AFRICAN FINANCIAL MARKETS AND POLITICAL UNCERTAINTIES

By

ALBERT ATTAH AGYEMANG-BADU

A thesis submitted in partial fulfillment of the

requirements for the award of the degree of

DOCTOR OF PHILOSOPHY (ECONOMICS AND FINANCE)

from

UNIVERSIDAD AUTÓNOMA DE MADRID

SEPTEMBER, 2021

DEDICATION

To my lovely wife Comfort and amazing kids Owusua and Paa Akwasi

ACKNOWLEDGEMENT

I am most grateful to Almighty God for successfully seeing me through this journey. This work would not have been a reality without His abundance grace.

I am indebted to my supervisors: Professors Fernando Olmedo Gallardo and Jose Maria Mella Marquez for their consistent support guidance and encouragement. They have been extremely supportive throughout this PhD process and my stay in Madrid. Fernando has been with me through thick and thin. His assistance and support in a number of ways goes beyond being a supervisor but as a mentor and a friend. Also, Prof. Mella for his love and support for African economy and education assisted me in the admission to UAM and has been with me throughout my studies. His assistance in documentations and the invitation to Erasmus+ programme was most valuable. They have been by side and I will forever cherish the memories we had in this period. I say God richly bless you for your dedication and many sacrifices in all this PhD process.

I am highly appreciative to Africa, Mediterranean and Europe regional integration (AMENET) for their contribution in completion of this programme. I thank AMENET and their directors for the several platforms they provided in my research activities. Their seminars, conferences and workshops were extremely helpful in the completion of this programme. I also thank to Instituto Complutense Análisis Económico (ICAE) for the opportunity they provided me during my stay in Madrid. Their seminars and access to their facilities was most valuable for the completion of this study. I am equally thankful to the European Union for enrolling me in the Erasmus+ 2020 Staff mobility programme for teaching and training. It accorded me the opportunity to gain practical skills relevant for my career and professional development.

My sincere gratitude also goes to the entire Spiritan University College (SUC) community for their prayers, encouragement and moral support. Specifically, I extend my heartfelt appreciation to the Rector; Rev. Fr. Anthony Dr. Anomah, the Vice Rector; Rev. Fr. Dr. Alphonsus Beni and my Head of Department Rev. Fr. Dr. Ekpaa Maalo for their support in diverse ways. I say may God richly bless and replenish whatever you lost on me.

The success of this thesis was largely dependent on the availability and quality of the data used in this studies. This would not have been possible without the help of certain generous persons who guided me in my data collection. These are: my supervisors Fernando Gallardo and Jose Maria

Mella, Theodosio Pérez Amaral and Jimenez-Martin, Juan-Angel of ICAE, Ernesto Bautista and George Tweneboah and George O.K. Asafo-Agyei of Wits University Business School, South Africa. I also thank my colleague and friend Kwasi Agyei for his assistance in certain challenges I encountered in the analysis of data. Your assistance have been very beneficial.

Finally, I thank my family and friends for their unconditional love and support. I thank my parents, my siblings Alfred Attah Agyemang and Augustine Appiah as well as Victoria Opoku and Anane Sovoe Sowornu for their prayers, encouragement and support in diverse ways. Without them I couldn't have come to a successful end of my degree.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ACMS	African Capital Markets
AfCTA	African Continental Free Trade Area
ASMs	African Stock Markets
AIC	Akaike Information Criterion
APT	Arbitrage Pricing Theory
ADF	Augmented Dickey-Fuller
ARCH	Autoregressive Conditional Heteroscedasticity
ARMA	Autoregressive Moving Average Models
AARs	Average Abnormal Returns
BIC	Bayesian Information Criteria
CAPM	Capital Asset Pricing Model
CPI	Consumer Price Index
COVID-19	Coronavrus Disease 2019
CARs	Cumulative Abnormal Returns
CAARs	Cumulative Average Abnormal Returns
CUSUMSQ	Cumulative Sum of Squares of Recursive Residuals
EMH	Efficient Market Hypothesis
EGARCH	Exponential GARCH
FE	Fixed Effect
FDI	Foreign Direct Investment
GARCH	Generalized Autoregressive Conditional Heteroscedasticity
GMM	Generalized Methods of Moments
GFC	Global Financial Crisis
GTD	Global Terrorism Database
GJR-GARCH	Glosten, Jaganathan and Runkle - GARCH
GDP	Gross Domestic Product
GNI	Gross National Income
GNP	Gross National Product
IPO	Initial Public Offering

ICRG	International Country Risk Guide
JB	Jarque-Bera
LAC	Latin American and Caribbean
LDCs	Less Developing Countries
Log L	Log-Likelihood Function
MS	Markov Switching
MD	Martingale Difference
MFIs	Microfinance institutions
MENA	Middle East and North Africa
MNCs	Multinational Companies
ODA	Official Development Assistance
OLS	Ordinary Least Square
OECD	Organisation for Economic Co-operation and Development
OTC	Over the Counter
OH	Overreaction Hypothesis
PBC	Political Business Cycle
PWC	PricewaterhouseCoopers
RPT	Rational Partisan Theory
SOEs	State-Owned Enterprises
SSA	Sub-Saharan Africa
UIH	Uncertain Information Hypothesis
UH	Underreaction Hypothesis
UNCTAD	United Nations Conference on Trade and Development
VaR	Value at Risk
VAR	Vector Autoregressive
WDI	World Development Indicators

ABSTRACT

This study examines the interplay between the development of African financial markets and political uncertainties. Specifically, this thesis is structured to: (1) investigate the development of African financial markets; (2) explore the nature of relationship between economic growth and African financial development; (3) assess how conditional macroeconomic volatilities influence African stock market returns; and (4) examine the interactions between domestic political events and stock market returns within the African context.

An extensive review of data from several sources revealed that African financial markets have undergone immense improvement, although they are not yet fully developed. Financial liberalisation, technological innovations, and improvements in supervision and regulation have aided that African banking sector, insurance sector and capital markets is bridging the gap between that of developed and African economies. Also, the explosion of microfinance and Fintech services have significantly improve financial inclusion in the continent. Moreover, the flow of financial resources to Africa have undergone dramatic changes, resulting in considerable economic development and structural transformation in the region.

Further, the study used panel data spanning from 1980 to 2019 from 37 African countries to determine the nexus between financial development, proxied by domestic credit, broad money, stock market capitalisation, bank overhead cost and bank deposits; with economic growth. Both static and dynamic linear models used in the estimation confirmed a positive relationship between financial development and economic growth. Also, threshold panel models revealed that the relationship between financial development and economic growth are nonlinear in nature from the bootstrap test of linearity. However, this study failed to confirm the 'too much' finance assumption in the African context. This suggest that economic growth is highly dependent on all sectors of African financial markets.

In relation to the effect of macroeconomic volatilities on African stock markets (ASMs) returns, a general Markov switching model confirmed the existence of two regimes: an economic expansion or 'tranquil' state with less volatility and an economic decline or 'crisis' state with high volatility. It was observed that ASMs experienced more extended crisis episodes than tranquil episodes. Furthermore, the coefficients estimates are more significant in the crisis state than the tranquil state, which means that there are some opportunities for prudent investors in periods of turmoil. In

general, the study found that macroeconomic volatilities significantly affect volatility of stock market returns in Africa. These findings are consistent with macroeconomic theory and points out policy implications for policy makers.

To deal with the impact of political uncertainties on stock market returns in Africa, events linked to politics are investigated to determine its relationship with abnormal and volatility of stock market returns in Africa. Specifically, event study methodology is used to examine the extent to which elections and regime changes events affect abnormal stock returns. Subsequently, a series of methodologies based on GARCH modelling are adopted to analyse how political events affects volatility of stock returns. Results show that political events, such as elections, political regime changes, political orientation and terrorism events are major determinants of daily stock price fluctuations. In terms of annual stock returns, the panel model revealed that in addition to macroeconomic variables, political uncertainties indicators such as years in office, political orientation, governments stability, internal conflict, military in politics, years in office and regime changes affect annual stock returns, volatility and Value at Risk. These findings suggest important implications for investors, managers as well as policy makers.

In general, this study made significant contribution to literature. First, this study extends empirical literature on finance and economic growth in the post 2008 Global Financial Crisis period. Second, using the African context, the study contributes to the on-going debate on the determinants of stock returns. This study deviates from the linear model mostly used by previous authors. Specifically, a Markov switching model established a relationship between macroeconomic volatilities and stock market returns. Lastly, no previous study has simultaneously analysed the effect of a number of political events and volatilities of returns on the African stock markets. This study put forward recommendations for governments, policy makers and regulators, investors, development partners and African supranational institutions.

CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND OF THE STUDY

Made up of 54 distinct countries, Africa is diverse economically as well as culturally. The financial sector has contributed significantly to the economic development of Africa since the financial liberalisation and deregulation of the African markets in the 1990s, paving way for increased foreign participation. Africa is extremely important because of its rich natural resources and its strategic geographical location. A lot of research attention have been directed to Africa due to the bright prospects of the region in the current geopolitical space. The long deserted continent is now seen as the land of boundless opportunities resulting in major geopolitical confrontations and strategic competition.

Africa constitutes 16.3% of the total population of the world but its economy amounts to only 2.9% of the world Gross Domestic Product (GDP). Africa is noted for its dependence on agricultural sector and the exportation of raw materials because of its rich natural resources. Natural resources, such as crude oil, gold, bauxite, diamonds, cobalt, manganese, platinum group metals among others; exist in abundance in Africa. Despite these vast natural resources Africa is still ranked among the poorest regions in the world. Economic growth in Africa has been trending upwards since the mid-1900s. The growth was robust and widespread in several Africa countries due to improved macroeconomic management and progress in good governance, which provides a conducive environment for financial sector growth. Economic growth increased further during the period from 2000 to 2008. For instance real GDP growth increased by 4.9% per year on average, representing twice its pace in the 1980s and 1990s. After the 2008 Global Financial Crisis (GFC), Africa's economic growth slowed to a decadal average of 3%. In recent years economic growth in Africa has been stable. More specifically, growth in the continent was 3.3 % in 2019 and was expected to reach 4.1 % in 2020 prior to the current COVID-19 pandemic. However, the estimated growth rate in 2020 is -2.1 % post Coronavirus Disease 2019 (COVID-19) pandemic (Adams & Opoku, 2017; United Nations Conference on Trade and Development (UNCTAD), 2019a; African Development Bank AfDB, 2020; 2021).

However, African markets are largely underdeveloped, especially Sub-Saharan Africa (SSA) even when compared with other developing countries, although these seen dramatic improvements in

recent decades. The improvements in capital markets, extensive financial sector reforms in Africa as well as global events have improved the allocation of capital and risk throughout the African economies. This is evident through the persistent and large inflows of capital to Africa from abroad; the enhanced stability of the banking system; the ability of new companies to raise funds and the raising of long-term funds by governments, banks, and corporations while providing a platform for the trading of securities (Allen, Otchere & Sebbet, 2011; Boako & Alagidede, 2017).

Volatility in stock market returns is a well-researched area in finance literature. Researchers are interested in assessing the impact of events on security prices. Frequent precursors to these variations in security prices have been documented to be economic in nature. These are systematic and unsystematic risk coupled with a number of macroeconomic variables (inflation, interest rate, money supply, exchange rate, GDP growth among others). Also, corporate events such as announcements of initial public offerings, earnings growth, dividends payments, mergers and acquisitions and capitalisation issues have been found to significantly influence changes in asset prices (Boutchkova *et al.*, 2012; Çolak, Durnev, & Qian, 2017).

Again, non-economic events such as floods, earthquakes, plane crashes and tsunamis can have a significant impact on a countrys' economy as well as a contagious effect on the global economy, thus affecting asset prices. For example the massive tsunamis in December 2004 and March 2011 spread destruction among several countries in the world (Nazir *et al.*, 2014). Another strand of literature established that religious practices have an impact on stock returns and volatility through its influence on investors' mood and emotions (Bialkowski, Etebari & Wisniewski, 2012; Canepa & Ibnrubbian, 2014; Mazouz, Mohamed & Saadouni, 2016; Al-Khazali *et al.*, 2017).

Currently, political events, actions of governments and GFC have been associated with stock fluctuations. They have been found to determine the financial wellbeing of people. Although politics and volatility of stock market dominate the media and daily conversations with the peak recorded during elections periods, the dynamic interactions between these are rarely considered together. However, recent decades have witnessed an interest in literature concerning the interplay of finance and politics (Pástor & Veronesi, 2012; Pástor & Veronesi, 2013; Chau, Deesomsak & Wang, 2014; Smales, 2015; Wisniewski, 2016). Researchers posit that politics can have a far reaching impact on the economy, equities prices and financial risk. These strands of literature on

how political environment of a country influences economic outcomes has now attracted a lot of academic and public attention (Pástor & Veronesi, 2013).

Pástor and Veronesi (2013) defines political uncertainty as the unknown political cost (or benefits) associated with political decisions by governments. These political costs are detected by investors by observing "political signals" and ascribing interpretations to various political events. The uncertainties in government actions could have a positive or negative effect on security prices. It largely depends on how government properly responds to unanticipated shocks in times of distress. According to Mattozzi (2008) political uncertainty is a pervasive phenomenon that is a characteristic of a political process. This is because political parties running elections are expected to implement different policies in addition to uncertainty in election results. A political event can have an explosive or a moderate effect on stock market volatility, depending on the severity of the event's economic implications (Boutchkova, 2012).

Likewise, firms and industries are susceptible to political uncertainties (Asteriou & Sarantidis, 2016; Çolak, Durnev & Qian, 2017). According to Çolak, Durnev and Qian, 2017 (2017), political risk affects the economy as a whole through corporate firm's reaction to political uncertainties. Gulen and Ion (2016) established a link between capital investment in firm and industry-level and the overall political uncertainties regarding future policy and regulation. Thus, political events are crucial determinant of firms' future decisions since they play a key role on a country's economic outlook.

