fundamentals. Baker and Wurgler (2006) link Investor sentiments to beliefs regarding future investment risks and future cash flows, which cannot be justified by facts at hand. Investor sentiments reflect the difference between what asset prices are and what they should be (Dalika & Seetharam, 2015). According to Lee, Shleifer and Stein (1991) Investor sentiments is equivalent to the asset valuation variation between rational and irrational investors in a market with the two types of investors.

Ilmanen (2011) suggests that irrational swings in Investor sentiments lead to aggregate market overvaluations called bubbles, undervaluations and crashes in stock markets characterised by excess volatility in share prices with deviations from fundamental values. Evanoff, Kaufman and Malliaris (2012) add that false beliefs about future cashflows, unsteady risk attitudes and risk perception mistakes are costly and risky as they affect market prices and destabilize arbitrage opportunities. In traditional finance, financial decision-making process is dependent on rationality of market players. However, according to behavioral finance, investors are unintentionally irrational because non-fundamental factors such as mental state, feelings, theories of trading, cultural beliefs and understanding affecting the investment decision. Behavioral finance seeks to explain how bias, heuristics and cognitive errors affect investors' decision-making process (Virigineni & Rao, 2017).

Various measures have been used to quantify investor sentiment. First day returns and initial public offer volume can be used to evaluate Investor sentiments. This is because investors beliefs and expectations are reflected in the market with high first

day returns signaling the investors' enthusiasm. Periods of high optimism are characterized by overoptimistic investors resulting in high first returns with firms issuing initial public offers during such periods of high Investor sentiments. In summary, the demand for initial public offers are highly sensitive to stock market Investor sentiments (Baker & Wurgler, 2005).

The equity component in total debt equity issues is another Investor sentiments substitute. Mispricing in the market induces rational managers to issue equity during stock overpricing (Baker & Wurgler, 2007). In addition, Investor sentiments can also be captured by dividend premium equivalent to average market to book ratios between non-dividend payers and payers. Large profitable dividend paying firms with predictable cash flows are considered less risky (Zaharieva, 2012). Thus, the demand for stocks of dividend paying firms is inversely related to the prevailing sentiment (Zhang, 2009). However, the change because of fluctuation in sentiment is irregular with high sentiment influencing stock prices more strongly than low sentiment (Ahmed & Ullah, 2013)**.** Brown and Cliff (2005) surmise that Investor sentiments is a leading cause of US equity market mispricing. Low returns have also been associated with low Investor sentiments in the US indicating negative relations between lack of confidence in the US market and returns (Chen, 2011; Singal,2012)

Furthermore, average discounts for individual investors partly owned close end funds can be used to capture Investor sentiments (Lee, Shleifer, & Thaler, 1991). Average close funds discounts are equivalent to the funds net asset value less fund trading price. The explanation for this scenario is that investor pessimism and optimism determine when and how investors sell their funds. Pessimistic fund holders must compensate buyers with large discounts compared to optimistic investors. The large discounts signal low Investor sentiments while small discounts present a case of high investor pessimism. (Dalika & Seetharam, 2015)

Sulphey (2014) surmises that Investor sentiments has the capacity to fuel bubbles and crashes in stock markets by overvalueing or undervalueing stocks, creating and destroying industries within a short duration of time. Investor sentiments has received limited attention as a crucial factor driving performance of equity market in Africa more so in Kenya, with the exception of Abdulahi (2012) on the NSE 20

share index. The current study contributed to behavioral finance theories development by examining the effect of Investor sentiments on performance of equity market in NSE, Kenya. An assortment of measures has been used in measuring Investor sentiments in the developed world most of which data is missing in the developing world.

Baker and Wurgler (2006) constructed an index comprising of several Investor sentiments proxies; number of Initial Public offers, closed end fund discount turnover, the ratio of equity shares in new issues and dividend premium initial returns on IPOs. According to Dalika and Seetharam (2015) constrained short selling, market liquidity or trading volume reflect Investor sentiments. The willingness of unsophisticated investors to add liquidity to the market is dependent on how optimistic the investors feel regarding the market in future. As such, the amount of funds available in the market as captured by trading volume is a proxy for Investor sentiments. According to Jones (2001) high overvaluation in the market results from increased market liquidity resulting from high trading. Irrational traders tend to flood the market during high Investor sentiments periods.

In concurrence with Baker and Wurgler (2007), Dalika, and Seetharam (2015) arguments that investors are willing to add liquidity to the market depending on how optimistic or pessimistic they feel about the market; the current study used trading volume as a proxy for Investor sentiments. The methodologies of previous studies also differed and so did the findings. The current study evaluated the effect of Investor sentiments on performance of equity market in NSE, Kenya.

Figure 1.5 indicates the trend in Investor sentiments measured by trading volume indicating a decline for funds available for investment by investors.

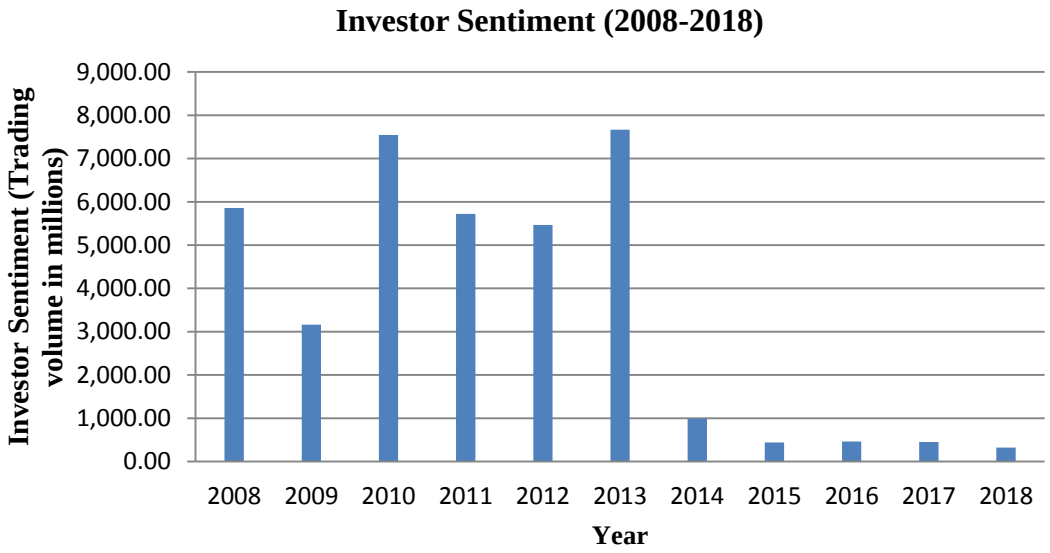


**Figure 1.5: Trend In Investor sentiments (2008-2018)**

**Source: Researcher, 2020**

Figure 1.5 indicates a decline in Investor sentiments measured by trading volume indicating a decline in investor appetite for stocks in the NSE. The declining Investor sentiments indicates that investors were less confident with the firms listed in Nairobi Securities exchange hence the decline in investments between 2008 and 2018.

### 1.1.3 Performance Of Equity Market

Performance of equity market refers to a measure of changes in value of issued shares in publicly owned firms. The indicators of performance of equity market include the Nairobi All Share index for stock price movements, NSE 20 share index and Market Capitalization that measures market value of issued shares (Capital markets Authority, 2009). Trade and industry expansion of a nation relies on the performance of the stock market and the financial sector. Financial sector intensiveness sustains the growth of the economy and a stable macro risk environment enhances economic efficiency (Mogaka, 2016). However, a thorough analysis of the Kenyan stock market indicates that it has not made any noteworthy contribution to the development of the economy in general for the period 2008 to 2018 (Ngugi, Maana, & Amanja, 2013).

Kenya's vision 2030 envisions a vibrant financial sector whereby the equity market contributes 90 percent market capitalization to Gross Domestic product (Government Of Kenya, 2018; Government of Kenya, 2007). However, between the period 2008 to 2018 when the study was conducted, market capitalization to GDP stood at 40 percent in 2013, 43 percent in 2014, 32 percent in 2015, 27 percent in 2016 and 31 percent in 2018 against a target of 90 percent as per vision 2030 (Finacial Sector Regulators , 2018).

In 2009, the Kenyan equity market registered KSH 31.79 billion loss representing a 1.32 percent drop in market capitalization from 2008 while Nairobi All Share Index registered figures signaled a drop in market performance, with December 2009 index figures remaining 7.78 percent below the December 2008 index figures (Capital markets Authority, 2009). In 2011, Nairobi All Share Index dropped by 28 percent to 3205 points from 4433 points in December 2010, while market capitalization dropped by 26 percent from KSH 1,167 billion to KSH 868 billion in December 2011 representing 299 billion loss to investors (Capital Markets Authority, 2011).

Further, in 2015, end-period market capitalization fell by 11.2 percent to KSH 2,053.52 billion from KSH 2,312.1 billion in 2014 representing 259 billion loss to investors (Capital Markets Authority, 2015). End-period market capitalization decreased by 4.46 percent to KSH 1,961.92 billion in of 2016. The year 2018 culminated with an average loss of KSH461 billion loss to investors in the equity market representing 20 percent of the Kenya's budget for 2018/2019(CMA, 2018).The current study adopted market capitalization as a proxy for performance of equity market because it incorporates the share price at base rate, the number of outstanding shares at base rate and the Nairobi all share index in its calculation.This was in line with Hasseeb(2015), Udi and Ohwofasa (2018) and Zafar (2013).

The general decline in the performance of equity market has posed serious questions on the role of macro risk factors and changes in Investor sentiments on performance of equity market (CMA, 2016).Consequently, current study used market capitalization as a proxy for performance of equity market. The suitability of market capitalization is pegged on the fact that it incorporates both the share price at base

rate, number of outstanding shares at base rate and the Nairobi all share index in its calculation (Capital Markets Authority, 2011).

### 1.1.4 Macro Risk Factors, Investor sentiments And Performance Of Equity Market

In accordance with the World Bank Group (2018), growth in the East African economies has dampened. The decline was associated with slow down in private sector credit growth, which reported growth of 5.4 percent on average. Regionally, private sector credit grew by 6.1 percent in Rwanda, 6.4 percent in Tanzania; Uganda grew by 4.0 percent while Kenya lagged below the regional average with 4.9 percent.

Empirically, macro risk factors and Investor sentiments are linked to performance of equity market. Notably, literature has shown that several factors in the macro environment have the ability to explain variations in performance of equity markets beyond the single factor model advocated by Sharpe in 1964. Most importantly, Multifactor pricing models were developed on the basis that performance of equity market is driven by a number of economic variables (Gatuhi, Gekara, & Muturi, 2015). These variables include foreign equity flows, domestic savings, private sector credit and inflation. Investor sentiments has also been recognised as a risk factor in performance of equity markets (Baker & Wurgler, 2007).

Decline in foreign equity flows reduces liquidity in a stock market leading to decline in market capitalization (African Development Bank Group, 2018). For instance, net foreign equity flows in NSE were negative in 2017 and 2018 as investors took a net selling position in the exchange. This resulted in a decline in the stock index from 3712 in december 2017 to 3203 in december 2018. On the other hand, Kenya's private sector credit growth declined significantly from 25 percent in 2014 to 1.4 percent in 2017 and 1.8 percent in 2018 starving key segments of the economy of credit such as the manufacturing sector, transport and communication. Reduced credit growth reduces firms capability to exploit new opportunities leading to decline in performance of equity markets (World Bank Group, 2018).

Domestic savings to gross domestic product and Inflation rate experienced a lot of volatility over the period between 2008-2018. The savings investment gap widened indicating that financial institutions were not channelling enough funds to firms. Volatility in Inflation Ratehampered business operations with the cost of doing business increasing leading to decline in profitablity and performance of equity market. Investor sentiments had mixed effects on the NSE with positive and negative sentiments experienced between 2008 and 2018. Positive Investor sentiments increases performance of equity market while negative Investor sentiments has a depressionary effect (Capital Markets Authority, 2018). In summary, instability in macro risk factors and Investor sentiments leads to volatility in performance of equity market leading decline in market capitalisation which reduce investor wealth in market.

### 1.1.5 Institutional Ownership

According to Gurunlu and Gursoy (2010) institutional ownership refers ownership stake in a company held by large corporate institutions such as banks, investment funds, hedge funds, mutual funds, pension funds and insurance companies. Normally, institutional investors have a tendency to invest in large volumes. Due to the high stakes they hold, they are able to exercise controls on the action of the management making them to be in tandem with shareholder wealth maximization objective (Matanda, Oyugi, & Lishenga, 2015).

Large institutional investors actively contribute to corporate governance in management of the companies they invest in through participation in the activities of the company, dialogue engagement with investee companies, exercising of voting rights in annual general meetings and sitting in the company's board (Kansil & Singh, 2018). Institutional investors' oversight role dissuades company managers from opportunistic activities and manipulation of earnings resulting in increased value of the firm (Mokhtari & Makerani, 2013)

Institutional investors have more information than other investors do. Due to their potential influence, institutional investors purchase shares with better performance. Institutional ownership or institutional investors consider various factors including

the company life, stock returns, fluctuations in stock prices as precautionary measures (Zaher, Rad, & Ebrahimi, 2017). In Kenya, institutional investors accounted for 68.5 percent of shares held in the equity market in 2018 a slight increase from 68.36 percent in 2017. Institutional investor share holdings were used to measure institutional ownership. This was in line with CMA (2018).Table 1.4 indicates the trend in institutional ownership in the NSE.

**Table 1.1: Trend in Institutional Ownership in the NSE (2008-2018)**

| Type of investor | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Institutional investors ( percent) | 68.0 | 74.16 | 73.6 | 68.33 | 66.7 | 64.58 | 64.16 | 65.68 | 66.38 | 68.36 | 68.50 |

**Source: CMA (2018)**

The table indicates volatility in institutional ownership from the 2008 to 2018 reflecting the changing economic, political and social structures in the country over the period under study.

### 1.1.6 Nairobi Securities Exchange, Kenya

Proper functioning financial and capital markets form requisites for economic development in a country. Efficiency in capital markets promotes investment and economic growth (Ngugi, Maana, & Amanja, 2013). The NSE is the only securities exchange in Kenya comprising of an equity market and a bond market. Companies in the NSE are categorized as financial and nonfinancial firms. The financial sector comprises of insurance companies and banks while the non-financial companies fall under telecommunication and technology, investment, energy and petroleum, manufacturing and allied, construction and allied, Growth enterprise market, commercial services and agricultural (NSE, 2017). The exchange has 67 listed companies as at December 2018 (Capital Markets Authority, 2018).

The key indices in the NSE include the NSE 20 share index comprising of 20 best performing companies known as blue chips and the Nairobi All Share Index

representing all listed firms in the Nairobi Securities exchange. Measures of equity market performance include the Nairobi All share index, NSE 20 share Index and Market Capitalization (Ngugi, Maana, & Amanja, 2013). However, only market capitalization was selected to measure performance of equity market in this study.

Nairobi Securities Exchange All Share Index Market capitalization was selected because it represents performance of all listed firms in major capital and industrial segments of the Kenyan stock market. Calculation of market capitalization is also comprehensive and includes the price of a stock at base rate, the number of outstanding shares at base rate and the Nairobi securities exchange all share index. Further, the aggregate market capitalization figures incorporate changes within the stock market including withdrawal of companies from the exchange due to delisting, suspension and financial failure (Nairobi Securities Exchange , 2020; Gatuhi, 2015). NSE 20 share index tracks movements in 20 blue chip companies in Nairobi securities Exchange and is not representative of all 67 firms listed in the exchange.

On emerging issues,as of march 2021, the equity market is still dominated by foreign investor trading with average of 60 percent participation by foreign investors. Net foreign equity flows stood at outflow of KSH.976 million during the first quarter of 2021. Assets under management also crossed the KSH.100 billion mark on february 2021 indicating siginificant growth and progress in the sector (Capital Markets Authority, 2021).Still on assets under management segment, Acorn limited launched two student accomomodation real investment trusts being the first of their kind in  the kenya market.On the regulatory framework, the capital markets authority is working on the whistle blowers act to promote ethics in the market and licencing of coffee brokers to promote efficiency in the market.The period also saw the introduction of derivatives and gold exchange traded fund to increase liquidity in the market (Financial Sector Regulators, 2020).

The state of decline in share prices in NSE has resulted in loss of wealth, decline in investor confidence and loss of interest in the equity market in Kenya (Omboi, 2011; Maina & Sakwa, 2010). The study, therefore, determined the effect of macro risk factors and Investor sentiments on performance of equity market in NSE, Kenya. The trend in performance of equity market is shown in figures 1.6 and 1.7.

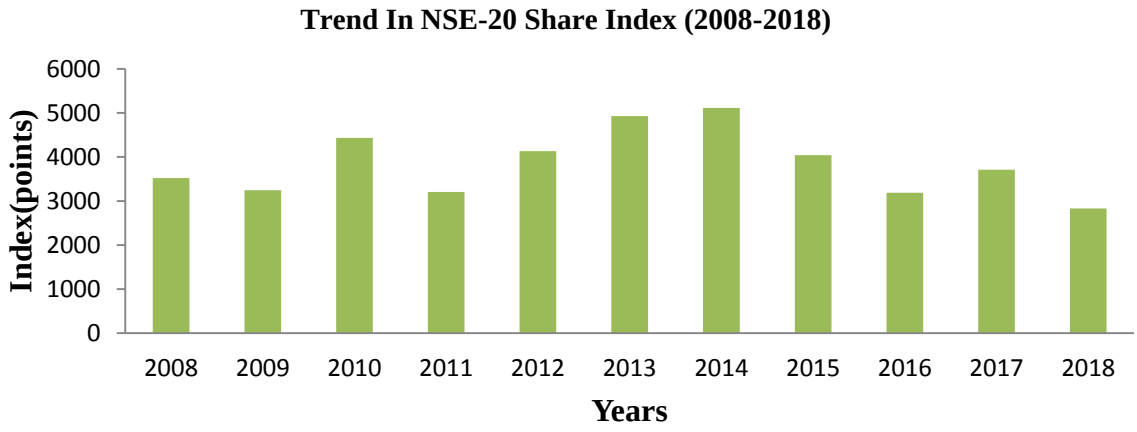


**Figure 1.6 Trends in NSE Index (2008-2018)**

**Source: Researcher, 2020**

Figure 1.6 shows volatility in share prices index from 2008-2018. On average, there is a general increase in the index from 2008 to 2014 before declining gradually to 2018.This indicates loss of investor wealth and decline in investor confidence in the Nairobi securities exchange.

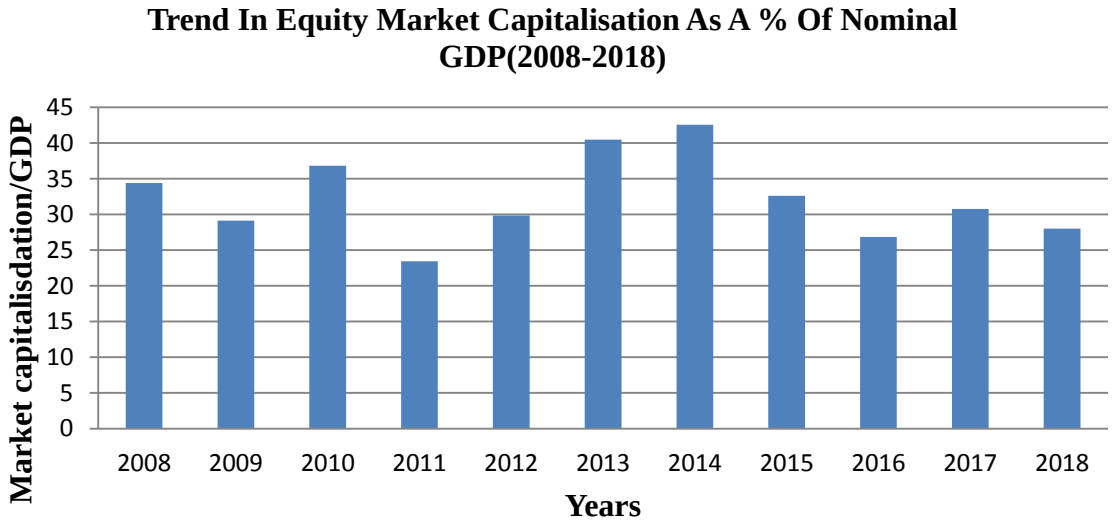


**Figure 1.7 Trend In Market Capitalization (2008-2018)**

**Source: Researcher, 2020**

Figure 1.7 depicts volatility in market capitalization as a percentage of gross domestic product for the period between 2008 to 2018 at the Nairobi Securities Exchange. The volatility in market capitalization indicates decline in investor wealth due to paper loss in the market. High volatility in market capitalization also has the effect of reducing investor confidence due to uncertainty in the market. The overall effect is decline in performance of equity market and decline in the equity market's contribution to economic growth.

## 1.2 Statement Of The Problem

Kenya's vision 2030 envisions the equity market as a source of financing for both corporate and government sectors aimed at achieving a 10 per cent average annual gross domestic product growth (Government of Kenya, 2007). However, Kenya's equity market remains constrained by high concentration risks, low market capitalization, absence of initial public offerings since 2014 and few listed stocks limiting liquidity despite numerous reforms to the market. For instance, between the period 2015 to 2018, market capitalization to Gross Domestic product in Kenya stood at approximately 33 percent in 2015, 27 percent in 2016 and 31 percent in 2017 before dropping to 24 percent in 2018 against the targeted 90 percent market capitalization to GDP (Finacial Sector Regulators , 2018). The market has high market concentration risks whereby the top 5 companies by market capitalization; Safaricom, East African Breweries, Equity Bank, Kenya Commercial Bank And Cooperative Bank control 70 percent the market value on average indicating their market dominance and exposing the equity market to financial contagion effects (Capital Markets Authority, 2018). Furthermore, Investors lost an average of KSH.20 billion in 2009, KSH.299 billion in 2011, KSH.262 billion in 2015 and KSH.461 billion in 2018 in market capitalization losses (Capital Markets Authority, 2018b) equivalent to 20 percent of the country's budget for the year 2018/2019. On average, the equity market has contributed less than one percent to economic growth against the government's vision 2030 target of ten percent. (Ngugi, Maana, & Amanja, 2013). This has led to loss of investor wealth, decline in investor confidence, limited investment opportunities and low equity market activity in Nairobi Securities Exchange. Decline in Performance of equity market has been linked to macro risk factors and Investor sentiments (Gatuhi, Gekara, & Muturi,

2015; Baker & Wurgler, 2006; Kenya Association of Manufacturers, 2018; Oner, 2018; Auernheimer, 2010; Dalika & Seetharam, 2015). The loss and decline in investor wealth in the equity market coupled with insufficient evidence relating macro risk factors and investor sentiment to performance of the equity market in Kenya formed the basis of the current study.

Existing studies on effect of macro risk factors and Investor sentiments on performance of equity market have produced varied, mixed and contradictory results (Bayar, 2016; Odhiambo, 2016; Zafar, 2013; Silva, 2016; Kim and Park, 2015). Lonca and Cadeira (2015) examined the effect of foreign capital flows on stock returns and found significant positive effect of foreign capital flows on stock returns. On the other hand, Adam and Tweneboah (2008) reported a negative relationship between foreign direct investment and stock prices. Ayunku and Etale (2015) examined the long run and short run effect of savings rate on stock market development and found that savings rate negatively affected stock market development. This was in disagreement with Sukruoglu and Nalin (2014) who found positive relationship between savings rate and stock prices. Odhiambo (2010), El-Nader and Alraimony(2013) examined the relationship between private sector credit and stock market performance and found a positive significant relationship between the variables while Zafar (2013) found no significant relationship. Silva (2016) found negative relationship between Inflation rate and stock prices while Oshaibat (2016) and Dengke (2015) found a positive relationship between Inflation rate and stock prices. Sokpo, Iorember and Usar (2017) and Limpanithiwat and Rungsombudpornkul (2010) found no relationship between Inflation rate and stock returns. Anusakumar, Ali and Wooi (2017) and Huang, Yang, Yang and Yang (2014) examined the effect of Investor sentiments on stock returns and found a positive relationship. However, Kim and Park (2015) found no relationship exists. The mixed, contradictory and inconclusive findings on the relationship between macro risk factors and Investor sentiments on performance of equity market indicate an empirical gap, which was addressed by the current study. Furthermore, most of these studies were done in developing and developed countries with different political, economic, social and market structures implying that their findings cannot be generalised directly to the kenyan equity market characterised by few firms, low

market capitalization, high concentration risks and information assyemetry (Gatuhi, Gekara, & Muturi, 2015; Capital Markets Authority, 2018).

Methodologically, most studies have focused on Ordinary least square regression and panel regressions, which assume that all economic data are stationary (Jun, Hongzhong, Thierry, & Yannick, 2015; Ho, 2017; Naceur, Ghazouani, & Omran, 2007; Andrianaivo & Yartey, 2009; Nguyen & Hanh, 2012 ). However, according to Baltagi (2008), most time series data is non-stationary or mixed stationary data. Ye (2013) contend that Ordinary least squares, Vector Autoregressive models and Panel regression models are inefficient when dealing with non-stationary data and lead to spurious or nonsense regression, biased estimators and erroneous conclusions. Thus, the statistical model has to address non-stationarity (Wang, 2014). Consequently, the study adopted ARDL models to eliminate problems associated with autocorrelation and omitted variables to determine long run and short run components for time series with mixed order variables in a single equation framework. (Emerald Publishing Group, 2015; Kreinovich & Sriboonchitta, 2018). However, the relationship between most economic variables is not linear or symmetric (Bock, Chiodi, & Mineo, 2012). Consequently, NARDL model was used by the current study to test for asymmetry in the long run. The study went further to test for cointegration and causality overlooked by previous studies. To fill the methodological gap, the current study employed ARDL and NARDL models.

Conceptually, most studies have focused on the direct effect of macro risk factors and Investor sentiments on performance of equity market (Wang & Chen, 2013; Rashid, Hassan & Yein, 2014; Chiu, Harris, Stoja & Chin, 2016). For instance, Mutuku and Ng'eny (2014) focussed on macro risk factors in terms of exchange rate, gross domestic product, treasury bill rates and Inflation rate while Elly and Oriwo (2013) focussed on macroeconomic variables in terms of inflation, lending interest rate and treasury bill rate. Both studies failed to consider moderating effect of institutional ownership. To fill the conceptual gap, the current study established the moderating effect of institutional ownership on the relationship between macro risk factors, Investor sentiments and performance of equity market in Kenya. Following the established empirical,contextual, methodological and conceptual

gaps, the study determined the effect of macro risk factors and Investor sentiments on performance of equity market in the NSE, Kenya.

## 1.3 Objectives Of The Study

The study sought to establish the following general and specific objectives.

### 1.3.1 General Objective

To determine the effect of macro risk factors and Investor sentiments on performance of equity market in Nairobi Securities Exchange, Kenya.

### 1.3.2 Specific Objectives

The study sough to achieve the following specific objectives:

i. To determine the effect of foreign equity flows on performance of equity market in Nairobi Securities Exchange, Kenya.
ii. To establish the effect of domestic savings on performance of equity market in Nairobi Securities Exchange, Kenya.
iii. To determine the effect of private sector credit on performance of equity market in Nairobi Securities Exchange, Kenya.
iv. To establish the effect of Inflation rate on performance of equity market in Nairobi securities Exchange, Kenya.
v. To determine the effect of Investor sentiments on performance of equity market in Nairobi Securities Exchange, Kenya.
vi. To establish the moderating effect of institutional ownership on the relationship between macro risk factors and Investor sentiments on performance of equity market in Nairobi Securities Exchange, Kenya.

## 1.4 Research Hypotheses

The study sought to test the following null hypotheses:

$H_{01}$: Foreign equity flows have no significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{02}$: Domestic savings have no significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{03}$: Private Sector Credit has no significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{04}$: Inflation rate does not have a significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{05}$: Investor sentiments have no significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{06}$: Institutional ownership does not have a significant moderating effect on the relationship between macro risk factors and Investor sentiments on performance of equity market in Nairobi Securities Exchange, Kenya.

## 1.5 Significance Of The Study

The study is insightful to the government and policy makers by expounding how various macro risk factors and Investor sentiments affect the performance of equity market. More specifically, the study evaluates whether macro risk factors and Investor sentiments are risks, which should be priced in determining performance of stock market. This will assist CMA in formulation of policies to improve performance of equity market by improving stock market liquidity, expansion of credit to private sector, controlling Inflation rate and encourage savings by appropriate incentives. The NSE will also use the insights provided by the study to improve on the quality of securities on offer in the market and in introduction of more securities such as derivatives to improve variety for investors.

The practical implications of the study are numerous. First, the study assists investment banks, corporate and individual investors in asset allocation and diversification by expounding how various macro risk factors affect the performance of their portfolios and in determining the optimal asset allocation in the investor's portfolios in different economic scenarios'. Secondly, the study emphasizes the role of Investor sentiments in stock pricing models by investors in the Kenyan market.

Empirical literature indicates that betting against sentimental investors is dangerous for rational investors. By determining the effect of Investor sentiments on performance of equity market, the study provides a pricing framework that incorporates Investor sentiments in stock pricing models for investors.

The study provides theoretical value to academia by testing the effectiveness of efficient market hypothesis, capital asset pricing model, arbitrage-pricing theory, behavioral finance theories and fisher's hypothesis in Kenya by providing more insights on how macro risk factors and Investor sentiments affect performance of stock market. The study contributes to finance theory by evaluating the moderating effect of institutional ownership on the effect of macro risk factors and Investor sentiments on performance of equity market in Kenya. The study contributes to existing literature in finance by examining the effect of macro risk factors and Investor sentiments on performance of equity market. The study extends finance theory by indicating that apart from the direct effect of macro risk factors and Investor sentiments on performance of equity market, there is moderation, cointegration and causality. This is crucial to scholars who want to research on macro risk factors, Investor sentiments and performance of equity market.

## 1.6 Scope Of The Study

The study's focal point was macro risk factors (foreign equity flows, domestic savings, private sector credit and inflation) and investor sentiment on performance of equity market in NSE, Kenya. The study was anchored on the efficient market hypothesis, fishers' hypothesis, arbitrage pricing theory and agency theory, behavioral finance theories (herding and prospect theory). The study confined itself to performance of equity market aggregates for the period between the period 2008 and 2018. This period was justified because the Nairobi All share index, which is the most representative index, came into effect in 2008. In addition, the period between 2008 and 2018 captured the financial crisis of 2008 and the associated contagion effects that affected world financial markets with a focus on the shocks and aftershocks of the financial crisis in the Kenyan equity market.

The study was limited to NASI index since all the other indices such as FTSE NSE 15 and FTSE 25 independently operated and beyond the jurisdiction of the Capital markets Authority of Kenya. Further, macro risk factors were limited to foreign equity flows, domestic savings, private sector credit and inflation.

## 1.7 Organization Of The Study

The thesis covered five chapters. Chapter one covered the study's background, problem statement, study objectives and hypotheses, study scope limitations and organization. Chapter two covered theoretical and empirical literature review, research gaps summary and conceptualization of the study. Chapter three captured research design and philosophy, model selection and procedures on collection and data analysis. Chapter four captured the study's data analysis, findings and presentation. Chapter five captured findings summary, conclusions and recommendations.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

The section presents theoretical and empirical review and research gaps summary. The theoretical review provides a general idea of theories behind the study. The empirical review provides an important assessment of the associated studies on macro risk factors, Investor sentiments and performance of equity market. The relationship between macro risk factors, Investor sentiments and performance of equity market is captured in the conceptual framework.

## 2.2 Theoretical Review

The theoretical review section presents an explanation of underlying relationships between macro risk factors, Investor sentiments and performance of equity market. The theories assessed include; Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT), Efficient Market Hypothesis, Behavioral Finance Theories and Fisher's Hypothesis.

### 2.2.1 Efficient Market Hypothesis

Efficient Market Hypothesis was developed by Fama (1970). According to efficient market hypothesis, a market is considered efficient depending on the speed at which new information is reflected on share prices (Teall, 2018). In an efficient market, investors cannot earn above average returns in the market regardless of the strategies used. The theory assumes that share prices follow a random walk and information is universally shared (Sharma , 2014). The inability to earn abnormal returns is attributed to the fact that security prices immediately incorporate past, present and future information as it becomes available to the market (Gerleman, 2012). The efficient market hypothesis exists in the weak form, which argues that security prices reflect all past information, the semi strong form whereby security prices reflect both past and present information and the strong form whereby security prices incorporate past, present and future information (Ikeora, Nneka, & Andabai,

2016).

According to Efficient Market Hypothesis, investors cannot beat the market to earn above average returns since security prices reflect all available information (Harder, 2008). Consistent with efficient market hypothesis assets are correctly priced and cannot be purchased either through undervalued or inflated prices (Malkiel, 2011). In the opinion of MacDowell, Thom, Frank and Bernanke (2009) equity prices not only depend on the future earnings of companies but also on how investors estimate them. Moreover, investors are concerned about current earnings, the prospects of industries, the economic health of an economy and other factors (MacDowell *et al*., 2009). However, the failure of EMH to explain certain financial phenomenon has brought alternative perspectives also called behavioral finance theories (Baker & Wurgler, 2005). Shiller (1992) and Shefrin (1999) highlight the importance of investor psychology as a major determinant of asset market prices. Delong, Shleifer *et al*., (1990) denote that sentiment affects investors and rational investors are advised against betting against sentimental investors.

According to Malkiel (2011), the semi strong form of the efficient market hypothesis is concerned with the speed at which past and present macroeconomic data is reflected in stock prices. However, the Kenyan equity market still operates in the semi strong form due to information asymmetry and market inefficiencies (Gatuhi, Gekara, & Muturi, 2015). In order to test the semi strong form of efficient market hypothesis in the Kenyan market, the study evaluated the short run and long run effects of foreign equity flows, domestic savings, private sector credit and Inflation rate on performance of equity market in NSE, Kenya.

### 2.2.2 Arbitrage Pricing Theory

Arbitrage Pricing Theory was developed by Ross (1976) to explain volatility in stock prices attributed to several variables capable of influencing income volatility. The theory assumes a perfectly competitive market, homogenous investor expectations, short selling allowable, multiple capital assets and preference for more wealth compared to less (Rahman *et al*., 2009). According to Koch (2009), the total risk of asset can be subdivided into unsystematic risk also called idiosyncratic or

specific risk and systematic risk also called market risk or macro risk. Unsystematic risk is diversifiable so the investors should only be concerned with systematic risk (Sharifzadeh, 2010).