Theory suggests that a rise in political uncertainty causes asset prices to fall, especially for companies that are more responsive to government policy changes. In addition, uncertainty in government actions and political events in certain parts of the world stimulates global markets volatility and spillovers as a result of the ever-increasing globalisation of financial markets. For instance, Ahmed (2017) suggests that investors buying and selling decisions are influenced by the scope of political events. According to their interpretations and reactions, investors can cause asset price bubbles triggering market frights in the entire globe. This was evident in the Asian financial crisis in 1997 and the 2008 GFC, European sovereign debt crisis during 2011 to 2013, the Britain vote to leave the European Union in 2016 (Brexit), the 2016 depreciation of the Chinese Yuan and the trade wars between US and China in 2018; leading to occurrence of large stock market fluctuations, financial crises and market crashes (Bala & Takimoto, 2017; Liu, Shu & Wei, 2017).

Several empirical evidences including Beaulieu, Cosset and Essaddam (2006), Pástor and Veronesi (2010, 2012, 2013), Essaddam and Karagianis (2014), Smales (2015), Yeung and Aman (2016), Ahmed (2017), Bala and Takimoto, (2017), Liu, Shu and Wei (2017), among others, outline the role political events (such as parliamentary and presidential elections, wars, terrorism, civil uprisings, assassinations, and military coups) plays in shaping the perceptions and actions of investors in the overall market risk. Unanticipated political events are viewed as exogenous shocks to price volatility as well as market risk premium. For instance, Howard and Walters (2014) contends that unexpected socio-political events and revolutionary actions such as the Tunisia revolution during the period of 2011 cannot be predicted by experts and scholars. Pástor and Veronesi (2012) document that government policy uncertainty leads to rise in volatility and risk premia. Investors and fund managers thus alter their asset valuations portfolio allocations decisions in tandem to the current and imminent tidings in a nation's political environment (Ahmed, 2017). Such events cause bubbles in asset prices which may not persist but generates an interest on how market players react in circumstances like these.

One strand of literature focuses on how the political partisanship of governments influences economic decisions in the country and stock performance as a whole. If opposing political parties have diametrically opposing policies, then in view of differing opinions about the future, financial markets participant's acts differently in tandem with the eventual winner. These greater uncertainties creates volatilities in financial markets which are inherently linked to each other. For example, Hibbs (1977) seminal work suggested that right-wing governments are characterized by high unemployment and low inflation relative to left-wing governments. Left wing-governments are however associated with high government spending (Roubini & Sachs, 1989; De Haan & Sturm, 1994 & Volkerink & de Haan, 2001) leading to budget overruns. Similarly, other studies have found that the presence of coalition governments orchestrated by the implementation of various political orientation in a country results in high budget deficit and public debt as compared to countries with no or small coalitions (Roubini & Sachs, 1989; Persson, Roland & Tabellini, 2004 and Bawn & Rosenbluth, 2006).

Regardless of the nature of events, scholar's addresses on political uncertainties and financial markets. Such research aid investors and other market participants to ascertain the directions and magnitude of the impact on asset prices as well as economic growth at large. Hence a proper

appreciation of financial development, macroeconomic uncertainties and the effects of political events on asset price volatility is of grave concern to investors, portfolio managers, regulators, policy makers and academia.

1.1 STATEMENT OF THE PROBLEM

Despite the anaemic growth rates developed economies continues to suffer, emerging and developing economies are experiencing rapid although uneven growth. This has drawn substantial attention of international portfolio managers and investors to these economies in recent decades resulting in injection of considerable capital into such economies (Reboredo & Uddin, 2016; French & Li, 2017). However, unexpected events like the Asian financial crisis in 1997 and the GFC from 2007 to 2009 resulted in sudden capital flights creating a contagion in financial markets. For instance, Pástor and Veronesi (2012) traces boom in commodity investment to 2007 and 2008 GFC period.

Understanding the impact of political uncertainties on performance of financial market is of key importance because of the following. Financial markets performance measures the growth of firms as well as the whole economy. The market index largely influence the perception of investors and other market participants. Thus, asset returns and volatility contain information on how well the public perceive the effect of political uncertainties on firms and the economy. Also, insecurity in a country as a result of political events generally dampens future economic outlook. Asset prices normally rises when there are favourable and stable political environment that gives investors' confidence to invest in the financial market. It is known that if there exist political uncertainty in any country then investors under the fear of losing their wealth will move their investments to safer markets. Moreover, it is argued that political uncertainty increases the riskiness of capital inflows to the country's capital markets (Beaulieu, Cosset, & Essaddam, 2006; Gulen & Ion, 2016). Investor sentiments arising from policy and political uncertainties affect financial markets, making it essential asset return determinants (Shahzad *et al.*, 2017). These drivers therefore need carefully scrutiny by investors, portfolio managers, regulators and policy makers. It is therefore important to understand the impact of political uncertainty on the volatility of stock return considering its recurrent nature.

A growing literature now explores this important relationship between political events, actions of governments and GFC and markets performance based on theory as well as empirical modelling. These studies are among the papers widely viewed, downloaded and cited in finance and financial economics. This has created a body of interdisciplinary that bridges the gap between finance and politics. It is well established in previous studies that political events just like economic factors are key determinants of asset prices and volatility (see Pástor & Veronesi, 2013; Liu, Shu & Wei, 2017). However, these studies have mainly focused their attention on advanced global financial markets. They are mostly concerned with how political events in US (elections, terrorist attack and policy uncertainty) influence advanced financial markets (Nippani & Medlin, 2002; Li & Born, 2006; He *et al.*, 2009; Goodell & Vähämaa 2013; Essaddam & Karagianis, 2014; Bowes, 2018), how political events affect Asia stock markets especially China (Wang & Lin, 2008; Nazir *et al.*, 2014; Yeung & Aman, 2016; Liew & Rowland, 2016; Liu, Shu & Wei, 2017), politics and stock markets returns in some European countries (Dopke & Pierdzioch, 2006; Floros, 2008; Furió & Pardo 2012; Stoian & Tatu-Cornea, 2015), political uncertainties and Australian financial markets (Smales, 2015) and Organisation for Economic Co-operation and Development (OECD) countries (Asteriou & Sarantidis, 2016).

Few studies linked to African stock markets involves political uncertainties and volatilities of stock markets in Middle East and North Africa (MENA), thus the North African countries inclusive (Chau, Deesomsak & Wang, 2014; Jeribi, Fakhfekh & Jarboui, 2015; Trabelsi Mnif, 2017; Ahmed, 2017). Also, another strand of literature looks at how African stock markets are integrated to experience global effect during financial crisis. Whilst some are of the view that global factors are less important to African stock markets with the exception of South Africa (Pukthuanthong & Roll, 2009; Alagidede, 2009a; Alagidede, 2010; Agyei-Ampomah, 2011; Ntim), recent evidence established an overwhelming increase in the global sector effects on the African capital markets, especially during the 2008 GFC (Boamah, 2016; Boamah, Watts & Loudon, 2017). It can be noticed that most of the existing studies examined the scope of political uncertainty in developed and emerging economies but few have explored in African countries as a composite. This study intends to extend current literature by filling this void in academia.

The focus on African markets is important for many reasons. First, as a result of projected population growth of about 1.5 billion by 2025, according to World Bank factsheet on population

estimates[1], Africa is increasingly becoming a frontier for investment and world economic development. As such, African stock markets presents rare opportunities for investors and international fund managers to diversify their capital as well as the trade across borders. In effect, African markets provide a better prospect for shielding investors from global commodity shocks because of the potential decoupling from global shock contagion and other global financial markets (Boako & Alagidede, 2016; 2017). Second, political uncertainties are more intense in African markets than other economies, because of weak democratization that characterized most African countries. Governments in Africa are reduced, in most of the cases, to autocratic rule with one-party or a straight two-party state. Hence unlike developed economies that elections, change of government and other political events are normal occurrences, such issues normally results in tensions, acrimony and rancour affecting the weak financial systems. Third, most African governments are centralized with mostly undeveloped private sector. Unlike developed economies where governments do not directly influence the market (they are mostly developed capital states with the so-called invisible hand to control the market), Africa countries are mostly a mixture of market economy and centralized planning systems. Hence, African governments uses the "visible hand" to directly control and allocate resources, which creates uncertainties to firms and volatilities in financial markets. These reasons therefore call for attention of scholars on how Africa stock markets deals with inherent political uncertainties and global effects.

Research on predicting asset returns through uncertainty and investors measures is relatively new area in finance literature. Policy makers and researchers alike have focused their attention mainly on economic factors, neglecting equally important political risk factors like democratization, change of governments and external trade exposures. Studies throughout the advanced and most emerging economies suggest mixed results. Some researchers document a positive relationship between political factors and equity prices (see Pástor & Veronesi 2010; Goodell & Vähämaa 2013; Essaddam & Karagianis, 2014) whilst others portray contrary view (Dopke & Pierdzioch, 2006). For instance, Boako & Alagidede (2017) reiterate that the 2007-2009 GFC contagion of financial markets in Africa has not been adequately investigated. Such situation will possibly affect cross-border trading of equities and liquidity in the financial system with consequential effects on co-movements. This calls for urgent need to ascertain the link between political risk factors and

[1] https://africacheck.org/factsheets/factsheet-africas-population-projections/.

stock return volatility in equity markets considering the increasing interest in the African markets by many portfolio investors as a way to diversify their portfolio.

This study attempts to address the development of financial markets in Africa and how it has been linked to economic growth, as well as how do African stock markets behave in response to domestic and global political incidents. Also, the study assess how international portfolio managers react to African stock markets in period of domestic and global uncertainties and how do firms within the African economy respond to global and domestic events regarding political uncertainties. Thus, the study is intended to determine the nexus between political uncertainties and volatility of stock returns in African Markets using current and extensive data. More importantly, the study will move from the aggregate exposure of political factors to the stock return in general and disaggregate political uncertainties into various events, since it is assumed that some political events will be more explosive to stock market than others.

1.2 OBJECTIVES OF THE STUDY

The overall objectives of this study are to examine the development of African financial markets and the reaction of African Stock Markets (ASMs) returns to political uncertainties. To achieve these main objectives they are sub divided into the following:

1. To examine the growth of African financial markets from 1980 to 2018.
2. To determine the relationship between economic growth and financial development in Africa.
3. To examine the relationship between volatilities of stock market and the real economy in Africa.
4. To examine the effect of domestic political events on stock market volatility in Africa.

1.3 RESEARCH QUESTIONS

This study aims to assess the development of African financial markets in the midst of political uncertainties on the volatility of African stock returns. Research questions serve as instrument that guides the researcher in achieving its stated objectives. Specifically, the study will explore Africa financial sector and analyse the effect of political events on equity markets in Africa. The researcher is also interested in the growth of African financial markets and its effect on economic

growth. In addition, the study assesses the nexus between uncertainties in macroeconomic factors and stock return volatilities. Specifically, the study will seek answers to the following questions:

1. What is the trend in growth of African financial market from 1980 to 2018?
2. What is the relationship between economic growth and financial development in Africa?
3. How do volatilities of stock market affect the real economy in Africa?
4. How do domestic political events influence stock market volatility in Africa?

1.4 SIGNIFICANCE OF THE STUDY

Financial markets are very important and an integral part of a country‘s economy. A developed and complex financial system is known to be a precursor of economic growth. Hence the development of financial markets in various economies. This has necessitated the establishment and development of stock market throughout Africa. A well organized and managed stock market encourages investment by identifying and supporting productive projects that will ultimately lead to economic development. The increasing importance of the financial markets in the capital formation process requires greater interest in research, especially towards understanding the stability of the African economy and improving the sector to its fullest potentials. Thus, understanding the drivers of financial markets cannot be overemphasized because of its role in economic development of Africa.

Mostly, scholars have ascribed economic factors as the causes of variation in security prices throughout the globe. But recent events link political uncertainties to stock market returns volatility. Therefore, a proper appreciation of how political events, actions of governments and GFC affect security prices and volatility of stock returns continues to be overriding interest to investors, policy makers, regulators and academia. Considering the political instability that poses threat to economies, African markets offers a unique case study to examine the reaction of asset prices to political events.

In the light of these developments, it is important to fully understand and accurately measure the impact of political events on stock markets volatility in Africa. This will provide a useful opportunity to maximize returns, maintain confidence and accurately forecast movement in security prices in stock markets in Africa. The results of the study will be valuable information to investors, fund managers, regulators, governments and policy makers in determining the impact

of economic variables, as well as political factors necessary for making prudent decisions. Also this study will lead the way in determining the interactions between the economic and the uncertain political environments inherent in financial markets.

This study could be a source of useful information to domestic and foreign investors to acquire strategies that will maximize returns by adopting appropriate diversified portfolio, management of risk and hedging. Moreover, investors will make informed investment decisions by considering the fluctuations in the macroeconomic factors as well as the political events.

The study will provide a benchmark for ascertaining the determinants of stock market volatility in the African region by incorporating recent identified factors into empirical model. Thus, international fund managers will be assisted in choosing suitable alternatives in the investment of their funds.

This study will build the awareness of governments, regulators and policy makers on the potential contagion of domestic political events, as well as global events which is very essential for mitigating risks and insecurities that characterized the African stock markets. Results of the study are of interest to governments and policy makers concerned with measuring and understanding the determinants of stock market volatility. This enables them to effectively articulate policies and minimize the effect of contagion arising from global events. Moreover, the study will assist governments and policy makers in making sound policy decisions whiles ensuring a stable macroeconomic and political environment in order to attract investors to the country.

The study will also build upon and extend current studies, filling gaps in researched areas through the identification of factors necessary to affect the movement stock prices in Africa markets as well as industry effects over time. To the best of my knowledge, this is the first comprehensive study of political uncertainties on the African stock markets. It will be extension of existing literature on the African studies. The study generally examines the factors that influence the variability of country index returns that are explained by political uncertainties and global effects.

1.5 RESEARCH APPROACH

This study adopts hypothesis testing in understanding the development of African financial markets and the role of political uncertainties on stock returns. Specifically, hypothesis 1 tests whether there exist a linear and/or nonlinear relationship between economic growth and financial

development. Hypothesis 2 indicates the nexus between macroeconomic volatilities and stock returns. Hypothesis 3 assesses the role of political events on abnormal stock returns. The effect of political uncertainties on volatilities of stock market returns are examined in hypothesis 4. Finally, hypothesis 5 examines the overall influence of political events on stock market returns.

This research is motivated by the positivism approach which is characterized as follows: reality is external, objective and independent of social factors; observable phenomena can provide credible knowledge through causality, generalisations and reducing phenomenon into simplest forms; research is undertaken in a value-free way as such the researcher is objective and independent of the data (Saunders, Lewis & Thornhill, 2009). Specifically, data was extracted from official sources including DataStream, Bloomberg, World Bank and national sources and incorporated into the proposed models.

The study adopts multiple econometric models to answer the research questions. Research question one is descriptive in nature. Hence data was presented in charts, graphs and tables. In answering research question two, both static and dynamic panel linear and threshold models are used to determine the finance-growth nexus. Research question three is answered with the adoption of Markov switching regime model in addition to Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models. An event study methodology is the main tool used to assess the impact of unanticipated political events on stock index over a relatively short time (5 to 21 days). A series of univariate GARCH models is then explored to determine the effect of political event on the volatilities of African stock returns.

1.6 STRUCTURE OF THE THESIS

This study is organized into eight chapters. Chapter one is the introductory chapter consisting the background of the study, the statement of the problem, research objectives and questions, the justification of the study and a brief description of the research approach and methodology. Chapter two provides an overview of the African financial markets. Chapter three presents a detailed survey of related literature pertaining to the study. This includes an examination of finance-growth nexus, political uncertainties factors and volatility of stock returns and a review of relevant theoretical models. Also, the study conducts a systematic review of empirical literature on financial development and economic growth as well as political uncertainties and stock returns.

Chapter four covers the development of the hypotheses for the study. Chapter five provides an empirical analysis of financial development and economic growth in Africa. Chapter six investigates the impact of conditional macroeconomic volatility on conditional stock market volatility under regime switching model. Chapter seven is devoted to political uncertainties and stock returns in Africa. The final chapter provides discussions and policy implications of the main findings of the study. It highlights the contributions and limitations of the study as well as conclusions and recommendations. Lastly, suggestions for future research attention are also presented

CHAPTER TWO

OVERVIEW OF AFRICAN FINANCIAL MARKETS

2.0 INTRODUCTION

This section reviews African financial markets by providing a detailed background on the banking sector, insurance sector, microfinance and capital markets in the continent using recent data. This chapter focuses on the overall financial sector in Africa by presenting the weaknesses and highlighting the investment opportunities available in the region. In general, a brief overview is provided on the various financial sectors before narrowing it down to the ASMs, which forms the basis of this study. The historical development of ASMs is presented, as well as the establishment and development of national stock exchanges. The characteristics, trends and risks that are inherent in ASMs are shown in this section. Finally, this study provides an overview of the flow of financial resources to Africa.

2.1 BANKING SYSTEM

African financial sector has undergone several transformations. This is mainly due to the implementation of financial sector liberalisation in the 1980s. This was associated with reforms that restructured and privatized state-owned enterprises. In addition, the financial sector liberalisation was accompanied with auxiliary policies that removed restrictions on entries and exits, interest rate and capital controls, as wells as strengthening regulations and supervision in the banking sector. This has spur growth in the financial sector leading to several benefits[2]. It agreed that such reforms have led to promotion and emergence of more efficient deposit taking institutions that channels finance to more productive sectors of the economy.

The banking system in Africa is made up of deposit taking institutions supervised by Central Banks. Technically, the Central Banks are independent from government control even though there is a close collaboration between the two. In most African countries the head of the Central Banks is appointed by the government, mostly for fixed term that normally span over the term of the governments. The Central Bank is mandated to adopt various monetary tools to stabilize price

[2] In spite of the debate among expert on the effect of financial sector reforms, some authors confirmed that such reforms leads to financial development which promotes economic growth (Levine, 2005; King and Levine, 1993), poverty alleviation and reduction in income inequality by making financial services available to the poor and marginalized groups (Beck, Demirguc-Kunt and Levine, 2007) among others.

and ensure overall financial stability. The deposit taking institutions are made up of commercial banks, rural and community banks, savings and loans, credit unions and other microfinance institutions. As expected, commercial banks control the banking sector in Africa. Commercial banks are mainly public capital banks, although there are also private capital banks. The private banks are mostly branches of foreign banks with few local private banks. There is a growing rate in the number of subsidiaries of foreign banks in Africa, as evidenced in Table 2.1[3]. This is mainly attributed to financial sector liberalisation, which have led to removal of entry barriers and promotion of competition, which ensure the growth in the banking sector. Also, African economies are undergoing several reforms to improve the quality of banking sector through the privatization of state-owned banks, strengthening the supervision and regulation and adoption of technology (Allen, Otchere & Senbet, 2011; Beck & Cull, 2013; Nyantakyi & Sy, 2015).

Table 2.1: Total Percent of Foreign Banks (2000-2013)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
North Africa	23	23	23	26	28	29	35	38	39	38	36	36	36	36
West Africa	51	54	52	51	52	52	54	56	59	61	60	62	61	63
Central Africa	32	33	33	33	38	43	45	47	61	63	58	56	56	56
East Africa	49	48	49	52	53	53	55	54	53	54	54	54	54	55
Southern Africa	50	51	50	50	51	53	51	54	52	51	52	52	52	53
Africa	41	42	42	42	44	46	48	50	53	53	52	52	52	52

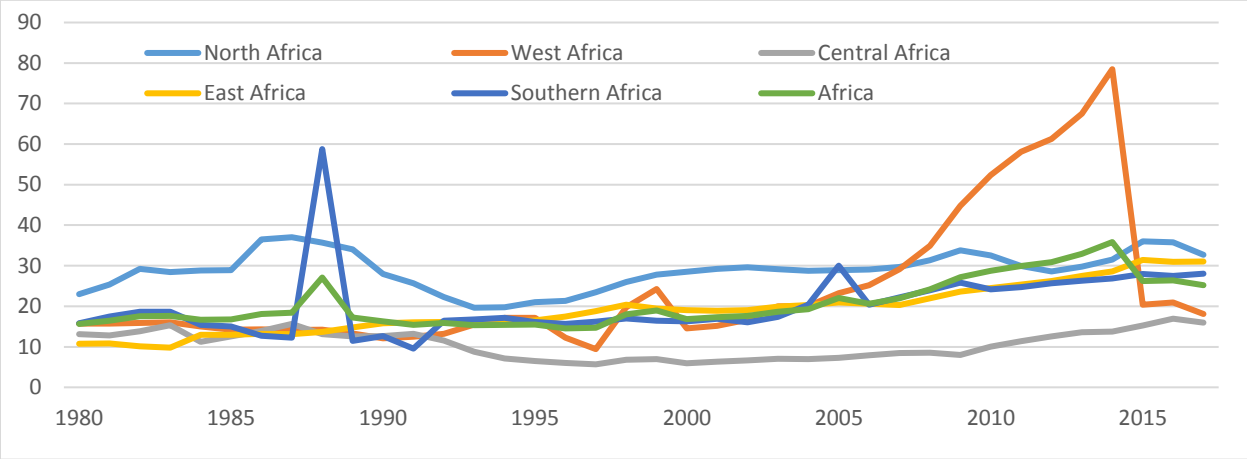
Source: Global Financial Development (2017); Author' computation

A common characteristic of African banking sector is the over investment in government securities, mostly treasury bills. This reliance of government securities is at the expense of providing credit to the private sector that directly enhance economic growth. Thus, the high returns as well as the less risky nature of government securities crowds-out private sector access to credit from commercial banks. This can be seen in the reduced average domestic credit provided by banking sector in Figure 2.1. Overall, it can be seen that; banking sector credit to private is low and also on a downward trajectory. This worrying dysfunctionality in financial intermediation have been recognized and trumpeted by African policy makers. Such several efforts and programmes

[3] Note: African countries are classified into sub-groups based on United Nations classifications. Details can be found in Appendix 1.

are been highlighted to provide a conducive environment for increased capital formation in African banks[4] for efficient resource allocation.

Figure 2.1: Domestic Credit to Banking Sector (% of GDP)



Source: Authors, using Global Financial Development (2017)

Table 2.2: Financial Deepening in Africa, 2017

	Domestic credit to private sec. (% of GDP)	Bank deposits to GDP (%)	Liquid liabilities to GDP (%)
Africa	31.85	33.58	43.37
North Africa	47.00	45.16	74.34
Sub-Saharan Africa	28.07	30.68	35.63
West Africa	23.95	23.22	32.10
West Africa without Nigeria	24.70	23.80	32.88
Central Africa	15.02	17.42	23.35
East Africa	31.64	46.55	52.29
Southern Africa	41.66	35.54	34.80
Southern Africa without South Africa	26.53	32.75	33.79

Source: Global Financial Development (2017); Author' computation

The depth of financial development, measured by the domestic credit to private sector, is still shallow in African markets, especially in SSA countries despite recent progress. The average domestic credit to the private sector of 28% as at 2017 (compared to 24% in 2014 reported by

[4] Allen, Otchere and Senbet (2011) reports that banking sector in Botswana, Malawi, Nigeria, Seychelles and South Africa are more capitalized to respond to private sector credit obligations and innovations. They report of a highly sophisticated banking sector in Seychelles similar to advanced economies.

Nyantakyi & Sy, 2015) is still about half that of North Africa countries. The overall average domestic credit to the private sector of the continent is 32%, with Central Africa being the lowest, followed by West Africa. Apart from North Africa, Southern Africa report a relatively high average domestic credit to the private sector of 42%, driven mainly by a high financial depth in South Africa (Table 2.2). The lack of financial depth in the continent is reflected in the high ratio of liquid liabilities to GDP but narrow deposits rate proxied by bank deposits to GDP. This shows the monetary resources available in the banking industry and the level of financial intermediation.

Despite recent improvements, financial penetration in Africa is still low. About two-thirds of Africa's population has no access to formal bank account with a financial institution or mobile-money provider. This is an indication of the low financial inclusion and the extent to which private individual can access financial services. From Table 2.3, Central Africa followed by West Africa have the lowest financial penetration with about 33% and 35% of adult population with bank account, respectively. In contrast, East and Southern Africa are relatively well penetrated with access to financial services. Also, the number of bank accounts per 1000 adult population shows that more than half of adults on the average have no formal bank accounts. This is more (less) pronounced in Central Africa (East Africa) as seen from the table below. Central Africa when compared to other regions has as twice or thrice less bank accounts per 1000 adult population.

Table 2.3: Financial Penetration in Africa, 2017

	Account ownership (%)	Bank accounts per 1,000 adults	Bank branches per 100,000 adults	5-bank asset concentration (%)
Africa	41.36	476.00	8.75	80.49
North Africa	35.89	517.68	10.36	79.11
Sub-Saharan Africa	42.61	465.58	8.34	80.84
West Africa	35.29	402.14	6.81	77.99
West Africa without Nigeria	34.93	358.74	6.99	79.33
Central Africa	32.95	230.53	6.89	84.26
East Africa	55.01	754.30	13.06	73.80
Southern Africa	52.87	–	6.62	87.31
Southern Africa without South Africa	53.87	475.33	5.98	85.72

Source: Global Financial Development (2019); Author' computation

Another measure of penetration of financial services is the number of bank branches per 100,000 adult population. The low ratio, especially in SSA except East Africa, is an indication of low availability of financial services. A common feature of banking sector in most African countries

is the high concentration ratio with a large share of assets held by few big banks. The World Bank estimate of the top 5 bank concentration of more than 80 % shows how few banks dominates the banking sector in Africa. This leads to excess liquid and risk aversion in the provision of financial services[5]. Moreover, the crave for government securities is exemplified by the high interest rate spread as presented in Table 2.4. This also shows the costly nature of credit in Africa.

Table 2.4: Average Interest Rate Spread in Africa, 1980-2019

Period	Lending rate (%)	Deposit rate (%)	Interest rate spread (%)
1980 – 1989	14.61	9.74	4.87
1990 – 1999	22.24	14.29	7.94
2000 – 2009	16.64	10.39	6.25
2010 – 2019	15.26	6.44	8.82

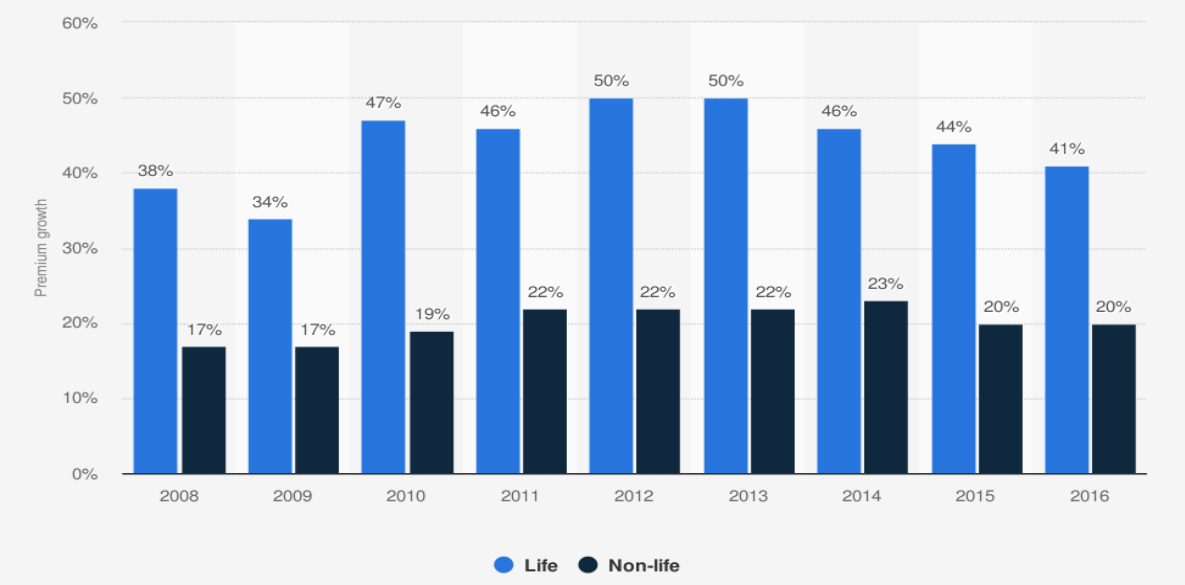
Source: World Development Indicators, 2020; Author' computation

2.2 INSURANCE SECTOR

Even though African insurance sector is not well developed compared to other regions, it has undergone immense developments in the 2000s despite continual disruptions because of technological advances. The insurance sector in Africa is dominated by motor, life and health. Motor and health insurance sector are often mandatory, thus, accounting for its bigger market share. A positive development is the improvement in life insurance which is the fastest growing sector serving to promote and protect savings as well as serving as collateral for credit. Non-life insurance accounting for about 70 % of industry premium from 2012 to 2018, is the slowest growing sector as a result of overcrowding and fierce competition as seen in Figure 2.2. As shown in Figure 2.3, insurance premiums in Africa have been remarkable stable over the period despite commodity crisis which affected the development of premiums.