The Arbitrage Pricing Theory (APT) incorporates risk factors in the macro environment and microenvironment apart from market risk as determinants of stock returns. In addition, variability in stock returns is associated with fluctuations in macro risk factors (Sabetfar, Fah, Mohamad, & Noordin, 2011). In accordance with Elton, Gruber and Blake (1995) Arbitrage Pricing Theory justifies returns better than all the other market proxies do. Asset pricing theories indicate how given associated risks, pricing of assets is done. The Arbitrage Pricing Theory is an extension of the CAPM that advocates for use of multiple risk factors to drive asset or expected market performance prices instead of the single factor proposed by the CAPM (Sharpe, 1964).

In the opinion of Rasiah (2011) and Ang *et al.*, (2008) APT does not provide a theoretical framework for selection of the risk factors that influence stock prices. Selection of relevant macro risk factors is influenced by empirical work. Empirical studies suggest that there are several macro risk factors that affect stock returns. The factors include investor confidence, inflation, interest rates, real business activity, foreign equity flows, domestic savings, private sector credit and Investor sentiments. Stock market performance varies with fluctuations in macro risk factors (Pratt & Grabowski, 2010; Paavola, 2006).

The study selects the factors that provide the best explanation for the sample at hand. The inability of APT to provide a framework for selection of macro risk factors that influence stock prices is the main limitation of the model and the current study relied on empirical studies to select macro risk factors for the study. The APT theory supports foreign equity flows, domestic savings, private sector credit and Inflation rate as macro risk factors, which affect performance of equity market. Based on the arguments of APT that macro risk factors influence stock prices, the current study sought to test the APT model by analyzing the effect of foreign equity flows, domestic savings, private sector credit and Inflation rate on performance of equity market in NSE, Kenya. The current study went further to determine the

moderating effect of institutional ownership on the relationship between macro risk factors, Investor sentiments and performance of equity market.

### 2.2.3 Fisher's Hypothesis

Fisher developed fishers' hypothesis in 1930. According to Fisher (1930), stocks can be used as protection against Inflation rate since they present claims against real business assets. When expected Inflation rate is pronounced, investors can dispose of their financial assets and substitute them for real assets. The relationship between Inflation rate and stock prices is positive since nominal stock prices reflect expected inflation (Grande, Locarno, & Massa, 2017).

The use of stocks as a hedge against Inflation rate ensures that investors are fully compensated when Inflation rate increases through corresponding gains in stock prices. Furthermore, the stock market can be used as a hedge against Inflation rate in the long run because equities present claims against the company's current and future earnings (Ioannides, *et.al*., 2005). The limitation of fisher's hypothesis is that empirically, studies show that the relationship between Inflation rate and stock markets is not always positive and at times may be negative. Inflation rate has the effect of increasing operating costs for businesses, this in return reduces corporate profitability and dividends causing decline in stock prices and consequently this reduces performance of equity markets (Oprea, 2014).

Uwubanmwen and Eghosa (2015) add that during periods of high inflation, individuals switch their expenditure from investments to consumption. This reduces the demand for securities in the market evidenced by reduced trading volumes and values in the market leading to overal decline is equity prices (Ozurumba, 2012). Other studies have also shown that Inflation rate has no effect on stock market performance (Hau, 2017). In view of the arguments of fisher's hypothesis that Inflation rate has a positive effect on stock prices, the study determined the effect of Inflation rate measured by consumer price index on performance of equity market in NSE, Kenya.

### 2.2.4 Behavioral Finance Theories

Kahneman and Tversky(1979), Shefrin(2000) and Baker and Wurgler(2007) are the key proponents of behavioral finance theories. Various biases in behaviour seconded by irrational factors in behavioral finance influence inconstistencies in investor decisions. The role of behavioral finance is provision of explanation of anomalies detected in the market and the psychological decisions associated with them (Chaffai & Medhioub, 2014). Behavioral finance theories assume that investors are irrational, information asymmetry, cognitive errors and personal factors influence decision-making (Sedaghati, 2016). Several biases influence decision-making including herding behavior bias, loss aversion, regret avoidance and cognitive dissonance (Virigineni & Rao, 2017).

#### 2.2.4.1 Herding Behavior Bias

Kahneman and Tversky (1979) and Shefrin(2000) are the key proponents of herding behaviour bias. According to Baker and Puttonen (2017) herding tendencies occur when investors flock together under conditions of uncertainity due to social pressure to conform. Investors under the influence of herding behavior mimic the behavior of other investors in the market in purchase and sale of securities. Herding is caused by information availability in the market whereby different investors receive different information of varying type and quality. The differences in investor characteristics and information available leads investor groups to behave differently while exhibiting herding tendencies within the groups sharing similar information (Itzhak, 2018).

During herding, fundamental information is disregarded by individual investors in favor of what the masses are doing regarding underlying securities and specialist information. Similarly, common individual investment decisions across the market, tends to move the market in the same direction with investors seemingly making buying or selling decisions simultaneously (Nofsinger & Sias, 1999 ). Herding behavior results to negative effects in the stock market characterized by poor and incorrect decision-making by the general population due to correlated behavioral patterns across in individuals in a market (Lehner & Harrison, 2014). Herding

behavior bias is also responsible for reduction in market efficiency due to dissemination of information, increased destabilizing volatility in the market and contagion between markets (Itzhak, 2018).

Virigineni and Rao (2017) put in that mental and emotional factors are inseparable when investors are gathering investment information. Shefrin (2000) argues that investors tend to overestimate their capacity leading them into unsafe investments. Sulphey(2014) observes that herding behaviour is a frequent occurrence in stock markets despite its costly implications characterised by investors loosing their wealth by entering the market late after the investors who initiated the herding behaviour have left the market.

According to Leibowitz, Emrich and Bova (2009) institutional investors are not immune to herding behaviour either. They observe that most volatility in fund portfolios ranges between 10 to 11 percent on average regardless of the stratetegies, status and mission used by the funds. This phenomenon results from investors assuming that other investors have the correct idea (Peterson, 2011). Consequently, a large number of investors sharing the same beliefs even when the shared beliefs are erroneous can move the market in a certain direction with stock prices incorporating such behaviour. Herding behaviour causes prices to deviate from equilibrium and investors are forced to trade on inefficient prices (Lehner & Harrison, 2014).

Wilkinson and Klaes (2017) associate stock market booms and crashes to herding behaviour. They explain that professional fund managers managing large scale investments and responsible for their clients returns, exhibit herding behaviour in the sense that it would be better to be wrong in a crowd than be right individually. Such fund managers choose the safe strategy that makes investors happy by investing where other funds are investing. Herding behaviour bias links Investor sentiments to performance of equity market. Based on arguments of herding behavior bias, the study determined the effect of Investor sentiments on performance of equity market in NSE, Kenya. The study used trading volume as a proxy for Investor sentiments as empirically used by Baker and Wurgler (2007).

#### 2.2.4.2 The Prospect Theory

Kahneman and Tversky developed prospect theory in 1979. The theory attempts to explain how investors make decisions under uncertainty with focus on changes in wealth under the assumption of risk aversion (Sulphey, 2014; Levine, 2012). According to Baker and Nofsinger (2010) financial markets are risky forcing investors into risky choice behavior, gambles or prospects. The theory helps explain certain human behaviors in the market such as investor preference of specific outcomes, the equity premium puzzle whereby average bond returns are higher than stock returns, insurance overpayments and investors engagement in lotteries of low value (Burghardt, 2011).

Further, prospect theory explains investor preference for weighing losses more than gains leading investors to withhold loss-making stocks longer in the hope of earning more returns in future to avoid the regret associated with incurring an immediate loss also called regret aversion (Baker, Filbeck, & Ricciardi, 2017). According to Wakker (2010) irrationality in investors decisions leads to serious financial catastrophes and crises in financial markets arising from institutional and individual investors.

Mishra and Debasish (2008) surmise that investors are willing to take risks in a bid to escape a loss making position but unwilling to lose already made gains. Investors aversion for losses forces them to hold loss making shares to avoid the responsibility and pain associated with financial loss and such investors are unwilling to invest more sums of money into stocks which have performed poorly in the past due to regret avoidance (Shefrin, 2000). Regret aversion also explains why investors invest in blue chip companies because their stocks carry implicit insurance against regret (Baker & Wurgler, 2006).

Nairobi securities exchange is characterised by a few firms and trading is limited to a few blue chip stocks (Capital markets Authority, 2016b). In order to explain the presence of risk aversion and the reason as to why trading is concentrated on a few firms based on arguments of prospect theory on investor behaviour, the current

study determined the effect of Investor sentiments on performance of equity market in Nairobi Securities Exchange, Kenya.

### 2.2.5 Agency Theory

The theory is attributed to Jensen and Meckling (1976) who tried to explain and resolve the conflict between the shareholders and management of a company (Tosi, 2009).The agency relationship arises when the principal appoints the agent to perform certain functions on behalf of the principal essentially delegating authority and decision-making to the agent (Bamberg & Spremann, 2012).

Since shareholders cannot manage the company on their own, they have to incur monitoring costs to ensure that the company's management maximizes value for the shareholders without exposing the company to unnecessary risks while doing so (Mile, 2012). The-monitoring costs include; establishment of a board of management with shareholders represented, audit fees, performance based remuneration and threats of firing (Bergstein, 2014). Institutional investors are known to invest heavily on corporate governance with a view to maximizing firm value for their investee companies (Tosi, 2009). This increases firm performance and profitability translating to higher share prices and dividends arising from low agency conflicts between the management and shareholders through well laid down contracts and external oversight over the management of the company (Tricker, 2009).

However, management, herein known as the agents, have been known to engage in empire building, paying themselves hefty remuneration and risky investment decisions at the expense of shareholders wealth maximization (Mile, 2012). The agency theory tries to formulate contracts and code of conduct to govern the relationship between the principal and agents with a view to maximizing cooperation between the management and the shareholders thus minimizing conflict (Eikelmann, 2020).

The agency theory underscores the critical role of oversight played by institutional ownership directly or indirectly in performance of equity market through board representation, investor activism and threats of ousting of firm management in

annual general meetings in case of deviation from the core mandate of maximizing shareholder value reflected in high profits and increase in share prices and dividends. With reference to the agency theory, the current study determined the moderating effect of institutional ownership on the relationship between macro risk factors, Investor sentiments on performance of equity market in the NSE, Kenya.

### 2.2.6 Capital Asset Pricing Model

Capital asset pricing model is single factor model attributed to Sharpe (1964), Lintner (1965), Mossin (1966) and Treynor (1961 and 1962) which uses market returns as the only determinant of performance of equity market. The theory assumes that investors are rational, no taxes and transaction costs, single factor, single period and risk free rate borrowing (MacLean & Ziemba, 2013). According to the model, total risk in the market is divided into two; systematic risk also called macro risk or market risk and unsystematic risk, which can be eliminated by diversification (Raza, Jawaid, Arif, & Qazi, 2011). According to Baker, Filbeck and Ricciardi (2017) investors should not be compensated for diversifiable unsystematic risk.

CAPM states that market portfolio risk is the only systematic risk that should be rewarded in the stock pricing assuming investors holds an efficient market portfolio (Hasan, Kamil, Mustafa, & Baten, 2011). Hence, investors are only compensated for the market risk, which affects the entire market while unsystematic risk specific to individual stocks is cancelled out through diversification. Beta is used to measure systematic risk in CAPM (Sabetfar *et al*., 2011).

CAPM explains tangency portfolio as the market portfolio that can be represented by a stock market index (Minovic & Zivkovic, 2012). CAPM assumes that there are many rational investors in the market, borrowing at risk free rate, a single period horizon, investors are price takers, no taxation and trading costs, investors have homogenous expectations and returns are normally distributed (Abonongo, Prah, & Boateng, 2017).

The use of one factor was CAPM's key short coming leading to the development of an alternative model, the arbitrage pricing theory which incorporated several other factors to explain stock market performance but with fewer assumptions compared to CAPM (Sabetfar, Fah, Mohamad, & Noordin, 2011). In the light of CAPM, transmission of macro risk factors to equity market prices occurs through the risk free rate, dividends growth rate, corporate earnings and the equity risk premium (Tapa, Tom, Lekoma, Ebersohn, & Phiri, 2016). However, empirically CAPM has been criticized because studies show that several macro risk factors have the ability to explain stock market performance better than market returns.

CAPM assumes a single factor model and a single period model (Koch, 2009). Since CAPM relies on market risk or beta and market returns in pricing of securities, CAPM fails to identify other risk factors and does not perform well in explaining stock returns across stocks (Baker, Filbeck, & Ricciardi, 2017). CAPM is also defective because it fails to capture stock variations over time (Munk, 2013).

The current study relaxed the assumption of a single factor and single period to explain the performance of equity market using several factors and instead of a single time period, the current study used monthly data for a period of twelve years in order to capture changes in different time periods. In view of CAPM, which captures systematic risk and relaxing the assumptions of a single factor and single period, the study determined whether foreign equity flows, domestic savings, private sector credit and Inflation rate have any effect on performance of equity market in NSE, Kenya and the nature of such effects.

## 2.3 Empirical Literature Review

This segment reviews empirical studies related to the primary variables under study. The section is subdivided into six segments. The segments analyze both local and international empirical studies related to foreign equity flows, domestic savings, private sector credit, inflation, Investor sentiments, moderating effect of institutional ownership and the joint effect of macro risk factors and Investor sentiments on the relationship between macro risk factors and Investor sentiments on performance of equity market respectively. The study also went ahead to summarize the empirical,

methodological, contextual and conceptual gaps.

### 2.3.1 Foreign Equity Flows And Performance Of Equity Market

Gachanja and Kosimbei (2018) used VAR models, vector decomposition, impulse response functions and granger causality tests to examine the effect of foreign equity flows on equity returns in the NSE for the period between 2007 and 2015. They concluded that foreign equity flows significantly and positively affects stock market returns and granger caused returns in the NSE. Gachanja and Kosimbei (2018) failed to consider domestic savings, private sector credit, Inflation rate and Investor sentiments which were encapsulated in the current study. Gachanja and Kosimbei (2018) also disregarded moderation effects which were captured by the current study. Lastly, the current study used ARDL and NARDL model to capture symmetric and assymmetric effects unlike Gachanja and Kosimbei (2018) who used symmetric vector autoregressive models.The study used equity returns while the present study used market capitalization to measure performance of equity market in Kenya.

Iriobe, Obamuyi and Abayomi (2018) used expost facto research and ARDL model to examine the relationship between foreign portfolio investments and bond stocks of Nigerian stock exchange using monthly time series data for the period 2007 to 2017. The study concluded that foreign portfolio investments significantly and positively influenced stock market performance in Nigeria and recommended implementation of policies to increase foreign investments in bonds. The findings were in disagreement with Koskei (2017). Unlike, Iriobe, Obamuyi and Abayomi (2018) who used bonds as dependent variable and proxy for stock market performance, the current study used market capitalization to measure performance of equity market. Furthermore, Iriobe, Obamuyi and Abayomi (2018) failed to consider causality, moderation effects of institutional ownership and asymmetric effects which were captured by the present study.

Makoni and Marozva (2018) examined the relationship between foreign portfolio investments and development of financial markets in Mauritius using granger causality, vector error correction model and ARDL. The findings of the study

indicated long run significant relationships between foreign portfolio investments, foreign direct investment, economic growth and financial market development measured by stock index. Bidirectional causality was also reported between the variables. However, Makoni and Marozva (2018) did not provide the direction of the relationship between foreign portflio investment and financial market development. The current study not only explored the direction of the relationship between the variables but also explored moderation effect of institutional ownership and asymmetric effects using NARDL model. Mauritius has different economic and regulatory structures making it difficult to generalise the findings in the Kenyan equity market.

Koskei (2017) used least squares based panel regression to examine the effect of foreign portfolio equity sales on market returns of 21 financial firms listed in Nairobi securities exchange between the period 2007 to 2015 using purposive sampling. The study concluded that there was no effective relationship between foreign portfolio equity outflows and market returns in Nairobi Securities exchange, Kenya. The study went ahead to recommend implementation of policies to reverse foreign portfolio equity outflows. Koskei (2017) study was limited to foreign portfolio equity outflows but the present study explored the net effect of both portfolio equity inflows and outflows on performance of equity market in Kenya using all listed firms between the period 2008 to 2018 hence it is more comprehensive. The current study also examined causal effects, moderation effect of institutional ownership and nonlinear effect of foreign equity flows which were failed to consider by Koskei (2017). This study focussed on 21 financial firms while the present study conducted a census of all the listed firms hence more comprehensive.

Shanab (2017) determined the effect of foreign portflio investment on stock indices in Amman stock exchange in Jordan using annual data for the period between 2005 to 2016 using linear regression. The study concluded that foreign portfolio investment flows had statistically significant effect on market capitalisation though the direction of the relationship was not provided. The study also concluded that Inflation rate had no significant effect on market capitalization. However, close examination of coefficients from the regression model indicated that though the R

squared was very high, all the coefficients were insignificant and so the conclusions arrived at by Shanab (2017) were erroneous due to spurrious regression. To avoid the short comings of Shanab (2017) the current study conducted diagnostic tests to ensure that the requirements of the classical linear regression model were not violated. Furthermore, according to Ye (2013) simple linear regression is inefficient in presence of economic time series data and so the current study employed ARDL and NARDL models which are suitable for both stationary and nonstationary data. The current study also examined causal effects, cointegration tests and asymmetric effects which were failed to consider by Shanab (2017).

Bayar (2016) used Hacker Hatemi Bootstrap model to determine the causal effect of foreign equity flows measured by remittances, foreign direct investment and foreign portfolio flows, on stock market development in Turkey for the period between 1995 and 2015. The study found that foreign capital inflows measured by remittances, foreign direct investment and foreign portfolio flows had unidirectional causality from foreign direct investment inflows to stock market development and unidirectional causality from stock market development to foreign portfolio investments. Bayar (2016) used symmetric Hacker Hatemi Bootstrap causality test for analysis while current study used ARDL and NARDL to capture asymmetric effects. Bayar (2016) study was in Turkey which is a developed country with different political, economic and legal systems and it is imperative to test whether the findings hold in a developing economy like kenya whose stock market suffers from information asymmetry. Lastly Bayar (2016) only investigated the direct effect of the foreign capital inflows on stock market development. The current study incorporated moderating effects of institutional ownership on the relationship between foreign equity flows and performance of equity market.

Lonca and Caldeira (2015) used aggregate and dissaggregate analysis to examine the relationship foreign capital flows and stock returns in Brazil. The aggregate analysis on the partial effect of foreign capital flows on equity returns was positive and significant. Also, according to dissagregate analysis done by economic activity, risk and corporate governance, foreign capital flows had a positive effect on returns of commodity, cyclical and industry consumption. Lonca and Caldeira (2015) disregarded domestic savings, private sector credit, Inflation rate and Investor

sentiments captured by current study. The present study also captured moderation effects failed to consider by Lonca and Caldeira(2015). Lastly, distinct from Lonca and Caldeira(2015) who used aggregate and disaggregate analysis, the present study used ARDL and NARDL model to capture both symmetric and asymmetric effects, causality and cointegration effects failed to consider by Lonca and Caldeira (2015). Brazil has different macroeconomic and regulatory environment and as such the findings of this study cannot be directly generalised in the kenyan equity market.

De and Chakraborty (2015) examined the effect of foreign portfolio investment on stock market volatility in India using vector autoregression model and panel data from 2003 to 2013. The findings of the study indicated no causal relations between foreign portfolio investment and stock market volatility. The study contends that foreign portfolio flows represent hot money shifting from one market to another in search of better returns while destabilising financial markets in the process though De and Chakraborty (2015) did not provide any evidence to support the claim. De and Chakraborty (2015) failed to consider cointegration tests and asymmetric tests which were captured by the present study using ARDL and NARDL models.This study used market volatility as the dependent variable while the current study used performance of equity market measured by market capitalization.

Sapian and Auzairy (2015) investigated whether foreign equity flows influence stock returns in Bursa Malaysia using Bivariate VAR model. They also examined the direction of causality using granger causality. The findings pointed out the existence of a positive bidirectional causality between foreign equity flows and stock market returns. Foreign equity flows also affect stock market returns though they did not provided the direction of the relationship. Sapian and Auzairy (2015) failed to consider private sector credit, domestic savings and Investor sentiments which were captured by the present study. The present study also explored institutional ownership moderation effects not captured by Sapian and Auzairy (2015). Finally, Sapian and Auzairy (2015) employed a linear VAR model while the present study estimated an ARDL and NARDL model to capture both symmetric and asymmetric effects. Malaysia has different macroeconomic and regulatory environment and as such the findings of this study cannot be directly generalised in the kenyan equity market.

Raza, Jawaid and Afshan (2013) determined the effect of foreign capital flows and growth of the economy on stock market capitalization in Pakistan using dynamic and fully modified ordinary least squares and ARDL for the period between 1976 and 2011 using annual time series data. The findings indicated positive effect of workers remittances, foreign capital flows and economic growth on market capitalization in Pakistan both in the short run and the long run. Furthermore, variance decomposition tests indicated bidirectional causality between stock market capitalization and foreign capital flows. The findings were in disagreement with Adam and Tweneboah (2008) and Koskei (2017) and in agreement with Lonca and Cadeira(2015) indicating an empirical gap which was addressed by the current study. The current study went further to determine the nonlinear effect of foreign equity flows on market capitalization. Pakistan has different macroeconomic and regulatory environment and as such the findings of this study cannot be directly generalised in the kenyan equity market.

Loomba (2012) examined the impact of foreign institutional investors on stock market volatility in Bombay stock exchange using purposive sampling and correlation analysis using daily data from 2001 to 2011. The findings indicated that foreign institutional investors significantly and positively affect stock market performance in Bombay stock exchange. The study also concluded that foreign institutional investors net inflows fully explain volatility in Indian stock market. Loomba(2012) concentrated on foreign institutional investors and stock index while the current study incorporated both individual and institutional foreign equity flows to obtain the net effect on market capitalization. The findings were in agreement with Lonca and Cadeira (2015) and in disagreement with Koskei(2017) indicating an empirical gap which was addressed by the present study. Loomba(2012) also failed to consider short run and long run effects, causal effects and asymmetric effects which were captured by the present study. This study used market volatility as the dependent variable while the current study used performance of equity market measured by market capitalization.

Adam and Tweneboah (2008) examined the effect of macroeconomic variables on stock prices in Ghana using Johansen multivariate cointegration for the period between 1991-2006. Long run relatioship between economic growth, treasury bill

rate, consumer price index and foreign direct investment was also examined. The findings established cointegration relationship between economic variables and the stock index. In addition, foreign direct investment negatively affects stock prices. Adam and Tweneboah (2008) failed to consider private sector credit and Investor sentiments which were captured by the current study. Also, Adam and Tweneboah (2008) failed to consider moderation effect captured by the present study. Lastly, Adam and Tweneboah (2008) used symmetric Johansen multivariate cointegration model while the current study uses ARDL and NARDL model model to capture both symmetric and asymmetric effects.This study used stock market volatiliy as the dependent variable while the present study used performance of equity market measured by market capitalization.

### 2.3.2 Domestic Savings and Performance of Equity Market

Tsaurai (2018) used pooled ordinary least squares regression with random and fixed approach to examine the determinants of stock market development in emerging markets. The determinants were selected based on empirical studies and included savings, infrastuctural development, inflation, economic growth, bank sector development, foreign direct investment, market liquidity, exchange rates and trade openness. The study was conducted with data for the period between 1994 to 2014. The study concluded that savings, trade openness, foreign direct investment, bank sector development and market liquidity positively affected stock market development in emerging markets. The findings were in agreement with Sukruoglu and Nalin (2014). Tsaurai (2018) failed to consider moderating effect of institutional ownership, cointegration tests, causality tests and asymmetric effects which were captured by the current study.This study was empirical in nature while the present study adopted an explanatory research design to establish causal relations between macro risk factors, investor sentiment and performance of equity market.

Abubakar and Danladi (2018) examined the effect of foreign direct investment on development of stock market in Nigeria using ARDL test approach using annual data between the period 1986 to 2016. Stock market development was proxied by market capitalization. The study also determined the effect of domestic savings,

inflation, gross domestic product and exchange rates on stock market development. The findings of the study indicate that gross domestic savings and exchange rates positively affect market capitalization whereas Inflation rate and foreign direct investment have no significant effect on market capitalization. Abubakar and Danladi (2018) assumed a linear relationship between domestic savings and market capitalization while the current goes further to examine the nonlinear relationship between domestic savings and market capitalization using NARDL. Abubakar and Danladi (2018) failed to consider Investor sentiments as an independent variable which was captured by the current study. Nigeria has different macroeconomic and regulatory environment and as such the findings of this study cannot be directly generalised in the kenyan equity market.

Celebi and Honig (2018) determined the relationship between macroeconomic factors and stock market index in Germany pre and post the financial crisis using data from 1991 to 2016 by applying GARCH analysis. The findings indicated that post crisis, savings rate and money supply had negative effect on stock market performance. The findings were in disagreement with Tsaurai (2018) and Sukruoglu and Nalin (2014). However, the study by Celebi and Honig (2018) was conducted in a developed market with different economic, political and social structures and hence the need to test the findings in the emerging market of kenya. Celebi and Honig (2018) also failed to consider moderating effects, cointegration, causality and asymmetric effects which were captured by the present study.This study used the stock market index as the dependent variable while the present study used performance of equity market measured by market capiotalization.

Ebele (2016) used ordinary least squares regression to examine the relationship between Savings and Stock Market Development in Nigeria for the period between 2002 and 2010. The study used market capitalization as proxy for stock market development. The study concluded that savings had a siginificant positive effect on stock market development in Nigeria. However, Ebele (2016) did not conduct any diagnostic tests prior to using Ordinary Least Squares. Furthermore, Ordinary Least Squares is not appropriate when dealing with economic data due to differences in stationarity among the variables. The current study used ARDL and NARDL which are more suitable when dealing with economic data for variables stationary at level

and data stationary at first difference.The current study also incorporated moderation effects, cointegration tests and asymmetric tests failed to consider by Ebele (2016).

Ayunku and Etale (2015) used Error correction model and Johanssen cointegration methodology to examine the long run and short run effects of stock market determinants in Nigeria for the period between 1977 to 2010. In the short run and long run, the study found that stock market development was positively affected by market capitalisation, exchange rates and private sector credit while Inflation rate and savings had negative effects. The present study incorporated Investor sentiments as an independent variable and institutional ownership as a moderating variable and also used NARDL to test for asymmetric effects not captured by Ayunku and Etale (2015).

Sukruoglu and Nalin (2014) used dynamic panel data to evaluate the relationship between macroeconomic variables and stock market development in selected European countries for the period 1995 to 2011. The study reported that savings, income and liquidity ratio had positive effect on development of stock market while monetization ratio and Inflation rate had significant negative effect on development of stock market. The study analyzed the direct relationship between the variables while the current study also incorporated the moderation effect of institutional ownership. Further, the study was conducted in Europe with developed financial markets and so there is a need to test the findings in an emerging market like Kenya. The current study also incorporated Investor sentiments and private sector credit as independent variables.

Rafique, Naseem and Sultana (2013) used multiple regression model to examine the impact of domestic savings, inflation, gross domestic product and discount rate on stock market index in Pakistan between the period 1991 to 2010. The study found that gross domestic savings and gross domestic product had significant positive effect on stock index while Inflation rate anddiscount rate had significant negative effects on stock index in Pakistan. Rafique, Naseem and Sultana (2013) did not determine diagnostic tests before estimating multiple regression and thus assumed that all data was stationary. However most time series data is nonstationary and thus multiple regression is inapproriate and so the conclusions by Rafique, Naseem and

Sultana (2013) could be misleading. The current study employed ARDL and NARDL models which are robust in the presence of stationary and nonstationary economic data. Further, the current study also evaluated the moderating effects of institutional ownership, cointegration effects and causality effects which were failed to consider by Rafique, Naseem and Sultana (2013).

Shahabz, Lean and Kalim (2013) used ARDL and error correction models to examine the effect of foreign direct investment, domestic savings, Inflation rate and income on stock market development in Pakistan. The study findings indicated that domestic savings and foreign direct investment had a positive effect on stock market development measured by market capitalization in Pakistan. Shahabz, Lean and Kalim (2013) failed to consider Investor sentiments as an independent variable, the moderating effect of institutional ownership and asymmetric effects which were captured by NARDL model in the current study.

Nguyen and Hanh (2012) used panel analysis to examine the factors affecting development of South Asian countries stock markets. Findings from the study indicate that financial development measured by macroeconomic stability, liquidity, income growth and savings rate positively affect development of stock market while Inflation rate andfinancial crisis have negative effects. Nguyen and Hanh (2012) study failed to consider Investor sentiments as an independent variable, which was the focus of the current study. In addition, the present study used ARDL and NARDL model to capture both symmetric and asymmetric effects compared to the panel analysis model used by Nguyen and Hanh (2012). Finally, Southeast Asian countries have different economic, political and social structures from Kenya, a developing country and so their findings need to be tested in Kenya, which is an emerging market with low market capitalization and few listed firms.

Aduda, Masila and Onsongo (2012) used regression analysis to determine the determinants of stock market development in Nairobi Securities Exchange for the period between 2005 to 2009. The findings indicate that domestic savings had a significant positive effect on stock market development. The study also found that market liquidity, institutional quality, bank development and income per capita had significant effects on stock market development while private capital flows and

Inflation rate had no effect on stock market development. Aduda, Masila and Onsongo (2012) failed to consider moderation effects, cointegration tests, causality tests and asymmetric tests which were captured by the current study using ARDL and NARDL models which are suitable for dealing with stationarity in economic data.

Andrianaivo and Yartey (2009) used dynamic panel data based on generalised least squares methodology to examine the determinants of stock market and banking system development. The findings indicate that the key determinants of banking sector development include political risk, financial repression, creditor rights protection and income level. The results also showed that key determinants of stock market development include political risk, domestic savings, stock market liquidity and banking sector development are the key determinants of stock market development of African financial markets. The study did not have a moderating variable, which was captured by the current study. The present study also incorporated Investor sentiments and used ARDL and NARDL model to capture both symmetric and asymmetric effects instead of GLS based dynamic panel data, which is linear model.

Naceur, Ghazouani and Omran (2007) used unbalanced panel data with fixed and random effects to investigate determinants of stock market development in twelve middle eastern and north african regions. The findings indicated that stabilization variable, saving rate, stock market liquidity and financial intermediaries are complementary and key drivers of stock market development. Naceur, Ghazouani and Omran (2007) did not address the moderation effects of institutional ownership, which were part of the current study. The current study also focused on Investor sentiments using an ARDL and NARDL models that was failed to consider by Naceur, Ghazouani and Omran (2007). In addition, The MENA region has different political and economic systems than those present in Kenya hence the need to test their findings in a developing country like Kenya.

### 2.3.3 Private Sector Credit And Performance Of Equity Market

Ho (2017) employed ARDL model to evaluate the long run and short run

macroeconomic determinants of development of stock market in South Africa. The study found that bank sector development and economic growth had a positive effect on performance of equity market in the long run. In the short run, the study found that trade openness, Inflation rate andeconomic growth had negative effect on development of stock market. In the long run, Inflation rate andtrade openness had negative effect whereas economic growth had positive effect on stock market development. Ho (2017) failed to consider Investor sentiments and foreign equity flows which form subject of the current study. Secondly, Ho(2017) did not incorporate asymmetric effects into the ARDL model of which the present study does using NARDL. Finally, the present study incorporated moderation effects of institutional ownership which was failed to consider by Ho(2017).

Paul, Japheth and Linus (2017) examined the effect of banking sector development, institutional quality, market liquidity and income levels on stock market performance in sub saharan Africa using panel time series regression model. Market capitalisation was used to measure stock market performance. The study found that bank sector development, income level and market liquidity positively affected stock market capitalization. Paul, Japheth and Linus (2017) failed to consider Investor sentiments as an independent variable , moderating effect of institutional ownership, cointegration effects, Causality and asymmetric effects which were captured by the present study.

Jonathan and Oghenebrume (2017) determined the effect of monetary policy (proxied by credit to private sector, monetary policy rate, broad money supply and exchange rate) on stock prices in Nigeria using ordinary least squares and error correction model. The findings indicated that credit to private sector negatively affects stock prices, monetary policy rate positively affects stock prices, broad money supply and exchange rate are positively correlated with stock prices. The findings were in disagreement with Paul, Japheth and Linus (2017). Jonathan and Oghenebrume (2017) used stock index as the dependent variable while the present study used market capitalization. Furthermore, Jonathan and Oghenebrume (2017) failed to consider the moderating effect of institutional ownership, Investor sentiments as an independent and asymmetric effects which were captured by the current study.

Faisal, Muhammad and Tursoy (2017) used ARDL to examine the effect of domestic credit to private sector, foreign direct investment and gross domestic product on stock prices in china for the period between 1999 to 2015.The findings indicated the presence of long run cointegration. Furthermore, domestic credit to private sector had negative effect while foreign direct investment had a positive effect on stock prices. Bidirectional causality was also reported between domestic credit to private sector and stock prices in china. The study by Faisal, Muhammad and Tursoy (2017) was conducted in China which has developed financial markets and thus there is a need to test the validity of their findings in Kenya, which is an emerging market with different economic, social and political structures from China. The current study also tested for moderation effects and asymmetric effects which were failed to consider by Faisal, Muhammad and Tursoy (2017).

Jun, Hongzhong, Thierry and Yannick (2015) used Generalised least squares and calderon rossel model to determine the effect of macroeconomic factors on cameroon stock market development. The findings indicated that bank sector development and economic growth have no significant effect while private capital flows and foreign direct investment influenced development of stock market in Cameroon. Jun, Hongzhong, Thierry and Yannick (2015) failed to consider Inflation rate andforeign equity flows as independent variables which the present study captured using ARDL and NARDL model contrasted with generalised least squares used by Jun, Hongzhong, Thierry and Yannick (2015). Jun, Hongzhong, Thierry and Yannick (2015) also failed to consider the moderation effect of institutional ownership which was captured by the present study.