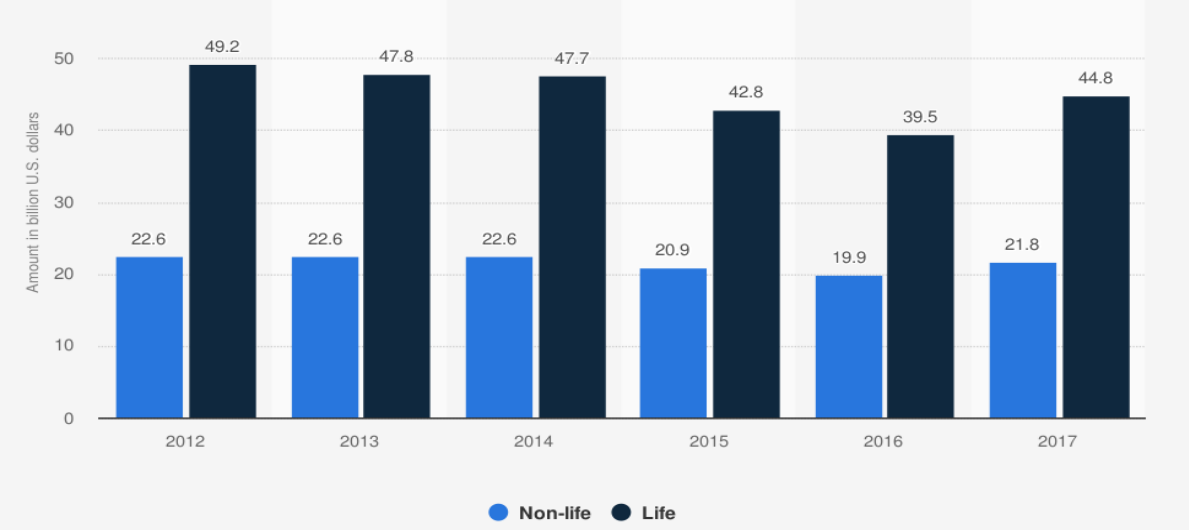
[5] According to Dahou, Omar and Pfister (2009), the oligopolistic behavior of banking sector in Africa leads to negative consequences such as high interest rate spreads which crowds out private sector access to credit in favor of government assets. This results in a low and dysfunctional financial intermediation causing resulting in only a small part of banks credit to be available to the private sector.

Figure 2.2: Growth of Insurance Premiums by Type in Africa, 2008-2016 (in millions USD)



Source: Pwc; Swiss Re

Figure 2.3: Value of Insurance Premiums by Type in Africa, 2011-2017 (in millions USD)

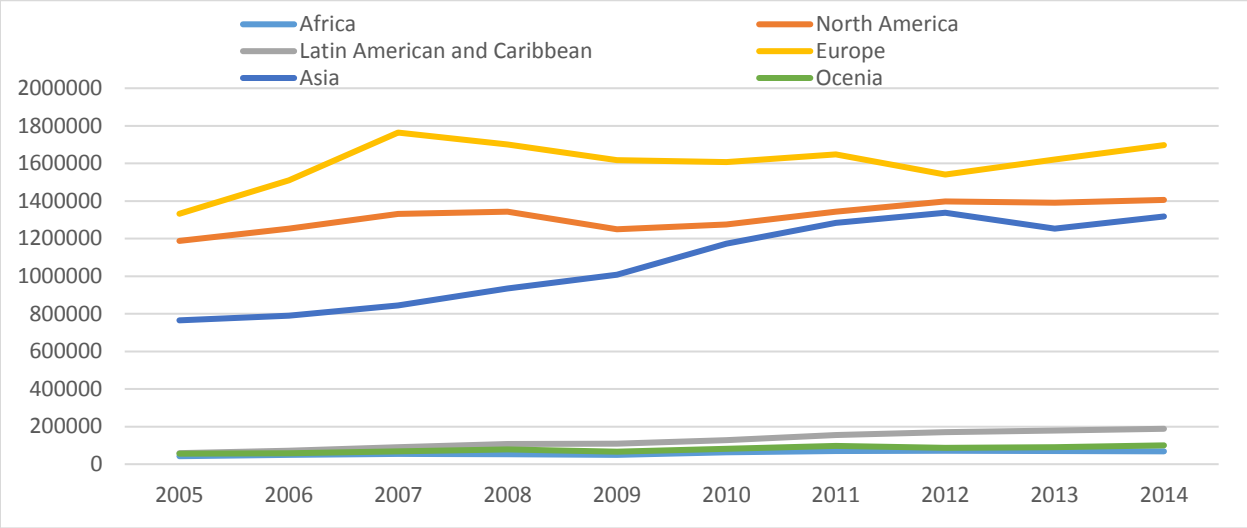


Source: Dr. Schanz, Alms & Company; Swiss Re

When compared to other regions, the value of insurance premiums in Africa is the lowest. Europe has the highest insurance premiums of about USD1.33 trillion to USD1.69 trillion for the period of 2005 to 2014. This is followed closely by North America and Asia with Latin American and

Caribbean (LAC) and the Oceania region a distance away (Figure 2.4). South Africa has the most developed insurance sector, which is similar to most emerging economies. Although most of the insurance companies in Africa has been privatized, government still holds substantial share in some countries (Allen, Otchere & Senbet, 2011; Sibindi, 2015).

Figure 2.4: Global Trends in Total Volume of Premiums, 2005-2014 (in millions USD)



Source: Sibindi (2015); Swiss Re

The importance of insurance sector for economic development cannot be overemphasized. Sibindi, (2015) emphasized that insurance sector: facilitates financial intermediation, mitigates firm's substantial risk, and promotes household savings and institutional investment. It is argued that insurance sector promotes the development of financial sector, which cascades into economic growth. Despite the strong underlying growth and profitability coupled with improvement in regulations in African insurance sector, lack of local expertise, harmonization and enforcement of regulations, as well as over concentration in motor, health and property continues to hinder the growth of the sector.

2.3 MICROFINANCE

The provision of micro financial services to the poor, referred as microfinance, is regarded as one of the largest and effective poverty alleviation programs in Africa. Microfinance services includes the provision of micro credit, payment, insurance and savings services to individuals and micro enterprises who may not be qualified for services in the formal financial sector. Microfinance

institutions (MFIs) exist in several parts of Africa mainly due to the structure of African financial sector[6]. Over the years, the sector has seen significant growth and it is becoming an important driver of development despite its challenges.

The providers of microfinance services ranges from informal providers i.e. individuals or groups to formal providers such as credit unions, banks and other deposit taking institutions as well as Non-Governmental Organisations. The growth of the sector has necessitated formalisation to counter frequent collapse of microfinance institutions. As such there have been major improvements in the regulation and supervision in most African markets. These microfinance institutions directly empower individuals economically and Small and Medium-Sized Enterprises (SMEs), and contribute to economic development. Microfinance is also a means of social progress and poverty alleviation when holistically combined with other social programmes and the microfinance institutions are improved[7]. Loans provided by MFIs are important in improving the rural economies especially the agriculture sector. Farmers are able to purchase inputs and expand their farms thereby generating adequate income.

There are however numerous challenges that bedevils the microfinance sector in Africa at various levels. These challenges have concealed the strengths and opportunities of the sector inhibiting its potentials of alleviating poverty. These are structural challenges including governance, internal control, portfolio management, financial sustainability and human resources facing MFIs at the firm level. At the industry level, MFIs are saddled with high transaction cost that prevent them from operating in rural communities. MFIs are thus concentrated in urban and semi-urban areas. Also, support services are unavailable to MFIs in most African countries. At the macro level, there exist weaknesses in supervision and coordinating, coupled with weak legal system. Policy makers, governments and development partners should as a matter of urgency address weaknesses in MFIs to consolidate the gains achieved so far in order to sustain the development of rural communities.

[6] Honohan and Beck (2007) suggests that African financial sector have the following features: are small sized, shallow, highly exposed to economic and sociopolitical shocks, largely informal in nature, exhibit deficiencies in regulations, dysfunctional financial intermediation and dominance of the banking sector.

[7] United Nations (2013) provides evidence to the fact that microfinance is developing in three levels of the African financial system: the micro (financial service providers), meso (support services to providers) and macro (policy, regulatory framework and supervision).

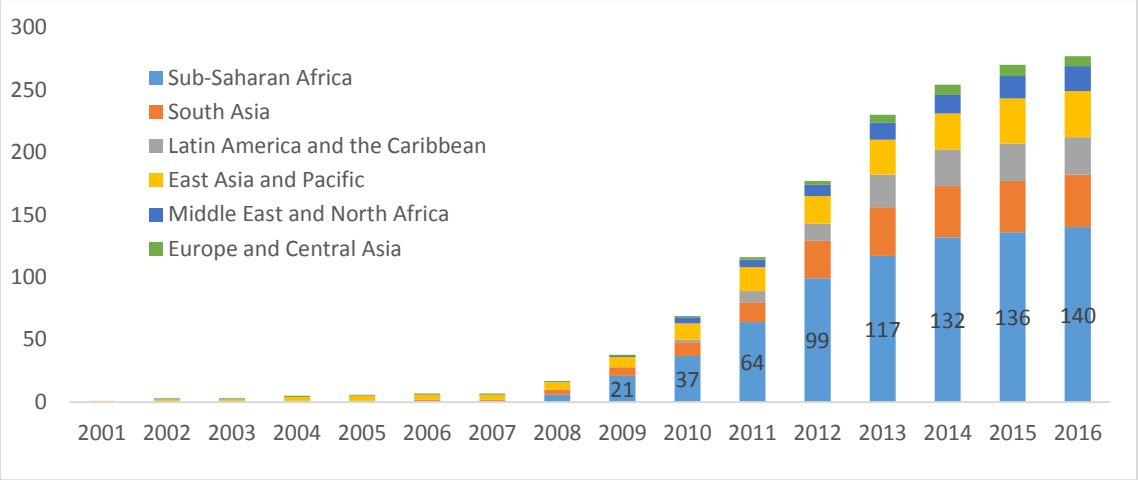
2.4 FINANCIAL TECHNOLOGY (FINTECH)

Technological innovations are driving changes in financial sector worldwide especially, after the 2008 GFC. In the advanced economies, these changes are seen as threat to traditional financial services providers such as banks and insurance companies. However, in Africa, especially SSA, financial services delivered through technology (Fintech) are creating an unprecedented opportunity to achieve universal access to financial services. Financial services such as mobile money banking, branchless distribution, machine-to-machine lending, big data and artificial intelligence and credit scoring are some of the Fintech models that are reducing costs and risks, enabling access to financial services of people who were previously unbanked, including the poor and rural communities' dwellers.

Financial technology is revolutionizing the global economy structure with cryptocurrencies, blockchain and mobile money. These services are more accessible, efficient and personal. Commercial banks in Africa are characterized by non-retail centred appraoch, cumbersome paper work, high transaction costs and with branches available only in city centres. These features cause many people to be excluded from formal banking services. However, the mobile money explosion has overcome these challenges and ensured that millions of unbanked people now have access to financial services. As seen in figure 2.5, the explosion of mobile money services started in 2009 in Africa. Sub-Saharan Africa is currently leading the world in the adoption of mobile money, almost 21% of adults have mobile money accounts from 2017 Global Findex (Demirgüç-Kunt *et al.*, 2018). East Africa region was the mobile money hub but has now spread to new parts of SSA[8]. As shown in Table 2.5, East Africa has the highest percentage of adults using mobile banking followed by Southern and West Africa. North Africa has the least mobile money penetration. Although, Southern Africa overtakes East Africa in the number of ATMs per 100,000 people driven mainly by the high density of ATMs per people in South Africa, there is relative high number of ATMs in East Africa. It can be therefore inferred that mobile money and ATMs are complementary to each other in East Africa.

[8] For example Demirgüç-Kunt *et al.* (2018) reports that more than 50% adults in Zimbabwe, 40% adults in Gabon and 30% adults in Cote d'Ivoire and Senegal have mobile money accounts. Also mobile money is now used more than traditional bank account in countries like Chad, Cote d'Ivoire, Gabon, Kenya, Mali, Senegal, Tanzania, Uganda and Zimbabwe.

Figure 2.5: Trends in Mobile Money Services, 2001-2016



Source: Global Mobile Money Dataset, GSMA.

Table 2.5: Financial Technology in Africa, 2017

	Mobile phone used to send money (% age 15+)	Mobile phone used to pay bills (% age 15+)	Electronic payments used to make payments (% age 15+)	ATMs per 100,000 adults
Africa	13.81	6.05	27.84	16.38
North Africa	1.37	0.62	12.44	13.33
Sub-Saharan Africa	16.92	7.40	31.70	17.15
West Africa	14.28	3.99	24.90	14.29
West Africa without Nigeria	15.04	4.22	24.99	13.88
Central Africa	13.20	5.37	23.37	8.04
East Africa	23.72	11.05	40.00	22.29
Southern Africa	16.50	9.20	38.52	23.98
Southern Africa without South Africa	17.42	9.58	37.87	17.70

Source: Global Financial Development (2019); Author computation

The massive adoption of mobile money platforms has propelled Fintech companies, mostly in collaboration with banks, and then have introduced several innovations financial service delivery. As such, financial products like savings, credit, insurance, and payment services have been successfully inculcated in mobile phones usage. For example, M-Shwari, a collaboration between CBA and Safaricom in Kenya, distributed about 25 million small loans through mobile money services to over 44 million inhabitants. This is like supplying credit to two-thirds of all mobile money users and all the population of Kenya (Lim, Lakhoua & Mazzawi, 2016).

The emergence of Fintech technologies is not without challenges. It is expected that overcoming these difficulties will deepen financial inclusion, which will have several positive spillovers. One of these challenges encountered by mobile money platform is interoperability, both within and outside countries. Significant steps are currently being taken in Africa to address interoperability issues to boost peer to peer transactions and remittance payments. For instance, Ghana introduced mobile money interoperability system in 2018, which allows seamless transfer of funds from one mobile money network to another. Another way to deal with interoperability issues are cryptocurrencies, which is gaining attention, especially in SSA due to high inflation and the depreciation of currencies. In particular, the popular cryptocurrency, Bitcoin is used in Zimbabwe and Nigeria to mitigate excessive depreciations of their local currencies in foreign transactions, as a means of savings and/or investments[9]. Although the prospects of cryptocurrencies might look bright, they have remarkable risks. Cryptocurrencies markets are generally unregulated, illiquid and prone to frequent price fluctuations, limiting its usage.

One other challenge of Fintech service providers is that their innovations are mostly not covered by existing regulations. Regulation and supervision are challenges to Fintech worldwide with different approaches across jurisdictions. Normally, regulatory feedbacks are incoherent, inconsistent or are not forthcoming. Also, they engage in services with no previous experience creating new risks that are not well understood. Nevertheless, Fintech is creating efficiency by broadening financial service value chain. It is not only improving financial inclusion in Africa but serving as a catalyst for emergence into several sectors like agriculture, energy and infrastructure; which promotes economic growth and development. This is evident by the expansion of the peer-to-peer transactions of mobile money and cryptocurrencies into different platforms such as peer-to-business, business-to-business and peer-to-government thereby expanding financial services to low income consumers.

2.5 CAPITAL MARKET

The capital market is also responding to reduction in the volatility of African economies. Recessions over the past decade are less frequent and not severe when they occur. This has

[9] As reported by Gadzala (2018), over one million transaction per month of six cryptocurrencies assets are traded by Golix in Zimbabwe. Also, Bitcoin increased over 1500 % in Nigeria and to $10,000 in Zimbabwe as a result of weakening local currencies in 2017.

motivated the proliferation of establishment of stock markets in many African countries over the past few decades (Andrianaivo & Yartey, 2010; Allen, Otchere & Senbet, 2011; McMillan & Thupayagale, 2011; Boako & Alagidede, 2016).

In 1989 stock exchanges established in Africa countries totalled 9 (Egypt, South Africa, Morocco, Zimbabwe, Kenya, Nigeria, Tunisia, Mauritius and Botswana). 12 more exchanges were added in the 1990s (Ghana, Swaziland, Namibia, Sudan, Angola, Malawi, Algeria, Uganda, Côte d'Ivoire, Nigeria, Tanzania and Mozambique). Currently, there are 30 independent stock exchanges and two regional stock exchange; namely: Bourse Régionale des Valeurs Mobilières (BRVM) with member countries from Senegal, Togo, Niger, Mali, Cote d'ivoire, Ginuea Bissau, Burkina Faso and Benin and Africa and Bourse des Valeurs Mobilières de l'Afrique Centrale (BVMAC) with member countries from Central Africa Republic, Chad, Congo DR, Equatorial Guinea and Gabon (ASEA annual report, 2017; PWC African market watch, 2018). The proliferation of stock exchanges in Africa is an indication of a framework for attracting foreign direct investment and an overall development of the African economies. Moreover, the boom in ASMs thrived on major financial reforms in the continent in the 1990s. These reforms include the financial sector liberalisation (especially banking sector), conversion of state-owned enterprises into private corporations, improving the investment and business environment in Africa (through policies aimed at achieving macroeconomic stability), developing a robust regulatory framework and enhancement of basic infrastructure for the development of capital markets among others (de la Torre & Schmukler, 2005).

ASMs has seen a major increase in the market capitalisation, trade value and the number of companies, as depicted in the summary of selected ASMs performance in the 2011. As at 1995, market capitalisation of ASMs stood approximately US$298 billion (excluding Egypt and with South Africa accounting for more than 90%). It increased from US$320 billion to approximately US$1,125 billion from 1997 and 2007 (McMillan & Thupayagale, 2011). This has changed significantly due to the proliferation of foreign investors in the African markets in search of diversification of their portfolio as well as anticipation of acceptable returns.

Stock market indicators as presented in Table 2.6 and 2.7. They show that market capitalisation as a percent of GDP, stood at approximately 20 % between 1995 and 2011. The number of domestic companies listed in ASMs were high in South Africa, Nigeria and Zimbabwe recording 612,181

and 65 respectively in 1995. Consequently, South Africa, Egypt and Nigeria recorded the highest listed domestic companies of 347, 231 and 196 respectively in 2011. With the exception of these top three ASMs, the mean of listed domestic companies were 23 and 44 in 1995 and 2011 respectively. This indicates a substantial growth in listed companies within that period.

Table 2.6: Summary of ASMs Indicators as at 1995

Country	Turnover (%)	Domestic Companies	MC ($ billion)	MC (% of GDP)	Value ($ billion)	Value GDP
Egypt	–	–	–	–	–	–
Botswana	9.54	12	0.40	8.40	0.38	0.80
Ghana	1.13	19	1.67	25.80	0.19	0.29
Kenya	2.97	56	2.02	22.30	0.60	0.66
Mauritius	4.00	28	1.34	33.10	0.54	1.33
Morocco	–	44	–	–	2.45	6.27
Namibia	1.58	10	0.19	4.79	0.003	0.08
Nigeria	1.07	181	7.78	17.65	0.84	0.19
South Africa	5.75	612	277.39	178.43	15.95	10.26
Tunisia	16.62	28	4.03	22.34	0.67	3.71
Zambia	0.05	2	0.43	11.24	0.000	0.01
Zimbabwe	6.55	65	2.13	29.95	0.14	1.96
ASM Median	**2.97**	**28**	**1.67**	**22.3**	**0.46**	**0.73**
ASM Mean	**4.49**	**88.42**	**27.07**	**33.99**	**1.81**	**2.13**

Source: Word Development Indicators

Table 2.7: Summary of ASMs Indicators as at 2011

Country Name	Turnover (%)	Domestic Companies	MC ($ billion)	MC (% of GDP)	S%P	Value GDP	Value ($ billion)
Algeria	–	–	0.20	0.10	–	–	–
Egypt	32.54	231	48.85	20.70	-49.14	6.74	15.90
Ghana	8.20	29	3.10	7.83	-22.82	0.64	0.25
Kenya	8.99	58	10.20	24.32	-31.63	2.19	0.92
Mauritius	6.50	63	7.85	68.11	-2.51	4.43	0.51
Morocco	6.81	75	60.09	59.28	-17.72	4.04	4.09
Namibia	–	6	1.15	9.29	6.23	0.10	0.013
Nigeria	9.92	196	39.03	9.51	-29.54	0.94	3.87
South Africa	28.62	347	789.04	189.48	-17.42	54.23	225.83
Tunisia	10.87	57	9.66	21.09	-13.43	2.29	1.05
Zambia	0.64	20	3.18	13.57	-1.29	0.09	0.02
ASM Median	**8.99**	**60.50**	**9.66**	**20.7**	**-17.57**	**2.24**	**0.99**
ASM Mean	**12.57**	**108.20**	**88.40**	**38.48**	**-17.93**	**7.57**	**25.25**

Source: Word Development Indicators, Authors computation

As at 2019, ASMs have a market capitalisation of more than 1.3trillion, with South Africa accounting for more than 80 %. This can be attributed to foreign portfolio investors that identify African market as an alternative investment hub. The percentage of market capitalisation to GDP has risen significantly from an average of 38% to 61% from 2011 to 2019. This is an indication of the contribution of capital market to the overall growth of African economies. However, there have been a reduction in the number of domestic firms listed in ASMs driven a delisting of domestic firms in South Africa and Nigeria. Apart from these countries, the rest saw a marginal increase in the number of listed firms.

Table 2.8: Summary of ASMs Indicators as at 2019

Country Name	Turnover (%)	Domestic Companies	MC ($ billion)	MC (% of GDP)	SnP	Value GDP	Value
Botswana	4.48	–	–	–	-7.28	–	–
Cote d'Ivoire	–	–	–	–	-7.87	–	–
Egypt	25.26	246	44.2	14.58	25.38	3.68	11.2
Ghana	–	–	–	–	-23.61	–	–
Kenya	1.88	59	25.1	26.24	26.59	0.49	0.47
Mauritius	4.00	95	8.62	61.33	-0.44	2.45	0.34
Morocco	4.98	74	65.4	54.65	8.04	2.72	3.26
Namibia	3.76	11	2.61	21.10	-2.24	0.79	0.09
Nigeria	6.19	180	43.9	9.80	-19.69	0.61	2.72
Rwanda	0.00	4	3.21	31.04	–	0.05	0.001
Seychelles	0.93	33	1.14	66.72	–	–	–
South Africa	33.13	274	1,060	300.58	8.55	81.04	285.0
Tunisia	5.38	81	8.5	21.92	2.96	–	–
Zambia	–	–	–	–	-37.41	–	–
ASM Median	**4.48**	**77.5**	**16.8**	**28.64**	**-1.34**	**1.62**	**1.59**
ASM Mean	**8.18**	**105.7**	**126.0**	**60.80**	**-2.25**	**11.48**	**37.9**

Source: World Development Indicators (2020); Author' computation

2.5.1 OVERVIEW OF NATIONAL EXCHANGES

This section presents an overview of ASMs analysed in the study. A historical overview is presented through a survey of official websites of the exchanges and World Development Indicators (WDI) and presented in tables (Table 2.6 to 2.8).

1. Algiers Stock Exchange (ASE)

Algiers Stock Exchange, also known as Bourse d'Algerie is managed by Societé de Gestion de la Bourse des Valeurs d'Alger (SGBV) and is by far the smallest stock exchange in Africa and the

World as at 2011, with a market capitalisation of USD197 million. The idea to establish an exchange in Algeria follows an economic reform that started in 1988. The SGBV was created by the Legislative Decree N°. 93-10 May 23, 1993 and operations started in May 1997. ASE composed of two market segments, namely the capital and debt securities market. The capital securities markets consist of the main market comprising of 5 listed large companies and SMEs market created in 2012. The SMEs market offers growth opportunity to start-ups and small firms through access to capital. The debt securities markets consist of the bond market and L'Obligation Assimilable du Trésor (OAT) for trading Treasury bond.

2. Egyptian Stock Exchange (ESE)

Egyptian Stock Exchange is the oldest stock exchange in Africa. It comprised of two exchanges; Alexandria and Cairo (established in 1983 and 1903, respectively) governed by the same board. The first attempt to set up an exchange in Egypt dates back to the 1860s, when an exchange dealing with cotton futures was established in Alexandria. Private brokers attempted to formalize the exchange but the company they set up went bankrupt three months after its establishment. They however continued transactions without formal or written rules but by conventions and best practices in some designated Cafés or their private offices until a formal law regulating stock exchanges in November, 1909. In 1996 the two exchanges were unified as the Cairo Alexandria Stock Exchange (CASE) becoming the fourth-largest exchange in the world (Schiereck *et al.*, 2018). The market performance is being tracked by the EGX30 (previously CASE 30) index along with seven other indexes (EGX50 EWI, EGX70, EGX100, Sectors, Nile Index, S&P/EGX ESG and EGX30 Capped) measuring several market performance. EGX 30 represents the 30 largest listed companies. The index is calculated by the weighted market capitalisation adjusted by the free float.

In 1996 the market capitalisation of ESE stood at $14.1 billion, representing 18.8% of GDP with a turnover of 22.2%. As at 2011, ESE market capitalisation increased to USD48.85 with a fairly stable market capitalisation as a percent of GDP. ESE is one of the most liquid markets in Africa with a turnover of 32.54% and 25.26% in 2011 and 2019, respectively. Currently, ESE is the third largest market in Africa in terms of market capitalisation – after the Johannesburg Stock Exchange and Casablanca Stock Exchange – with a market capitalisation of $44.2 billion, representing almost 15% of GDP.

3. Botswana Stock Exchange (BSE)

The Botswana Stock Exchange started with 5 listed companies in 1989 as the Botswana Share Market (BSM) with a single brokerage firm mandated to promote trading on the exchange by matching orders[10]. This was obviously not sustainable, as such measures were taken to separate the exchange from the brokerage services. BSM was changed in 1995 by the passing of BSE Act of 1994. With this, the BSE was established as a separate legal entity and formal trading started in November 1995. In order to reflect the diverse nature of the market, the performance in the exchange is measured by three main indices, namely Domestic Company Index (DCI), Foreign Company Index (FCI) and the All Company Index (ACI). The DCI tracks the performance of listed local companies, the FCI monitors the performance of listed foreign firms whilst the ACI is the average of DCI and FCI measures the entire performance of the exchange.