Hasseeb (2015) used panel data models to examine the relationship between the real economy and performance of stock markets in Arab countries for the period between 1995 to 2014. The study differentiated arab countries based on their membership(or lack of) of gulf cooperation council and their oil production (or lack of ). The findings indicated the negative effects of domestic credit, net remittances, Gross domestic product and economic freedom on stock market performance measured by market capitalization. Inflation, investment and stocks traded had a positive effect of stock market performance. The findings were in disagreement with Jun, Hongzhong, Thierry and Yannick (2015). Hasseeb (2015) failed to consider moderation effects of

institutional ownership, Investor sentiments as an independent variable, cointegration, causality and asymmetric effects which were captured by the current study using ARDL and NARDL models.

Ali and Akujuobi (2014) examined the effect of credit to private sector, money supply, exchange rate and net foreign assets on stock market returns in Nigeria using engler and granger cointegration test. The findings indicated the presence of cointegration between all the variables and stock market returns. Furthermore, credit to private sector positively affects stock returns while exchange rate had a negative effect. The findings were in disagreement with Zafar (2013). Ali and Akujuobi (2014) failed to consider causality tests, moderation effects and asymmetric effects which were captured by the present study using ARDL and NARDL models. The current study also incorporated Investor sentiments as an independent variable.

Shahbaz, Rehman and Zainudin (2013) used ARDL model, VECM and granger causality with unknown structural breaks to evaluate determinants of stock market capitalization in Pakistan. The findings indicated presence of long run cointegration between the variables and positive effect of financial development measured by private sector credit, investment, Inflation rate andeconomic growth on stock market capitalization while trade openness had a negative effect and stock market development granger causes financial development, economic growth, inflation, trade openness and investment. The findings were in agreement with Ali and Akujuobi (2014) and in disagreement with Zafar( 2013) indicating an empirical gap which was addressed by the current study. Shahbaz, Rehman and Zainudin (2013) failed to consider moderation effects and asymmetric effects which were captured by the present study using NARDL.

Zafar (2013) used panel regression to evaluate factors affecting stock market performance measured by market capitalization in Pakistan between the year 1988 and 2018. Determinants selected included bank sector credit, interest rate and Gross domestic product and market capitalization. Findings from the study indicated that foreign direct investment and value traded have positive effects, real interest rates have negative effect while bank sector development has no effect on performance of equity market. Zafar (2013) employed panel regression while the present study used

ARDL and NARDL models. Secondly, Zafar (2013) failed to consider Investor sentiments, foreign equity flows and Inflation Rateas an independent variables which were captured by the present study. Lastly, the present study incorporated moderation effects into the model which was failed to consider by Zafar(2013).

El-Nader and Alraimony (2013) used variance decomposition and multivariate cointegration analysis to evaluate causes of stock market development in Jordan between 1990 to 2011. The findings demonstrated significant positive effects of private sector credit, inflation, money supply, gross capital formation and total value traded on stock market development. Net remmitances and Nominal Gross domestic product had negative significant effects on stock market development in Jordan. A dynamic short run and long run relationship was also reported between the variables. Jordan has different political and economic structures from Kenya hence the need to test the findings of El-Nader and Alraimony (2013) in a developing nation like Kenya. Secondly, El-Nader and Alraimony (2013) failed to consider foreign equity flows and Investor sentiments which were addressed by the present study using ARDL and NARDL model to capture both sysmetric and asymmetric effects.

Odhiambo (2010) used ARDL bound test to examine the association between bank development and stock market development in South Africa. In both the short run and long run, the study observed a positive relationship between banks and stock markets in South Africa. Further, development of stock market was affected negatively by its own lags and Inflation rate andpositively by savings in the short run while in the longrun, Inflation rate andreal income positively affect stock market development. Odhiambo (2010) did not focus on foreign equity flows, Investor sentiments and Inflation Ratewhich were captured by the current study.The present study also incorporated moderation effects of institutional ownership into the model of which Odhiambo(2010) disregarded. In addition, the present study incorporated asymmetric effects NARDL model for analysis of which Odhiambo (2010) did not pay attention to.

### 2.3.4 Inflation Rate And Performance Of Equity Market

Chauque and Rayappan (2018) used multiple regression and granger causality to determine the effect of Inflation rate and exchange rate on stock market performance in Malaysia. The study found that Inflation rate andexchange rate had a significant negative effect on performance of stock market in malaysia. The findings were in agreement with Akani and Uzobor (2015) and Njogo, Inim and Ohiaeri (2018). Chauque and Rayappan (2018) failed to consider the moderating effect of institutional ownership, Investor sentiments as an independent variable and asymmetric effects which were captured by the present study using ARDL and NARDL.

Njogo, Inim and Ohiaeri (2018) determined the relationship between Inflation rate and stock returns in Nigerian stock exchange between 1995 and 2014 using error correction and granger cointegration model using the Consumer Price Index and the All Share Index on the Nigerian stock market. The findings indicated the existence of cointegration and Inflation Ratesignificantly and negatively affects stock returns in Nigeria. Also, the findings pointed out the existence of unidirectional causality between the variables. A similar study in Nigeria on stock prices by Akani and Uzobor (2015) also indicated that Inflation rate negatively affects stock prices. These findings were in disagreement with Sokpo, Iorember and Usar (2017) in Nigeria which calls for the further research into the nature of relationship between Inflation rate andstock returns. Njogo, Inim and Ohiaeri (2018) did not capture moderation effect, cointegration and causality which were captured by the present study.

Similarly, Udi and Ohwofasa (2018) used cointegration and error correction model to examine the factors influencing performance of stock market in Nigeria during the period 1986 to 2016. The study used market capitalization as proxy for performance of stock market. The study found that inflation, per capita income and interest rate negatively affected performance of stock market. Udi and Ohwofasa (2018) failed to consider moderation effect of institutional ownership, Investor sentiments as an independent variable and asymmetric effects which were addressed by the current study.

Megaravalli, Sampagnaro and Murray (2017) employed Johanssen cointegration and granger causality to examine the impact of macroeconomic indicators in stock market performance in India, China and Japan(ASIAN 3) using monthly data between 2008 to 2016. Inflation Rateproxied by consumer price index and exchange rate were used as macroeconomic indicators. The study found that Inflation rate had no significant effect while exchange rates had a significant positive effect on performance of stock markets. The findings were in agreement with Sokpo, Iorember and Usar (2017) and in disagreement with Udi and Ohwofasa (2018). However, Megaravalli, Sampagnaro and Murray (2017) failed to consider the moderating effect of institutional ownership and asymmetric effects which were captured by the current study. In addition, ASIAN 3 countries have well established and developed markets hence the need to test their findings in a emerging market like Kenya characterised by market concentration risks, trading limited to a few stocks and market inefficiency.

Sokpo, Iorember and Usar (2017) used GARCH and EGARCH analysis to determine the influence of Inflation rate measured by consumer price index, on stock returns of Nigerian Stock Exchange. The study concluded that Inflation rate has no significant effect on stock market returns in Nigeria. No asymmetric effects were reported meaning that both good and bad news had the same effect on Nigeria's stock returns. Sokpo, Iorember and Usar (2017) failed to consider foreign equity flows, private sector credit and Investor sentiments which form subject of the current study. They also failed to consider moderation effects which also covered by the current study. Unlike Sokpo, Iorember and Usar (2017) who used GARCH and EGARCH, the current study estimated an ARDL and NARDL model for analysis of symmetric and asymmetric effects.

Kaur (2016) used multiple regression to examine the relationship between inflation, exchange rate and stock returns in India. Consumer price index was used to measure Inflation Ratewhile exchange rate was measured using united states dollar-Indian rupee rate. The findings indicated that Inflation rate had a significant positive effect on stock returns while exchange rate had no effect on stock returns in India. The findings were in disagreement with Upadhyay (2017) who found that Inflation rate had no effect on stock market performance in India. Kaur (2016) used multiple

regression which is deficient when dealing with non stationary economic data. To address this problem, the current study employed ARDL and NARDL models which perform better in presence of stationary and non stationary data. Kaur (2016) also failed to consider cointegration and causality which were addressed by the present study.

Ramzan (2016) used VAR model and granger causality to determine the impact of Inflation Rateon stock market performance in Pakistan between the period 2009 to 2015. The findings indicate that Inflation rate had a significant negative effect on stock market performance. Granger causality indicated that Inflation Rategranger causes stock market performance. The findings were in disagreement with Sokpo, Iorember and Usar (2017) and Oshaibat (2016) indicating an empirical gap that was addressed by the current study. Ramzan (2016) also failed to consider moderating effects and asymmetric effects which were addressed by the current study using NARDL model.

Silva (2016) used OLS to examine relationship between Inflation rate and stock prices in Sri Lanka using monthly data spanning 10 years. The findings of the study indicated the existence of a negative relationship between Inflation rate and stock prices in Sri Lanka. However, a percentage change approach shows that Inflation Rategrowth rate positively affects stock returns. Silva (2016) did not provide any explanation as to the discrepancy in the findings and the study also failed to consider other factors such as foreign equity flows, private sector credit and domestic savings captured by the current study. The current study employed ARDL and NARDL to capture asymmetric effects which was disregarded by Silva (2016). Furthermore, Sri lanka has different social, economic and political framework from Kenya hence the need to test the validity of the findings in the Kenyan market which suffers from information asymmetry and low market capitalization.

Ahmadi (2016) used EGARCH analysis to examine the relationship between Inflation rate and stock prices in Tehran stock exchange from 2005 to 2014. The study found that Inflation rate had no significant effect on stock prices.The findings were in agreement with Upadhyay (2017) and disagreement with Dengke (2015) and Oshaibat (2016). The disagreement in findings indicates an empirical gap which

was addressed by the current study. Ahmadi (2016) also failed to consider moderation effects and asymmetric effects which were captured by the current study using ARDL and NARDL models.

Onundu(2016) used EGARCH analysis to examine the relationship between stock prices and volatility in Nairobi Securities Exchange in Kenya. The study found that Inflation rate had a significant negative effect on stock prices and volatility in Kenya. This was in agreement with Udi and Ohwofasa (2018) and in disagreement with Oshaibat (2016). However, Onundu(2016) failed to consider moderation effect of institutional ownership and Investor sentiments as an independent variable which was captured by the current study using ARDL and NARDL models for asymmetric effects.

Oshaibat (2016) determined the effect of inflation, workers' remittances, share liquidity, and interest rates on stock returns in Amman Stock Exchange in Jordan between 1980 and 2014 using granger causality, cointegration and Vector Autoregressive model. The findings indicated a positive relationship between Inflation rate andstock returns. The current study employed ARDL model to accommodate lags in economic data which was disregarded by Oshaibat (2016). NARDL was also be used to test for asymmetric effects. Furthermore, Jordan has different different economic, social and political framework from kenya, hence the need to test the validity of the findings in the Kenyan market.

Dengke (2015) investigated the relationship between stock price and Inflation rate in China between 1997 and 2015 using Vector Error Correction Model (VECM) to determine the long and short run relationships among the variables respectively. The findings indicated the presence of cointegration and unidirectional causality between Inflation rate andstock market. In addition, Inflation rate had a significant positive effect on chinese stock prices. Dengke (2015) findings were in agreement with Oshaibat (2016). Dengke (2015) study failed to consider other factors such as foreign equity flows, private sector credit and domestic savings which were captured by the current study. The current study employed ARDL and NARDL to accommodate lags in economic data and asymmetric effects which were disregarded by Dengke (2015). Further, China is a developed market with different economic

and social structures hence the need to test the findings in an emerging market like Kenya.

Qamri, Haq and Akram (2015) examined the impact of Inflation Rateon stock prices in Karachi stock exchange using linear regression with data spanning 10 years. The findings indicated that Inflation rate negatively affects stock prices in Pakistan.The findings were in disagreement with Dengke (2015) and Oshaibat (2016). Qamri, Haq and Akram (2015) failed to consider cointegration, causality, moderation effects and asymmetric effects which were addressed by the current study using ARDL and NARDL models.

Khumalo (2013) used ARDL model and VECM to examine the association between Inflation rate and stock prices in South Africa for the period between 1984 to 2010.The findings indicated unidirectional causality between Inflation rate and stock prices. In the long run, Inflation Ratesignificantly and negatively affects stock prices in South Africa. The findings were in agreement with Qamri, Haq and Akram (2015) and in disagreement with Dengke (2015) and Oshaibat (2016). This indicates an empirical gap which was addressed by the current study. Khumalo (2013) ingnored moderation effects and asymmetric effects which were captured by the current study.

Limpanithiwat and Rungsombudpornkul (2010) examined the effect of inflation, global financial crisis and Tsunami on stock prices in Thailand between 2000 and 2010 using vector Autogression for analysis. Limpanithiwat and Rungsombudpornkul (2010) concluded that Inflation Ratehas no effect on stock prices in Thailand. The findings were in agreement with Sokpo, Iorember and Usar (2017) in Nigeria and in disagreement with Njogo, Inim and Ohiaeri (2018). Unlike Limpanithiwat and Rungsombudpornkul (2010) who only considered Inflation Rateusing vector autoregression, the current study incorporated foreign equity flows, private sector credit, domestic savings and Investor sentiments using ARDL and NARDL. Thailand also has different social, economic and political framework from Kenya, hence the need to test the validity of the findings in the Kenyan emerging market.

### 2.3.5 Investor Sentiments And Performance Of Equity Market

Anusakumar, Ali and Wooi (2017) examined the effect of Investor sentiments measured by trading volume on equity market returns of emerging Asian markets. The findings indicated that equity specific sentiment positively affects equity returns. The findings also indicated country variations on the effects of market wide sentiments on stock returns. Anusakumar, Ali and Wooi (2017) study was conducted in Asian markets which are a developed nations with well-established equity markets and so the findings may not be applicable to the Kenyan market which suffers from low capitalization and small number of listed firms. The current study also utilized ARDL and NARDL methodology to capture symmetric and asymmetric effects and incorporated moderation effect of institutional ownership.The current study also incorporated causality which was failed to consider by the Anusakumar, Ali and Wooi (2017).

Gizelis and Chowdhury (2016) evaluated whether Investor sentiments proxied by closed end fund discount and european commision compiled Investor sentiments indicators influenced market returns in Athens stock exchange for the period between 1995-2014 using regression analysis. The findings of study indicated that Investor sentiments weakly explains equity returns. Gizelis and Chowdhury (2016) failed to consider moderation effects, which formed the subject matter of the current study. In addition, Gizelis and Chowdhury (2016) failed to consider foreign equity flows, domestic savings, private sector credit and Inflation rate captured by the present study. Lastly, Gizelis and Chowdhury (2016) used regression analysis while the current study used ARDL and NARDL, which accommodates lags, symmetric and asymmetric effects.

Kim and Park (2015) established the influence of individual Investor sentiments on Korean stock market returns. The study concluded that equity returns were not affected by individual Investor sentiments though individual investor contrarian trading behaviour influenced specific stock prices thus providing liquidity to the market implicitly while receiving compensation for the same in form of limited excess returns adjusted for the market. The study by Kim and Park (2015) was conducted in Korea, which is a developed nation with well-established equity

markets and so the findings may not be applicable to the Kenyan market, which suffers from low capitalization and small number of listed firms hence the need to test the findings of Kim and Park (2015) locally. Kim and Park (2015) also failed to consider foreign equity flows, private sector, domestic savings, Inflation rate andmoderation effects captured by the present study.The present study also analysed long run effects, short run effects and causality relationships between the variables which was failed to consider by the previous study.

Fayyazi and Maharlouei (2015) used OLS and granger causality to examine the relationship between Investor sentiments proxied by Investor sentiments index and stock market index in Tehran stock exchange from 2001 to 2014. The findings indicated a significant positive effect of Investor sentiments on stock market performance in Tehran stock exchange, Iran. Fayyazi and Maharlouei (2015) used Investor sentiments index as proxy for Investor sentiments while the current study used trading volume as proxy for Investor sentiments. Fayyazi and Maharlouei (2015) also failed to consider moderation effects and asymmetric effects which were captured by the current study using ARDL and NARDL models.

Cuong and Ishaq (2015) examined the relationship between Investor sentiments (proxied by Investor sentiments index) and stock returns volatility puzzle in Chinese stock market using OLS. The findings indicated that Investor sentiments had no effect on stock returns volatility in chinese stock exchange. The findings were in disagreement with Li and Zhang (2008) and this indicates an empirical gap which was addressed by the current study. Cuong and Ishaq (2015) also failed to consider the moderating effect of institutional ownership, cointegration effects, causality effects and asymmetric effects which were captured by the current study.

Naik and Padhi (2014) used EGARCH, VAR models and granger causality to evaluate the relationship between Investor sentiments and volatility of stock returns in national stock exchange in India between 2001 to 2013. The findings of the study indicated that Investor sentiments had a negative effect on stock markets returns volatility. Further, the study also found asymmetric effects between Investor sentiments and stock returns volatility. Bidirectional causality was also found. The findings were in disagreement with Kim and Park (2015) and Ahmed and Ullah

(2013). Naik and Padhi (2014) failed to examine the moderating effect of institutional ownership and failed to consider other variables such as domestic savings, private sector credit, Inflation rate andforeign equity flows which were captured by the current study.

Uygur and Tas (2014) used EGARCH model to examine the relationship between Investor sentiments proxied by weekly trading volume on sectoral stock market indices in Instambul stock exchange. The findings indicated that Investor sentiments positively affects stock market performance of Instambul stock exchange. The findings were in agreement with Fayyazi and Maharlouei (2015) and in disagreement with Naik and Padhi (2014). Uygur and Tas (2014) failed to consider moderating effect of institutional ownership which was captured by the current study. The current study also used other independent variables such as foreign equity flows, private sector credit and Inflation Ratewhich were failed to consider by Fayyazi and Maharlouei (2015).

Huang, Yang, Yang and Sheng (2014) investigated the influence of optimistic and pessimistic Investor sentiments on Chinese specific industry returns using principal component analysis. The study reported positive effects of current Investor sentiments and negative effects of lagged Investor sentiments on specific industry returns in China. Further, optimistic sentiment positively affected returns while pessimistic Investor sentiments had no effect on returns. Huang, Yang, Yang and Sheng (2014) failed to consider foreign equity flows, private sector, domestic savings, Inflation rate andmoderation effects captured by the present study. Huang, Yang, Yang and Sheng (2014) used Principle Component Analysis model while the current study used ARDL and NARDL to capture lags, symmetric and asymmetric effects in economic data failed to consider by the Huang, Yang, Yang and Sheng (2014).

Oprea and Brad (2014) used OLS to determine the impact of Investor sentiments (proxied by consumer confidence index) on stock returns in Romania between 2002 to 2011 using monthly data. The findings indicated that Investor sentiments had a positive effect on stock returns in Romania. The findings were in agreement with Anusakumar, Ali and Wooi (2017) and in disagreement with Naik and Padhi

(2014). However, Oprea and Brad (2014) failed to consider cointegration, causality and asymmetric effects which were captured by the current study. Oprea and Brad (2014) used market returns as the dependent variable while the current study used market capitalization.

Ahmed and Ullah (2013) investigated the influence of Investor sentiments on stock returns in Pakistan Karachi stock exchange using ARDL. The findings indicated long run positive effects of Investor sentiments on stock returns. The study by Ahmed and Ullah (2013) however contradicts other studies (YoshinagaI & Junior, 2012; Huang *et al*.,2014). The study assumed a symmetrical relationship between Investor sentiments and stock returns while the current study estimated both symmetrical and asymmetrical relationships. Ahmed and Ullah (2013) failed to consider foreign equity flows, private sector, domestic savings, Inflation rate andmoderation effects captured by the present study.

Abdullahi (2013) used Error Correction Model and Engle Granger Cointegration test to investigate the long run and short effect of Investor sentiments measured by volume and value of shares traded on performance of equity market in Kenya measured by market capitalization between 1996-2013. The results indicated the existence of both long run and short run relationships between Investor sentiments and performance of equity market. Abdullahi (2013) failed to consider foreign equity flows, private sector, domestic savings, Inflation rate andmoderation effects captured by the present study. Abdullahi (2013) failed to consider causality and asymmetric effects captured in the current study's ARDL and NARDL.

Rahman, Shien and Sadique (2013) used GARCH model to examine the relationship between sentiment changes and stock returns in Dhaka Stock Exchange in Bangladesh. The study found that Investor sentiments significantly and positively influenced excess market returns in Bangladesh. The findings were in disagreement with Yoshinagal and Junior (2012) and Naik and Padhi (2014). The discrepancy in findings indicates an empirical gap which was addressed by the current study. Rahman, Shien and Sadique (2013) also failed to consider moderation effects of institutional ownership, cointegration and causality which were captured by the current study.The current study also incorporated foreign equity flows, domestic

savings, private sector credit and Inflation Rateas independent variables which were failed to consider by Rahman, Shien and Sadique (2013).

Yoshinagal and Junior (2012) used panel data analysis to examine the relationship between Investor sentiments and stock market index in Brazil between 1999 and 2008. The findings indicated that Investor sentiments significantly and negatively affects stock returns in Brazil. Yoshinagal and Junior (2012) study failed to consider moderation effect of institutional ownership and asymmetric effects which were captured by the current study. The current study also incorporated other independent variables such as inflation, foreign equity flows and private sector credit which were failed to consider by Yoshinagal and Junior (2012).

Grigaliuniene and Cibulskiene (2010) used OLS and granger causality to examine the relationship between Investor sentiments (proxied by economic sentiment indicator and consumer confidence index) and future stock returns in scandinavian stock market. The findings indicated that high Investor sentiments negatively affects future stock returns. The findings were in agreement with Naik and Padhi (2014). Grigaliuniene and Cibulskiene (2010) failed to consider moderation effect of institutional ownership and asymmetric effects which were captured by the current study. Grigaliuniene and Cibulskiene (2010) used economic sentiment indicator and consumer confidence index as proxies for Investor sentiments while the current study used trading volume to measure Investor sentiments.

Paudel and Laux (2010) used ordinary least squares to examine the influence of Investor sentiments on stock prices of 35 firms in the United States of America between the period 1950 to 2008. The findings indicated that Investor sentiments had no significant effect on stock prices in the USA for the sample studied. Paudel and Laux (2010) failed to consider moderation effects of institutional ownership, cointegration tests, granger causality and asymmetric effects which were captured by the current study. OLS is inefficient when dealing with non stationary economic data so the current study employed ARDL model which performs better in presence of stationary and non stationary variables. The current study also incorporated other independent variables such as domestic savings, private sector credit, foreign equity flows and Inflation Ratewhich were failed to consider by Paudel and Laux (2010).

Furthermore, Paudel and Laux (2010) study was conducted in the USA which has well developed and advanced markets hence the need to test the findings in an emerging market like Kenya characterised by high concentration risks, low number of listed firms and concentration of trading on a few listed firms.

Li and Zhang (2008) used a unique data set to examine the effect of Investor sentiments on stock market behaviour in China. The study found that Investor sentiments had a positive effect on stock returns in china. Li and Zhang (2008) study was conducted in China which well developed market with different economic, social and political structures hence the need to test the findings in the emerging market of Kenya. The current study also examined asymmetric effects and moderation effects which were failed to consider by Li and Zhang (2008). The current study also incorporated foreign equity flows, domestic savings, private sector credit and Inflation Rateas independent variables which were failed to consider by Li and Zhang (2008).

### 2.3.6 Institutional Ownership And Performance Of Equity Market

Kibiya, Aminu and Abubakar (2019) used OLS and fixed effects to moderate the relationship between intellectual capital and firm performance in Nigeria using institutional ownership. Kibiya, Aminu and Abubakar (2019) found that institutional ownership had a significant positive moderating effect on intellectual capital and firm performance. Kibiya, Aminu and Abubakar (2019) used intellectual capital as the independent variable while the current study used macro risk factors and Investor sentiments. Furthermore, the current study also examined asymmetric effects, cointegration and causality which were failed to consider by Kibiya, Aminu and Abubakar (2019).

Miko and Ajuma (2018) used OLS to examine the relationship between audit committee and quality of earnings moderated by institutional ownership. The findings indicated that institutional ownership had significant positive moderating effect. The current study explored the moderating effect of institutional ownership on macro risk factors, Investor sentiments and performance of equity market in Kenya using ARDL and NARDL. Further, Miko and Ajuma (2018) failed to

consider cointegration, causality and asymmetric effects which were captured by the current study.

Zaher, Rad and Ebrahimi (2017) examined the moderating effect of institutional ownership on informational assymetry and dividend policy in Tehran stock exchange using panel data and multivariate regression between 2011 and 2017. The findings indicated that information asymmetry negatively influences dividend policy while institutional ownership positively moderates the relationship. Zaher, Rad and Ebrahimi (2017) failed to consider foreign equity flows, private sector, domestic savings, Inflation rate andmoderation effects captured by the present study. Zaher, Rad and Ebrahimi (2017) failed to consider asymmetric effects which were captured by the current study. Zaher, Rad and Ebrahimi (2017) used Multivariate regression method and panel data while the current study used ARDL and NARDL models.

Salehi, Mohammadi and Afshari (2017) examined the effect of excess free cashflow on earnings management moderated by board independence and institutional ownership in Tehran stock exchange for the period between 2009 and 2015. The study found that institutional ownership and board independence have no significant moderating effect on excess free cashflow and earnings management. This was in disagreement with Zaher, Rad and Ebrahimi (2017) in the same country indicating an emprical gap which was addressed by the current study. Salehi, Mohammadi and Afshari (2017) failed to consider cointegration, causality and asymmetric effects which were captured by the current study.

Trisnawati and Nasser (2017) examined the impact of tax avoidance on cost of debt moderated by institutional ownership in Indonesian stock exchange. The study concluded that institutional ownership had no significant moderating effect on the relationship between tax avoidance and cost of debt in Indonesia. The findings were in agreement with Salehi, Mohammadi and Afshari (2017) and in disagreement with Zaher, Rad and Ebrahimi (2017). Trisnawati and Nasser (2017) failed to consider cointegration and asymmetric effects which were addressed by the current study.

Guizani (2013) examined the effect of board structure on firm performance of non-financial firms listed Tunis stock exchange moderated by institutional ownership,

ownership concentration and family ownership in the period 2004 to 2010 using OLS. From the findings, board structure and firm performance were positively moderated by ownership concentration and institutional ownership while family ownership has a negative moderating effect. Guizani (2013) failed to consider foreign equity flows, private sector credit, domestic savings, Inflation rate andmoderation effects captured by the present study. Guizani (2013) failed to consider asymmetric effects captured in the current study. Zaher, Rad and Ebrahimi (2017) used OLS while the current study used ARDL and NARDL models. The current study examined causality, short run and long run relationships between the variables, which failed to consider by Guizani (2013).

Ratnawati and Hamid (2015) moderated control rights and earnings management in pyramid company ownership in Indonesian Stock exchange, using least square regression between 2007 and 2011 using institutional and managerial ownership. The findings indicated that institutional ownership had no moderating effects while managerial ownership moderated the relationship between control rights and earnings management. Ratnawati and Hamid (2015) failed to consider foreign equity flows, private sector credit, domestic savings, Inflation rate andmoderation effects captured by the present study. Ratnawati and Hamid (2015) failed to consider asymmetric effects which were captured by the current study. Ratnawati and Hamid (2015) used OLS while the current study used ARDL and NARDL models.

Hsu (2013) evaluated the effect of research and development expenditures on firm performance of technology firms listed in Taiwan moderated by leverage and ownership structure between 2006-2009 using OLS. The findings indicated that ownership structure had positive moderating effects while leverage had negative moderating effects on the relationship between research and development expenditures and firm performance of technology. Hsu (2013) failed to consider foreign equity flows, private sector credit, domestic savings, Inflation rate andmoderation effects captured by the present study. Hsu (2013) failed to consider short run and long run relationship between the variables and asymmetric effects captured in the current study. Ratnawati and Hsu (2013) used OLS while the current study uses ARDL and NARDL model.

### 2.3.7 Macro Risk Factors, Investor Sentiments And Performance Of Equity Market

Wang and Chen (2013) examined the interaction between macro economy, Investor sentiments and momentum using VAR models in Taiwan stock exchange. The findings indicated that the macroeconomic situation and Investor sentiments affect stock prices. Further, exchange rates and oil prices affect stock prices. Also, changes in Investor sentiments further influence stock prices. Wang and Chen (2013) failed to consider domestic savings and private sector credit and the moderation effect of institutional ownership captured by the current study. Furthermore, Wang and Chen (2013) applied a VAR model while the current study used ARDL and NARDL. Finally, Taiwan has different political, social and economic structures from Kenya hence the need to test the findings in the Kenyan developing market.

Rashid, Hassan and Yein (2014) investigated the influence of macroeconomic factors and Investor sentiments on stock prices in Malaysia using regression.The findings indicated that the FTSE Bursa Malaysia, currency index and interests rates strongly influence islamic price index compared to Investor sentiments whereas industrial production, money supply and Inflation rate had limited influence. More specifically, FTSE Bursa Malaysia, money supply and Investor sentiments positively affects stock prices whereas interest rates negatively affect islamic stock prices. Rashid, Hassan and Yein (2014) disregarded foreign equity flows, private sector credit and domestic savings captured by the current study. Secondly, unlike Rashid, Hassan and Yein (2014) who used linear time series regression, the current study employed ARDL and NARDL models to capture both linear and nonlinear relationships between study variables. Finally, Malaysia has different political, social and economic structures from Kenya hence the need to test the findings in the Kenyan developing market.

Chiu, Harris, Stoja and Chin (2016) used structural VAR model to investigate the relationship between financial market volatility, macroeconomic fundamentals and Investor sentiments in the United States. The study found that aggregate supply and demand increased longterm volatility in stock and bond market. In addition, association between short term volatility transitory component and macroeconomic

factors was not confirmed. Chiu, Harris, Stoja and Chin (2016) focused on real output growth, inflation, short term interest rates and Investor sentiments and failed to consider foreign equity flows, private sector credit and domestic savings covered by the current study. The current study also incorporated moderation effect of insitutional ownership which was failed to consider by Chiu, Harris, Stoja and Chin (2016). In contrast with Chiu, Harris, Stoja and Chin (2016) who used a VAR model, the current study uses an ARDL and NARDL models to capture symmetric and assymmetric effects.

## 2.4 Summary Of Empirical Literature And The Research Gaps

This section summarizes the review of literature to bring out the empirical, conceptual, contextual and methodological gaps. Most of the reviewed studies on macro risk factors, Investor sentiments and performance of equity markets were conducted on developed markets with well-established stock markets. These findings from such studies cannot be generalized to the Kenyan equity market characterized by low market capitalization to GDP, low number of listed companies and information asymmetry. Furthermore, even for those studies conducted in developing countries, there are differences in economic, social and political structures making it difficult to generalize the findings in the Kenya market.

Secondly, empirical studies on macro risk factors, Investor sentiments and performance of equity markets especially in Kenya indicate mixed, contradictory and inconclusive findings depending on the context, sample, time period and methodology used. Measures of performance of equity markets were also varied. The current study used aggregated market capitalization as a proxy for performance of equity market. Market capitalization is a better measure of performance since it is based on the current share price; the outstanding issued shares and the Nairobi all share index hence most conclusive.

In addition, previous studies failed to consider the moderation effects on the relationship between macro risk factors, Investor sentiments and performance of equity market. To fill this conceptual gap. the current study examined the moderating effect of institutional ownership on the relationship between macro risk factors, Investor sentiments and performance of equity market in the NSE, Kenya. The current study also acknowledged that most time series data is not stationary and employed unit root based model selection criteria for selecting the ARDL model used in the study. The study used aggregated market capitalization figures for all the 67 listed firms in the NSE without segregating the firms on the basis of whether they are financial or non financial between the period

2008 to 2018.The aggregated market capitalization figures also provided for delisted and suspended firms increase accuracy during analysis.