At the end of 1995, 12 companies were listed on BSE with a market capitalisation of $398 million and market capitalisation as a percentage of GDP of 8.4%. BSE was highly liquid compared to other ASMs with a turnover of 9.54%. However, liquidity has declined sharply over the years. By the end of 2018 the turnover stood at 4.3% (4.5% in 2019) with market capitalisation of P413,168.3 million ($38,507 million). BSE has 26 domestic companies and 9 foreign listed firms as at the end of 2018. Currently, BSE is regarded as one of the best stock exchanges in Africa with an average return of 24% within the past decade, making it the third largest in terms of market capitalisation in Southern Africa.

Major market developments include introduction of Venture Capital Board for raising funds for start-up in 2001, listing of government of Botswana bonds in 2003, implementation of a Central Securities Depository (CSD) to promote market efficiency, which was started in 2006; and on-going process to review the BSE Act of 1994 to reflect current global trends and innovations.

4. Casablanca Stock Exchange (CSE)

Casablanca Stock Exchange started as early as 1929 as the Office for Clearing of Transferable Securities. As a result of interest in stock market by both domestic and foreign investors, Morocco's financial markets undertook a major reform in 1967 in order to provide an organized legal and technical framework. This was followed by a Structural Adjustment Program in 1986 for

[10] BSE did not have a market maker. It was not until 1998 before another brokerage firm was established.

a period of ten years to consolidate the macroeconomic fundamentals in Morocco. Again, another major reforms took place in 1993 to complement the legal framework of the CSE. The Stock Exchange comprises of two market segments namely: a central market where trading is matched and a block-trade market where trading is executed in an Over the Counter (OTC) basis.

The Index de la Bourse des Valeurs de Casablanca (IGB), created in 1986, was previously used to track performance. This was replaced with Moroccan All Shares Index (MASI) and Moroccan Most Active Shares Index (MADEX) in 2002. In 2004 the exchange adopted float-weighted capitalisations for computing these indices. These indices are complemented by FTSE CSE Morocco 15 Index, FTSE CSE Morocco All-Liquid Index, Casablanca ESG 10 Index as well as several Sector indices.

There were 47 listed companies on CSE with a market capitalisation of $8.7 billion and a market capitalisation as a percent of GDP of 23.8% as at 1996. At the end of 2011 domestic companies has risen to 75, with a market capitalisation of about $60 billion and a market capitalisation as a percent of GDP of approximately 59%. Within this same period, turnover increased from 5.9% to 6.8%. Currently, CSE is the second largest bourse in Africa with a market capitalisation of $65.4 billion, representing about 55% of GDP. Turnover has decreased to 4.98%, slightly above the ASMs median but significantly lower than the ASMs mean.

5. The Ghana Stock Exchange (GSE)

It was incorporated in July, 1989 as a private company limited by guarantee under Ghana's Companies Code, 1963 (Act 179). The Exchange was given recognition as an authorized Stock Exchange under the Stock Exchange Act of 1971 (Act 384) in October 1990, and trading on the floor of the exchange commenced in November 1990. In April 1994, it was converted into a public company limited by guarantee under the companies' code 1963(Act 179).

The GSE introduced a new method of calculating closing prices of equities. The two new indices introduced in January 4, 2011 replaced the GSE All-Share Index which tracks price changes in the listed equities. The new indices are the GSE Composite Index (GSE-CI) and the GSE Financial Stocks Index (GSE-FSI). The calculation of the GSE Composite Index is based on the volume weighted average closing price of all listed stocks whilst the GSE Financial Stocks Index tracks banking and insurance company shares. Both have a base date of December 31, 2010 and base index value of 1000.

The GSE had 19 listed companies with a market capitalisation of $1.6 billion in 1995. After 16 years, the GSE has 29 listed companies with an increase in its market capitalisation to $3.1 billion. However, there have been a decline in the market capitalisation as a percent of GDP from 25.8 % to 8.3% in the same period. This is sharply contrasted by an improved turnover ratio (a measure of liquidity) from 1.13% to 8.2% in that period of time.

Over the years, Ghana Stock Exchange has achieved recognition in the global investment arena. For instance, in 2004 it was recognized as the best performing market in the world after its performance increased about 154.67% (144% in US dollar terms) as compared to 30% by Morgan Stanley Capital International (MSCI) Global Equity Index in that year. This remarkable performance was attributed to stable economic performance resulting from sound macroeconomic management during the period leading to investor interest on the exchange. Also, in 2008 the Exchange was adjudged one of the best during the period of financial meltdown of advanced markets. This feat in 2008 was however followed by over 46% negative performance in 2009, the lowest in Africa. The poor performance was also the result of poor macroeconomic factors. In 2011, the Ghana Stock Exchange (GSE) became the third largest capital market in SSA, after South Africa and Nigeria after the official listing of Tullow Oil PLC on July 27, 2011. This listing more than doubled the market capitalisation from a little over ¢20 billion to almost ¢49 billion in 2011.

6. Johannesburg Stock Exchange (JSE)

This is the oldest stock exchange in Africa. It was established in 1887 following the gold discovery in Transvaal, present day Gauteng Province in South Africa with the aim of facilitating the injection of capital into the booming mining industry. The exchange was created by Benjamin Wollan with the listing of a single company (Johannesburg Chambers and Company- Benjamin's company). Trading was such in demand that there were crowds after the closure of trading even after constructing the second JSE building in 1890. Early developments of JSE includes the opening of the third JSE building in 1903, enactment of The Stock Exchange Control Act in 1947, admission into the World Federation of Exchanges (WFE) in 1963, as a founding member the African Stock Exchanges Association (ASEA) in 1993; and the adoption of an electronic trading platforms in the 1996 in order to replace the open outcry trading floor system.

Recent developments of JSE are the acquisition of the South African Futures Exchange (SAFEX) in 2001, introduction of the second tier market, an alternative exchange, (AltX) in 2003 for SMEs and the acquisition of the Bond Exchange of South Africa (BESA) in 2009. Currently, JSE serves a diversified securities such as equities, bonds, derivative markets for financials assets, commodities and interest rate. These derivatives are traded in the form of futures, options on stocks and bonds, currency derivatives, forward rate agreements and swaps.

Performance is tracked by a variety of indices issued by the JSE together with the British FTSE Group. It is headlined as FTSE/JSE-Africa Index Series. The main index of the series is FTSE/JSE All-Share Index which tracks the entire listed equity of the exchange. This is complemented by a number of indices such as Growth and Value Index, FTSE/JSE Top 40 Index, Mid Cap, Small Cap, Index FTSE/JSE Gold Mining Index, the FTSE/JSE Industrials 25 Index and others.

JSE remains the largest exchange in the continent, currently ranked as the 19th largest stock exchange in the world by market capitalisation. As at 2011, there were 347 listed companies at JSE with a market capitalisation of USD789 billion, against 612 companies with market capitalisation of USD277 billion in 1995. Similarly, turnover have increased significantly in that period from 5.75% to 28.62%. In 2019, market capitalisation increased to over one trillion dollars, representing over 300 % of GDP. The high market capitalisation as a percent of GDP is caused by the participation of foreign investors in the JSE, which are attracted by multinational listed firms such as SAB Miller, BHP Biliton and British American Tobacco. JSEs remains the most liquid exchange in Africa. It recorded a turnover of 33.13% in 2019.

7. Lusaka Stock Exchange (LuSE)

The Lusaka Stock Exchange was founded in 1993 through the technical assistance and support of the International Finance Corporation and the World Bank. LuSE began its operations in February 1994 as part of the government economic reforms to stimulate the participation of the private sector. The foundation of LuSE was directly linked to the financial liberalisation program that began in 1991. The establishment of the stock exchanges was seen as a critical issue for the privatization process of the State-Owned Enterprises (SOEs). Performance is mainly tracked by LuSE All Share Index.

As at the end of 1995, there were only 2 domestic listed companies and a market capitalisation of $428 million, representing 11.24% of GDP. This has increased significantly to 20 domestic

companies and a market capitalisation of $3.18 billion, representing 13.57% of GDP as at 2011. LuSE is one of illiquid stock exchange in Africa with a turnover of 0.05% in 1995 and 0.64% in 2011.

8. Nairobi Stock Exchange (NSE)

Nairobi Stock Exchange started through informal shares trading described as 'gentleman's agreement', with no formal exchanges during the 1920s. The need for formal exchange was required and achieved in 1954, as a regional exchange to cater for Kenya, Uganda and Zanzibar. This continued until each countries attained their independence thereby stopping regional capital market operations. NSE then became a national exchange in 1975 when the East African Community finally collapsed. It was not until 1991 that NSE became a registered private company limited by shares.

The index used to track performance of all equities is the NSE All Share Index and is complemented by other indices, such as FTSE NSE Govt. Bond Index, NSE 20 Share Index and Kenya 15 Index, among others. NSX is one of the few developed exchanges in Africa with 58 domestic companies and a market capitalisation of $10.2 billion constituting about 24% of Kenya's GDP as at 2011. This is a massive improvement from 1995 with 56 domestic companies and a market capitalisation of $2.0 billion, constituting about 22% of GDP. Similarly, liquidity of NSE has risen from 2.97 to 8.99 from 1995 to 2011. As at 2019, market capitalisation of NSE is of $25.1 billion, representing about 25% of Kenya's GDP.

9. Namibia Stock Exchange (NSX)

There was an initial attempt to establish an exchange in 1904 after the diamond rush but closed six years after its inception when the rush was over in the colonial era. In 1990 the idea to establish another exchange became necessary after Namibia had independence from the South African occupation. This was sponsored by 36 top Namibian business executives. This exchange was officially launched in 1992 with one dual listed firm and a single broker. The performance of the exchange is mirrored in the NSX Overall Index. NSX has the prospects to become one of the leading exchanges in Africa even though most of the top companies are foreign owned and mostly has dual listing (i.e. primary listings on the JSE in South Africa).

As at the end of 1995, NSX had 10 domestic companies with a market capitalisation of USD189 million, representing about 4.8% of Namibia's GDP. By the end of 2011, the domestic companies

had decreased to 6 but with an increased market capitalisation of USD1.15 billion, representing 9.3% of Namibia's GDP. Currently in 2019, the number of domestic companies has risen to 11 with an increase market capitalisation of USD2.61 billion, which represents 21.1% of Namibia's GDP. NSX liquidity was low in 1995, recording a turnover of 1.58%. This however, improved significantly with a turnover value of 3.76% in 2019.

10. Nigeria Stock Exchange (NiSE)

The NiSE was established in September 1960 as the Lagos Stock Exchange, but formal trading started on June 1961. Initially trading activities commenced with two Federal Government Development Stocks, one preference shares and three domestic equities. The Lagos Stock Exchange became the Nigerian Stock Exchange in 1977, paving way for the establishment of branches in different parts of the country (Kaduna in 1978, Port Harcourt in 1979, new customs street-Lagos in 1986, Kano in 1989, Onitsha in 1990 and Ibadan in 1990). In 1985, the NiSE introduced the Second-Tier Securities Market (SSM) to cater for the SMEs. The capital market deregulation in 1993 and the 1995 abrogation of the Exchange Control Act 1962 and the Nigerian Enterprises Promotion Decree 1989 liberalize the financial market in Nigeria. This resulted in a substantial growth of equities listed on NiSE. Prior to this, trading mainly involved government fixed income and securities.

All-Share Index (ASI) was the first index introduced in 1984. This index tracks the general market movement of the listed equities on the exchange, including the Alternative Securities Market regardless of the market capitalisation. Currently, there are other market indices (FTSE ASEA Pan Africa Index Series, NSE CG, AFRINVEST Bank Value Index, MERISTEM Growth Index) together with sector indices that tracks performance. The NiSE has experienced immense growth as market capitalisation increase from 7.78 billion dollars to 39.03 billion dollars from 1995 to 2011. This makes Nigeria the second largest stock exchange in SSA after the JSE. Also, there have been a substantial growth in the liquidity of the NSE evidenced by a rise in turnover from 1.1% to 9.9% from the period of 1995 to 2011. Although, there have been a slight drop to 6.19 in 2019. Currently, NiSE remains the second largest exchange in SSA with a market capitalisation of 43.9 billion dollars, representing 9.80% of GDP.

11. Stock Exchange of Mauritius (SEM)

The Stock Exchange of Mauritius was established by the Stock Exchange Act 1988, in 1989 as a private company assigned for capital market operations in Mauritius. SEM started operations with five listed companies, ten registered brokers and a market capitalisation of $70 million. The Official market is tracked by the SEMDEX, the all share index measured by the weighted market capitalisation of all quoted firms. Other complementary indices are SEM-ASI, SEMTRI SEMTRI-ASI, SEM10, DEMEX, and DEMTRI among others.

SEM has seen tremendous growth both in market capitalisation and number of companies, because of its strategic location[11] and its position as an offshore financial service centre. The number of companies have increased from 28 to 63 and market capitalisation from USD1.34 billion to USD7.85 billion from 1995 to 2011. This has resulted in the rise of market capitalisation as a percent of GDP from 33.1% to 68.1% in that period. SEM turnover has also increased from 4.0% to 6.5% within this period. Currently, there are 95 domestic firms listed in SEM. The market capitalisation has increased to USD8.62 billion constituting 61.33% of Mauritius's GDP with a turnover of 4.0%.

12. Tunisia Stock Exchange (TSE)

The Tunisia Stock Exchange, also known as Bourse des Valeurs Mobilières de Tunis (BVMT) or Bourse de Tunis, was established in 1969. Major developments of TSE occurred in November 1994 when there was a liberalisation of the financial markets that ensured separation of control and the management of the stock market. This enabled the formal launching of the TSE as a limited liability company in 1995. This continued with the introduction of electronic trading platform in 1996. In 2007, TSE became one of the few exchanges in Africa to introduce alternative stock market for SMEs.