**Table 2.4: Summary Of Literature Review And Research Gaps**

| Authors and Context | Focus of study | Major findings | Gaps In Research | Key findings |
|---|---|---|---|---|
| Gachanja & Kosimbei, (2018) | Effect Of Foreign Equity Flows On Stock Market Returns In Nairobi Securities Exchange | Foreign equity flows positively affects returns | The study did not consider private sector credit, Domestic savings Inflation rate andInvestor sentiments<br><br>Used VECM model<br><br>The study did not consider Moderation effects<br>Used market returns | This study captured private sector credit, Domestic savings Inflation rate and Investor sentiments<br>This study Estimated ARDL and NARDL<br><br>Captures moderation effect<br>Used market capitalization |
| Lonca & Caldeira, (2015) | Effect Of Foreign Portfolio Capital Flows On Stock Returns In Brazil | Foreign Capital flows positively affects returns | The study did not consider foreign equity flows,private sector credit, Inflation rate andInvestor sentiments<br><br>Focussed on stock returns in Brazil | This study included foreign equity flows, private sector credit, Inflation rate and Investor sentiments<br>Focussed on market |

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|---|---|---|---|---|
| | | | The study assumed a linear relationship bewteen variables<br>Brazil has different economic and political systems | capitalization in kenya<br>This study estimated asymmetric effects<br><br>Test findings in developing country, Kenya |
| Sapian & Auzairy, (2015) | Influence Of Foreign Equity Flows On Market Returns In Malaysia | Foreign Capital flows positively affects returns | The study used VAR granger causality<br><br>The study did not consider private sector credit and Investor sentiments<br><br>Did not consider moderation effects | This study Will use ARDL and NARDL<br><br>This study Captured private sector credit and Investor sentiments<br><br>This study included moderation effect of institutional ownership |
| Naceur, Ghazouani Omran (2007) | Factors Determining Stock Market Development In MENA. | Savings rate affect stock market development | The study did not consider moderation effect | This study included moderation effect of institutional ownership<br>This study used |

| | | | | |
|---|---|---|---|---|
| | | | The study used unbalanced panel<br><br>Focused on MENA. Findings not directly generalized to Kenya | ARDL and NARDL<br><br>Conducted in kenya |
| Andrianaivo & Yartey, (2009) | Factors Determining Development Financial Markets Development In Africa | Domestic savings influence stock market development. | The study did not consider moderation effects<br><br>The study Assumed a linear model between variables | This study captured moderation effects of institutional ownership<br><br>This study captured asymmetric effects |
| Ayunku & Etale, ( 2015) | Factors Determining Stock Market Development In Nigeria | Savings negatively affect stock market development | The study did not consider moderation effect<br><br>Nigeria has different economic, political and regulatory structures<br><br>The study assumed a linear relationship | This study captured moderation effect of institutional ownership<br>Focused on performance of equity market in kenya<br><br>This study captured asymmetric effects |
| Odhiambo(2010) | Banks And Stock Market Development In South | Positive relationship between banks and | The study did not consider foreign equity flows, Investor sentiments | This focuses on foreign equity flows, |

| | | | | |
|---|---|---|---|---|
| | Africa | stock market development | and inflation and moderation effect<br><br>The study assumed a linear relationship between variables<br><br>South Africa has different economic, political and regulatory structures | Investor sentiments and Inflation rate and moderation effect<br><br>This study Captured asymmetric effects<br><br>Focused on performance of equity market in kenya |
| Zafar, (2013) | Factors Determining Stock Market Performance In Pakistan | Banking sector development has no effect on stock market performance | The study did not consider foreign equity flows, Investor sentiments and inflation<br><br>The study did not consider moderation effect<br><br>The study did not consider asymmetric effects<br>The study used panel regression | This study captured foreign equity flows, Investor sentiments and inflation<br>This study captured moderation effect<br>This study captured asymmetric effects<br><br>This study used ARDL and NARDL |

| | | | | |
|---|---|---|---|---|
| El-Nader & Alraimony, (2013) | Macroeconomic Factors Determining Stock Market Development In Jordan | Private sector credit positively affects stock market development | The study did not consider foreign equity flows and Investor sentiments<br><br>The study used Multivariate Cointegration and variance decomposition<br>Jordan has different economic, political and regulatory structures | This study captured foreign equity flows and Investor sentiments<br>This study used ARDL and NARDL<br>Focused on performance of equity market in kenya |
| Jun, Hongzhong, Thierry, & Yannick (2015) | Macroeconomic Factors Determining Stock Market Development In Cameroon | Banking sector development has no effect on stock market development | The study did not consider Inflation rate and foreign equity flows<br><br>The study used GLS<br><br>The study did not consider moderation effect | This study captured Inflation rate and foreign equity flows<br>This study used ARDL and NARDL<br><br>This study captured Moderation effect |
| Ho S.-Y. , (2017) | Macroeconomic Factors Determining Stock Market Development In South Africa | Bank sector development positively affects stock market development | The study did not consider Investor sentiments and foreign equity flows<br><br>The study isolated asymmetric effects | This study captured Investor sentiments and foreign equity flows.<br>This study captured asymmetric effect |

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|---|---|---|---|---|
| Anusakumar, Ali, & Wooi, (2017) | The Effect Of Investor sentiments On Equity Returns In Emerging Asian Markets | Investor sentiments Positively affects stock returns | The study used panel regression<br><br>The study did not consider moderation effect<br><br>The study did not consider foreign equity flows and inflation | The study used ARDL and NARDL<br><br>This study captured Moderation effect<br><br>This study captured foreign equity flows and inflation |
| Njogo, Inim, & Ohiaeri (2018) | Association Between Stock Returns And Inflation rate In Nigeria Between 1995 To 2014 | Inflation rate negatively affects stock returns<br>Long run cointegration<br>Unidirectional causality between stock returns and inflation | The study findings were in disagreement with Sokpo, Iorember, & Usar, (2017) in same country,nigeria<br><br>The study did not consider private sector credit and domestic savings<br><br>The study Used Error correction and granger cointegration | This study clarified the effect of Inflation rate on stock performance<br><br>This study focused on private sector credit and domestic savings<br><br>This study used ARDL and NARDL |

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|---|---|---|---|---|
| Sokpo, Iorember, & Usar, (2017) | The Relationship Between Inflation rate and Volatility In Stock Returns Nigeria Stock Exchange | Inflation rate has no effect on stock returns<br>No asymmetric effects | The study did not consider foreign equity flows and private sector credit<br><br>The study did not consider moderation effect<br><br>Used stock returns | This study captured foreign equity flows and private sector credit<br>This study captured moderation effect<br><br>Used stock market capitalization |
| Silva (2016) | Inflation rate and stock prices In Sri Lanka | Inflation rate negatively affects stock prices | The study did not consider foreign equity flows, domestic savings and private sector credit<br><br>The study Used OLS<br><br>Sri-lanka has different economic, social and political structures. Findings cannot be generalized | This study captured foreign equity flows, domestic savings and private sector credit<br>This study used ARDL and NARDL<br>Focused on performance of equity market in kenya |
| Oshaibat (2016) | Stock Returns And Inflation, Interest Rates, Share Liquidity And Workers' Remittances In The Amman Stock Exchange | Inflation rate positively affects stock returns | The study used Vector autoregressive model<br><br>The study did not consider moderation effect | This study used ARDL and NARDL<br><br>This study Captured moderation effect of institutional |

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|---|---|---|---|---|
| | | | The study did not consider Domestic savings and private sector credit | ownership<br><br>This study captured domestic savings and private sector credit |
| Dengke (2015) | Inflation rate and Stock Market In China | Inflation rate positively affects stock prices<br><br>Unidirectional causality between stock returns and inflation | The study did not consider foreign equity flows, private sector credit and domestic savings<br><br>The study isolated moderation effect<br><br>The study used VECM | This study captured foreign equity flows, private sector credit and domestic savings<br><br>This study captured moderation effect<br><br>This study Used ARDL and NARDL |
| Limpanithiwat & Rungsombudpornkul (2010) | Inflation rate and stock prices In Thailand | Inflation rate has no effect on stock prices | The study did not consider foreign equity flows, private sector credit and domestic savings<br><br>The study isolated moderation effect | This study captured foreign equity flows, private sector credit and domestic savings<br>This study captured moderation effect |

| | | | | |
|---|---|---|---|---|
| | | | The study used vector auto regression | This study used ARDL and NARDL |
| Gizelis, Demetrios, Chowdhury, & Shah (2016) | Investor sentiments And Equity Returns In Greece | Investor sentiments weakly explains returns | The study used regression analysis<br><br>The study did not consider foreign equity flows, private sector credit and domestic savings<br><br>The study isolated moderation effect | This study used ARDL and NARDL<br>This study captured foreign equity flows, private sector credit and domestic savings<br><br>This study captured moderation effect |
| Kim& Park(2015) | Individual Investor sentiments & Equity Market Returns In Korea | Investor sentiments has no effect on equity returns | The study did not consider foreign equity flows, private sector credit and domestic savings<br><br>The study used regression analysis<br><br>The study isolated moderation effect | This study captured foreign equity flows, private sector credit and domestic savings<br>This study used ARDL and NARDL<br><br>This study captured moderation effect |

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|---|---|---|---|---|
| Huang, Yang, Yang, & Sheng, (2014) | Investor sentiments And Industry Specific Returns In China | Optimistic Investor sentiments positively affects returns while negative sentiment negatively affects returns | The study did not consider foreign equity flows, private sector credit and domestic savings<br><br>The study used principal component analysis<br><br>The study did not consider asymmetric effects | This study captured foreign equity flows, private sector credit and domestic savings<br><br>This study used ARDL and NARDL<br><br>This study captured asymmetric effects |
| Ahmed & Ullah(2013) | Investor sentiments On Returns Of Karachi Equity Exchange | Investor sentiments positively affects stock returns | The study did not consider foreign equity flows, Inflation rate and domestic savings<br><br>The study did not consider asymmetric effects<br><br>The study isolated moderation effects | This study captured foreign equity flows, Inflation rate and domestic savings<br><br>This study captured asymmetric effects<br><br>This study captured moderation effects |
| YoshinagaI &Junior (2012) | Market Sentiment And Performance Of Equity | Market sentiment negatively affects | The study used Panel Regression | This study Used ARDL and NARDL |

| | | | | |
|---|---|---|---|---|
| | Market In Brazil | stock returns | The study did not consider foreign equity flows, Inflation rate and domestic savings<br><br>The study did not consider asymmetric effects | This study captured foreign equity flows, Inflation rate and domestic savings<br><br>This study captured asymmetric effects |
| Abdullahi (2013) | Investor sentiments And NSE 20 Share Index | Cointegration exists | The study used Engle and Granger cointegration<br><br>The study did not consider foreign equity flows, Inflation rate and domestic savings<br><br>The study did not consider moderation effects | This study used ARDL and NARDL<br><br>This study captured foreign equity flows, Inflation rate and domestic savings<br><br>This study captured moderation effects |
| Zaher, Rad, & Ebrahimi, (2017) | The Moderating Effect Of Institutional Ownership On The Relationship Between | Institutional ownership has moderating effects on information | The study Did not consider foreign equity flows, Inflation rate anddomestic Savings | This study captured foreign equity flows, Inflation rate and domestic savings |

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|---|---|---|---|---|
| | Information Asymmetry And Dividend Policy In Tehran Stock Exchange | asymmetry and dividend policy | The study used panel regression<br><br>The study did not consider asymmetric effects | This study used ARDL and NARDL<br><br>This study captured asymmetric effects |
| Guizani, (2013) | The Moderating Effect Of Large Shareholders On Board Structure–Firm Performance Relationship: An Agency Perspective | Institutional ownership positively moderates on Board Structure–Firm Performance Relationship | The study did not consider foreign equity flows, Inflation rate and domestic Savings<br><br>The study used OLS<br><br>The study did not consider asymmetric effects | This study captured foreign equity flows, Inflation rate and domestic savings<br>This study used ARDL and NARDL<br><br>This study captured asymmetric effects |
| Ratnawati & Hamid, (2015) | The Moderating Effect Of Managerial Ownership And Institutional Ownership On The Relationship Between Control Right And Earnings | Institutional ownership has no moderating effects | The study did not consider foreign equity flows, Inflation rate and domestic savings<br><br>The study used OLS | This study captured foreign equity flows, Inflation rate and domestic savings<br><br>This study used ARDL and NARDL |

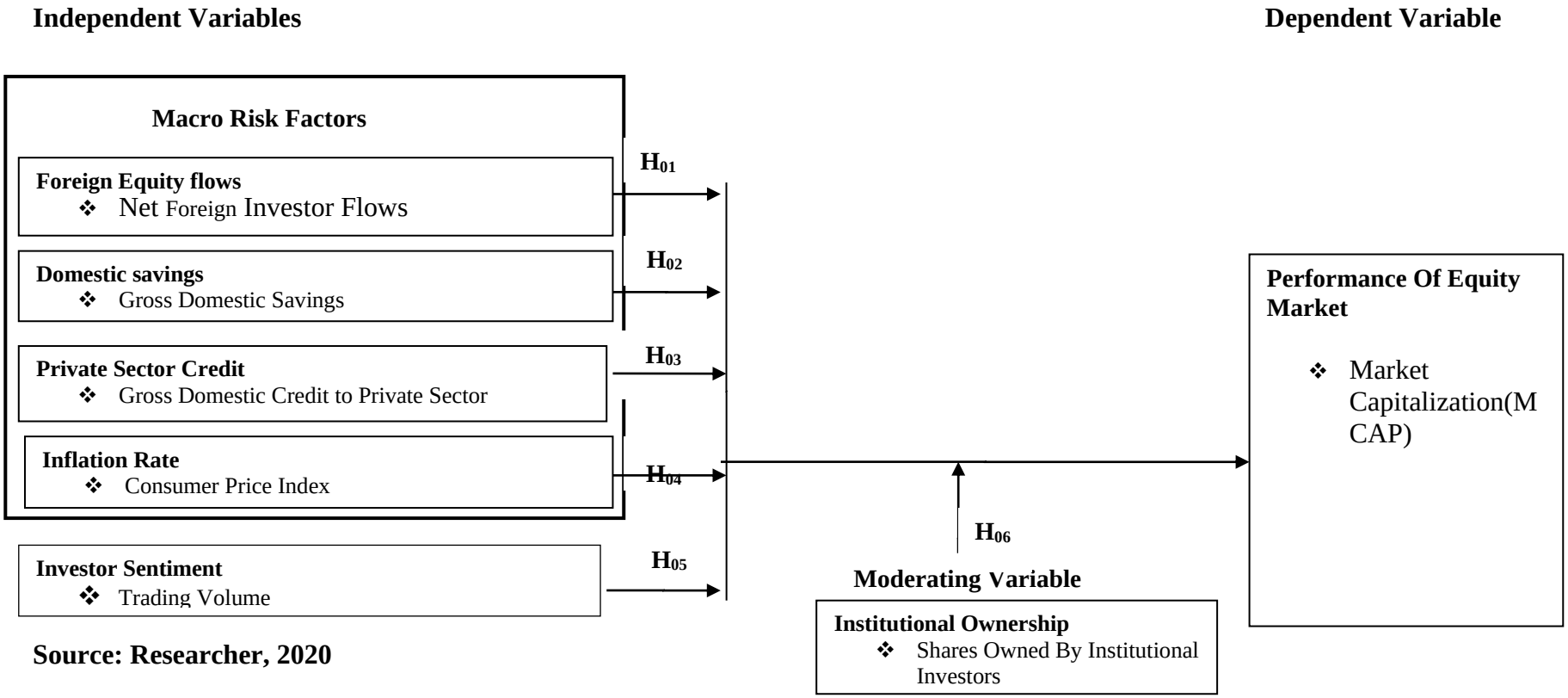
| | | | | |
|---|---|---|---|---|
| | Management | | The study did not consider asymmetric effects | This study captured asymmetric effects |
| Hsu, (2013) | The Moderating Effects Of Leverage And Ownership Structure On Firm Performance | Institutional ownership has positive moderating effects | The study did not consider foreign equity flows, Inflation rate and domestic Savings<br>The study used OLS<br>Did not consider Asymmetric effects | This study captured foreign equity flows, Inflation rate and domestic savings<br>The study used ARDL and NARDL<br>Captured asymmetric effects |
| Wang & Chen, (2013) | Market Momentum, Macroeconomic Factors And Investor sentiments In Taiwan Stock Exchange | macroeconomic factors-exchange rates and oil prices and Investor sentiments influence stock prices | The study did not consider foreign equity flows, Inflation rate and domestic savings<br>The study used VAR model<br>The study did not consider asymmetric effects | This study captured foreign equity flows, Inflation rate and domestic savings<br>This study used ARDL and NARDL<br>This study captured asymmetric effects |

| | | | | |
|---|---|---|---|---|
| Rashid, Hassan, & Yein, (2014) | Macroeconomics, Investor sentiments, And Islamic Stock Price Index In Malaysia | Money supply and Investor sentiments positively affect stock prices | The study used OLS<br><br>The study did not consider asymmetric effects | This study used ARDL and NARDL<br>Study captured asymmetric effects |
| Chiu, Harris, Stoja, & Chin, (2016) | Financial Market Volatility, Macroeconomic Fundamentals And Investor sentiments | Macroeconomic fundamental and Investor sentiments influence stock volatility | The study did not consider foreign equity flows, Inflation rate and domestic savings<br><br>The study used VAR model<br><br>The study did not consider asymmetric effects | Study captured foreign equity flows, Inflation rate and domestic savings<br>Study used ARDL and NARDL<br><br>Captured asymmetric effects |

**Source: Researcher, 2020.**

## 2.5 Conceptual Framework

The conceptual framework assimilates macro risk factors, Investor sentiments, institutional ownership and performance of equity market. The conceptual framework is a diagrammatic representation of relationships and interactions between the variables under study




**Source: Researcher, 2020**

**Figure 2.1: Conceptual Framework**

The conceptual framework presents the dependent variables, the independent variables and moderating variable. The independent variables are macro risk factors (namely foreign equity flows, domestic savings, private sector credit and inflation) and Investor sentiments. The dependent variable is performance of equity market measured by market capitalization. The moderating variable is institutional ownership. According to the conceptual framework, macro risk factors influence performance of the equity market. The relationship between macro risk factors, investor sentiment and performance of equity market is moderated by institutional ownership, which is hypothesized to strengthen or weaken the relationship between the dependent and independent variables. The variables were measured as follows; foreign equity flows is measured by net foreign investor flows, domestic savings is measured by gross domestic savings, private sector credit is measured by Gross domestic credit to private sector, Inflation rate is measured by the consumer price index while institutional ownership is measured by shares owned by institutional investors.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.0 Introduction

Chapter three sums up the philosophy of the study and research design, empirical model, population, sampling, variable operationalization and measurement, analysis of data and considerations for ethics

## 3.1 Research Philosophy

Wilson (2010) and Schlegel (2015) define research philosophy as the development, transmission and nature of knowledge. According to Saunders, Lewis and Thornhill (2016) research philosophy refers to assumptions and beliefs concerning how knowledge is developed. Consideration of the philosophical perspectives underpinning research and how these perspectives influence research methods and findings is crucial to the research process (Bryman & Bell, 2011). The research philosophy helps shape, clarify and identify working research designs and research designs not previously explored by other researchers (Wilson, 2010; Easterby-Smith, Thorpe & Jackson, 2008).

The main research philosophies include pragmatism, postmodernism, interpretivism, critical realism and positivism. Critical realism philosophy argues that the researcher's upbringing, culture and skewed worldviews affect research while interpretivism incorporates the researcher's subjectivity as part of research. On the other hand, the researcher's beliefs and doubts are the key drivers of pragmatism. Under postmodernism, power relations between the researcher and research influence the outcome of the research findings (Saunders, Lewis, & Thornhill, 2016).

Positivism research paradigm forms the backbone of the study. Positivism paradigm views reality as real, external and independent and advocates for the use of scientific methods when dealing with observable and measurable facts (Sharma., 2010). The researcher maintains an objective stance. (Saunders, Lewis, & Thornhill, 2016).

Existing financial theories were used to derive hypotheses for data collection, analysis and empirical testing to support or reject hypotheses. This was concurrence with Mogaka (2016). In view of the arguments for positivism, the study determined the effect of macro risk factors and investor sentiment on performance of equity market in NSE, Kenya and the moderating effect of institutional ownership on the relationship between macro risk factors and investor sentiment on performance of equity market in NSE, Kenya.

## 3.2 Research Design

Research design is a methodical framework for planning what is to be done, how it will be done and how data will be analysed (Heppner, Wampold, Thompson, & Wang, 2015). Sahu and Singh (2016) and Saunders, Lewis and Thornhill (2016) describe research design as the overal plan that allows the researcher to gather answers to study questions and test hypotheses. The research design is the means through which the researcher can answer the questions under consideration (Flick, 2008). The researcher evaluates the research designs available and selects the most apropriate design for the research questions. The decision to use a particular research design is pegged on the ability of the design to provide valid results (Vogt, Gardner, & Haeffele, 2015).

Explanatory research attempts to clarify why and how there is a relationship between two or more variables (Andrew, Pedersen, & McEvoy, 2011; Engel & Schutt, 2009). The goal of explanatory research is to assess causal relationships between variables inorder to determine the accuracy of a theory, extend a theory to a new context, advance knowledge about an underlying process and to provide evidence to support or refute a statement (Thyer, 2010). Therefore, an explanatory research design explains the effect of the independent variables on the dependent variables and the nature of such relationships.

The study therefore adopted an explanatory research design to explain causal relations between macro risk factors, Investor sentiments and performance of equity market in NSE, Kenya.The independent variables were the macro risk factors; foreign equity flows,domestic savings, private sector credit,inflation. In addition

Investor sentiments was also used as an independent variable.The dependent variable was performance of equity market.The study also determined the moderatung effect of insititutional ownership on the relationship between macro risk factors,investor sentiment and performance of equity market in NSE, Kenya.

## 3.3 Empirical Model

The model selection and specification was based on stationarity test or unit root test. According to Shrestha and Bhatta (2018) and Wang (2014) methods used to analyze stationary data cannot be used on non-stationary data. According to Wooldridge (2008) a time series is considered stationary if its probability distribution remains constant over time. If all variables are stationary, OLS or VAR models can be used. If the variables are non stationary 1(1) or mixed stationarity, 1(1) and 1(0), then ARDL models should be used. If all variables are non stionary 1(1) then Johansen Test should be conducted (Brooks, 2008).

Inorder test for long run equilibrium relationships between variables, cointegration test shoud be carried out. If cointegration does not exist, then only the short run ARDL should be conducted. However, if the presence of cointegration is detected, then an error correction model or vector should be conducted.The presence of cointegration indicates causality at least in one direction and so granger causality test should be conducted. Model selection was based on the model selection criteria by Meo (2018) and Shrestha and Bhatta (2018) as illustrated by Figures 3.3a.and Figures 3.3b

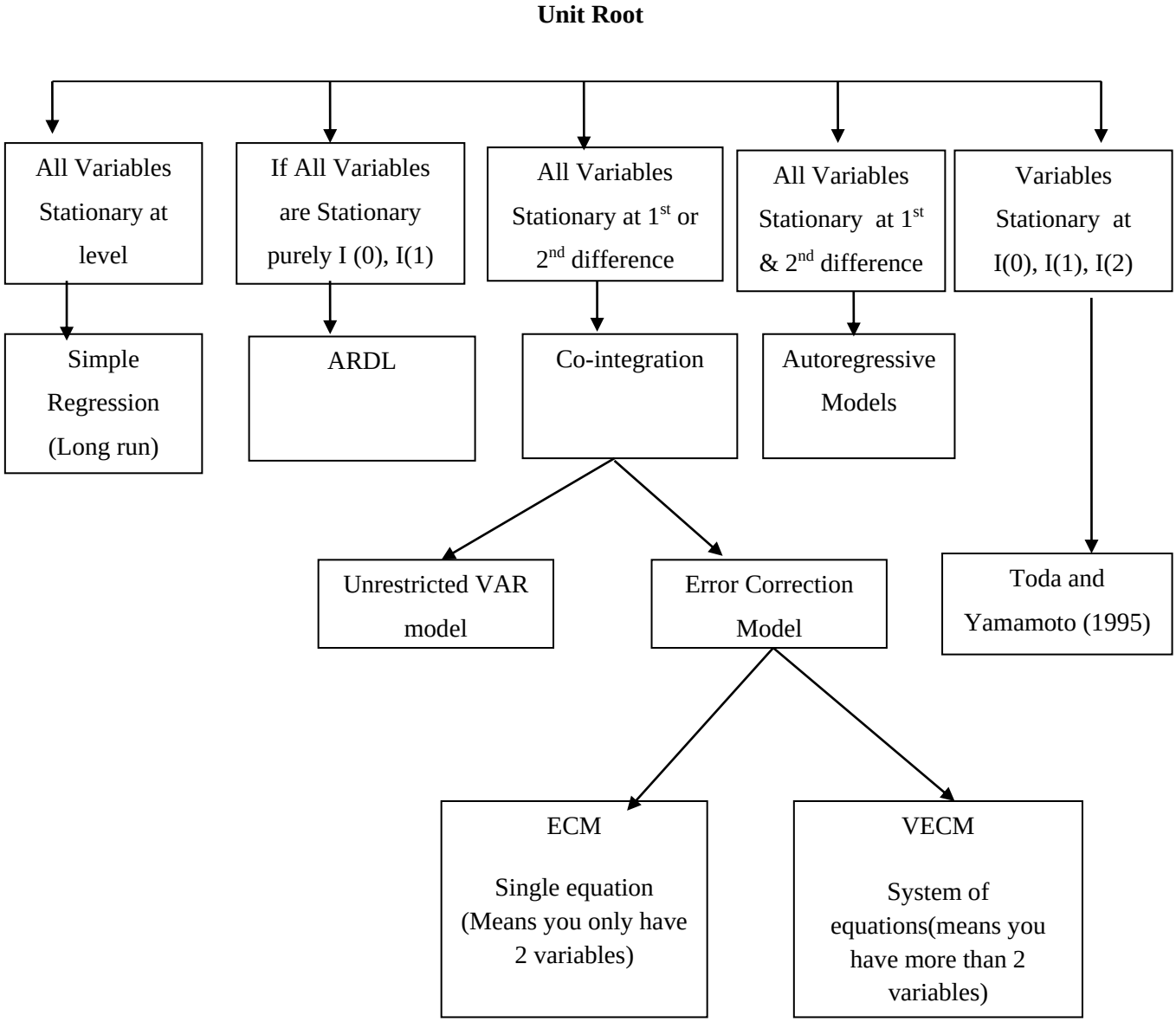



**Figure 3.3a: Model Selection Criteria Based On Unit Root Test**

Figure 3.3a indicates the statistical model selection criteria based on stationarity test whereby model selection depends on the stationarity of the variables.

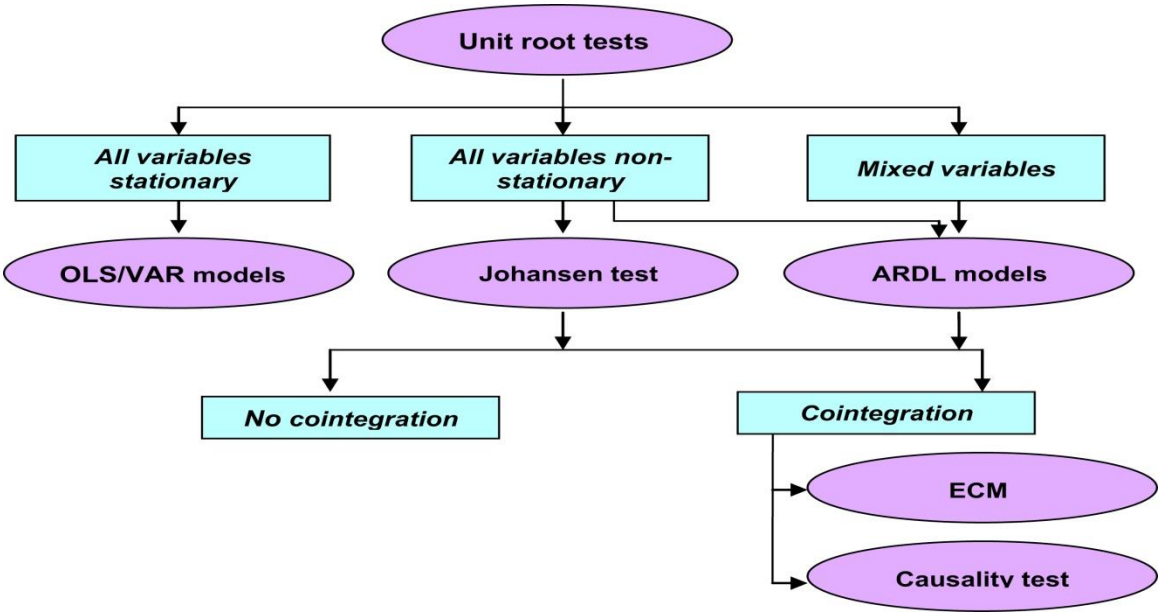



**Figure 3.3b: Model Selection Criteria Based On Unit Root Test**

**Source: Shrestha & Bhatta (2017)**

Figure 3.3b indicates that if all variables are non stationary then johansen test should be done. If all variables are nonstationary or of mixed stationarity, an ARDL model should be estimated. The presence of cointegration should be followed by an error correction model and causality tests.

### 3.3.1 Model Specification

The study adopted an ARDL model developed by Pesaran, Smith and Shin(2001) and applied by Odhiambo(2010), Ahmed and Ullah(2013) and Ho( 2017) to determine the effect of macro risk factors and Investor sentiments on performance of equity market in NSE, Kenya. The model was selected because the variables were of mixed stationarity; Market capitalisation, domestic savings, private sector credit, Inflation rate andInvestor sentiments were non stationary and had to differenced to become stationary 1(1). Foreign equity flows and institutional ownership were stationary at level. Guided by Meo(2018) and Shrestha & Bhatta (2018) (see figures 3.3a and 3.3b) the study adopted an ARDL model. Further, the model tested for cointegration and the presence of cointegration was followed by granger causality test as stipulated by Shrestha & Bhatta (2018).

The generalised ARDL (p,q) model is specified as follows.

$$Y_t = \gamma_{0i} + \sum_{i=1}^{p} \delta_i Y_{t-1} + \sum_{i=0}^{q} \acute{\beta}_\iota X_{t-1} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

(3.1)

Where $Y_t$ is a vector and the variables in $X_t$ are allowed to be integrated of order zero, I(0) or integrated of order one, I(1) or co integrated. $\beta$ and $\delta$ are coefficients while $\gamma$ is a constant. $i = 1 \ldots$k number of variables in the model; p, q represent optimal lag orders for dependent and independent variables respectively while $\varepsilon_{it}$ is the vector or error terms. From equation 3.1, the dependent variable $Y_t$ is a function of its own lags and the current and lagged values of the independent variables (Pesaran, Smith, & Shin, 2001). The study converted all data series to natural logs for rescaling purposes and pulling in for values extreme as recommended by Brooks (2008). Adding specific values to equation 3.1 yields equation 3.2.

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$$\ln \mathrm{PEM}_t = \gamma_{0i} + \sum_{i=1}^{p} \delta_i \ln \mathrm{PEM}_{t-1} + \sum_{i=0}^{q} \acute{\beta}_1 \ln FEF_{t-1} + \sum_{i=0}^{q} \acute{\beta}_2 \ln DS_{t-1} + \sum_{i=0}^{q} \acute{\beta}_3 \ln PSC_{t-1} + \sum_{i=0}^{q} \acute{\beta}_4 \ln IF_{t-1} + \sum_{i=0}^{q} \acute{\beta}_5 \ln IS_{t-1} + \varepsilon_{it}$$

.....3.2

Where LnPEM=Log of Performance of Equity Market (Market capitalization was used as proxy for performance of equity market being equivalent to aggregated: share market price*Outstanding shares)

Ln$FEF$=Log of Foreign Equity Flows,

Ln$DS$ =Log of Domestic Savings

Ln$PSC$= Log of Private Sector Credit

Ln$IF$= Log of Inflation Rate

Ln $IS$=Log of Investor sentiments

$\beta_{1-5}$ and $\delta$ are coefficients while $\delta$ is a constant.

### 3.3.2 Moderation Effect of Institutional Ownership

The study employed two-step hierarchical multiple regression proposed by Cohen, Cohen, West and Aiken (2003) and used by Razi,

Karim and Mohamed (2012) to determine the moderating effect of institutional ownership on macro risk factors and Investor sentiments on performance of equity market. In step one, equation 3.3 capturing the main effects of the independent and moderator variables are estimated as indicated below.

$$\ln PEM = \beta_0 + \beta_1 FEF_1 + \beta_2 DS_2 + \beta_3 PSC_3 + \beta_4 IF_4 + \beta_5 IS_5 + \beta_6 IO_6 + \varepsilon_{it} \quad \ldots\ldots 3.3$$

Step two incorporated the moderation effects estimated by entering the independent variables and the interaction/moderation variables to obtain equation 3.4 shown below.

$$\ln PEM = \beta_0 + \beta_1 FEF_1 + \beta_2 DS_2 + \beta_3 PSC_3 + \beta_4 IF_4 + \beta_5 IS_5 + \beta_6 (FEF * IO) + \beta_7 (DS * IO) + \beta_8 (PSC * IO) + \beta_9 (IF * IO) + \beta_{10} (IS * IO) + \varepsilon_{it} \quad \ldots\ldots 3.4$$

The decision criteria by Cohen, Cohen, West and Aiken (2003) was be used. If $\beta_6$ to $\beta_{10}$ in models 3.4 are not significant but $B_6$ in equation 3.3 is significant then insititutional ownership is just an explanatory variable. However if $\beta_6$ to $\beta_{10}$ in models 3.4 are significant, then institutional ownership is a moderator whose effect and direction is given by the $\beta_{is}$ (Aguinis, 2004; Baron & Kenny, 1986).

## 3.4 Operationalization And Measurements Of Study Variables

Table 3.1 below presents how the study operationalized and measured the variables under study. The variables were selected based on empirical studies. All the data was logarithm transformed by taking the natural logarithms of all the variables raw data for harmonization, rescaling and removal of outliers and normalization of the data as suggested by Brooks (2008)

**Table 3.1 Variable Operationalization And Measurement**

| **Variable Type** | **Variable** | **Operationalization** | **Measure** | **Measurement Scale** | **Direction Hypothesized** |
|---|---|---|---|---|---|
| Dependent Variable | Performance Of Equity Market | ❖ Measures the market value of listed company for shares issued | ❖ Market capitalization(Shares outstanding * market price per share) | Ratio | Positive |
| Independent Variables | Foreign Equity Flows | ❖ Measures the net value of foreign investor investment in the equity market in Kenya shillings | ❖ Net foreign investor flows(Foreign investor inflows less foreign investor outflows in KSH) | Ratio | Negative |

| | | | | | |
|---|---|---|---|---|---|
| | Domestic Savings | ❖ Comprises of household savings, public savings(government) and private savings(companies) | ❖ Gross Domestic Savings in millions (KSH) | Ratio | Positive |
| | Private Sector Credit | ❖ Growth in credit advanced to the private sector | ❖ Gross Domestic credit to private sector in Millions (KSH) | Ratio | Negative |
| | Inflation rate | ❖ Rate of change in commodity prices | ❖ Consumer Price Index | Ratio | Negative |
| | Investor sentiments | ❖ Investor misevaluation of stock prices | ❖ Trading Volume in millions | Ratio | Positive |
| Moderating Variable | Institutional Ownership | ❖ Ownership stake in companies held by large organizations | ❖ shares owned by institutional investors in millions | Ratio | Positive |

**Source: Researcher (2020)**

## 3.5 Target Population

Target population refers to a division of the general population that forms the focus of the research enquiry (Herkowitz, Garfin, Eismont, Bell, & Balderston, 2011). Whitley, kerlinger and Lee (2008) assert that target population is synonymous with universe in which the findings of a study are generalised. Jani (2014) adds that a target population is a collection of all subjects for the purpose of inference about a certain phenomenon.The study's target population was all 67 firms listed in Nairobi Securities in Kenya as at December 2018 as listed in Nairobi securities exchange all share index. The data for the 67 firms is aggregated on a monthly basis for all the periods (2008-2018) hence time series data and not panel data was used.

## 3.6 Sampling Design

A sample is a component of a larger population from which data collection, summary and analysis is done for inferences to be drawn about the target population (Lohr, 2009). Sampling involves selection and observation of a section of the population in order to facilitate inferences about the general population (Thompson, 2012). A census of all listed firms was conducted for the 67 companies as at 2018 since the number of firms was small. In addition, calculation of aggregated market capitalization on Nairobi securities Exchange All Index was already adjusted for newly listed, delisted, suspended and financially failed firms (Nairobi Securities Exchange , 2020). Lavrakas (2011) contends that a Census provides more validity to a study through provision of more rich information that would otherwise not be obtainable by other approaches.