Performance of TSE was tracked with BVMT Index in 1990. Two more indices; TUNINDEX index and the Sector Indexes, were later created in 1997. The TSE stopped disseminating BVMT as well as the method of computation of TUNINDEX index and the Sector Indexes in 2009 to reflect currents trends in the Exchanges around the world. The computation was changed from

[11] The exchange is located in Port Louis, in the Indian Ocean in between Africa and Central Asia

weighted market capitalisation to float-adjusted market capitalisation. In addition, the TUNINDEX20 was introduced in 2006 to track the performance of 20 largest listed companies.

As at the end of 1995, the listed domestic companies on TSE were 28, with a market capitalisation of about USD4 billion and a market capitalisation as a percentage of GDP of 22.3 %. The number of listed companies has risen significantly to 57 with a market capitalisation of USD9.7 billion in 2011. However, the market capitalisation as a percent of GDP remained fairly the same with a figure of 21.1%. On the contrary, the turnover decreased from 16.6% to 10.9% from 1995 to 2011. Currently, the listed domestic companies on TSE are 81 with a market capitalisation of about USD8.5 billion and a market capitalisation as a percentage of GDP of 21.92.

13. Zimbabwe Stock Exchange (ZSE)

Zimbabwe Stock Exchange has evolved to become one of the longest stock exchange in Africa. The first stock exchange opened in Bulawayo in 1896 and was in operation for six years. Two other stock exchanges were also opened in Gweru and Mutare in 1896. The Mutare exchange thrived on the local mining industry but closed in 1924 when it was realized that the gold deposits were not extensive. The current exchange operating in Bulawayo started in 1946 after the Second World War. A second trading floor was opened in Harare, which later became its headquarters. Operation in the stock exchange stopped temporarily in 2008 following a massive depreciation of the local currency. Upon intervention of the Reserve Bank of Zimbabwe, the economy was dollarized, hence adopting the dollar as its primary trading currency. The industrial and mining indices were thus rebased to 100 in January 2009. Current indices used at ZSE are ZSE industrial index, ZSE Mining index, ZSE Top 10 index and ZSE All share index.

At the end of 1995, there were 65 companies listed on ZSE with a market capitalisation of 2.13 billion dollars. This represented almost 30 % of Zimbabwe's GDP. The turnover ratio of ZSE in that year was above the mean of ASMs. Current figures on trading in ZSE are not available on its official website. However, Zimbabwe Independent newspaper reports that market capitalisation of ZSE was $3.4 billion as at September 2015, after shedding about almost $2 billion dollars since its peak (Zimbabwe Independent, 2015).

2.5.2 NATURE OF AFRICAN STOCK MARKETS

ASMs are still small and fledging, especially in comparison to their counterparts in other regions. The exception is JSE, whose market capitalisation account for more than 80% of the entire ASMs. The rest are characterized by low market capitalisation, few domestic companies, small size of listed firms and low levels of liquidity with few shares mostly dominating total trading activity. These also suggest avenue for potential significant growth in the future. The section below provides in detail the nature of ASMs.

2.5.2.1 ASM and Economic Growth

Adequate scholarly literature exists on the linkage between stock market and economic growth (see: Levine & Zervos, 1996; Levine, 1997; Singh, 1997; Senbet & Otchere, 2008; among others). As stated in Senbet and Otchere (2008), a well-functioning stock exchange lowers cost of accessing financing resources and ensures funds are allocated efficiently. A clear example is as follows: East Asian countries experienced high economic growth compared to that of Latin America in the 1970s and 1980s due to increased market capitalisation.

The emergence of stock markets in Africa is known to have a positive impact on the economic growth of African countries (Yartey & Adjasi, 2007). This has been the motivation of most African countries liberalizing their financial sector to make it possible to establish stock markets. This has resulted in increased access to finance in corporations. For example, Yartey and Adjasi (2007) reported that about 12 % of total asset growth of listed companies in Ghana were financed by stock market in the period of 1995 to 2002.

ASMs have seen rapid development over recent decades. While stock market development has a positive benefit to corporations and the economy in the long run, African economies have gained little. This is because most local companies in Africa tend to be small or medium sized so hardly make use of the stock exchange. Also, the fear of losing corporate control after being listed have ensured that most eligible companies do not take advantage of going public (Irving, 2000).

2.5.2.2 Depth of African Stock Markets

In terms of both market capitalisation and the number of listings, ASMs are small as compared to other emerging markets excluding South Africa and Egypt. As such ASMs may be exposed to

price appreciation when they receive relatively large orders. ASMs are dominated by few large firms with substantial market capitalisation. In terms of market capitalisation, ASMs increased significantly from 1995 to 2011. As seen from Tables 2.6 to 2.8, the mean market capitalisation excluding South Africa increased from USD2.03 billion to USD18.33 billion (over 800% increase) from 1995 to 2011 and is now about USD203 billion (1107%). Similarly, the mean market capitalisation as a percent of GDP excluding South Africa rose from 19.56 % to 23.38 % from 1995 to 2011 and its now 34.15 %.

The number of companies listed on ASMs are generally small, with the exceptions of South Africa, Egypt and Nigeria. With a net positive listing and delisting, the mean number of companies listed on ASMs increased from 88 to 108 from 1995 to 2011. However, there have been a slight decrease to 106 in 2019. The number decreased from 27 in 1995, 44 in 2011 and 51 in 2019 when South Africa, Egypt and Nigeria are excluded. This clearly indicates the size of ASMs as compared to other developing and emerging economies.

2.5.2.3 Liquidity of African Stock Markets

ASMs suffers from the problem of low liquidity. Liquidity measured by value of trading as a percentage of GDP and turnover shows ASMs are thin and illiquid. The first measure tracks the trading activity in the market relative to economic activity and the latter measures the total trading relative to the total market capitalisation. These measures are not ideal measure of liquidity in the stock market. The best one should be the ease with which investors can trade securities at posted prices. Nevertheless, these two measures can serve as a rough measure of overall trading activity relative to the size of both the economy and the stock market (Allen, Otchere & Senbet, 2011).

The value of shares traded as a percent of GDP of ASMs are low as in most cases as seen from Tables 2.6 to 2.8; the values are 1 percent with the exception of South Africa, Egypt and to some extent Morocco. Also, the turnover ratio is mostly high for South Africa and Egypt but low for other ASMs. This confirms the illiquidity of ASMs. Senbet and Otchere (2010) attributed the very low liquidity of ASMs to the concentration of few equities and the dominance of few large companies in the exchanges.

In order to improve depth and liquidity in the ASMs, there should by more privatization of SOEs, as well as the consolidation of small exchanges to form a regional exchange. An example is the

regional exchange namely Bourse Regional des Valeurs Mobiliéres (BVRM) domiciled in Abidjan. This serve the Francophone West African countries namely Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo. Similar plans are expected to be implemented in Anglophone West African countries, Southern African countries and Eastern African countries according to Allen, Otchere & Sebbet (2011).

2.5.2.4 Performance of ASMs

ASMs will attract significant attention from Global portfolio investors depending on the extent to which investment as well as diversification opportunities are available. The historical data are used to track performance of the ASMs. In spite of its low liquidity, ASMs continuous to perform significantly well in terms of both absolute returns and risk-adjusted returns. Also, it is important to understand the extent to which ASMs are affected by global shocks. It is estimated that stock markets that are more integrated into the global economy will be seriously be affected as compared to those that are less integrated (Allen, Otchere & Senbet, 2011). Senbet and Otchere (2010) provided evidence to the fact that markets such as South Africa and Nigeria that are highly integrated to the global economy were seriously hit by the global financial crisis. However, countries that are less integrated like Ghana, Malawi and Namibia rather had positive returns in the wake of the global financial crisis.

Significant achievements of ASMs over the years include the ranking of the Egyptian Stock Exchange as the fifth best in the world during the 1940s, Ghana Stock exchange as the sixth best performing market in 1993 and the award of star performance to Zimbabwe Stock exchange and Lusaka Stock exchange in 1996 and 1997 respectively.

2.5.2.5 Trading Systems in ASMs

Apart from liquidity challenges, ASMs are known to be operationally inefficient due to the usage of manual trading systems (Senbet & Otchere, 2010; Allen, Otchere & Senbet, 2011). This narrative is gradually changing as most ASMs are now adopting electronic systems of trading. The manual trading systems slows down the flow of information and trading in the stock exchange. This is evident by the low levels of liquidity of most ASMs in the time past. Table 2.9 shows most ASMs now use electronic system of trading as well as their clearing and settlement systems. This is a good sign towards consolidation of ASMs into regional markets as consolidation cannot be

done without automation. Also, all African markets with the exception of Algeirs Stock Exchange trades every week day and allows foreign portfolio investors to participate in the market.

Table 2.9: Current Trading Systems of ASMs as at December, 2019

Country Name	Clearing and Settlement	Foreign Participation	Trading System	Trading Days
Algeria	Electronic	Yes	Electronic	3
Botswana	Manual	Yes	Manual	5
Cote d'Ivoire	Electronic	Yes	Electronic	5
Egypt	Electronic	Yes	Electronic	5
Ghana	Manual	Yes	Manual	5
Kenya	Manual	Yes	Electronic	5
Malawi	Manual	Yes	Manual	5
Mauritius	Electronic	Yes	Electronic	5
Morocco	Manual	Yes	Electronic	5
Namibia	Manual	Yes	Electronic	5
Nigeria	Electronic	Yes	Electronic	5
South Africa	Electronic	Yes	Electronic	5
Swaziland	Manual	Yes	Manual	5
Tanzania	Electronic	Yes	Electronic	3
Tunisia	Electronic	Yes	Electronic	5
Uganda	Electronic	Yes	Electronic	5
Zambia	Electronic	Yes	Electronic	5
Zimbabwe	Manual	Yes	Electronic	5

Source: Senbet and Otchere, 2010; Official websites of ASMs

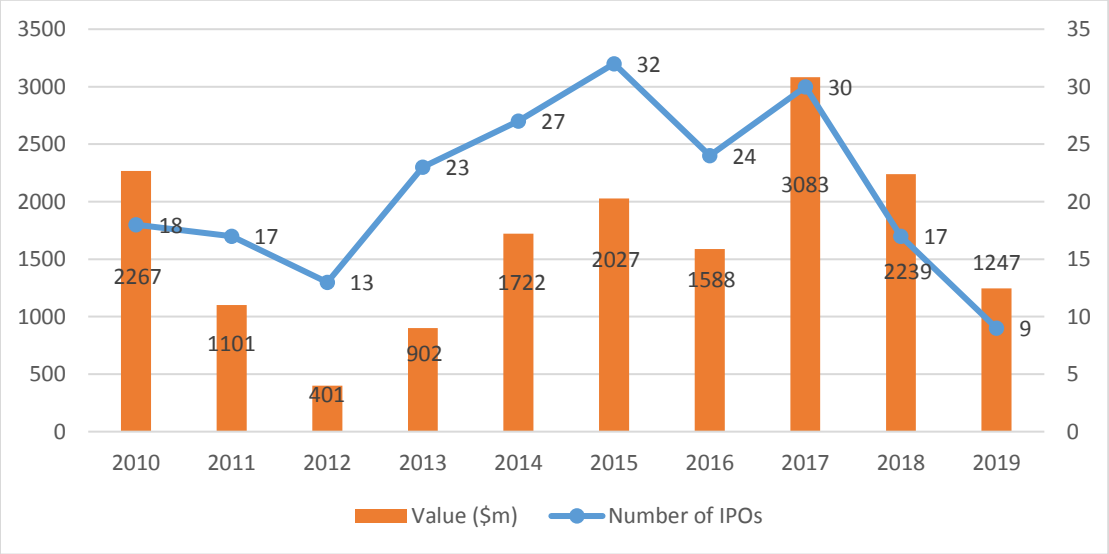
2.5.3 AFRICAN IPO MARKETS

Initial Public Offering (IPOs) in ASMs is driven by financial liberalisation of the financial markets in Africa, resulting in privatization of SOEs, divestitures, enhancements to regulatory frameworks, improved infrastructure and reduced political interference in certain large markets. This has resulted in increased levels of IPOs in the ASMs over the past decade. IPOs are issued by both domestic and foreign owned companies. Foreign owned companies issue IPOs as a means to raise capital directly on ASMs or are enshrined in regulations as a way to involve local participation. Also, domestic firms issue IPOs as a means of diversifying their investment by targeting both local and international investors and institutional buyers.

Figure 2.6 indicates that over 210 IPOs have been raised in ASMs from 2010 to 2019 resulting in approximately $16.6 billion. The lowest volume of IPOs occurred in 2019 followed by 2012 with

number of IPOs being 9 and 13 respectively. 2015 had the highest number of IPOs with 32. However, 2010 recorded the highest value of IPOs resulting in $2.2 billion.