## 3.7 Data Collection Instrument

Data collection refers to the process of gathering information and evidence to provide a solution to the problem being addressed by the study. The study relied on secondary data for analysis. Secondary data provides ease and convenience compared to other sources of data (Saunders, Lewis, & Thornhill, 2016). The use of secondary data was also best suited for the objectives of the study and the hypotheses used to address the problem of the study. Document review guide (See Appendix 5) was used for data collection of secondary data. This is consistent with

Gatuhi (2015) and Elly and Oriwo (2013).

## 3.8 Data Collection Procedure

The researcher obtained Kenyatta university graduate school approval letter from the university, which was used to obtain a research permit from National Commission of Science and Innovation (NACOSTI) allowing the researcher conduct research in Nairobi, County. Monthly secondary data on market capitalization was obtained from the aggregated figures provided by the Capital Markets Authority and the Nairobi Securities Exchange. Monthly secondary data on foreign equity flows and Investor sentiments was obtained from the Capital Market Authority's website, reports and handbooks. Monthly Secondary data on private sector credit and Inflation rate was obtained from the Kenya national bureau of statistics and central bank of Kenya. Data on domestic savings, inflation, foreign equity flows, private sector credit, Investor sentiments, Inflation rate and institutional ownership was obtained from KNBS, CBK, CMA, NSE and World Bank.

## 3.9 Data Analysis And Presentation

Descriptive and inferential statistics were used to elaborate the data and facilitate deduction assisted by STATA 13. Descriptive statistics were used to give a general feel of the data in terms of central tendency and dispersion. The mean was used as the main measure of central tendency as it was more representative and included all the observations. The study used standard deviation as the key measure of dispersion because it is not affected by fluctuations in the sample. The standard deviation is also closely related to the mean. The maximum and minimum values were used to elaborate how the data deviated from the mean.

Correlation analysis was also conducted with the aid of Karl Pearson's correlation matrix. Correlation analysis was crucial in detecting the level of interconnectedness and association between the variables under study and in determination of potential multicollineality between macro risk factors, investor sentiment and performance of equity market.

Stationarity test for unit root was used to determine the analysis model for the data. If all variables were stationary, then OLS or VAR models was to be used. However, if not all are stationary or mixed then Johansen or ARDL model was to be used for analysis. In addition, in order to test for cointegration, the ARDL bounds test was conducted to determine the existence of a long run relationship between the macro risk factors, Investor sentiments and performance of equity market. The study adopted ARDL models to eliminate problems associated with autocorrelation and omitted variables to determine long run and short run components for time series with mixed order variables in a single equation framework. (Emerald Publishing Group, 2015; Kreinovich & Sriboonchitta, 2018). Furthermore, the empirical studies, which used ARDL model, assumed a symmetrical relationship between the variables (Odhiambo, 2010; Akbar, Ali & Khan 2012; Ahmed and Ullah 2013 and Wanja (2017). However, relationships between most time series economic variables is not linear as positive and negative values of the independent variable have effects of different magnitudes on the dependent variable due to asymmetric effects (Bock, Chiodi, & Mineo, 2012). Consequently, the study decomposed the independent variables into positive and negative values in order to test for asymmetric effects or nonlinearity using Nonlinear Autoregressive Distributed Lag model (NARDL). The ARDL model was recommended by Pesaran, Smith and Shin (2001) and used by Shahbaz, Ahmed, & Ali, (2008) and Shahbaz, Rehman and Afza(2015). The NARDL model was adapted from Shin, Yu and Greenwood-Nimmo (2014). The study's findings are presented in tables, graphs and figures.

Diagnostic tests were conducted first to avoid violation of the classical linear regression model. Consequently, Diagnostic tests of normality, heteroscedasticity, multicollineality, autocorrelation, stationarity and model stability test were conducted and the appropriate remedial measures taken to correct violations of the classical linear regression model. This was followed by model estimation to test the hypotheses under the joint null hypothesis that all the coefficients are not different from Zero at 95 percent confidence level . P-values were used for analysis at 5 percent significance level.

### 3.9.1 Diagnostic Tests

Diagnostic tests were conducted in line with the classical linear regression model in order to ensure that the ordinary least squares estimators are unbiased, efficient and linear. Violation of classical linear regression assumptions leads to inefficient and biased estimators which are unreliable for hypothesis testing. The diagnostic tests conducted include normality, heteroscedasticity, multicollineality, autocorrelation, stationarity and model stability test.

#### 3.9.1.1 Normality

Normality assumes that the regressor's disturbance terms are distributed normally allowing for the use of parametric tests, which rely on normality assumptions (Seddighi, 2013). Deviations from normality lead to inconsistent estimators (Brooks, 2008). The Jarque Bera (1980) test based on skewness and kurtosis was used. According to Wang, Yang, Yang, Guo and Tan (2014) variables are normally distributed when the Jarque Bera statitistic is zero, Skewness is zero and kurtosis is equivalent to 3. Data approaches normal distribution as Jarque Bera statistic approaches Zero (Ruppert, 2010). Brooks (2008) and Seddighi (2013) suggest that log transformations, removal of ouliers and dummy variables can be used to normalise the data. Consequently, log transformations of the data were used to normalise the data and remove outliers.

#### 3.9.1.2 Test For Heteroscedasticity

Heteroscedasticy refers to a scenario whereby the variance of residuals is not constant over time as stipulated by the classical linear regression model (Youseop, 2017). According to Webster (2013) OLS estimates are unbiased in the presence of heteroscedasticity but inefficient regardless of the sample size. Brooks (2008) recomends whites test for heteroscedasticity under the null hypothesis of homoscedasticity. Remedies for heteroscedasticity include the use of weighted least squares which is a variation of the generalised least squares (Sen & Srivastava, 2012).

#### 3.9.1.3 Test For Multicollineality

Multicollineality results from high correction between regressors. Multicollineality has adverse effects on multiple regression analysis (Whitley & Kite, 2012). According to Kacapyr (2015) multicollineality leads to Inflation Rateof the standard errors of regression coefficients which lead to nonsignificant statistical tests and erroneous conclusions that that there is no relationship between the predictor and criterion variables. Multicollineality can also lead to misleading conclusions about the $R^2$. If two predictor variables are highly correlated, when the relationship of the predictor variable is partialed our of the criterion variable, the second predictor variable is only left with only a small partial correlation with the criterion variable (Neeleman, 2012). According to Whitley and Kite (2012) the easiest way of determining multicollineality is assessing the correlation matrix. Correlation matrix was used to test for multicollineality. Correlation coefficients of 0.8 or more indicate the presence of multicollineality (Whitley & Kite, 2012; Brooks & Tsolacos, 2010).

#### 3.9.1.4 Test For Autocorrelation

Autocorrelation occurs when the values of the dependent variable is related to its lagged values in violation of the linear regression assumption of independence of error terms (Anderson, Sweeney, Williams, Camm, & Cochran, 2015). Presence of autocorrelation in a model leads to insignificant and inefficient parameters, which cannot be used in hypothesis testing (Sinno & Makki, 2018). Breutch Godfrey serial correlation LM test was used to test for autocorrelation under the null hypothesis of no autocorrelation in the residuals. According to Dougherty (2011) the rule of thumb is that a P value greater than 5 percent indicates no autocorrelation and the null hypothesis is rejected. Brooks and Tsolacos (2010) recommend the use of generalized least squares in the presence of autocorrelation. The study used lags of the dependent variable in the model to eliminate autocorrelation.

#### 3.9.1.5 Stationarity Test

According to Wooldridge (2008) a time series is considered stationary if its probability distribution remains constant over time. Brooks(2008) adds that a stationary series must have a constant mean, variance and autocovariance. Verbeek

(2008) notes that running regression analysis with non stationary dependent and independent variables leads to spurious or nonsense regression characterised by misleading estimators and coefficients. Kočenda (2015) proposes the use of Augmented Dicker Fuller Test(ADF) and Philip peron test (PP) to test for non stationarity under the null hypothesis of series contains unit root and the alternate hypothesis of stationarity. If all variables stationary then VAR/OLS models can be used. However, in case all variables are non stationary or mixed, then Johansen test or ARDL model should be applied. ARDL model was used since some of the variables were stationary at level and stationary at first difference. According to Ye (2013) stationary and non stationary time series data requires different statistical procedures for inference to avoid biased estimators and wrong conclusions. Since time series data are nonstationary, the statistical model has to address non stationarity to avoid spurious or nonsense regression (Wang, 2014). ARDL model is justified since it eliminates problems associated with autocorrelation and omitted variables. ARDL model was used to determine long run and short run components for time series with mixed order variables in a single equation framework by allowing the dependent variable to be affected by lags of the dependent variable, the current and lagged values of the independent variables (Emerald Publishing Group, 2015; Kreinovich & Sriboonchitta, 2018).

#### 3.9.1.6 Stability Test

The classical linear regression model assumes that the regression parameters are constant across the sample, data and period of the study (Brooks, 2008). Heshmati (2017) recommends the use of cumulative sum (CUSUM) and Cumulative sum of squares(CUSUMSQ) to test for stability under the null hypothesis of parameter stability. For a regression model to be considered stable, the plots of both CUSUM and CUSUMSQ should lie within the lower and upper critical values at 5 percent significance level (Pesaran , 2018).

### 3.9.2 The Short Run And Long Run ARDL Regression

Once diagnostic tests have been conducted and the all variables are non stationary or mixed stationarity that stationary at level and stationary at first difference, I(O) and I(1), the following combined short run and long run ARDL model by Pesaran, Smith, & Shin (2001) was estimated as shown by equation 3.5 below

$$\Delta \ln \mathrm{PEM}_t = \rho_0 + \sum_{i=1}^{p} \rho_{1i} \Delta \ln \mathrm{PEM}_{t-1} + \sum_{i=0}^{q} \rho'_{2\iota} \Delta \ln FEF_{t-1} + \sum_{i=0}^{q} \rho'_{3\iota} \Delta \ln DS_{t-1} + \sum_{i=0}^{q} \rho'_{4\iota} \Delta \ln PSC_{t-1} + \sum_{i=0}^{q} \rho'_{5\iota} \Delta \ln IF_{t-1} + \sum_{i=0}^{q} \rho'_{6\iota} \Delta \ln IS_{t-1} + \rho_7 \ln PEM_{t-1} + \rho_8 \ln FEF_{t-1} + \rho_9 \ln DS_{t-1} + \rho_{10} \ln PSC_{t-1} + \rho_{11} \ln IF_{t-1} + \rho_{12} \ln IS_{t-1} + \varepsilon_{it} \quad \ldots 3.5$$

Where the coefficients of first differenced variables $\rho_{2i}, \rho_{3i}, \rho_{3i}, \rho_{4i}, \rho_{5i}, \rho_{6i}$ indicate the short run effects of macro risk factors and Investor sentiments on performance of equity market in NSE, Kenya. The long run effects are presented by the coefficients of lagged macro risk factors and Investor sentiments, $\rho_8, \rho_9, \rho_{10}, \rho_{11}, \rho_{12}$ normalized on $\rho_7$. The optimum lag length was determined using Akaike Information criteria (AIC). Cointegration in the model is a prerequisite for the long run coefficients to be valid. Consequently, the joint standard F test was used to check the significance of coefficients of level variables, $\rho_7 - \rho_{12}$, in equation 3.5 as a indicators of cointegration under the null hypothesis of no cointegration using Pesaran, Smith and Shin (2001) distribution and critical values.

### 3.9.3 Nonlinear ARDL Regression (NARDL)

Previous studies have assumed that changes in macro risk factors and Investor sentiments affect performance of equity market symmetrically or lineally. However, most time series economic data has asymmetric effects or nonlinearity (Bock, Chiodi, & Mineo, 2012). According to Khan, Teng and Khan (2019) NARDL allows for testing of the effect of positive and negative variations in the independent variables on the dependent variables in the short and long run. NARDL model will facilitate short run and long run tests for cointegration in a single equation Framework. The current study examined short run and long run asymmetric effects or Nonlinearity of macro risk factors and Investor sentiments on performance of equity market using the model recommended by Shin, Yu and Greenwood-Nimmo(2014) whereby macro risk factors and Investor sentiments were decomposed into positive and negative partial sums as shown in equations 3.6

$$\Delta\ln FEF^{+}{}_{t} = \sum_{j=1}^{t} \Delta\ln FEF^{+}{}_{j} = \sum_{j=1}^{t} \max(\Delta\ln FEF_{j}, 0)$$

$$\Delta\ln FEF^{-}{}_{t} = \sum_{j=1}^{t} \Delta\ln FEF^{-}{}_{j} = \sum_{j=1}^{t} \min(\Delta\ln FEF_{j}, 0)$$

$$\Delta\ln DS^{+}{}_{t} = \sum_{j=1}^{t} \Delta\ln DS^{+}{}_{j} = \sum_{j=1}^{t} \max(\Delta\ln DS_{j}, 0)$$

$$\Delta\ln DS^{-}{}_{t} = \sum_{j=1}^{t} \Delta\ln DS^{-}{}_{j} = \sum_{j=1}^{t} \min(\Delta\ln DS_{j}, 0)$$

$$\Delta\ln PSC^{+}{}_{t} = \sum_{j=1}^{t} \Delta\ln PSC^{+}{}_{j} = \sum_{j=1}^{t} \max(\Delta\ln PSC_{j}, 0)$$

$$\Delta\ln PSC^{-}{}_{t} = \sum_{j=1}^{t} \Delta\ln PSC^{-}{}_{j} = \sum_{j=1}^{t} \min(\Delta\ln PSC_{j}, 0)$$

$$\Delta\ln IF^{+}{}_{t} = \sum_{j=1}^{t} \Delta\ln IF^{+}{}_{j} = \sum_{j=1}^{t} \max(\Delta\ln IF_{j}, 0)$$

$$\Delta\ln IF^{-}{}_{t} = \sum_{j=1}^{t} \Delta\ln IF^{-}{}_{j} = \sum_{j=1}^{t} \min(\Delta\ln IF_{j}, 0)$$

$$\Delta\ln IS^{+}{}_{t} = \sum_{j=1}^{t} \Delta\ln IS^{+}{}_{j} = \sum_{j=1}^{t} \max(\Delta\ln IS_{j}, 0)$$

$$\Delta\ln IS^{-}{}_{t} = \sum_{j=1}^{t} \Delta\ln IS^{-}{}_{j} = \sum_{j=1}^{t} \min(\Delta\ln IS_{j}, 0) \quad \text{……..……3.6}$$

A nonlinear model similar to the one developed by Shin, Yu and Greenwood-Nimmo (2014) was generated by replacing the macro risk factors and Investor sentiments, LnFEF, LnDS, LnPSC, LnIF, LnIS in equation 3.5 with the decomposed components of partial sums in equation 3.6. Pesarans *et al*., (2001) bounds test was used to test for asymmetric effects or Nonlinearity as indicated in equation 3.7 below

$$\Delta\ln\mathrm{PEM}_{t} = \gamma_{0} + \sum_{i=1}^{p} \gamma_{1i}\, \Delta\ln\mathrm{PEM}_{t-1} + \sum_{i=0}^{q} \gamma'_{2\iota}\, \Delta\ln FEF^{+}_{t-1} + \sum_{i=0}^{q} \gamma'_{2\iota}\, \Delta\ln FEF^{-}_{t-1} + \sum_{i=0}^{q} \gamma'_{3\iota}\, \Delta\ln DS^{+}_{t-1} + \sum_{i=0}^{q} \gamma'_{4\iota}\, \Delta\ln DS^{-}_{t-1} + \sum_{i=0}^{q} \gamma'_{5\iota}\, \Delta\ln PSC^{+}_{t-1} + \sum_{i=0}^{q} \gamma'_{6\iota}\, \Delta\ln PSC^{-}_{t-1} + \sum_{i=0}^{q} \gamma'_{7\iota}\, \Delta\ln IF^{+}_{t-1} + \sum_{i=0}^{q} \gamma'_{8\iota}\, \Delta\ln IF^{-}_{t-1} + \sum_{i=0}^{q} \gamma'_{9\iota}\, \Delta\ln IS^{+}_{t-1} + \sum_{i=0}^{q} \gamma'_{10\iota}\, \Delta\ln IS^{-}_{t-1} + \gamma'_{11}\ln\mathrm{PEM}_{t-1} + \gamma_{12}\ln FEF^{+}_{t-1} + \gamma_{13}\ln FEF^{-}_{t-1} + \gamma_{14}\ln DS^{+}_{t-1} + \gamma_{15}\ln DS^{-}_{t-1} + \gamma_{16}\ln PSC^{+}_{t-1} + \gamma_{17}\ln PSC^{-}_{t-1} + \gamma_{18}\ln IF^{+}_{t-1} + \gamma_{19}\ln IF^{-}_{t-1} + \gamma_{20}\ln IS^{+}_{t-1} + \gamma_{21}\ln IS^{-}_{t-1} + \varepsilon_{it} \quad \text{……...…..3.7}$$

Equation 3.6 was estimated using the OLS and then NARDL bounds test and F test were used to establish asymmetric effects or Nonlinearity between performance of equity market and the positive and negative partial sums of macro risk factors-foreign equity flows, domestic savings, private sector credit and Inflation rate and Investor sentiments. Statistically significant partial sum components coefficients $\gamma_{2i} - \gamma_{10i}$ indicate short run asymmetric effects or nonlinearity while coefficients $\gamma_{12-}\gamma_{21}$ indicate long run asymmetric effects.

### 3.9.4 Granger Causality

According to Engle and Granger (1987) the presence of cointegration is an indication of granger causality between variables at least in one direction. Consequently, if the Joint F test and ARDL bounds test signify the presence of cointegration, the following equations were estimated to test for causality for both symmetric and asymmetric models as indicated in equations 3.8 and 3.9 respectively.

$$\Delta \ln PEM_t = \lambda_0 + \sum_{i=1}^{p} \lambda_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \lambda_{2\iota}^{'} \Delta \ln FEF_{t-1} + \lambda_3 \ln PEM_{t-1} + \lambda_4 \ln FEF_{t-1} + \omega_{it}$$

$$\Delta \ln PEM_t = \lambda_0 + \sum_{i=1}^{p} \lambda_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \lambda_{2\iota}^{'} \Delta \ln DS_{t-1} + \lambda_3 \ln PEM_{t-1} + \lambda_4 \ln DS_{t-1} + \omega_{it}$$

$$\Delta \ln PEM_t = \lambda_0 + \sum_{i=1}^{p} \lambda_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \lambda_{2\iota}^{'} \Delta \ln PSC_{t-1} + \lambda_3 \ln PEM_{t-1} + \lambda_4 \ln PSC_{t-1} + \omega_{it}$$

$$\Delta \ln PEM_t = \lambda_0 + \sum_{i=1}^{p} \lambda_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \lambda_{2\iota}^{'} \Delta \ln IF_{t-1} + \lambda_3 \ln PEM_{t-1} + \lambda_4 \ln IF_{t-1} + \omega_{it}$$

$$\Delta \ln PEM_t = \lambda_0 + \sum_{i=1}^{p} \lambda_{1i} \Delta \ln PEM_{t-1} +$$
$$\sum_{i=0}^{q} \lambda_{2\iota}^{'} \Delta \ln IS_{t-1} + \lambda_3 \ln PEM_{t-1} + \lambda_4 \ln IS_{t-1} + \omega_{it} \quad \text{.....3.8}$$

Equations 3.8 explain how much variation in performance of equity market can be explained by macro risk factors and Investor sentiments in a linear model

$$\Delta \ln PEM_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \gamma'_{2\iota} \Delta \ln FEF^{+}{}_{t-1} + \sum_{i=0}^{q} \gamma'_{3\iota} \Delta \ln FEF^{-}{}_{t-1} + \gamma_4 \ln PEM_{t-1} + \gamma_5 \ln FEF^{+}{}_{t-1} + + \gamma_5 \ln FEF^{-}{}_{t-1} + \upsilon_{it}$$

$$\Delta \ln PEM_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \gamma'_{2\iota} \Delta \ln DS^{+}{}_{t-1} + \sum_{i=0}^{q} \gamma'_{3\iota} \Delta \ln DS^{-}{}_{t-1} + \gamma_4 \ln PEM_{t-1} + \gamma_5 \ln DS^{+}{}_{t-1} + + \gamma_5 \ln DS^{-}{}_{t-1} + \upsilon_{it}$$

$$\Delta \ln PEM_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \gamma'_{2\iota} \Delta \ln PSC^{+}{}_{t-1} + \sum_{i=0}^{q} \gamma'_{3\iota} \Delta \ln PSC^{-}{}_{t-1} + \gamma_4 \ln PEM_{t-1} + \gamma_5 \ln PSC^{+}{}_{t-1} + + \gamma_5 \ln PSC^{-}{}_{t-1} + \upsilon_{it}.$$

$$\Delta \ln PEM_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \gamma'_{2\iota} \Delta \ln IF^{+}{}_{t-1} + \sum_{i=0}^{q} \gamma'_{3\iota} \Delta \ln IF^{-}{}_{t-1} + \gamma_4 \ln PEM_{t-1} + \gamma_5 \ln IF^{+}{}_{t-1} + + \gamma_5 \ln IF^{-}{}_{t-1} + \upsilon_{it}$$

$$\Delta \ln PEM_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1i} \Delta \ln PEM_{t-1} + \sum_{i=0}^{q} \gamma'_{2\iota} \Delta \ln IS^{+}{}_{t-1} + \sum_{i=0}^{q} \gamma'_{3\iota} \Delta \ln IS^{-}{}_{t-1} + \gamma_4 \ln PEM_{t-1} + \gamma_5 \ln IS^{+}{}_{t-1} + + \gamma_5 \ln IS^{-}{}_{t-1} + \upsilon_{it}$$

……..…….3.9

Where PEM =performance of equity market

MRFIS = macro risk factors and Investor sentiments

Equations 3.9 explain how much variation in performance of equity market can be explained by macro risk factors and Investor sentiments in a nonlinear ARDL model also called asymmetric ARDL model.

**Table 3.2 Summary of Data Analysis Techniques**

| | **Objective** | **Methodology** |
|---|---|---|
| i. | To establish the effect of foreign equity flows on performance of equity market in NSE, Kenya. | ARDL and NARDL model |
| ii. | To establish the effect of domestic savings on performance of equity market in NSE, Kenya. | ARDL and NARDL model |
| iii. | To establish the effect of private sector credit on performance of equity market in NSE, Kenya. | ARDL and NARDL model |
| iv. | To determine the effect of Inflation rate on performance of equity market in NSE, Kenya. | ARDL and NARDL model |
| v. | To establish the effect of Investor sentiments on performance of equity market in NSE, Kenya. | ARDL and NARDL model |
| vi | To determine the moderating effect of institutional ownership on the relationship between macro risk factors and Investor sentiments on Performance of equity market in NSE, Kenya. | 2 step Hierarchical regression |

**Source: Researcher (2020)**

### 3.9.5 Ethical Considerations

Data was carefully analyzed and only information from credible sources was used for data analysis and presentation and only findings emanating from the study were reported. Secondly, data and information collected from third parties was fully acknowledged using the APA referencing style. In addition, Books, journals and other studies cited from third parties were fully acknowledged. A research permit from NACOSTI was obtained to facilitate data collection.

# CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

## 4.0 Introduction

Chapter four presents findings of the study, interpretation and discussion of results in form of tables and figures. The first section consist of descriptive statistics which was followed by diagnostic tests to ensure that classical linear regression assumptions were not violated leading to biased and non efficient estimators. This was followed by tests for hypotheses to determine the effect of macro risk factors, Investor sentiments on performance of equity market using inferential statistics.

## 4.1 Descriptive Statistics

Descriptive statistics including minimum and maximum value, standard deviation and mean were determined. The mean was the preferred measure of central tendency because it is more representative, uses all the scores in a distribution and is closely related to variance and standard deviation, which are the most common measures of variability (Gravetter, Wallnau, & Forzano, 2016). The standard deviation was selected because it is less affected by fluctuations of sample size compared to other measures of variation and it is also used for comparing correlation and skewness (Sharma, 2018). The descriptive statistics results are presented in table 4.1.

**Table 4.1 Descriptive Statistics**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| MC | 132 | 1627139 | 616745.5 | 834170 | 2817360 |
| FEF | 132 | 251.7576 | 2091.918 | -5799 | 9839 |
| DS | 132 | -19504.9 | 207220.7 | -399802.5 | 231353 |
| PSC | 132 | 1519258 | 666751.6 | 530705 | 2494085 |
| IF | 132 | 8.308712 | 4.565504 | 3.18 | 19.72 |
| IS | 132 | 3692.598 | 2877.756 | 289 | 7666 |
| IO | 132 | 9204.514 | 1201.212 | 5879.898 | 11772.22 |

**Source: Study Data (2020)**

**(KEY: MC; Market Capitalization, FEF; Foreign Equity flows, DS; Domestic Savings, PSC; Private Sector Credit, IF; Inflation Rate, IS; Investor sentiments, IO; Institutional Ownership)**

Table 4.1 shows that market capitalization has a mean value of KSH. 1627139 million with a standard deviation of 616745.5 million indicating a high degree of variation evidenced by a maximum value of 2817360 million against a minimum value of 834170.This indicates that market capitalization experience a lot of fluctuation over the period under study as evidenced by the standard deviation of 616745.5 and mean of KSH. 1627139 million.

Foreign equity flows measured by net foreign investor flows had an average value of KSH.251.7576 million and maximum value of KSH.9839 million and a minimum value of KSH.-5799 million indicating that some months experienced a decline in foreign equity flows. The standard deviation of KSH.2091.918 million indicates a large deviation of foreign equity flows from the mean indicating high volatility as evidenced by a minimum of KSH.-5799 million against a maximum value of KSH.9839 million.

Domestic savings measured by gross domestic savings has mean of KSH. -19504.9 million with a standard deviation of KSH 207220.7 million and maximum and minimum values of KSH. 231353 and KSH. -399802.5 indicating a low savings rate for the country during the period as supported by a minimum value of KSH. -399802.5 and a mean of -19504.9 million.

Private sector credit measured by gross credit to private sector has a mean of KSH. 1519258 million with a maximum value of KSH.2494085 million and a minimum value of KSH. 530705 million with a standard deviation of KSH. 666751.6 indicating difficulties in accessing credit by the private sector during the period. This is supported by the maximum value of KSH.2494085 million against a minimum value of KSH. 530705 million meaning that the fluctuations in private sector credit were starving key areas of the economy of the required funds for expansion.

Inflation rate measured by the consumer price index has a mean value of 8.308712 with a standard deviation of 4.565504 and maximum value of 19.72 and minimum value of 3.18, a big variation in Inflation rate during the period. This implied that Inflation rate experienced a lot of volatility over the period under study with a standard deviation of 4.565504 and a mean of 8.308712.This is supported by the maximum value of 19.72 and minimum value of 3.18. Investor sentiments measured by trading volume registered a mean value of 3692.598 million and standard deviation of 2877.7256 million with a maximum value of 7666 million against a minimum value of 289 million indicating sharp fluctuations in Investor sentiments during the period under study as supported by a minimum value of 289 million against a maximum value of 7666 million.

Institutional ownership has mean value of 9204.514 million and a standard deviation of 1201.212 million with a maximum value of 11772.22 million and a minimum value of 5879.898 million. This means that the changes in institutional holdings fluctuated over the period under study. This implied fluctuations in institutional holdings over the period under study as investors reacted to changes in the economic, political and social structures in the Kenyan equity market. This is supported by mean value of 9204.514 million and a standard deviation of 1201.212 million.

## 4.2 Diagnostic Tests Results

The study conducted diagnostic tests to ensure that the assumptions of the classical linear regression model were not violated. The diagnostic tests conducted include tests for normality, heteroscedasticity, multicollineality, autocorrelation, unit root and model stability. Violation of the assumptions of the classical linear regression model leads to biased, inefficient estimated estimators.

### 4.2.1 Normality Test Results

Jarque Bera statistic for normality was used to test for normality under the null hypothesis that the regressors' disturbance terms were normally distributed. It is important for data to be normally distributed since most parametric tests rely on normality assumptions. Jarque bera statistic is based on skewness and kurtosis,

which measures deviations from the mean and the fatness of the distribution tails. Skewness should lie between +2 and -2 while kurtosis should be between +3 and -3 for a normal distribution. The joint test for skewness and kurtosis is shown in table 4.2.

**Table 4.2: Jarque-Bera(Skewness And Kurtosis) Tests For Normality**

```
. sktest myresiduals

                    Skewness/Kurtosis tests for Normality
                                                        ------- joint ------
    Variable |    Obs   Pr(Skewness)   Pr(Kurtosis)  adj chi2(2)  Prob>chi2
-------------+-------------------------------------------------------------
 myresiduals |    132      0.2560         0.0160         6.65        0.0359
```

**Source: Study Data (2020)**

From Table 4.2, adj Chi statistic is 6.65 with a P value of 0.0359 that is less than 0.05; the null hypothesis of normality was rejected leading to the finding that the data was not normally distributed at 5 percent significance level. In concurrence with Rupert (2010) and Brooks (2008), the study used log transformations to normalize the data.

### 4.2.2 Heteroscedasticity Test

The study used whites test to test for heteroskedasticity because it is not sensitive to normality assumption violation. The test is also more representative as it is based on regression of the error term of all explanatory variables, their cross products and squares (Seddighi, 2013; Webster, 2013). The test was conducted under the null hypothesis that the error term is homoskedastic. The results are presented in table 4.3.

**Table 4.3: Whites Test Result**

```
. estat imtest,white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(20)     =     48.36
         Prob > chi2  =    0.0004

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |      48.36     20    0.0004
            Skewness |      27.17      5    0.0001
            Kurtosis |          .      1         .
---------------------+-----------------------------
               Total |          .     26         .
---------------------------------------------------
```

**Source: Study Data (2020)**

The findings in table 4.3 indicate that heteroscedasticity at 20 degrees of freedom has a chi statistic value of 48.36 with a P value of 0.0004. Since P value of 0.0004 is less than 0.05, at 5 percent significance level, the null hypothesis of homoscedasticity was rejected indicating the presence of heteroskedasticity. To solve the heteroscedasticity problem, Brooks (2008) recommends transformation of the variables into logs for rescaling the data to pool in extreme values. The study converted all the data to natural logarithms and analysis was conducted on the transformed data.

### 4.2.3 Multicollinearity Test

According to Brooks (2008) correlation matrix presents an efficient test of multicollinearity because of its simplicity. The independent variables used were foreign equity flows, domestic savings, private sector credit, inflation, Investor sentiments and institutional ownership as moderator. The findings of multicollinearity are presented in table 4.4

**Table 4.4: Multicollineality Test Results**

| | FEF | DS | PSC | IF | IS | IO |
|---|---|---|---|---|---|---|
| FEF | 1.0000 | | | | | |
| DS | 0.3379 | 1.0000 | | | | |
| PSC | -0.2679 | -0.8291 | 1.0000 | | | |
| IF | -0.1131 | 0.4695 | -0.4163 | 1.0000 | | |
| IS | 0.3342 | 0.6540 | -0.7077 | 0.1984 | 1.0000 | |
| IO | -0.0058 | -0.4043 | 0.3966 | -0.2297 | -0.2126 | 1.0000 |

**Source: Study Data (2020)**

**(**KEY: MC; Market Capitalization, FEF; Foreign Equity flows, DS; Domestic Savings, PSC; Private Sector Credit, IF; Inflation, IS; Investor sentiments, IO; Institutional Ownership)

According to Whitley and Kite (2012) the easiest way of determining multicollineality is assessing the correlation matrix; correlation coefficients of 0.8 or more indicate the presence of multicollineality. From the findings in Table 4.4 domestic savings and foreign equity flows had a correlation coefficient of 0.3379 which was an indication of no multicollineality. Private sector credit and foreign equity flows had a correlation coefficient of -0.2679 indicating no multicollineality, Inflation rate andforeign equity flows had a correlation coefficient of -0.1131 indicating no multicollineality. Investor sentiments and Institutional ownership had correlation coefficients of 0.3342 and -0.0058 with foreign equity flows respectively. Private sector credit and domestic savings had a correlation coefficient of -0.8291 indicating presence of multicollineality. Saunders, Lewis and Thornhill (2016) suggests ignoring multicollineality if the model is adequate in terms of appropriate sign and significant coefficients because multicollineality is not a variable but data problem and does not violate the classical linear regression assumptions. Brooks (2008) suggests elimination of one of the collinear variables to solve multicollinealty. However, due to the strong priori theoritical reasons, the study opted to convert their values into logs and used them in the regression.

### 4.2.4 Autocorrelation Test Results

The study employed Breusch Godfrey test to test for serial correlation because it is less sensitive to non-normal distribution of residuals and makes use of several lags to test for serial correlation, which is lacking in other methods. The null hypothesis for the test was no serial correlation. The results are shown below in Table 4.5.

**Table 4.5: Breusch Godgrey Serial Correlation LM Results**

| | | | |
|---|---|---|---|
| Breusch-Godfrey | LM | | test for autocorrelation |
| lags(p) | chi2 | df | Prob > chi2 |
| 2 | 105.883 | 2 | 0.0000 |
| | H0: no serial correlation | | |

**Source: Study Data (2020)**

Table 4.5 indicates a chi2 statistic of 105.883 at 2 degrees of freedom with a P value of 0.000. Since the P value of 0.000 is less than 0.05, the null hypothesis of no serial correlation was rejected indicating that the model suffers from serial correlation. The study added lags of the dependent and independent variable in the model to solve the serial correlation problem.

### 4.2.5 Unit Root Test Results

The study carried out unit root test on all variables using the Phillip Perron Test for unit root test to avoid nonsense regression. According to Goss (2013) Phillip perron test has greater power and is more definitive compared Augmented Dicker Fuller Test. This is because Phillip perron test allows for autocorrelation and heteroscedasticity in disturbances hence it is more robust than Augmented Dickey Fuller test, which is based on the assumption of homogeneity and independence (Hashim, Chalapat, Raganathan, & Murthy, 2009). The unit root tests results are presented in the table 4.6 below.

**Table 4.6: Unit Root Test Results**

| Variable | Level | | | First difference | | |
|---|---|---|---|---|---|---|
| | **Intercept** | **P value** | **Order** | **Intercept** | **P value** | **Order** |
| Market capitalization | | | | -1.284 | 0.6363 | 1(1) |
| Foreign Equity Flows | -6.558 | 0.0000 | 1(0) | | | |
| Domestic Savings | | | | -0.041 | 0.9938 | 1(1) |
| Private sector Credit | | | | 0.527 | 0.9969 | 1(1) |
| Inflation Rate | | | | -2.299 | 0.1723 | 1(1) |
| Investor sentiments | | | | -2.426 | 0.1345 | 1(1) |
| Institutional Ownership | -3.760 | 0.0033 | 1(0) | | | |

*The numbers in parenthesis are the respective probabilities.

**Source: Study Data (2020)**

From the findings in table 4.6. The series designated 1(1) were integrated of order 1 because the value of the Philip perron Z statistic was greater than 0.05 at five percent significance level so the null hypothesis of non-stationarity could not be rejected and the series had to be differenced to become stationary. The variables with the designation 1(0) meant that the series were integrated of order 0 because their Philip Perron Z statistic was less than the P value of 0.05 at five percent significance leading to rejection of the null hypothesis of non-stationarity and the finding that the series was stationary. The I(0) series were therefore stationary at their levels did not require differencing.

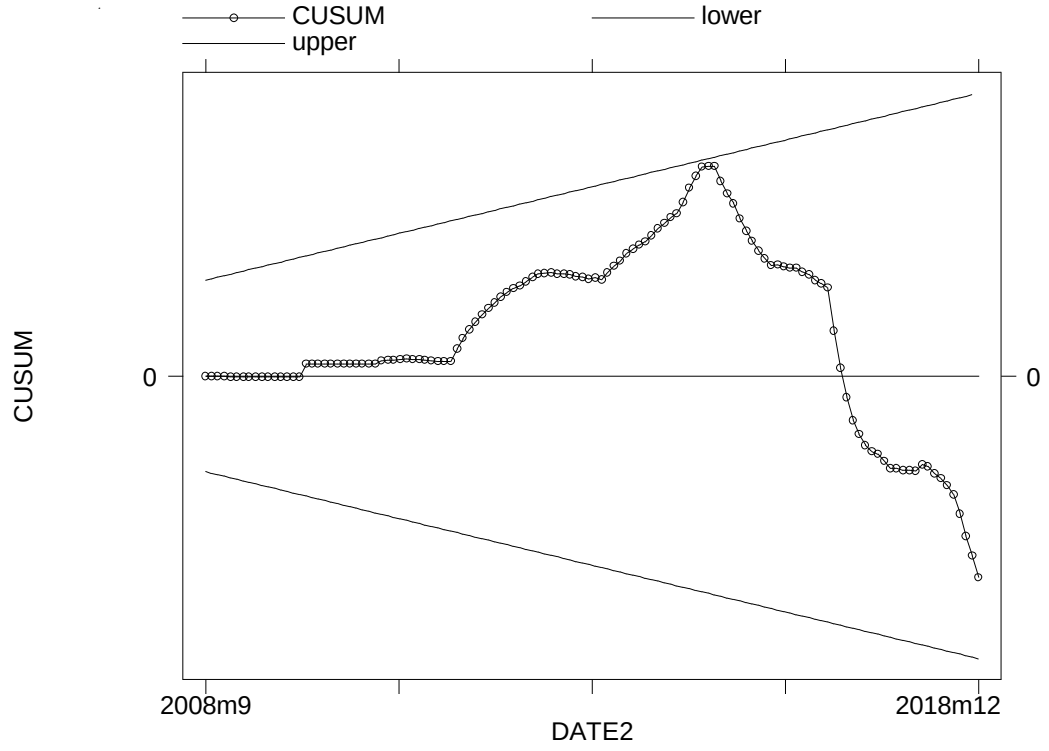
Table 4.6 indicates that market capitalization, Domestic savings, private sector credit, inflation, Investor sentiments were not stationary and had to be differenced to become stationary and such are designated 1(1) meaning they are integrated of order 1. Foreign equity flows and institutional ownership were stationary at level are designated 1(0) meaning they are stationary at level and did not require differencing.

### 4.2.6 Stability Test Results

The study used Cumulative Sum of Recursive Residuals (CUSUM) test to check for coefficients stability under the null hypothesis that stability plot of CUSUM statistic

lies between the significance levels critical bounds. The null hypothesis was that all coefficients are stable in the regression. This was in accordance Pesaran (2018). CUSUM test results are summarized in figure 4.7.

**Table 4.7: CUSUM Results**




**Source: Study Data (2020)**

From table 4.7. CUSUM statistic plot lies within critical bounds at 95 percent confidence level with an insignificant test statistic. The study failed to reject the null hypothesis that the coefficients were stable at 5 percent significance level. This implied that the coefficients in the model were stable and constant across the sample and time period under study leading to efficient and stable parameters estimates.

### 4.2.7 Lag Selection Test

The lag length was determined using the minimum values of either AIC, SC or HQ Prior to estimation of coefficients. Estimation of the correct ARDL F-statistic is dependent on having the correct lag length. The results of the lag length selection are presented in Table 4.8.

**Table 4.8: Lag Selection Order Criterion**

```
Selection-order criteria

   Sample:  May 2008 - December 2018            Number of obs      =       128

  +---------------------------------------------------------------------------+

  |lag |    LL      LR      df    p      FPE       AIC      HQIC      SBIC    |

  |----+----------------------------------------------------------------------|

  |  0 | -9039.98                     5.8e+52   141.359   141.422   141.515  |

  |  1 | -7951.74  2176.5   49  0.000  5.2e+45   125.121   125.628*  126.369* |

  |  2 | -7891.85  119.77   49  0.000  4.4e+45*  124.951*  125.901    127.29  |

  |  3 | -7857.06  69.591   49  0.028  5.6e+45   125.173   126.567   128.604  |

  |  4 |    -7820  74.114*  49  0.012  6.9e+45   125.359   127.197   129.883  |

  +---------------------------------------------------------------------------+

   Endogenous:  MC FEF DS PSC IF IS IO

    Exogenous:  _cons
```

*indicates lag order selected by criterion

**Source: Study Data (2020)**

(KEY: LR: Sequential modified LR test statistic at 5 percent level, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz criterion, HQ: Hannan Quinn information criterion)

From table 4.8 the optimal lag length selected was 2 based on the minimum value of Akaike information criterion

### 4.2.8 Cointegration Test Results

The study used the ARDL bounds test because the series were integrated of orders 1(0) and 1(1) but not 1(2). This was in accordance with Shin, Yu and Greenwood-Nimmo (2014) who contend that ARDL bound test is suitable when variables are integrated of different orders 1(0) and 1(1) but not 1(2). The null hypothesis was that variables are not cointegrated(no levels relationship). The cointegration test results are presented in table 4.9

**Table 4.9:Cointegration ARDL Bounds Test**

**Pesaran/Shin/Smith (2001) ARDL Bounds Test**
H0: no levels relationship F = 33.169
t = -13.070

Critical Values (0.1-0.01), **F-statistic**, Case 3

| | [I_0] L_1 | [I_1] L_1 | [I_0] L_05 | [I_1] L_05 | [I_0] L_025 | [I_1] L_025 | [I_0] L_01 | [I_1] L_01 |
|---|---|---|---|---|---|---|---|---|
| k_5 | 2.26 | 3.35 | 2.62 | 3.79 | 2.96 | 4.18 | 3.41 | 4.68 |

accept if F < critical value for I(0) regressors
reject if F > critical value for I(1) regressors

Critical Values (0.1-0.01), **t-statistic**, Case 3

| | [I_0] L_1 | [I_1] L_1 | [I_0] L_05 | [I_1] L_05 | [I_0] L_025 | [I_1] L_025 | [I_0] L_01 | [I_1] L_01 |
|---|---|---|---|---|---|---|---|---|
| k_5 | -2.57 | -3.86 | -2.86 | -4.19 | -3.13 | -4.46 | -3.43 | -4.79 |

accept if t > critical value for I(0) regressors
reject if t < critical value for I(1) regressors

k: # of non-deterministic regressors in long-run relationship
Critical values from Pesaran/Shin/Smith (2001)

**Source: Study Data (2020)**

From table 4.9 the F statistic of 33.169 is greater than critical values for [1 1] regressors i.e. 33.169 >3.35, 33.169>3.79, 33.169>4.18, 33.169>4.68 leading to the rejection of the null hypothesis of no levels relationship and the conclusion that a stable long run cointegration relationship existed between macro risk factors, Investor sentiments and performance of equity markets in NSE Kenya.

## 4.3 Correlation Analysis

Correlation matrix was used to assess the level of association between macro risk factors, Investor sentiments and performance of the equity market in the NSE, Kenya at 5 percent significance level on STATA. The correlation coefficient is indicated with an asteric(*) while the respective P Values were compared to the 0.05 significance level.

**Table 4.10 :Correlation Analysis Test Results**

| | MC | FEF | DS | PSC | IF | IS | IO |
|---|---|---|---|---|---|---|---|
| MC | 1.0000 | | | | | | |
| FEF | -0.2371*<br>0.0062 | 1.0000 | | | | | |
| DS | -0.8913*<br>0.0000 | 0.3379*<br>0.0001 | 1.0000 | | | | |
| PSC | 0.9010*<br>0.0000 | -0.2679*<br>0.0019 | -0.8291*<br>0.0000 | 1.0000 | | | |
| IF | -0.5445*<br>0.0000 | -0.1131<br>0.1967 | 0.4695*<br>0.0000 | -0.4163*<br>0.0000 | 1.0000 | | |
| IS | -0.6229*<br>0.0000 | 0.3342*<br>0.0001 | 0.6540*<br>0.0000 | -0.7077*<br>0.0000 | 0.1984*<br>0.0226 | 1.0000 | |
| IO | 0.4436*<br>0.0000 | -0.0058<br>0.9472 | -0.4043*<br>0.0000 | 0.3966*<br>0.0000 | -0.2297*<br>0.0081 | -0.2126*<br>0.0144 | 1.0000 |

**Source: Study Data (2020)**

Table 4.10 indicates that foreign equity flows(r=-0.2371*,p=0.000) had significant negative correction with market capitalization. This was in disagreement with Raza, Jawaid and Afshan who found negative correlation between foreign capital flows and market capitalization. This implied that decline in foreign equity flows had a negative effect on performance of equity market due to decline in market liquidity associated with capital flight.

Domestic savings(r=--0.8913*, p=0.000) had significant negative correction with market capitalization which was in disagreement with Ayunku and Etale (2015) who reported positive correlation between savings and market capitalization in Nigeria. The negative correlation indicated that decline in domestic savings of country has a multiplier effect which starves key areas of the required capital injection for expansion and this leads to decline in performance of equity market.

Private sector credit(r=-0.9010*, p=0.000) had significant positive correction with market capitalization. This was in agreement with Paul, Japheth and Linus (2017) who reported positive correlation between bank sector development and market capitalization and in Disagreement with Haseeb (2015). The positive correlation underscored the positive association between the banking sector and the stock market whereby increase in domestic credit extension to private sector for expansion purposes results in increase in performance of equity market.

Inflation Rate(r=-0.5445*, p=0.000) had significant negative correction with market capitalization. This was in agreement with Udi and Ohwofasa (2018) who found negative correlation between Inflation rate and market capitalization in Nigeria. This implied that inflation had the effect of increasing the cost of doing business due to high prices of inputs and this had a depressing effect on performance of the equity market hence the negative correlation.

Investor sentiments (r=-0.6229*, p=0.000) had significant negative correction with market capitalization. This was in agreement with Uygur and Tas (2014) who found positive correlation between Investor sentiments and performance of equity market. This implied declining Investor sentiments in the Kenyan market. It also implied that performance of the equity market rises with positive Investor sentiments and declines with negative Investor sentiments Institutional ownership(r=0.4436*, p=0.000) had significant positive correction with market capitalization. This implied the importance of corporate governance on performance of equity market as evidenced by the positive correlation.

## 4.4 Hypothesis Testing

The hypothesis testing section covers the tests of the hypotheses emanating from the research of objectives of the study. Test of hypotheses ($H_{01}$-$H_{05}$) were based on the scope performance of equity market. Testing and confirmation of cointegration was followed by test of hypotheses through estimation of both long run and short run coefficients. Estimation of coefficients was done using Autoregressive Distributed Lag Model with an Error Correction Model. Coefficients and their P values were

estimated and interpreted at 5 percent significance level (0.05). The following null hypotheses were tested;

$H_{01}$: Foreign equity flows have no significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{02}$: Domestic savings have no significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{03}$: Private Sector Credit has no significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{04}$: Inflation rate does not have a significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{05}$: Investor sentiments have no significant effect on performance of equity market in Nairobi Securities Exchange, Kenya.

$H_{06}$: Institutional ownership does not have a significant moderating effect on the relationship between macro risk factors and Investor sentiments on performance of equity market in Nairobi Securities Exchange, Kenya.

### 4.4.1 Long Run ARDL Model Coefficients

After confirmation of Cointegration, ARDL with an error correction model (ARDL ECM) was conducted. The sign and magnitude of the coefficients of the error correction model indicate the long run coefficients. The magnitude is represented by the coefficient of the lagged error correction model, which indicates the speed of adjustment towards the long run equilibrium. The sign of the adjustment term should be negative and significant to show convergence in the long run (Akanni and Isah, 2018; Pesaran, 2018). The results of the ARDL ECM model coefficients are presented in table 4.11. The lag length selected was 2 based on the AIC criterion. The model was estimated under the joint null hypothesis that all the coefficients of the macro risk factors and Investor sentiments were equivalent to zero.

**Table 4.11: Long Run ARDL Model Coefficients**

```
. ardl LNMC_d1 LNFEF LNDS_d1 LNPSC_d1 LNIF_d1 LNIS_d1,lags(1,2,2,2,2,2) ec

ARDL(1,2,2,2,2,2) regression

Sample:     April 2008 - September 2016, but with gapsNumber of obs=         40
                                                R-squared       =     0.9843
                                                Adj R-squared   =     0.9734
Log likelihood =  117.78811                     Root MSE        =     0.0168

------------------------------------------------------------------------------
   D.LNMC_d1 |      Coef.   Std. Err.      t    P>|t|     [95 percent Conf. Interval]
-------------+----------------------------------------------------------------
ADJ          |
     LNMC_d1 |
         L1. |  -1.435157   .1098073   -13.07   0.000     -1.66231   -1.208003
-------------+----------------------------------------------------------------
LR           |
       LNFEF |   -.006104   .0027125    -2.25   0.034    -.0117152   -.0004927
     LNDS_d1 |  -.1672053   .0506439    -3.30   0.003    -.2719703   -.0624404
    LNPSC_d1 |   1.203043   .4022386     2.99   0.007     .3709492    2.035137
     LNIF_d1 |   -.133085   .0265239    -5.02   0.000    -.1879538   -.0782163
     LNIS_d1 |   .3707643   .0264472    14.02   0.000      .316054    .4254745
-------------+----------------------------------------------------------------
SR           |
       LNFEF |
         D1. |   .0019414   .0039483     0.49   0.628    -.0062264    .0101091
         LD. |  -.0070077   .0033415    -2.10   0.047      -.01392   -.0000953
             |
     LNDS_d1 |
         D1. |   -.020608   .0611192    -0.34   0.739    -.1470428    .1058268
         LD. |  -.0733619   .0315285    -2.33   0.029    -.1385836   -.0081402
             |
    LNPSC_d1 |
         D1. |  -1.255573   .4714329    -2.66   0.014    -2.230807   -.2803403
         LD. |  -.7159472   .3443536    -2.08   0.049    -1.428297   -.0035975
             |
     LNIF_d1 |
         D1. |   .1639376   .0355487     4.61   0.000     .0903996    .2374757
         LD. |   .1443805   .0320917     4.50   0.000     .0779937    .2107674
             |
     LNIS_d1 |
         D1. |  -.2390522   .0338593    -7.06   0.000    -.3090954    -.169009
         LD. |  -.0449417   .0085839    -5.24   0.000     -.062699   -.0271845
             |
       _cons |   .0206705      .0256     0.81   0.428    -.0322871    .0736281
------------------------------------------------------------------------------
```

**Source: Study Data (2020)**

From table 4.11 the coefficient of the lagged ECM adjustment term is negative and significant at 5 percent significance level with a value of -1.435157 with a P value of 0.000 indicating that in the short run, performance of equity market tend to adjust to long run equilibrium given disturbances resulting from changes in macro risk factors and Investor sentiments. The adjustment term -1.435157 indicates that 100 percent of the disequilibrium in performance of equity market from the previous period shock will converge back to the long run equilibrium in the current period.

#### 4.4.1.1 $H_{01}$: Foreign Equity Flows Has No Significant Effect On Performance Of Equity Market In Nairobi Securities Exchange, Kenya.

The first objective of the study was to determine the effect of foreign equity flows on effect on performance of equity market in Nairobi Securities Exchange, Kenya. Consequently, the null hypothesis that foreign equity flows has no effect on performance of equity market was formulated to address this objective at 95 percent confidence level. Table 4.11 indicates that in the long run, foreign equity flows had a coefficient of -0.006104 with a P value of 0.034 which was less than 0.05 leading to the rejection of the null hypothesis and finding that foreign equity flows had a negative significant effect on market capitalization at 5 percent significance level implying that declining foreign equity flows signify capital flight with foreign investors taking a net selling position in the equity market and this leads to decline performance of equity market due to reduced market liquidity. The findings were in agreement with Adam and Tweneboah (2008) who concluded that foreign direct investments negatively affect stock prices. The findings contradicted with those of Gachanja and Kosimbei (2018); Lonca and Cadeira (2015); Sapian and Auzairy (2015); Iriobe, Obamuyi, & Abayomi, (2018); Raza, Jawaid, & Afshan, (2013); Loomba(2012) who found that foreign equity flows positively affects stock returns. The findings also contradicted with Koskei (2017) and De and Chakraborty (2015) who found that foreign equity flows had no effect on performance of equity market.The contradictory and mixed findings were due to different contexts,time periods,methodologies and samples used.

#### 4.4.1.2 $H_{02}$: Domestic Savings Has No Significant Effect On Performance Of Equity Market In Nairobi Securities Exchange, Kenya.

The second objective of the study was to determine the effect of domestic savings on performance of equity market in NSE, Kenya. Subsequently, the null hypothesis was formulated to address this objective at 95 percent confidence level. The findings in table 4.11 indicate that in the long run, domestic savings measured by gross domestic savings had a coefficient of -0.1672053 with a P value 0.003 which was less than 0.05 leading to the rejection of the null hypothesis and the study found that domestic savings had a negative significant effect on market capitalization at 5

percent significance level signifying that decline in domestic savings starves companies of the necessary funds for expansion which reduces profitability and equity market performance. These findings were in agreement with Ayunku and Etale (2015); Şükrüoğlu and Nalin (2014) and Celebi and Honig (2018) who found that Savings rate had negative relationship with performance of stock market. The findings were in disagreement with Akbar, Ali and Khan(2012), Amara, Naseem and Sultana(2013), Odhiambo(2010), El-Nader and Alraimony (2013), Ho (2017), Tsaurai (2018), Abubakar and Danladi (2018), Ebele, (2016), Rafique, Naseem and Sultana (2013), Shahabz, Lean, and Kalim (2013), Aduda, Masila and Onsongo (2012) who found that gross domestic savings positively affected stock market performance and development. The findings were in disagreement with Owiredu, Oppong and Asomaning (2016), Zafar(2013), Jun, Hongzhong, Thierry and Yannick(2015) who found that domestic savings had no effect on performance of stock market.The differences in findings in emprical studies is attributed to contexts, samples and time periods.

#### 4.4.1.3 $H_{01}$: Private Sector Credit Has No Significant Effect On Performance Of Equity Market In Nairobi Securities Exchange, Kenya.

Thirdly, the study determined the effect of private sector credit on performance of equity market in NSE, Kenya. The null hypothesis was formulated to address this objective at 95 percent confidence level. In addition, from the findings in table 4.11 in the long run, Private sector credit had coefficient of 1.203043 with P value of 0.007 which was greater than 0.05 leading to rejection of the null hypothesis and the finding that private sector credit had significant positive effect on market capitalization. This implied positive correlation between the banking sector and performance of equity market whereby increase in credit to private sector spurs expansion and profitability for listed firms and this increases performance of the equity market. The findings were in agreement with Olowofeso, Adeleke and Udoji (2015), Marshal, Solomon and Onyekachi (2015), Bakang (2013), Ali & Akujuobi (2014), Shahbaz, Rehman & Zainudin (2013), Paul, Japheth and Linus (2017) who found that private sector credit had a significant poisitive effect on perfomance of equity market. These findings are in disagreement with Kagochi (2013) who found that private sector credit had no effect on performance of equity market and

Jonathan and Oghenebrume (2017); Faisal, Muhammad and Tursoy (2017) and Hasseeb (2015) who reported that private sector credit had negative effect on performance of equity market. The differences in findings in emprical studies is attributed to contexts, samples and time periods.

#### 4.4.1.4 $H_{04}$: Inflation Rate Has No Significant Effect On Performance Of Equity Market In Nairobi Securities Exchange, Kenya.

Fourthly, the study determined the effect of Inflation rate on performance of the equity market in NSE, Kenya. The null hypothesis was formulated to address this objective at 95 percent confidence level. Table 4.11 also indicates that in the long run, Inflation rate had a coeficient of -0.133085 with P values of 0.000 which was less than 0.05. This means that the null hypothesis had to be rejected at 5 percent significance level leading to the finding that Inflation rate had negative significant effect on market capitalisation.The implication was that Inflation rate raised the cost of doing business due to increase in prices of inputs for production and this reduced corporate profitability and performance of equity market due to reduced profitability and dividends. The findings were in agreement with Chauque and Rayappan (2018), Udi and Ohwofasa (2018), Ramzan (2016), Onundu (2016), Qamri, Haq and Akram (2015), Khumalo (2013), Mutuku and Ngeny(2014), Njogo, Inim and Ohiaeri (2018), Silva (2016) who found that Inflation rate negatively affected stock returns and performance of equity market . In addition, the findings also contradicted with Elly and Oriwo(2013) in kenya ; Dengke(2015) in China; Oshaibat (2016) in Oman; who found that Inflation Ratepositively affected performance of stock market. The findings also contradicted with Kaur (2016); Megaravalli, Sampagnaro and Murray (2017) and Ahmadi (2016), Limpanithiwat and Rungsombudpornkul (2010) in Thailand, Sokpo, Iorember and Usar (2017) in Nigeria who found that Inflation rate had no effect on performance of equity market and stock returns. The differences in findings in emprical studies is attributed to contexts, samples and time periods.

#### 4.4.1.5 $H_{05}$: Investor Sentiments Has No Statistical Significant Effect On Performance Of Equity Market In Nairobi Securities Exchange, Kenya.

The fifth objective was to determine the effect of Investor sentiments on performance of the equity market. The null hypothesis was formulated to address this objective at 95 percent confidence level. The findings in Table 4.11 also indicate that in the long run, Investor sentiments had coefficient of 0.3707643 and P value of 0.000 which was less than 0.05 leading to the rejection of the null hypothesis at 5 percent significance level and leading to the conclusion that Investor sentiments had a significant positive effect on market capitalisation implying that investors willingness to add liquidity into the market through trading volume depends on how optimistic or pessismistic the investors feel about the market. The findings were in agreement with Huang, Yang, Yang and Sheng (2014), Ahmed and Ullah(2013), Anusakumar, Ali, and Wooi (2017), Fayyazi and Maharlouei (2015, Uygur and Tas (2014), Oprea and Brad (2014), Rahman, Shien and Sadique (2013), Li and Zhang (2008) who found that Investor sentiments positively affects performance of equity market. On the other hand, the findings were in disagreement with Yoshinagal and Junior (2012); Naik and Padhi (2014) and Grigaliuniene and Cibulskiene (2010) who found that Investor sentiments negatively affects stock returns and performance of equity market. The findings were also in disagreement with Kim and Park (2015), Paudel and Laux (2010) and Cuong and Ishaq (2015) who found that Investor sentiments had no effect on performance of equity markets. The differences in findings in emprical studies is attributed to contexts, samples and time periods.

In the long run, the adjusted R squared was 0.9734 which meant that foreign equity flows, domestic savings, private sector credit, Inflation rate and Investor sentiments jointly explained 97 percent of variation in performance of equity market in Nairobi Securities Exchange, Kenya. The remaining 3 Percent could be explained by other factors not included in the study. In conclusion, the constant in the model was insignificant meaning that performance of equity market would be 0 in absence of macro risk factors and Investor sentiments.

The findings in table 4.11 contradict the efficient market hypothesis by Fama 1970 (Gerleman, 2012; MacDowell, Thom, Frank, & Bernanke, 2009) which affirm that investors cannot earn abnormal returns in the market since security prices immediately incorporate past, present and future information and as such macro risk factors do not affect perfomance of equity market. The findings also supported behavioral finance theories by Baker and Wurgler (2007); Shiler (1992) and Shefrin (1999) who argued that Investor sentiments affects the performance of equity markets.

The findings in table 4.11 were in disagreement with CAPM by Sharpe(1964) which relied on a single factor to explain performance of equity market since foreign equity flows, domestic savings, private sector credit, Inflation rate andInvestor sentiments had significant effect on performance of equity market in NSE,Kenya. Further, the findings on Inflation Ratewhich has a negative effect on performance of equity market were in disagreement with Fisher's hypothesis which suggests that Inflation Ratepositively affects performance of equity market as investors substitute financial assets with real assets to hedge against inflation.

Further, the findings support the arbitrage pricing theory by Ross(1970) who established the theoritical framework linking performance of equity markets to several variables in the macro and micro environment. The results in table 4.11 indicated that in the long run foreign equity flows, Domestic savings, private sector credit, Inflation rate and Investor sentiments had significant effect on performance of equity market in NSE, Kenya since their coefficients had P values less than 0.05 at 5 percent significance level. Foreign equity flows had a coefficient of -0.006104 with a P value of 0.034, domestic savings measured by gross domestic savings had a coefficient of -0.1672053 with a P value 0.003, Private sector credit had coefficient of 1.203043 with P value of 0.007, Inflation rate had a coefficient of -0.133085 with P values of 0.000 and Investor sentiments had coefficient of 0.3707643 and P value of 0.000 all which were less than 0.05 meaning that all the coefficients were significant at 5 percent significance level.

Findings in Table 4.11 were in disagreement with Fishers hypothesis, which claims that Inflation rate positively affects performance of stock market. The findings

indicate a significant negative effect of Inflation rate on performance of equity market in NSE, Kenya. In addition, the findings were in support behavioral finance theories of herding bias and prospect theory since Investor sentiments had a significant positive effect on performance of equity market in NSE, Kenya. The findings on Investor sentiments support herding bias and prospect theory in Nairobi securities exchange whereby investors concentrate their trading on a few blue chip stocks because the blue chip stocks offer intrinsic insurance against regret and losses due to their well established performance and dividend paying history.

### 4.4.2 Short Run ARDL Model Coefficients

The short run ARDL model was estimated to explain the effects of macro risk factors and Investor sentiments on performance of equity market in the NSE, Kenya in the short run. The lag length selection criteria was 2 based on AIC criterion. The model was estimated under the null joint hypothesis that in the short run, all coefficients of macro risk factors and Investor sentiments were equivalent to zero. The short run ARDL model coefficients are presented below in table 4.12.

**Table 4.12: Estimated Short Run ARDL Coefficients**

```
. ardl LNMC_d1 LNFEF LNDS_d1 LNPSC_d1 LNIF_d1 LNIS_d1,maxlags(2) aic

ARDL(1,2,2,2,2,2) regression

Sample:     April 2008 - September 2016, but with gapsNumber of obs=         40
                                                 F(  16,     23) =      43.76
                                                 Prob > F        =     0.0000
                                                 R-squared       =     0.9682
                                                 Adj R-squared   =     0.9461
Log likelihood =  117.78811                      Root MSE        =     0.0168

------------------------------------------------------------------------------
     LNMC_d1 |      Coef.   Std. Err.      t    P>|t|     [95 percent Conf. Interval]
-------------+----------------------------------------------------------------
     LNMC_d1 |
         L1. |  -.4351565   .1098073    -3.96   0.001    -.6623101   -.2080029
             |
       LNFEF |
         --. |  -.0068188   .0032827    -2.08   0.049    -.0136096    -.000028
         L1. |   -.008949   .0028619    -3.13   0.005    -.0148693   -.0030287
         L2. |   .0070077   .0033415     2.10   0.047     .0000953      .01392
             |
     LNDS_d1 |
         --. |  -.2605738   .0365315    -7.13   0.000    -.3361449   -.1850027
         L1. |  -.0527539   .0517727    -1.02   0.319    -.1598538     .054346
         L2. |   .0733619   .0315285     2.33   0.029     .0081402    .1385836
             |
    LNPSC_d1 |
         --. |   .4709818   .2196181     2.14   0.043     .0166671    .9252965
         L1. |   .5396263   .2096167     2.57   0.017      .106001    .9732515
         L2. |   .7159472   .3443536     2.08   0.049     .0035975    1.428297
             |
     LNIF_d1 |
         --. |  -.0270602   .0326115    -0.83   0.415    -.0945222    .0404018
```

| | | | | | | |
|---|---|---|---|---|---|---|
| L1. | -.0195571 | .031232 | -0.63 | 0.537 | -.0841653 | .0450512 |
| L2. | -.1443805 | .0320917 | -4.50 | 0.000 | -.2107674 | -.0779937 |
| | | | | | | |
| LNIS_d1 | | | | | | |
| --. | .2930526 | .0239328 | 12.24 | 0.000 | .2435438 | .3425614 |
| L1. | .1941104 | .0324126 | 5.99 | 0.000 | .1270599 | .261161 |
| L2. | .0449417 | .0085839 | 5.24 | 0.000 | .0271845 | .062699 |
| | | | | | | |
| _cons | .0206705 | .0256 | 0.81 | 0.428 | -.0322871 | .0736281 |

**Source: Study Data (2020)**

From table 4.12, the short run signs were maintained in the long run whereby foreign equity flows, domestic savings and Inflation rate had a negative significant effect on performance of equity market whereas private sector credit and Investor sentiments had significant positive effect on performance of equity market in the NSE, Kenya. The R squared has a value of 0.9461 meaning that the combination of foreign equity flows, private sector credit, domestic savings, Inflation rate and Investor sentiments explained 94.6 percent of variation in performance of equity market in Kenya in the short run. The constant in model was insignificant meaning that in the absence of macro risk factors and Investor sentiments, performance of equity market would be equivalent to zero.

Table 4.12 also indicates that in the short run, the first lag of performance of equity market has a significant negative effect on performance of equity market with a coefficient of -0.4351565 with a P value of 0.001 which is less than 0.05 at 5 percent significance leading to the rejection of the null hypothesis that lags of equity market performance have no effect on performance of equity market.

## 4.5 NARDL Model For Asymmetric Effects

The nonlinear Autoregressive distributed lag model (NARDL) simultaneously evaluates asymmetric short run and long run effects. The results from the bounds test indicated the presence of cointegration indicating that long run relationship exists between macro risk factors and Investor sentiments and performance of equity market in NSE, Kenya. The study used Nonlinear ARDL to test for asymmetry in the long run relationship between the dependent and independent variables.

Asymmetric effects are present if the effects of positive and negative shocks in the independent variables are not of same magnitude on the dependent variable (Rocher, 2017). Table 4.13 presents the NARDL regression and the asymmetry statistics

comprising of coefficients of decomposed long run positive values and long run negative values of the macro risk factors and Investor sentiments. The asymmetry statistics also present the long run asymmetry statistics and short run asymmetry statistics in the same model. The model was estimated under the null hypothesis of no asymmetry.

**Table 4.13: NARDL Model Test for Asymmetric Effects**

```
. nardl LNMC_d1  LNFEF LNDS_d1 LNPSC_d1  LNIF_d1 LNIS, p(2) q(2) deterministic(LNIO )
horizon(41) residuals

Regression results (variables renamed):
note: _delete omitted because of collinearity
note: _dx2n omitted because of collinearity

      Source |       SS       df       MS              Number of obs =      40
-------------+------------------------------           F( 31,     8) =       .
       Model |  .412573616    31  .013308826           Prob > F      =  0.0000
    Residual |  1.5423e-08     8  1.9278e-09           R-squared     =  0.0000
-------------+------------------------------           Adj R-squared =  1.0000
       Total |  .412573631    39  .010578811           Root MSE      =  4.4e-05

------------------------------------------------------------------------------
         _dy |      Coef.   Std. Err.      t    P>|t|     [95 percent Conf. Interval]
-------------+----------------------------------------------------------------
          _y |
          L1. |    -1.2278   .0011364 -1080.47   0.000     -1.23042   -1.225179
              |
        _x1p |
          L1. |  -.0001021   .0000275    -3.71   0.006    -.0001656   -.0000387
              |
        _x1n |
          L1. |  -.0001689   .0000348    -4.85   0.001    -.0002492   -.0000887
              |
        _x2p |
          L1. |   .0006931   .0002596     2.67   0.028     .0000945    .0012918
              |
        _x2n |
          L1. |          0  (omitted)
              |
        _x3p |
          L1. |     .00896   .0027753     3.23   0.012     .0025601    .0153598
              |
        _x3n |
          L1. |   .0057785   .0044341     1.30   0.229    -.0044466    .0160036
              |
        _x4p |
          L1. |    .000047   .0002031     0.23   0.823    -.0004213    .0005152
              |
        _x4n |
          L1. |   .0001467   .0005367     0.27   0.791    -.0010909    .0013843
              |
        _x5p |
          L1. |  -.0004629   .0002775    -1.67   0.134    -.0011028     .000177
              |
        _x5n |
          L1. |   .0021831   .0001288    16.95   0.000     .0018861    .0024801
              |
         _dy |
          L1. |   .2016442   .0006125   329.23   0.000     .2002319    .2030566
              |
      _dx1p |
        --. |  -.0001032   .0000337    -3.06   0.016    -.0001809   -.0000255
          L1. |  -3.45e-06   .0000194    -0.18   0.864    -.0000483    .0000414
              |
      _dx1n |
        --. |   .0000216   .0000334     0.65   0.535    -.0000553    .0000986
```

```
          L1. |   .0000506   .0000523     0.97   0.362      -.00007    .0001712
              |
       _dx2p |
          --. |  -.4824292   .0006558  -735.67   0.000    -.4839414    -.480917
          L1. |   .5302659   .0020013   264.97   0.000      .525651    .5348808
              |
       _dx2n |
          --. |          0  (omitted)
          L1. |   .0922603    .000463   199.28   0.000     .0911927    .0933279
              |
       _dx3p |
          --. |  -.0016443     .00207    -0.79   0.450    -.0064176    .0031291
          L1. |  -.0084455    .001937    -4.36   0.002    -.0129123   -.0039786
              |
       _dx3n |
          --. |    .003094   .0021157     1.46   0.182    -.0017848    .0079728
          L1. |   .0002393   .0025606     0.09   0.928    -.0056656    .0061442
              |
       _dx4p |
          --. |  -.0003249   .0002157    -1.51   0.170    -.0008223    .0001726
          L1. |  -.0005207   .0003018    -1.73   0.123    -.0012167    .0001753
              |
       _dx4n |
          --. |  -.0000527   .0002694    -0.20   0.850    -.0006738    .0005684
          L1. |   .0001001    .000387     0.26   0.802    -.0007923    .0009925
              |
       _dx5p |
          --. |   .3856113   .0002458  1568.66   0.000     .3850444    .3861782
          L1. |   .0943267    .000592   159.34   0.000     .0929616    .0956919
              |
       _dx5n |
          --. |  -.0575766   .0012305   -46.79   0.000    -.0604141   -.0547392
          L1. |   1.265655   .0027682   457.21   0.000     1.259271    1.272038
              |
        LNIO |   .0002679   .0004269     0.63   0.548    -.0007166    .0012524
       _cons |  -.0018875   .0039383    -0.48   0.645    -.0109691    .0071942
------------------------------------------------------------------------------
(211 missing values generated)


Asymmetry statistics:
-------------------------------------------------------------------------------
             |            Long-run effect [+] |            Long-run effect [-]
  Exog. var. |       coef.     F-stat     P>F |       coef.     F-stat     P>F
-------------+--------------------------------+--------------------------------
       LNFEF |      -0.000      13.72   0.006         0.000      23.49   0.001
     LNDS_d1 |       0.001      7.141   0.028         0.000          .       .
    LNPSC_d1 |       0.007      10.42   0.012        -0.005      1.698   0.229
     LNIF_d1 |       0.000     .05348   0.823        -0.000     .07477   0.791
        LNIS |      -0.000      2.779   0.134        -0.002      292.5   0.000
-------------+--------------------------------+--------------------------------
             |            Long-run asymmetry |           Short-run asymmetry
             |                F-stat     P>F |                F-stat     P>F
-------------+--------------------------------+--------------------------------
       LNFEF |                 21.97   0.002                  3.639   0.093
     LNDS_d1 |                 7.141   0.028                  336.8   0.000
    LNPSC_d1 |                  1.34   0.280                  15.86   0.004
     LNIF_d1 |                .04014   0.846                  1.526   0.252
        LNIS |                 275.1   0.000                  28732   0.000
-------------------------------------------------------------------------------
Note: Long-run effect [-] refers to a permanent change in exog. var. by -1

  Cointegration test statistics:    t_BDM =   -1080.4716
                                    F_PSS =  990576.8133

  Model diagnostics                                       stat.    p-value
  ---------------------------------------------------------------------------
  Portmanteau test up to lag  18 (chi2)                  21.46     0.2570
  Breusch/Pagan heteroskedasticity test (chi2)         .002212     0.9625
  Ramsey RESET test (F)                                      .          .
  Jarque-Bera test on normality (chi2)                   1.265     0.5312
```

**Source: Study Data (2020)**

The study determined the asymmetric effect of macro risk factors and Investor sentiments on performance of equity market. To achieve this, the study employed wald tests for asymmetry. The tests were conducted under the null hypothesis of no asymmetry. Table 4.13 presents the asymmetry statistics, which are explained below.

The upper part of asymmetry statistics in Table 4.13 decomposes the macro risk factors and Investor sentiments into positive and negative values and presents their long run effects on performance of equity market. In the long run, positive foreign equity flows has a coefficient of -0.000 with a P value of 0.006 while negative foreign equity flows has a coefficient of 0.000 and P value of 0.001; both P values are statistically significant at 5 percent significance level since they are less than 0.05 indicating asymmetric effects of foreign equity flows on performance of equity market. Also, Positive domestic savings has a coefficient of 0.001 and P value 0.028 which is statistically significant since it is less than 0.05 at 5 percent significance level while negative domestic savings has coefficient of 0.000 and missing P value indicating asymmetric effects of domestic savings on performance of equity market. Positive private sector credit has a coefficient of 0.007 and P value 0.012, which is statistically significant since it is less than 0.05 at 5 percent significance level while negative private sector credit has a coefficient of -0.005 with P value of 0.229 that is statistically insignificant since it is greater than 0.05 at 5 percent significance level meaning that only positive values of private sector credit have an effect on performance of equity market. Further, positive Inflation rate has a coefficient of 0.000 with P value 0.823 which is statistically insignificant since it is greater than 0.05 at 5 percent significance level, while negative Inflation rate has a P value of -0.000 with P value 0.791 which is statistically insignificant since it is greater than 0.05 at 5 percent significance level indicating that Inflation rate has no asymmetric effect on performance of equity market. In addition, positive Investor sentiments has a coefficient of -0.000 with p value 0.134, which is statistically insignificant since it is greater than 0.05 at 5 percent significance level, while negative Investor sentiments has a coefficient of -0.002 with p value 0.000 which is statistically significant since it is less than 0.05 at 5 percent significance level indicating that only negative Investor sentiments has an effect on performance of equity market.

The lower part of asymmetry statistics in Table 4.13 summarizes long run asymmetry and short run asymmetry for macro risk factors and Investor sentiments. From the long run asymmetry statistics, foreign equity flows has an F-statistic of 21.97 and p value 0.002, domestic savings has an F statistic of 7.141 and p value 0.028 and Investor sentiments has F statistic of 275.1 and p value of 0.000. The F statistics are less than 0.05 leading to the rejection of the null hypothesis of no asymmetry. These results imply that in the long run, increase and decline in foreign equity flows, domestic savings and Investor sentiments have effects of different magnitude on performance of equity market. This was in accordance with (Akanni & Isah, 2018; Pesaran, Smith, & Shin, 2001; Naik & Padhi, 2014). Private sector credit has an F statistic of 1.34 with a P value of 0.280 while Inflation rate has an F statistic of 0.04014 with a P value of 0.846, which are greater than 0.05 thus insignificant leading to the finding of no asymmetric effects for private sector credit and Inflation rate on performance of equity market meaning that their effects on performance of equity market were identical irrespective of appreciation or depreciation. According to the nonlinear ARDL model, when long run relationship exists, it is asymmetrical in nature (Shin, Yu, & Greenwood-Nimmo, 2014). The findings were in agreement with Sokpo, Iorember and Usar (2017) reported no asymmetrical effects of Inflation rate on performance of equity market in NSE.

The lower part of asymmetry statistics in Table 4.13 also summarizes short run asymmetry. In the short run, domestic savings, private sector credit and Investor sentiments have F statistic values of 336.8, 15.86, 28732 and P values of 0.000, 0.004 and 0.000 respectively leading to the rejection of the null hypothesis of no asymmetry in the short run. The asymmetric effects imply that the performance of the equity market does not react lineally in the short run to positive and negative shocks in domestic savings, private sector credit and Investor sentiments. In addition, in the short run, foreign equity flows had an F statistic of 3.369 with a P value of 0.093 while Inflation rate had an F statistic of 1.526 with P value of 0.252. The P values of foreign equity flows and Inflation rate are greater than 0.05 meaning that the null hypothesis for no asymmetry could not be rejected leading to the finding that foreign equity flows and Inflation rate did not have short run asymmetric effects on performance of equity market.

The R squared in the NARDL model is equivalent to 1 meaning that the lags of market capitalization and the positive and negative current and lagged values of the macro risk factors and Investor sentiments explained a hundred percent of the variation in market capitalization. The R squared of 1 arose from decomposition of the independent variables into positive and negative values which had a higher explanatory ability compared to the direct linear ARDL model.

Model diagnostics in table 4.13 indicate that portmanteau test has chi2 statistic of 21.46 with P value of 0.2570 that is greater than 0.05 so the null hypothesis of no autocorrelation cannot be rejected leading to the finding that the model does not suffer from autocorrelation. Breusch/pagan test for heteroscedasticity has a chi2 statistic of 0.002212 with a P value of 0.9625, which is greater than 0.05 hence the null hypothesis of homoscedasticity cannot be rejected leading to the finding that the model does not suffer from heteroscedasticity. Lastly, Jarque Bera test for normality has a chi2 statistic of 1.265 with P value of 0.5312, which is greater than 0.05 meaning that the null hypothesis of normality cannot be rejected leading to the finding that data is normally distributed.

## 4.6 Test For Moderation Effects

In the sixth objective, the study sought to establish the moderating effect of institutional ownership on performance of equity market in NSE, Kenya. The null hypothesis was that institutional ownership has no statistical significant effect on the relationship between macro risk factors, Investor sentiments and performance of equity market in NSE,Kenya. The study adopted the two step hierarchical regression by Cohen, Cohen, West and Aiken(2003) to test the sixth objective. The first step uses the moderating variable as an explanatory variable while the second step introduces the interaction terms between the moderator and the regressors.. The results are presented in table 4.14 and 4.15.

**Table 4.14: Moderation Effect Results with Moderator As Explanatory Variable**

```
Sample:     April 2008 - September 2016, but with gapsNumber of obs=         40
                                                 R-squared       =     0.9902
                                                 Adj R-squared   =     0.9799
Log likelihood =  127.24269                      Root MSE        =     0.0146

------------------------------------------------------------------------------
   D.LNMC_d1 |      Coef.   Std. Err.      t    P>|t|     [95 percent Conf. Interval]
-------------+----------------------------------------------------------------
ADJ          |
     LNMC_d1 |
         L1. |  -1.275863   .1345694    -9.48   0.000     -1.55752   -.9942062
-------------+----------------------------------------------------------------
LR           |
       LNFEF |  -.0048586   .0029792    -1.63   0.119    -.0110942     .001377
     LNDS_d1 |  -.1683248   .0716909    -2.35   0.030    -.3183757    -.018274
    LNPSC_d1 |   1.199832   .4239867     2.83   0.011     .3124173    2.087246
     LNIF_d1 |  -.1144785   .0311281    -3.68   0.002    -.1796303   -.0493267
     LNIS_d1 |   .3384635   .0322385    10.50   0.000     .2709877    .4059394
        LNIO |   .0189612   .0344899     0.55   0.589     -.053227    .0911495
-------------+----------------------------------------------------------------
SR           |
     LNMC_d1 |
         LD. |   .0670237    .064672     1.04   0.313    -.0683363    .2023838
             |
       LNFEF |
         D1. |  -.0003249   .0037227    -0.09   0.931    -.0081167    .0074668
         LD. |  -.0102247   .0031896    -3.21   0.005    -.0169007   -.0035488
             |
     LNDS_d1 |
         D1. |  -.0023764   .0754881    -0.03   0.975    -.1603749    .1556221
         LD. |  -.0484808   .0462804    -1.05   0.308    -.1453467    .0483851
             |
    LNPSC_d1 |
         D1. |  -1.180562   .4218437    -2.80   0.011    -2.063491   -.2976326
         LD. |  -.7324404   .3256635    -2.25   0.037    -1.414062   -.0508188
             |
     LNIF_d1 |
         D1. |   .1185866   .0382453     3.10   0.006     .0385382     .198635
         LD. |   .0836819   .0356807     2.35   0.030     .0090013    .1583625
             |
     LNIS_d1 |
         D1. |  -.1788228   .0345763    -5.17   0.000    -.2511919   -.1064538
         LD. |   -.033889   .0084453    -4.01   0.001    -.0515651   -.0162129
             |
        LNIO |
         D1. |   .1370912   .0750409     1.83   0.083    -.0199713    .2941537
         LD. |  -.1006281   .0769413    -1.31   0.207     -.261668    .0604118
             |
       _cons |  -.2082568   .3930161    -0.53   0.602    -1.030849    .6143353
------------------------------------------------------------------------------
```

**Source: Study Data (2020)**

Table 4.14 indicates that institutional ownership has a coefficient of 0.0189612 and P value of 0.589, which was greater than 0.05 at 5 percent significance level so the null hypothesis could not be rejected that the coefficients of institutional ownership were not different from 0 meaning that institutional ownership had no effect on performance of equity market. This means that institutional ownership is not an explanatory variable.

**Table 4.15: Moderation Effect Results With Moderating Variable Interaction Terms**

```
ARDL(2,2,2,2,2,2,2,2,2) regression

Sample:     April 2008 - September 2016, but with gaps Number of obs=         40
                                                       R-squared       =     0.9962
                                                       Adj R-squared   =     0.9887
Log likelihood =  146.36117                            Root MSE        =     0.0109

------------------------------------------------------------------------------
   D.LNMC_d1 |      Coef.   Std. Err.      t    P>|t|     [95 percent Conf. Interval]
-------------+----------------------------------------------------------------
ADJ          |
     LNMC_d1 |
         L1. |  -1.938788   .1770786   -10.95   0.000    -2.321343   -1.556233
-------------+----------------------------------------------------------------
LR           |
       LNFEF |   .4863693    .084986     5.72   0.000     .3027683    .6699703
     LNDS_d1 |  -.6195261   .0940066    -6.59   0.000    -.8226151   -.4164371
    LNPSC_d1 |  -171.7235   29.90109    -5.74   0.000    -236.3209   -107.1262
     LNIF_d1 |    13.3742   2.500518     5.35   0.000     7.972156    18.77624
     LNIS_d1 |   .3407531   .0185106    18.41   0.000     .3007633    .3807429
   LNFEFLNIO |  -.0542269   .0093514    -5.80   0.000    -.0744293   -.0340244
 LNPSC_dLNIO |   18.99494   3.286798     5.78   0.000     11.89425    26.09564
 LNIF_d1LNIO |  -1.479142   .2739277    -5.40   0.000    -2.070926   -.8873571
-------------+----------------------------------------------------------------
SR           |
     LNMC_d1 |
         LD. |   .2033228   .0708086     2.87   0.013     .0503502    .3562953
             |
       LNFEF |
         D1. |   -.720175   .1628317    -4.42   0.001    -1.071951   -.3683985
         LD. |  -.3478394   .1518381    -2.29   0.039    -.6758657   -.0198131
             |
     LNDS_d1 |
         D1. |   .7777799   .1971192     3.95   0.002     .3519298     1.20363
         LD. |   .3951185   .1173334     3.37   0.005     .1416351    .6486019
             |
    LNPSC_d1 |
         D1. |    219.088   54.38643     4.03   0.001     101.5932    336.5827
         LD. |   91.60511   31.42791     2.91   0.012     23.70923     159.501
             |
     LNIF_d1 |
         D1. |  -11.39565    5.14285    -2.22   0.045     -22.5061   -.2852005
         LD. |  -3.022227   3.283931    -0.92   0.374    -10.11673    4.072275
             |
     LNIS_d1 |
         D1. |  -.3177959   .0400813    -7.93   0.000    -.4043862   -.2312055
         LD. |  -.0433547    .007323    -5.92   0.000    -.0591752   -.0275343
             |
   LNFEFLNIO |
         D1. |   .0800968    .017952     4.46   0.001     .0413139    .1188797
         LD. |     .03803   .0167853     2.27   0.041     .0017677    .0742924
             |
 LNPSC_dLNIO |
         D1. |   -24.2395   5.993612    -4.04   0.001    -37.18792   -11.29109
         LD. |  -10.11872   3.458537    -2.93   0.012    -17.59044   -2.647007
             |
 LNIF_d1LNIO |
         D1. |   1.264444   .5633315     2.24   0.043       .04744    2.481448
         LD. |   .3409875    .358785     0.95   0.359    -.4341204    1.116095
             |
       _cons |   .0597489   .0221957     2.69   0.018     .0117979    .1076999
------------------------------------------------------------------------------
```

**Source: Study Data (2020)**

Table 4.15 indicates that in the long run, the interaction between foreign equity flows and institutional ownership had a coefficient of -0.0542269 and p value of

0.000. Private sector credit and institutional ownership had a coefficient of 18.99494 and P value of 0.000 while Inflation rate and institutional ownership had a coefficient of -1.479142 with a P value of 0.000 which were less than 0.05 leading to the rejection of the null hypothesis that the interaction terms had no effect on performance of equity market at 0.05 percent significance level. The interaction terms between institutional ownership and domestic savings and institutional ownership and Investor sentiments were dropped due to collineality.

Since the coefficients of all the moderation interaction terms were significant in the long run with P values less than 0.05 in table 4.15 whereas the coefficients of institutional ownership as an explanatory variable in table 4.14 was insignificant in the long run model, the study concluded that institutional ownership was a moderating variable and not an explanatory variable. In conclusion, institutional ownership has significant moderating effect on the relationship between macro risk factors, Investor sentiments and performance of equity market in NSE, Kenya since all the coefficients of moderation interaction terms are less than 0.05 so the null hypothesis that the interaction coefficients are equivalent to zero was rejected.

The findings in table 4.15 were in agreement with Kibiya, Aminu, and Abubakar (2019); Miko and Ajuma (2018); Guizani (2013) and Hsu (2013) who reported that institutional ownership had positive moderating effect on board structure and firm performance and earnings management. The findings were in disagreement with Salehi, Mohammadi and Afshari (2017); Trisnawati and Nasser (2017) and Ratnawatti and Hamid (2015) who found that institutional ownership had no moderating effect on control rights and earnings management.

## 4.7 Granger Causality Analysis

The existence of Cointegration proved the existence of granger causality at least in one direction. Granger causality test (1987) was carried out to establish the direction of the causal link between macro risk factors and Investor sentiments and performance of equity market in NSE, Kenya. The null hypothesis was that granger macro risk factors and Investor sentiments do not granger cause performance of

equity market in NSE, Kenya. The results for granger causality are presented in table 4.16.

**Table 4.16: Granger Causality Wald Tests Results**

Granger causality Wald tests

| Equation | Excluded | chi2 | df | Prob > chi2 |
|---|---|---|---|---|
| LNMC_d1 | LNFEF | 4.3646 | 2 | 0.113 |
| LNMC_d1 | LNDS_d1 | 2.7761 | 2 | 0.250 |
| LNMC_d1 | LNPSC_d1 | 1.2796 | 2 | 0.527 |
| LNMC_d1 | LNIF_d1 | 21.176 | 2 | 0.000 |
| LNMC_d1 | LNIS_d1 | 3.547 | 2 | 0.170 |
| LNMC_d1 | ALL | 23.174 | 10 | 0.010 |
| LNFEF | LNMC_d1 | .37938 | 2 | 0.827 |
| LNFEF | LNDS_d1 | 1.3722 | 2 | 0.504 |
| LNFEF | LNPSC_d1 | 7.4231 | 2 | 0.024 |
| LNFEF | LNIF_d1 | 3.6709 | 2 | 0.160 |
| LNFEF | LNIS_d1 | 5.5864 | 2 | 0.061 |
| LNFEF | ALL | 16.654 | 10 | 0.082 |
| LNDS_d1 | LNMC_d1 | 1.366 | 2 | 0.505 |
| LNDS_d1 | LNFEF | 5.1648 | 2 | 0.076 |
| LNDS_d1 | LNPSC_d1 | 1.3221 | 2 | 0.516 |
| LNDS_d1 | LNIF_d1 | 12.282 | 2 | 0.002 |
| LNDS_d1 | LNIS_d1 | 2.2555 | 2 | 0.324 |
| LNDS_d1 | ALL | 13.839 | 10 | 0.180 |
| LNPSC_d1 | LNMC_d1 | 1.4472 | 2 | 0.485 |
| LNPSC_d1 | LNFEF | 3.209 | 2 | 0.201 |
| LNPSC_d1 | LNDS_d1 | .53027 | 2 | 0.767 |
| LNPSC_d1 | LNIF_d1 | 6.2072 | 2 | 0.045 |
| LNPSC_d1 | LNIS_d1 | 1.3719 | 2 | 0.504 |
| LNPSC_d1 | ALL | 10.575 | 10 | 0.392 |
| LNIF_d1 | LNMC_d1 | 3.7232 | 2 | 0.155 |
| LNIF_d1 | LNFEF | 1.3798 | 2 | 0.502 |
| LNIF_d1 | LNDS_d1 | 1.4866 | 2 | 0.476 |
| LNIF_d1 | LNPSC_d1 | 2.4624 | 2 | 0.292 |
| LNIF_d1 | LNIS_d1 | 6.6224 | 2 | 0.036 |
| LNIF_d1 | ALL | 22.974 | 10 | 0.011 |
| LNIS_d1 | LNMC_d1 | 4.1418 | 2 | 0.126 |
| LNIS_d1 | LNFEF | 1.0311 | 2 | 0.597 |
| LNIS_d1 | LNDS_d1 | 1.9885 | 2 | 0.370 |
| LNIS_d1 | LNPSC_d1 | .18383 | 2 | 0.912 |
| LNIS_d1 | LNIF_d1 | 10.738 | 2 | 0.005 |
| LNIS_d1 | ALL | 13.464 | 10 | 0.199 |

**Source: Study Data (2020)**

Granger causality wald test was conducted for all the equations. From table 4.16, First equation for market capitalization indicates that Inflation rate granger causes market capitalization with a P value of 0.000 for the coefficient of inflation, which was less than 0.05 leading to rejection of null hypothesis of no granger causality.

The joint chi statistic for the first equation for market capitalization is 23.174 with a P value of 0.010 which is less than 0.05 meaning that the null hypothesis that foreign equity flows, domestic savings, private sector credit, Inflation rate and Investor sentiments do not granger cause market capitalization is rejected. This means that the values of macro risk factors and Investor sentiments can jointly be used to predict performance of equity market measured by market capitalization.

Secondly, in the second equation for foreign equity flows, Private sector credit granger causes foreign equity flows with a P value of 0.024 for the coefficient of private sector credit that was less than 0.05 leading to the rejection of the null hypothesis of no granger causality. The joint chi statistic for the second equation for foreign equity flows is 16.654 with a P value of 0.082 which is greater than 0.05 meaning that the null joint hypothesis that market capitalization, domestic savings, private sector credit, Inflation rate and Investor sentiments do not granger cause foreign equity flows cannot be rejected.

The third equation for domestic savings indicates that Inflation rate granger causes domestic savings with a P value of 0.002 for coefficient of inflation, which was less than 0.05 leading to the rejection of the null hypothesis of no granger causality. The joint statistic is 13.839 with a P value of 0.180, which is greater than 0.05 meaning that the null hypothesis that market capitalization, foreign equity flows, private sector credit, Inflation rate and Investor sentiments do not granger cause domestic savings cannot be rejected.

The fourth equation for private sector credit indicates that Inflation rate granger causes private sector credit with a P value of 0.045 for the coefficient of inflation, which was less than 0.05 leading to the rejection of null hypothesis of no granger causality. The joint chi statistic has a coefficient of 10.575 with P value 0.392, which is greater than 0.05 meaning that the null hypothesis that market capitalization, foreign equity flows, domestic savings, Inflation rate and Investor sentiments do not cause Inflation rate cannot be rejected.

Further, the fifth equation for Inflation rate indicates that Investor sentiments granger causes Inflation rate with a P value of 0.036 for coefficient of Investor

sentiments, which is less than 0.05 leading to the rejection of the null hypothesis of no granger causality. The joint chi statistic is 22.974 with P value of 0.011 which is less than 0.05 meaning that the null hypothesis that market capitalization, foreign equity flows, Domestic savings, private sector credit and Investor sentiments do not granger cause Inflation rate is rejected at 5 percent significance level. This means that jointly market capitalization, foreign equity flows, Domestic savings, private sector credit and Investor sentiments can be used to predict inflation.

Lastly, the sixth equation for Investor sentiments indicates that Inflation rate granger causes Investor sentiments with a P value of 0.005 for the coefficient of inflation, which is less than 0.05 leading to the rejection of the null hypothesis of no granger causality. The joint chi statistic is 13.464 with P value of 0.199 which is greater than 0.05 meaning that the null hypothesis that market capitalization, foreign equity flows, Domestic savings, private sector credit and Inflation rate do not granger cause Investor sentiments cannot be rejected. The findings were in agreement with Gachanja and Kosimbei, 2018; Makoni and Marozva, 2018; Bayar, 2016; Sapian and Auzairy, 2015; Ramzan, 2016; Faisal, Muhammad, and Tursoy, 2017; Dengke, 2015 and in disagreement with De and Chakraborty (2015).

**Table 4.17: Summary Of Hypotheses Tests**

| **Hypothesis** | **Reject $H_0$/Fail to reject $H_0$** |
|---|---|
| There is no significant foreign equity flows effect on performance of equity market in NSE, Kenya. | **Reject $H_0$** |
| There is no significant domestic savings effect on performance of equity market in NSE, Kenya. | **Reject $H_0$** |
| There is no significant private sector credit effect on performance of equity market in NSE, Kenya. | **Reject $H_0$** |
| There is no significant Inflation rate effect on performance of equity market in NSE, Kenya. | **Reject $H_0$** |
| There is no significant Investor sentiments effect on performance of equity market in NSE, Kenya. | **Reject $H_0$** |

| | |
|---|---|
| Institutional ownership does not moderate the relationship between macro risk factors, Investor sentiments and performance of equity market in NSE, Kenya | **Reject $H_0$** |

**Source: Researcher, 2020**

# CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

Chapter five presents a summary of the study, conclusions, implications, recommendations, limitations and suggested areas for further research. The study's summary originates from the objectives and the hypotheses of the study. The conclusions, recommendations and suggestions for further study originated from the significant findings of the study. The study further presented implications and contributions to new knowledge based on the significant findings of the study. The chapter also summarized the limitations of the study.

## 5.2 Summary Of The Study

The study determined the effect of macro risk factors, Investor sentiments and performance of equity market in NSE, Kenya. Equity market capitalization was selected as proxy for performance of equity market. The study was based on positivism research paradigm, which views reality as real, external and independent. Consequently, explanatory research design was selected to clarify the relationship between the variables under study. The study relied on monthly time series data between 2008 and 2018. Secondary data on foreign equity flows, domestic savings, private sector credit, inflation, Investor sentiments and market capitalization were used. ARDL and NARDL models were used for analysis.

The study relied on descriptive and inferential statistics. Descriptive statistics were used to summarize the data in terms of mean, standard deviation, maximum and minimum values. The descriptive statistics indicated volatility in foreign equity flows, domestic savings, private sector, Inflation rate and investor sentiment as indicated by their respective deviations from the mean. Performance of equity market also experienced fluctuations over the period under study as indicated by the difference between the maximum and minimum values. Correlation analysis was used to show the linkage between macro risk factors, investor sentiment and performance of equity market. Foreign equity flows, domestic savings, inflation and investor sentiment were negatively correlated with market capitalization while private sector credit was positively correlated with market capitalization used as proxy for performance of equity market.

The first objective was to determine the effect of foreign equity flows on performance of equity market in NSE, Kenya. Net foreign equity flows were used to measure foreign equity flows. Market capitalization was used to measure performance of equity market. The study found that foreign equity flows had significant negative effect on market capitalization both in the short run and in long run. The findings support the notion that foreign equity flows represent hot money in the equity market in search of high returns . slight social, political and economic instability in the Kenyan market results in capital flight with foreign investors taking a net selling position thus reducing liquidity in the equity market and consequently leading to decline in performance of equity market in Kenya.

The second objective was to establish the effect of domestic savings on performance of equity market in NSE, Kenya using gross domestic savings to measure domestic savings. The study found that domestic savings had a negative significant effect on performance of equity market. This implied that decline in domestic savings results in limited funds for commercial banks to channel to the corporate sector and this starves listed firms of the requisite funds for expansion that reduces their profitability leading to decline in performance of equity market. The findings also signify short term invested horizon undertaken by investors who only invest to make short term gains and exit the market hence the negative effect on performance of equity market in Kenya.

The third objective was to determine the effect of private sector credit on performance of equity market in NSE, Kenya using gross credit to private sector to measure private sector credit. The study found that private sector credit had a significant positive effect on performance of equity market in Kenya. This supports the idea that there is a positive correlation between the banking sector and stock market. More specifically, increase in private sector credit results in capital availability for listed firms for expansion and investment. This leads to increase in profitability of listed firms and dividends, which increases performance of the equity market in Kenya measured by market capitalization..

The fourth objective was to establish the effect of Inflation rate on performance of equity market in NSE, Kenya. Consumer price index was used to measure inflation

rate. The study found that Inflation rate had a significant negative effect on market capitalization. This was in disagreement with Fishers hypothesis that positively linked Inflation rate to performance of equity market due to substitutability between stocks and real assets. The findings imply that during high periods of inflation, investors increase their consumption consequently reducing the amount of funds available for investment in the equity market. This leads to decrease in demand for shares and performance of equity market declines due to reduced liquidity. Furthermore, increase in inflated rate increases the cost of doing business for listed companies, which reduces their profitability and capacity to pay dividends leading to decline in performance of equity market.

The fifth objective was to determine the effect of Investor sentiments on performance of equity market in NSE, Kenya. Trading volume was used as a proxy for Investor sentiments. The findings indicated that Investor sentiments had a positive significant effect on performance of equity market in Kenya.. The findings support the arguments of Baker and Wurgler (2007) and Dalika and Seetharam(2015) who contended that investors' willingness to add liquidity to the market depends on how optimistic or pessimistic the investors feel concerning the market. The findings confirm the presence of optimistic investor sentiment in the equity market that positively affects performance of the equity market. This was due to raft of reforms in the equity market including liberalization, demutualization and introduction of derivatives market linked to the equity market among other reforms which increased investor confidence on the performance of the equity market.

The sixth objective of the study sought to establish the moderating effect of institutional ownership on the relationship between macro risk factors, Investor sentiments and performance of equity market in NSE, Kenya using Hierarchical multiple regression. The findings of the study concluded that institutional ownership had significant moderating effect on the relationship between macro risk factors, Investor sentiments and performance of the equity market in NSE, Kenya.

The study also tested for asymmetry in the long run relationship between macro risk factors, Investor sentiments and performance of equity market in NSE, Kenya using NARDL. The results of NARDL indicated the existence of long run asymmetric

effects for foreign equity flows, domestic savings and Investor sentiments. The asymmetric effects imply that the performance of the equity market does not react equally in the long term to positive and negative shocks in foreign equity flows, domestic savings and investor's sentiment in the long run. Short run asymmetric effects were also reported for domestic savings, private sector credit and Investor sentiments. The short term asymmetric effects imply that the performance of the equity market does not react equally in the short run to positive and negative shocks in domestic savings, private sector credit and Investor sentiments.

Lastly, the study sought to establish the direction of causal link between macro risk factors, Investor sentiments and performance of equity market in NSE, Kenya. The study found that Inflation rate granger caused market capitalization, private sector credit granger causes foreign equity flows, Inflation rate granger caused domestic savings, Inflation rate granger causes private sector credit; Investor sentiments granger causes Inflation rate and Inflation rate granger causes Investor sentiments. In addition, jointly, foreign equity flows, domestic savings, private sector credit, and Inflation rate and Investor sentiments granger cause market capitalization; Jointly, market capitalization, foreign equity flows, Domestic savings, private sector credit and Investor sentiments granger caused Inflation rate and Jointly, market capitalization, foreign equity flows, Domestic savings, private sector credit and Inflation Rate do not granger causes Investor sentiments. Granger causality results imply that the values selected variables could be used to forecast the values of the granger caused variables.

## 5.3 Conclusions

The study made conclusions based on the unique findings of the study associated with the formulated research hypotheses to address the objectives of the study. Correlation analysis indicated that macro risk factors and investor sentiment significantly influenced performance of equity market in Kenya measured by market capitalization.

With respect to the test for hypothesis one, the study concluded that in both the short run and the long run, foreign equity flows had significant effect on

performance of equity market performance in NSE, Kenya. This was an indication that the net value of foreign equity flows significantly influenced equity market performance in NSE, Kenya. The findings were in line with other empirical studies. The study concluded that decline in foreign equity flows had a negative effect on performance of equity market in NSE, Kenya.

Test for Hypothesis two found that domestic savings had a significant effect on performance of equity market in NSE, Kenya. The study concluded that domestic savings negatively affected performance of equity market both in the short run and in long run. The study concluded that declining domestic savings had a negative effect on performance of equity market in NSE, Kenya. This was evidence that declining and negative domestic savings were unfavorable to the performance of equity market since financial institutions could not channel enough funds from savers to firms for expansion.

Test for hypothesis three established that private sector credit had significant effect on performance of equity market in NSE, Kenya. The study concluded that private sector credit had significant positive effect on performance of equity market in NSE, Kenya. The findings were consistent with theory and empirical studies. This was evidence that credit availability leads to increase in listed company profits and dividends which increases performance of equity market.

Test for hypothesis four indicated that Inflation rate had significant effect on performance of equity market in NSE, Kenya. The study concluded that inflation negatively affected performance of equity market both in the short run and in long run. The findings were in disagreement with fisher's hypothesis, which links Inflation rate to increase in stock values due to substitution of financial assets to real assets to hedge against inflation but in agreement with empirical studies. This meant that rising Inflation rate was hampering firm performance due to high cost of inputs, which reduced profitability and reduced performance of equity market in the NSE, Kenya.

Test for hypothesis five found that Investor sentiments had significant effect on performance of equity market in NSE, Kenya. The study concluded that investor

sentiment had significant positive effect on performance of equity market in NSE, Kenya. The findings were in agreement with herding behavior bias and prospect theory and in consonance with empirical studies. The inference was that investors were confident with the operations and management of the underlying companies in the NSE and this positively affected market capitalization.

Test for Hypothesis six concluded that institutional ownership significantly moderates the relationship between macro risk factors, Investor sentiments and performance of equity market in NSE Kenya. This was due to the nature and size of institutional owners who use their power to keep checks and balances on firm management through board representation and corporate governance.

In addition, the study established asymmetric effects between foreign equity flows, domestic savings and Investor sentiments and performance of equity market performance measured by market capitalization meaning negative and positive changes in Investor sentiments do not have effects of the same magnitude on performance of equity market in the NSE, Kenya. Lastly, with regard to the direction of causal links, the study concluded that there were causal relations. More specifically, the study found that Inflation rate granger caused market capitalization, private sector credit granger causes foreign equity flows, Inflation rate granger caused domestic savings, Inflation rate granger caused private sector credit, Investor sentiments granger caused Inflation rate and Inflation rate granger causes Investor sentiments. In addition, granger causality tests indicated that jointly, foreign equity flows, domestic savings, private sector credit and Inflation rate and Investor sentiments granger caused market capitalization and Jointly, market capitalization, foreign equity flows, domestic savings, private sector credit and Investor sentiments granger caused inflation.

## 5.4 Policy Implications

The study findings are of implication to various stakeholders in the market including the government, policy makers, investment banks, asset managers, corporate and individual investors and academia. The study implications are base on the significant findings of the study. The government and policy makers will find the study very

insightful. To start with, the findings of the study have policy implications on the central bank, which is tasked with role of stimulating economic growth and full employment.

The study concluded that foreign equity flows had a significant negative effect on performance of equity market. This implies the presence of capital flight and hot money seeking high returns in the market which implies that the capital markets authority has to put up mechanisms to attract and retain foreign investors by ensuring that there is stability in the market and introduce new securities to make the market more liquid. The central bank also needs to monitor and maintain favorable exchange rates and interest rates in order for the market to remain attractive to foreign investors. Taxes should be lowered or eliminated to lower the cost of financial transactions in the country thus making the market attractive to foreign investors in search of high returns. The central bank should also regulate foreign inflows by vetting foreign investors to ensure that the stock market does not harbor and clean ill-gotten money thus facilitating money laundering and to minimize the destabilizing effects associated with sudden foreign investor outflows in the equity market.

The study also reported that domestic savings had a significant negative effect on performance of equity market. This is explained by increased cost of living meaning that Kenyans had less to save and this had an overall effect on domestic savings. The policy implication is that the government should reduce taxation, create more jobs and lend more money to small and medium enterprises to increase disposable incomes and consequently reverse the negative trend in domestic savings and consequently increase performance of equity market. The capital markets authority should also come up with innovative savings schemes and tools to encourage savings. This includes development of investment vehicles and pension schemes, which do not require high initial capital.

The study concluded that private sector credit had a significant positive effect on performance of equity markets. This underscores the importance of credit growth to the economy. The central bank should put measures in place to stimulate more lending by commercial banks to the private sector. This can be done by central bank

reducing the central bank rate whose multiplier effect is reducing the cost of lending by commercial banks to the private sector for expansion purposes. Commercial banks should also minimize lending to the government, which crowds out private sector lending affecting credit growth to the private sector.

The study concluded that Inflation rate had significant negative effect on performance of equity market. This implies that a favorable Inflation rate was generally good for firms. The central bank should monitor Inflation rate and keep it within acceptable levels to avoid increase in cost of doing business, which negatively affects the general economy and the equity market. The central bank should control Inflation rate using money supply by issuing treasury bonds with high interest rates to mop excess liquidity in the market.

Asset managers, investment banks, corporate and individual investors will find the study very useful in asset allocation and diversification. The findings of the study on risk pricing based on macro risk factors and Investor sentiments will assist in determining optimal asset allocation under different economic scenarios of foreign equity flows, domestic savings, private sector credit and inflation. Negative trends in foreign equity flows should inform asset managers on the direction the equity market is likely to take with a possibility of capital flight and the associated decline in performance of the equity market due to reduced demand for stocks as hot money leaves the market in search for better returns in other markets. The negative effect of domestic savings implies that investment banks, corporate and individuals should be wary of government policies and taxation measures, which reduce disposable income and reduce the demand for securities as this has a depressing effect on performance of stock markets. The positive effect of private sector credit emphasizes the correlation between the banking sector and the equity market. Negative trends in growth of private sector credit should signal decline in performance of equity market due to lack of funds to firms for expansionary purposes. Inflation rate had a negative effect on performance of equity market. This implies that corporate and individual investors must monitor inflation.

In addition, the study found that Investor sentiments had significant positive effect on performance of equity market. Individual and corporate investors will be able to

incorporate Investor sentiments in their technical and fundamental analysis of stock prices. The findings on Investor sentiments also explain the prospect theory in Kenya and its associated risk avoidance in the market whereby Kenyan investors concentrate their investments on a blue chip shares for companies like Safaricom, Equity bank, Kenya commercial bank, cooperative bank and east African breweries with proven track recorded as an implicit insurance against losses. This also implies that it would not be prudent for Asset managers, investment banks, corporate and individual investors to bet against sentimental investors, as they possess the ability to move the market and cause financial catastrophes and crisis in the market. The findings on the significant moderating effect of institutional ownership on the relationship between macro risk factors and Investor sentiments and performance of equity market implies that firms with strong corporate governance in form of board of directors, internal and external auditors have better prospects and instill investor confidence.

The academia will also benefit immensely from the study. The study findings found evidence in support of arbitrage pricing theory with foreign equity flows, domestic savings and private sector significantly influencing equity market performance. The findings also disapproved the single factor and single period capital asset pricing model by concluding that several factors affect performance of equity market across several time periods. The study concluded that Investor sentiments had significant positive effect performance of equity market. This supports behavioral finance theories of herding behavior bias and prospect theory meaning that investors are averse to risk and hold their loss making portfolios to avoid the responsibility of incurring immediate losses. The findings also explain the reason why trading in Nairobi securities exchange is concentrated on a few blue chip firms with a proven track record of performance since investing in such securities has implicit insurance against making losses compared to other firms. The negative effect of Inflation rate on performance of equity market disapproves Fishers hypothesis on the substitutability between stocks and real assets during periods of high Inflation rate in Kenya. This implies that Inflation rate increases the cost of doing business through increase in cost of raw materials and this eats into the profits of the business and this has a depressing effect on performance of stock prices. The study also contributed to

finance theory by demonstrating significant moderating effects of institutional ownership on performance of equity markets.

## 5.5 Recommendations Of The Study

The study findings indicate that foreign equity flows had a significant negative effect on performance of equity market. This implies the presence of capital flight and hot money seeking high returns in the market which implies that the capital markets authority has to put up mechanisms to attract and retain foreign investors by ensuring that there is stability in the market and introduce new securities to make the market more liquid. The central bank also needs to monitor and maintain favorable exchange rates and interest rates in order for the market to remain attractive to foreign investors. Taxes should also be lowered or eliminated to lower the cost of financial transactions in the country thus making the market attractive to foreign investors in search of high returns. The central bank should also regulate foreign inflows by vetting foreign investors to ensure that the stock market does not harbor and clean ill-gotten money thus facilitating money laundering.

The study found that domestic savings negatively influence market capitalization. Data from the period under study indicates that private savings have been declining during the period under study and at times, the figures are negative. This means that banks do not have adequate savings to channel to firms for expansionary purposes to increase profitability. The negative effect of domestic savings also indicates that investors have a short term investment horizon and only invest their savings in the market to make short term returns and then move out on the market rather than invest for the long term as indicated by movement in and out of safaricom initial public offers leading to market instability and uncertainty. Local investors also concentrate their trading on blue chip stocks which are easily disposable with minimal loss in value. The CMA and CBK should come up with innovative ways of increasing domestic savings in the economy to correct the current negative trend, which is causing a decline in equity market performance. Aggressive investor education should also be done to sensitize investors on the benefits of long term investment depending on the investors risk appetite. The government (Kenya revenue authority) should lower income tax and value added tax on basic

commodities and increase cash transfers to the vulnerable segments of the country to increase cash available to Kenyans for consumption and investment through increased domestic savings of households and companies. Austerity measured by the government such as reduction of unnecessary travel and reduction of government wage bill the salaries and remuneration commission will also go a long way in increasing government savings and ultimately domestic savings.

The study also recommends implementation of measures by CBK aimed at correcting the current decline in private sector credit by financial institutions to stimulate investment and expansion of firms, which will in turn increase firm value, and consequently performance of equity market in the long run. The CBK should employ expansionary measures to increase credit available for commercial banks to lend to firms. Some of the measures which can be used include lowering the central bank rate and cash reserve ratios whose multiplier effect will be low lending rates by commercial banks which trickles down to the borrowing firms for expansionary costs and lowering of financing costs for firms which increase firm profitability translated into higher equity market performance. In addition, the study recommends, introduction of new products and services in the NSE to promote variety for investors and increase liquidity in the market. Public education and awareness campaigns should also be conducted to sell the NSE as an investment hub for local and international investors.

The study found that Inflation rate had significant negative effect on performance of equity market performance. This implies that a favorable Inflation rate was generally good for firms. The central bank should monitor Inflation rate and keep it within acceptable levels to avoid increase in cost of doing business, which negatively affects the general economy and the equity market. The study also recommends that the CMA should put measures in place to attract more foreign investment into the NSE in order to increase equity market performance since the decline in foreign equity flows had a negative effect on performance of equity market in the NSE. The findings from the study indicate that current net foreign flows are dismal to influence equity market performance through increase liquidity in the market.

The study identified Investor sentiments as a crucial factor influencing performance of equity market. This study recommends that the CMA and CBK incorporate investor irrationality in policy making since behavioral aspects of the investors influence investment decisions. The findings of the study have strongly contradicted with previous studies on the effect of foreign equity flows, domestic savings, private sector credit, Inflation rate and Investor sentiments on performance of equity market in NSE, Kenya. The study recommends conducting of unit root tests before regressions to avoid spurious regressions and finance researchers can enhance stability by analyzing the effect of macro risk factors on performance of equity market using other methodologies.

## 5.6 Limitations Of The Study

The findings of the study are applicable to the Kenyan economy; applicability of the findings on other jurisdictions should be done in consideration of the size of the market, information asymmetry, number of listed firms, and market capitalization contribution to GDP. The Kenyan equity market though developing is not mature as characterized by high concentration risks whereby five firms control more than 70 percent of the market.

The period under study was characterized by elections in 2008 and post election violence of 2008,elections in 2013 and 2017 which directly of indirectly could have influenced performance of the equity market during the period under study. The macro economy was also volatile over the 2008-2018 period and this might have adversely affected the macro risk factors and Investor sentiments thus increasing or decreasing their effect on performance of the equity market in the NSE, Kenya over the period.

Daily time series data is sometimes noisy and so the study used monthly data and introduced lags into the model to address this problem. Some of the variables had missing and negative observations. To address, the problem of missing data, the study employed the ARDL model and NARDL models, which perform better, even with small samples. The study relied on data from secondary sources and as such, the accuracy of the findings was dependent on the accuracy of the data provided. To

enhance accuracy, the study collected data from credible sources for instance the KNBS, NSE, CMA and CBK.

## 5.7 Contributions To Knowledge

This section captures study's contribution to knowledge concerning macro risk factors, Investor sentiments and performance of equity market in NSE, Kenya with focus on theories, practice and policy. The study was anchored on the arbitrage pricing theory, efficient market hypothesis, arbitrage pricing theory, Fishers hypothesis and behavioral finance theories. The study extended the applicability of the efficient market hypothesis by testing the semi strong form of the efficient market hypothesis in the Kenyan market by examining the effect of macro risk factors and Investor sentiments on performance of equity market in Kenya.

The study also evaluated the arbitrage-pricing model in Kenya by linking performance of the equity market to several macro risk variables and Investor sentiments. Fisher's hypothesis was used to link Inflation rate to performance of the equity market positively. Herding behavior bias and prospect theory were used to relate Investor sentiments to performance of the equity market in Kenya. The two theories were also used to explain the concentration of trading on a few firms in the NSE implying that investors are risk averse and only concentrate on blue chip company securities because of their inherent insurance against losses.

The study findings also contributes to knowledge by determining the effect of macro risk factors and Investor sentiments on performance of equity market in the NSE, Kenya. The study effectively tested the effect of foreign equity flows, domestic savings, private sector credit, Inflation rate and Investor sentiments on performance of the equity market. The study also confirmed the significant moderating effect of institutional ownership on the relationship between macro risk factors and Investor sentiments thus adding to the already existing body of empirical literature.

Conceptually, the study provided a diagrammatic representation of the interaction between macro risk factors, Investor sentiments, moderating effect of institutional ownership and performance of equity market in Kenya in the conceptual framework. This assists in positioning the study comparatively with other studies done on the

same field by linking the dependent, moderating and independent variables to elucidate the linkage between them in the Equity market.

## 5.8 Suggestions For Further Research

The study determined the effect of macro risk factors, Investor sentiments on performance of equity market in NSE, Kenya. The study also analyzed and summarized other empirical studies with a focus on the conceptual framework, methodology, context and findings. The findings of the current study indicated that foreign equity flows and domestic savings had a significant negative effect while Investor sentiments had a significant positive effect on performance of the equity market in Kenya with asymmetric effects meaning positive and negative effects shocks of these variables have different effects on performance of equity markets. Further studies can be conducted across different and longer periods to find out if the signs and asymmetric effects still hold.

The study findings also documented significant negative effect of Inflation rate on performance of equity market in NSE Kenya. This was against fisher's hypothesis, which positively links Inflation rate to performance of equity market. The findings were puzzling since Inflation rate declined over the period under study and cost of doing business should have declined increasing profitability of firms in the equity market and consequently increasing performance of the equity market. The study recommends further studies using different measures of Inflation rate across different samples and longer periods to find out whether the relationship holds in the long run with less noisy monthly data.

Lastly, the study documented that institutional ownership significantly moderated the relationship between macro risk factors, Investor sentiments and performance of the equity market although the direction of the moderation effect varied depending on the variable the moderating variable was interacting with. Further, studies may be conducted using different measures of institutional ownership.

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# APPENDICES

## Appendix 1a: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **530980**

Date of Issue: **23/April/2020**

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**This is to Certify that Mr.. MICHAEL MAKAU MUSEMBI of Kenyatta University, has been licensed to conduct research in Nairobi on the topic: MACRO RISK FACTORS, INVESTOR SENTIMENT AND PERFORMANCE OF EQUITY MARKET IN NAIROBI SECURITIES EXCHANGE,KENYA for the period ending : 23/April/2021.**

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# Appendix 1b: Research Permit

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearence from relevant Government Agencies
5. The License does not give authority to tranfer research materials
6. NACOSTI may monitor and evaluate the licensed research project
7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one of completion of the research
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E-mail: dg@nacosti.go.ke / registry@nacosti.go.ke
Website: www.nacosti.go.ke

# Appendix 2: Copy Of KU Graduate School Letter

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: kubps@yahoo.com
dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 57530

Internal Memo

FROM: Dean, Graduate School

DATE: 2nd March, 2020

TO: Mr. Musembi M. Makau
C/o Department of Accounting & Finance
KENYATTA UNIVERSITY

REF: D86/CTY/38463/16

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

This is to inform you that the Graduate School Board at its meeting 26th February,2020 approved your Ph.D. Research Proposal entitled "Macro Risk Factors, Investors Sentiment and Performance of Equity Market in Nairobi Securities Exchange, Kenya".

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed supervision Tracking and Progress Report Forms. The Forms are available at the University's Website under Graduate School webpage downloads.

By copy of this letter, the Registrar (Academic) is hereby requested to grant you substantive registration for your Ph.D. studies.

Thank you.

REUBEN MURIUKI
FOR: DEAN, GRADUATE SCHOOL

c.c. Chairman, Department of Accounting & Finance
Registrar (Academic) Att; Mrs. Lucy Njenga

Supervisors:

1. Dr. Eddie Simiyu
C/o Department of Accounting & Finance
KENYATTA UNIVERSITY

2. Dr. Charity Njoka
C/o Department of Accounting & Finance
KENYATTA UNIVERSITY

RM/cao

## Appendix 3: Listed, Delisted And/Or Suspended Companies

| Year | Number Of Listed Companies | Number Of Delisted Companies | Number of Suspended Companies |
|---|---|---|---|
| **2008** | 55 | 1 (Unilever Tea (K) Ltd.) | 1 (A. Baumann) |
| **2009** | 55 | - | - |
| **2010** | 55 | - | - |
| **2011** | 58 | - | 2(CMC Holdings Limited); EAPCC (Re-admitted 2012) |
| **2012** | 61 | - | - |
| **2013** | 61 | 1 (Access Kenya) | 2 (City Trust Limited) – Re-admitted and renamed I&M Holdings Limited; Rea Vipingo, pending a take-over bid. |
| **2014** | 64 | - | 2 (City Trust Limited) – Re-admitted and renamed I &M Holdings Limited; Rea Vipingo, pending a take-over bid. |
| **2015** | 64 | 1 (Rea Vipingo) | - |
| **2016** | 66 | - | 1 Atlas Development and Support Services |
| **2017** | 67 | 3 (Marshall East Africa Limited, Hutchings Biemer and A. Baumann) | 1 (Atlas Africa) |
| **2018** | 67 | | 3(Atlas Africa, Athi River Mining Cement PLC, Deacons |

Source: CMA/NSE(2018)

## Appendix 4: Number Of Listed Firms In Nairobi Securities Exchange As At 2018

| | COMPANY | SECTOR |
|---|---|---|
| 1 | Arm Cement Plc Ord 1.00 | Construction & Allied |
| 2 | Atlas African Industries Ltd*gems* | Commercial And Services |
| 3 | B.O.C Kenya Plc Ord 5.00 | Manufacturing & Allied |
| 4 | Bamburi Cement Ltd Ord 5.00 | Construction & Allied |
| 5 | Barclays Bank Of Kenya Ltd Ord 0.50 | Auautomobile Astomobiles & Accessories |
| 6 | Barclays New Gold Etf | Exchange Traded Funds |
| 7 | Bk Group Plc Ord 0.80 | Auautomobile Astomobiles & Accessories |
| 8 | Britam Holdings Plc Ord 0.10 | Insurance |
| 9 | British American Tobacco Kenya Plc Ord 10.00 | Manufacturing & Allied |
| 10 | Car & General (K) Ltd Ord 5.00 | Auautomobile Astomobiles & Accessories |
| 11 | Carbacid Investments Plc Ord 1.00 | Manufacturing & Allied |
| 12 | Centum Investment Co Plc Ord 0.50 | Investment |
| 13 | Cic Insurance Group Ltd Ord.1.00 | Insurance |
| 14 | Crown Paints Kenya Plc Ord 5.00 | Construction & Allied |
| 15 | Deacons (East Africa) Plc Ord 2.50*aims* | Commercial And Services |
| 16 | Diamond Trust Bank Kenya Ltd Ord 4.00 | Auautomobile Astomobiles & Accessories |
| 17 | E.A.Cables Ltd Ord 0.50 | Construction & Allied |
| 18 | E.A.Portland Cement Co. Ltd Ord 5.00 | Construction & Allied |
| 19 | Eaagads Ltd Ord 1.25 *Aims* | Agricultural |
| 20 | East African Breweries Ltd Ord 2.00 | Manufacturing & Allied |
| 21 | Equity Group Holdings Plc Ord 0.50 | Auautomobile Astomobiles & Accessories |
| 22 | Eveready East Africa Ltd Ord.1.00 | Commercial And Services |
| 23 | Express Kenya Ltd Ord 5.00*aims* | Commercial And Services |
| 24 | Flame Tree Group Holdings Ltd Ord 0.825*gems* | Manufacturing & Allied |
| 25 | Hf Group Plc Ord 5.00 | Auautomobile Astomobiles & Accessories |
| 26 | Home Afrika Ltd Ord 1.00*gems* | Investment |

| | | |
|---|---|---|
| 27 | I&M Holdings Plc Ord 1.00 | Auautomobile Astomobiles & Accessories |
| 28 | Jubilee Holdings Ltd Ord 5.00 | Insurance |
| 29 | Kakuzi Plc Ord.5.00 | Agricultural |
| 30 | Kapchorua Tea Kenya Plc Ord Ord 5.00*aims* | Agricultural |
| 31 | Kcb Group Plc Ord 1.00 | Auautomobile Astomobiles & Accessories |
| 32 | Kengen Co. Plc Ord. 2.50 | Energy E& Petroleum |
| 33 | Kenolkobil Ltd Ord 0.05 | Energy E& Petroleum |
| 34 | Kenya Airways Ltd Ord 1.00 | Commercial And Services |
| 35 | Kenya Orchards Ltd Ord 5.00*aims* | Manufacturing & Allied |
| 36 | Kenya Power & Lighting Co Ltd Ord 2.50 | Energy E& Petroleum |
| 37 | Kenya Power & Lighting Ltd 4 percent Pref 20.00 | Energy E& Petroleum |
| 38 | Kenya Power & Lighting Ltd 7 percent Pref 20.00 | Energy E& Petroleum |
| 39 | Kenya Re Insurance Corporation Ltd Ord 2.50 | Insurance |
| 40 | Kurwitu Ventures Ltd Ord 100.00*gems* | Investment |
| 41 | Liberty Kenya Holdings Ltd Ord. 1.00 | Insurance |
| 42 | Longhorn Publishers Plc Ord 1.00*aims* | Commercial And Services |
| 43 | Mumias Sugar Co. Ltd Ord 2.00 | Manufacturing & Allied |
| 44 | Nairobi Business Ventures Ltd Ord. 1.00*gems* | Commercial And Services |
| 45 | Nairobi Securities Exchange Plc Ord 4.00 | Investment Services |
| 46 | Nation Media Group Plc Ord. 2.50 | Commercial And Services |
| 47 | National Bank Of Kenya Ltd Ord 5.00 | Auautomobile Astomobiles & Accessories |
| 48 | Nic Group Plc Ord 5.00 | Auautomobile Astomobiles & Accessories |
| 49 | Olympia Capital Holdings Ltd Ord 5.00 | Investment |
| 50 | Safaricom Plc Ord 0.05 | Telecommunication |
| 51 | Sameer Africa Plc Ord 5.00 | Commercial And Services |
| 52 | Sanlam Kenya Plc Ord 5.00 | Insurance |
| 53 | Sasini Plc Ord 1.00 | Agricultural |

| | | |
|---|---|---|
| 54 | Stanbic Holdings Plc Ord.5.00 | Auautomobile Astomobiles & Accessories |
| 55 | Standard Chartered Bank Kenya Ltd Ord 5.00 | Auautomobile Astomobiles & Accessories |
| 56 | Standard Group Plc Ord 5.00 | Commercial And Services |
| 57 | Stanlib Fahari I-Reit Ord 20.00 | Real Estate Investment Trust |
| 58 | The Co-Operative Bank Of Kenya Ltd Ord 1.00 | Auautomobile Astomobiles & Accessories |
| 59 | The Limuru Tea Co. Plc Ord 20.00*aims* | Agricultural |
| 60 | Total Kenya Ltd Ord 5.00 | Energy E& Petroleum |
| 61 | Tps Eastern Africa Ltd Ord 1.00 | Commercial And Services |
| 62 | Trans-Century Plc Ord 0.50*aims* | Investment |
| 63 | Uchumi Supermarket Plc Ord 5.00 | Commercial And Services |
| 64 | Umeme Ltd Ord 0.50 | Energy E& Petroleum |
| 65 | Unga Group Ltd Ord 5.00 | Manufacturing & Allied |
| 66 | Williamson Tea Kenya Plc Ord 5.00*aims* | Agricultural |
| 67 | Wpp Scangroup Plc Ord 1.00 | Commercial And Services |

Source: CMA/NSE (2018)

# Appendix 5: Document Review Guide

| Year | Foreign Equity Flows= Foreign investor inflows - foreign investor outflows | Domestic Savings | Private Sector Credit | Inflation | Investor sentiments | Institutional ownership | Market Capitalization |
|---|---|---|---|---|---|---|---|
| | **SOURCE** | **KNBS** | **KNBS** | **CBK** | **CMA** | **CMA** | **CMA/NSE** |
| YEAR | MONTH | | | | | | |
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| 2008 | 10 | | | | | | |
| 2008 | 11 | | | | | | |
| 2008 | 12 | | | | | | |

**Source: Researcher, 2020**

# Appendix 6: Unit Root Tests

## Table A6 (a):Unit root Test for market capitalization at level with intercept and trend

```
Phillips-Perron test for unit root                Number of obs   =       131
                                                  Newey-West lags =         4

                           ---------- Interpolated Dickey-Fuller ---------
                 Test      1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)          -2.512          -19.903           -13.762           -11.041
 Z(t)            -1.284           -3.500            -2.888            -2.578
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.6363
```

## Table A6 (b): Unit root Test for market capitalization at first difference with intercept and trend

```
. pperron LNMC, trend

Phillips-Perron test for unit root                Number of obs   =       131
                                                  Newey-West lags =         4

                           ---------- Interpolated Dickey-Fuller ---------
                 Test      1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)         -10.476          -27.607           -20.824           -17.603
 Z(t)            -2.145           -4.030            -3.446            -3.146
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.5210
```

## Table A6(c): Unit root Test for Foreign Equity Flows at level with intercept

```
. . pperron LNFEF

Phillips-Perron test for unit root                Number of obs   =        64
                                                  Newey-West lags =         3

                           ---------- Interpolated Dickey-Fuller ---------
                 Test      1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)         -45.105          -19.152           -13.412           -10.784
 Z(t)            -6.558           -3.560            -2.919            -2.594
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000
```

## Table A6(d): Unit root Test for Foreign Equity Flows at level with intercept and trend

```
. pperron LNFEF, trend

Phillips-Perron test for unit root                Number of obs   =        64
                                                  Newey-West lags =         3

                                ---------- Interpolated Dickey-Fuller ---------
                   Test         1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)          -47.049          -26.176           -20.052           -16.996
 Z(t)             -6.732           -4.119            -3.486            -3.172
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000
```

## Table A6(e): Unit root Test for Domestic Saving at level with intercept and trend

```
. . . pperron LNDS

Phillips-Perron test for unit root                Number of obs   =        70
                                                  Newey-West lags =         3

                                ---------- Interpolated Dickey-Fuller ---------
                   Test         1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)           -0.144          -19.260           -13.460           -10.820
 Z(t)             -0.246           -3.552            -2.914            -2.592
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.9328
```

## Table A6(f): Unit root Test for Domestic Saving at first difference with intercept and trend

```
. pperron LNDS,trend

Phillips-Perron test for unit root                Number of obs   =        70
                                                  Newey-West lags =         3

                                ---------- Interpolated Dickey-Fuller ---------
                   Test         1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)           -0.041          -26.380           -20.160           -17.080
 Z(t)             -0.041           -4.106            -3.480            -3.168
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.9938
```

## Table A6(g): Unit root Test for Private Sector Credit at level with intercept and trend

```
. . pperron LNPSC

Phillips-Perron test for unit root                Number of obs   =       131
                                                  Newey-West lags =         4

                                ---------- Interpolated Dickey-Fuller ---------
                   Test         1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)           -1.136          -19.903           -13.762           -11.041
 Z(t)             -3.299           -3.500            -2.888            -2.578
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0149
```

## Table A6(h): Unit root Test for Private Sector Credit at first difference with intercept and trend

```
. . pperron LNPSC,trend

Phillips-Perron test for unit root                Number of obs   =       131
                                                  Newey-West lags =         4

                                ---------- Interpolated Dickey-Fuller ---------
                   Test         1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)            0.989          -27.607           -20.824           -17.603
 Z(t)              0.527           -4.030            -3.446            -3.146
------------------------------------------------------------------------------

MacKinnon approximate p-value for Z(t) = 0.9969
```

## Table A6(i): Unit root Test for Inflation Rate at level with intercept and trend

```
. . pperron LNIF

Phillips-Perron test for unit root                Number of obs   =       131
                                                  Newey-West lags =         4

                                ---------- Interpolated Dickey-Fuller ---------
                   Test         1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)         -10.553          -19.903           -13.762           -11.041
 Z(t)            -2.299           -3.500            -2.888            -2.578
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.1723

. . pperron LNIF,trend
```

## Table A6(j): Unit root Test for Inflation Rateat first difference with intercept and trend

```
Phillips-Perron test for unit root                Number of obs   =       131
                                                  Newey-West lags =         4

                                 ---------- Interpolated Dickey-Fuller ---------
                   Test          1 percent Critical       5 percent Critical      10
percent Critical
                 Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)          -12.559           -27.607           -20.824           -17.603
 Z(t)             -2.504            -4.030            -3.446            -3.146
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.3257
```

## Table A6(k): Unit root Test for Investor sentiments at level with intercept and trend

```
. . pperron LNIS

Phillips-Perron test for unit root                Number of obs   =       131
                                                  Newey-West lags =         4

                                 ---------- Interpolated Dickey-Fuller ---------
                   Test          1 percent Critical       5 percent Critical      10
percent Critical
                 Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)          -11.859           -19.903           -13.762           -11.041
 Z(t)             -2.426            -3.500            -2.888            -2.578
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.1345
```

## Table A6(l): Unit root Test for Investor sentiments at level with intercept and trend

```
. pperron LNIS,trend

Phillips-Perron test for unit root                Number of obs   =       131
                                                  Newey-West lags =         4

                                 ---------- Interpolated Dickey-Fuller ---------
                   Test          1 percent Critical       5 percent Critical      10
percent Critical
                 Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)          -40.422           -27.607           -20.824           -17.603
 Z(t)             -4.890            -4.030            -3.446            -3.146
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0003
```

## Table A6(m): Unit root Test for Institutional Ownership at level with intercept

```
. pperron LNIO

Phillips-Perron test for unit root                 Number of obs   =       131
                                                   Newey-West lags =         4

                                 ---------- Interpolated Dickey-Fuller ---------
                    Test         1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)          -23.265           -19.903           -13.762           -11.041
 Z(t)             -3.760            -3.500            -2.888            -2.578
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0033
```

## Table A6(n): Unit root Test for Institutional Ownership at level with intercept and trend

```
. pperron LNIO,trend

Phillips-Perron test for unit root                 Number of obs   =       131
                                                   Newey-West lags =         4

                                 ---------- Interpolated Dickey-Fuller ---------
                    Test         1 percent Critical       5 percent Critical      10
percent Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(rho)          -29.253           -27.607           -20.824           -17.603
 Z(t)             -4.122            -4.030            -3.446            -3.146
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0059
```

**Source: Research Data, 2020**

# Appendix 7: ARDL Bounds Test Results

```
. ardl LNMC_d1 LNFEF LNDS_d1 LNPSC_d1 LNIF_d1 LNIS_d1,lags(1,2,2,2,2,2) ec btest

ARDL(1,2,2,2,2,2) regression

Sample:     April 2008 - September 2016, but with gapsNumber of obs=         40
                                                R-squared       =     0.9843
                                                Adj R-squared   =     0.9734
Log likelihood =  117.78811                     Root MSE        =     0.0168

------------------------------------------------------------------------------
   D.LNMC_d1 |      Coef.   Std. Err.      t    P>|t|     [95 percent Conf. Interval]
-------------+----------------------------------------------------------------
ADJ          |
     LNMC_d1 |
         L1. |  -1.435157   .1098073   -13.07   0.000     -1.66231   -1.208003
-------------+----------------------------------------------------------------
LR           |
       LNFEF |   -.006104   .0027125    -2.25   0.034    -.0117152   -.0004927
     LNDS_d1 |  -.1672053   .0506439    -3.30   0.003    -.2719703   -.0624404
    LNPSC_d1 |   1.203043   .4022386     2.99   0.007     .3709492    2.035137
     LNIF_d1 |   -.133085   .0265239    -5.02   0.000    -.1879538   -.0782163
     LNIS_d1 |   .3707643   .0264472    14.02   0.000      .316054    .4254745
-------------+----------------------------------------------------------------
SR           |
       LNFEF |
         D1. |   .0019414   .0039483     0.49   0.628    -.0062264    .0101091
         LD. |  -.0070077   .0033415    -2.10   0.047      -.01392   -.0000953
             |
     LNDS_d1 |
         D1. |   -.020608   .0611192    -0.34   0.739    -.1470428    .1058268
         LD. |  -.0733619   .0315285    -2.33   0.029    -.1385836   -.0081402
             |
    LNPSC_d1 |
         D1. |  -1.255573   .4714329    -2.66   0.014    -2.230807   -.2803403
         LD. |  -.7159472   .3443536    -2.08   0.049    -1.428297   -.0035975
             |
     LNIF_d1 |
         D1. |   .1639376   .0355487     4.61   0.000     .0903996    .2374757
         LD. |   .1443805   .0320917     4.50   0.000     .0779937    .2107674
             |
     LNIS_d1 |
         D1. |  -.2390522   .0338593    -7.06   0.000    -.3090954    -.169009
         LD. |  -.0449417   .0085839    -5.24   0.000     -.062699   -.0271845
             |
       _cons |   .0206705      .0256     0.81   0.428    -.0322871    .0736281
------------------------------------------------------------------------------

note: estat btest has been superseded by estat ectest
      as the prime procedure to test for a levels relationship.
      (click to run)

Pesaran/Shin/Smith (2001) ARDL Bounds Test
H0: no levels relationship             F =  33.169
                                       t = -13.070

Critical Values (0.1-0.01), F-statistic, Case 3

      | [I_0]   [I_1]  | [I_0]   [I_1]  | [I_0]   [I_1]  | [I_0]   [I_1]
      |    L_1     L_1 |   L_05    L_05 |  L_025   L_025 |   L_01    L_01
------+----------------+----------------+----------------+--------------
  k_5 |   2.26    3.35 |   2.62    3.79 |   2.96    4.18 |   3.41    4.68
accept if F < critical value for I(0) regressors
reject if F > critical value for I(1) regressors

Critical Values (0.1-0.01), t-statistic, Case 3

      | [I_0]   [I_1]  | [I_0]   [I_1]  | [I_0]   [I_1]  | [I_0]   [I_1]
      |    L_1     L_1 |   L_05    L_05 |  L_025   L_025 |   L_01    L_01
------+----------------+----------------+----------------+--------------
  k_5 |  -2.57   -3.86 |  -2.86   -4.19 |  -3.13   -4.46 |  -3.43   -4.79
accept if t > critical value for I(0) regressors
reject if t < critical value for I(1) regressors
```

k: # of non-deterministic regressors in long-run relationship
Critical values from Pesaran/Shin/Smith (2001)

**Source: Research Data, 2020**