Figure 2.6: Trends in ASMs IPOs, 2010 – 2019



Source: PWC African Market Watch (2014 - 2018)

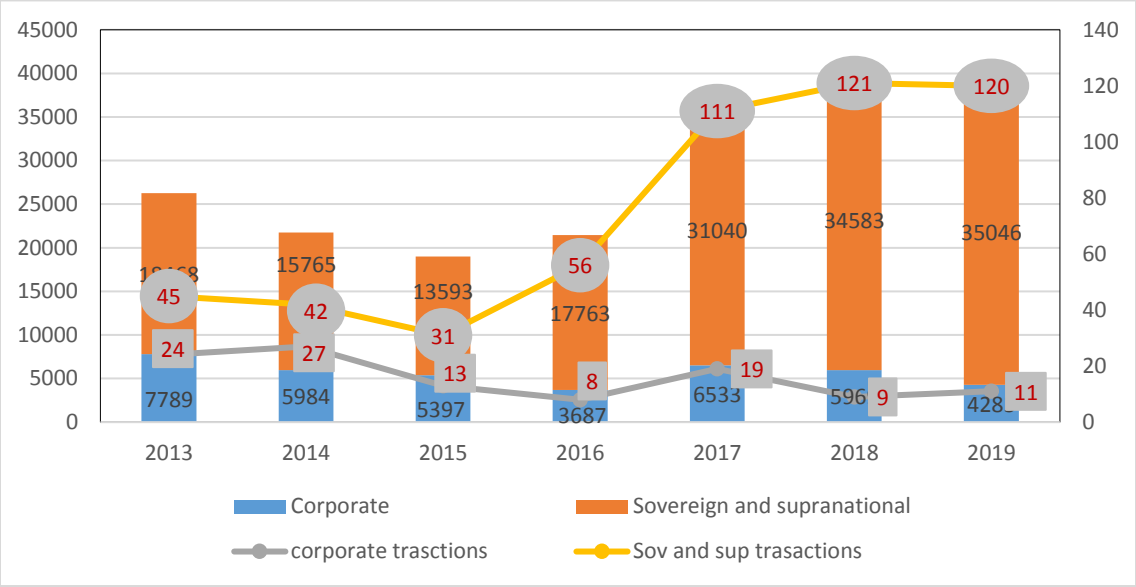
2.5.4 AFRICAN DEBT MARKETS

African Capital Markets (ACMs) do not have a well-developed capital debt market. It is only a small fraction of the financial assets. Bond markets are less developed or at infant stage in ACMs. The few markets in Africa with a secondary debt market includes South Africa, Nigeria, Ghana and Botswana. African debt capital market is dominated by government and corporate investment grade and high yield debt. Government bonds represents the majority of long-term securities issued on the ASMs. Corporate bonds including issues by SOEs, generally lag behind the government bonds (Senbet and Otchere, 2010). It should be noted that debt capital market only represents a small fraction of debt raised in Africa. Most of the debt is raised from the traditional bank finance or other multilateral and bilateral lending arrangements, outside capital markets.

From the PricewaterhouseCoopers (PWC) African Market Watch (2017), it can be seen that; there is a gradual improvement in debt issuance in the African market. While there were decline in the number of issuance and value after 2013, this has changed significantly since 2017. Non-local currency corporate bond as well as sovereign and supranational (including government agencies)

debt reached a 5 year high in 2017 and a further increase in 2018 and 2019. This indicates the appetite for emerging debt market in response to low yields in the US and European debt markets or probably the appetite for debt financing by African governments (PWC African Market Watch, 2017). This raises the issue of merits and demerits of debt financing frequented by excessive debt level in most African countries, pushing them to indebtedness and unsustainable levels.

Figure 2.7: Trends in ASMs Debt Market, 2010 – 2019



Source: PWC African Market Watch (2014 - 2018)

2.5.5 AFRICAN DERIVATIVE MARKETS

The only developed derivative market in Africa exist on the JSE. The derivative markets in other ASMs are either non-existent or at their infant stage and mostly unregulated. The South African Futures Exchange market started informally in 1987 by a local merchant, Rand Merchant Bank. Officially the Equity Derivative Division of JSE started in 1990. Since then, the JSE derivative market has undergone several stages introducing more assets into the market. Currently, the market consists of two broad categories of derivative assets, namely options and futures. Specific assets traded on the JSE derivative market include agricultural commodity futures and options, currency futures, equity futures and options, fixed income derivatives, interest rate futures and options and warrants. These assets are traded in both organized markets and OTC markets.

Apart from JSE, the few derivatives markets in ASMs includes futures market based on treasury bonds in Morocco opened in 2008, a foreign exchange forwards in the BRVM, an OTC foreign exchange forwards and currency swaps in the Botswana Stock exchange, the Bond & Derivatives Exchange (Badex) in Zambia among others. Recently, Kenya established the first derivatives market in East Africa trading single stock futures and Index futures. Trading commenced on 11th July, 2019. Efforts are being made to develop derivative markets in most African countries, as a means to provide hedging for investors.

2.5.6 RISKS OF AFRICAN STOCK MARKETS

Risk is inherent in every market even in well-developed efficient markets. Thus, ASMs are predisposed to certain risk that must be mentioned to guide prospective portfolio investors. Foreign portfolio investments on ASMs are susceptible to factors such as unstable macroeconomic environment, exchange rate fluctuations, political risk factors, and low international confidence stemming from images of wars, corruptions, famine, failed projects, indiscipline in governance and gross human rights violations (Senbet & Otchere, 2010). In addition, ASMs are bridled with low levels of liquidity, institutional barriers and information asymmetries.

Uncertainties in returns from investing in Africa are deemed to be a contributing factor of reduced portfolio investment inflows. However, considering the fact that the recent Global financial crisis in 2007-2008 is offering investors the opportunities to diversify their investment portfolio across diverse geographic regions, suggests an interest in African markets (Boako & Alagidede, 2016). Such diversification opportunities have resulted in rapid and substantial growth in ASMs because of increased participation of international portfolio investor's, in pursuit of a higher returns for their investments. This has favourably contributed to the development and modernization of the ASMs (McMillan & Thupayagale, 2011).

2.6 FINANCIAL FLOWS TO AFRICA

The flow of financial resources to Africa have undergone dramatic changes since the financial liberalisation. These changes have resulted in considerable economic development and structural transformation in the region (Economic Commission for Africa 2017). This section reviews the traditional financial flows to governments in Africa by analysing the trends and highlighting challenges associated with these inflows.

2.6.1 TAXES

Achieving sustainable economic growth requires governments to mobilize adequate financial resources, especially domestic resources, to fund public good and services. Taxation provides a secure source of funding government programmes and projects. Developing economies are mostly characterized by low tax revenue that is unable to meet government ambitious expenditures. Hence several measures have been adopted to increase government revenue through taxes. However, increasing taxation beyond certain levels can distort economic growth, especially when tax bases are not widened. Therefore, an optimum tax to GDP ratio is necessary to achieve sustainable economic growth. A review of tax revenue as a percentage of GDP (excluding statutory transfers such as fines, penalties and social security contributions) suggest that Africa is one of the region with a high tax dependent economy. Table 2.10 indicates that Europe & Central Asia and Euro area have the highest tax to GDP ratio followed by Africa. Tax revenue to GDP ratio in Africa increased from 15 % to about 16.3 % between the period 2009 and 2018. Similarly, all other regions show significant increase in ratio of tax revenue to GDP. It can be seen that the average of North Africa region is higher than the SSA.

Table 2.10: Tax Revenue to GDP Ratio, 2009-2018

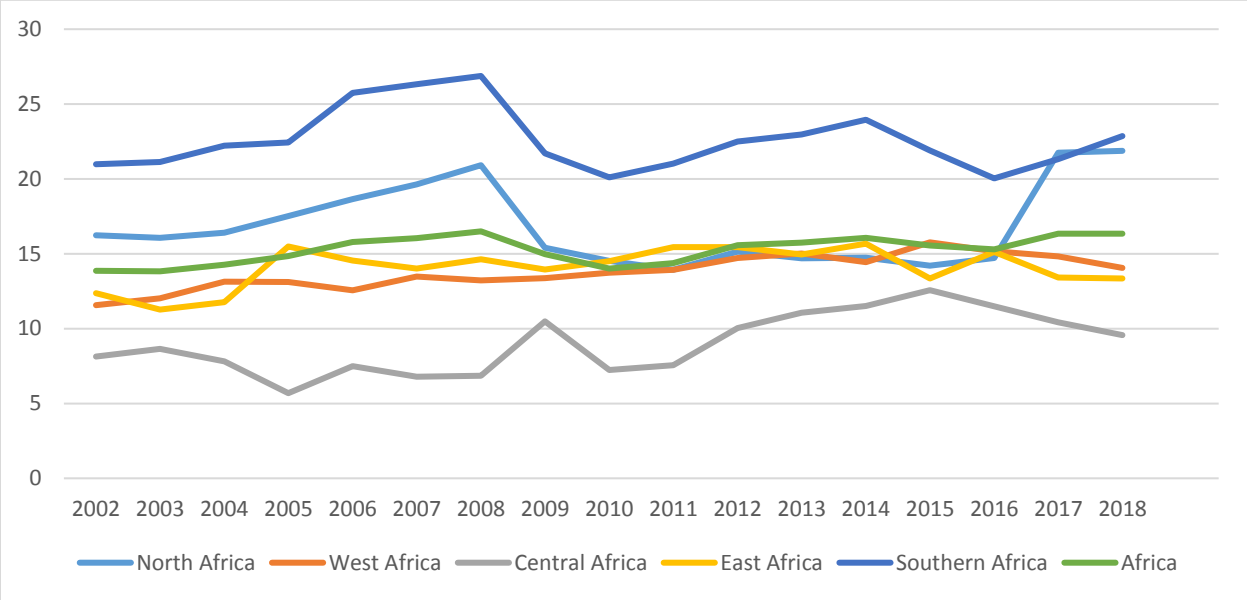
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Africa	15.0	14.0	14.4	15.6	15.7	16.1	15.6	15.3	16.3	16.3
North Africa	15.4	14.5	13.9	15.1	14.7	14.7	14.2	14.7	21.8	21.9
Sub-Saharan Africa	14.9	13.9	14.5	15.7	16.0	16.4	15.9	15.5	15.0	15.0
LAC	12.7	13.0	13.3	13.0	13.0	12.9	13.4	13.5	13.2	13.4
OECD members	13.0	13.5	13.9	14.1	14.6	14.9	15.0	14.9	15.3	14.7
East Asia & Pacific	10.7	10.7	11.1	11.2	11.4	11.7	11.5	11.3	11.6	–
South Asia	9.7	10.3	10.1	10.7	10.9	9.9	10.5	11.1	11.5	12.0
Euro area	16.2	16.7	16.6	17.0	17.5	17.5	17.4	17.3	17.5	17.5
Europe & Central Asia	17.6	18.0	18.1	18.2	18.4	18.4	18.2	18.1	18.3	18.4
North America	8.3	8.9	9.8	10.0	10.6	11.0	11.3	11.0	11.8	10.2

Source: World Development Indicators, 2020; Author computation

When the regions in Africa are observed separately, it can be seen that the levels of tax revenue to GDP ratio varies greatly. Figure 6 presents tax revenue as percent of GDP in the African sub regions for the period 2002 to 2018. Southern Africa (Central Africa) has the highest (lowest) tax revenue to GDP ratio over the period. Central and West Africa have tax revenue to GDP ratio below the regional average whiles Southern and North Africa's tax revenue to GDP ratio are above

the regional average. It can be seen that tax revenue increased in all the regions over the period, driven mostly by natural-resource related revenues.

Figure 2.8: Tax Revenue as Percent of GDP in Africa by Region, 2002-2018



Source: World Development Indicators, 2020; Author computation

Taxation is a powerful form of financing since it can be used at government discretion unlike other external source of financing. They can be effectively spent on poverty alleviation programmes and other national development objectives. It is suggested, among others, that efficient tax management and administration, improving tax capacities and tax reforms, can transform African economies into sustainable levels[12].

2.6.2 FOREIGN DIRECT INVESTMENT (FDI)

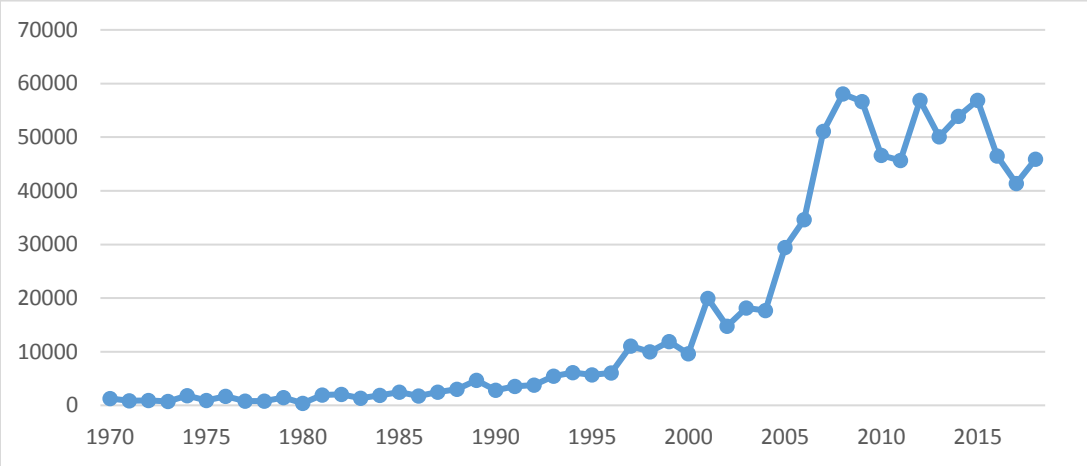
Foreign Direct Investment (FDI) is known to contribute significantly to the economic development of the recipient economy. The inflow of FDI to Africa is on the rise for a couple of decades now. However, Africa is still the lowest recipient of FDI compared to Asia and Latin America and the Caribbean (LAC). Even though FDI increased by 11 % in 2018 more than Asia (4%) and LAC (-6%), it still does not match to its peers in terms of numbers. FDI inflows to Africa in 2018 was

[12] Economic Commission for Africa (2017) catalogues several measures to increase revenue mobilization in Africa.

a mere USD46 billion compared to USD512 billion to Asia and USD147 billion to LAC (UNCTAD, 2019b).

Generally, FDI are largely undertaken by Multinational Companies (MNCs). MNCs takes advantage of reduced cost of production as opposed to export to penetrate local markets. MNCs are important channels of investment to developing economies. Africa is the continent that needs capital inflow the most to support its developmental gaps. The continent has not been able to attract sufficient MNCs that will enable it to achieve sustained level of growth. The continent therefore needs to attract MNCs by creating a conducive institutional and macroeconomic environment for their success.

Figure 2.9: Trends in FDI Inflows to Africa for the Period 1970 – 2018



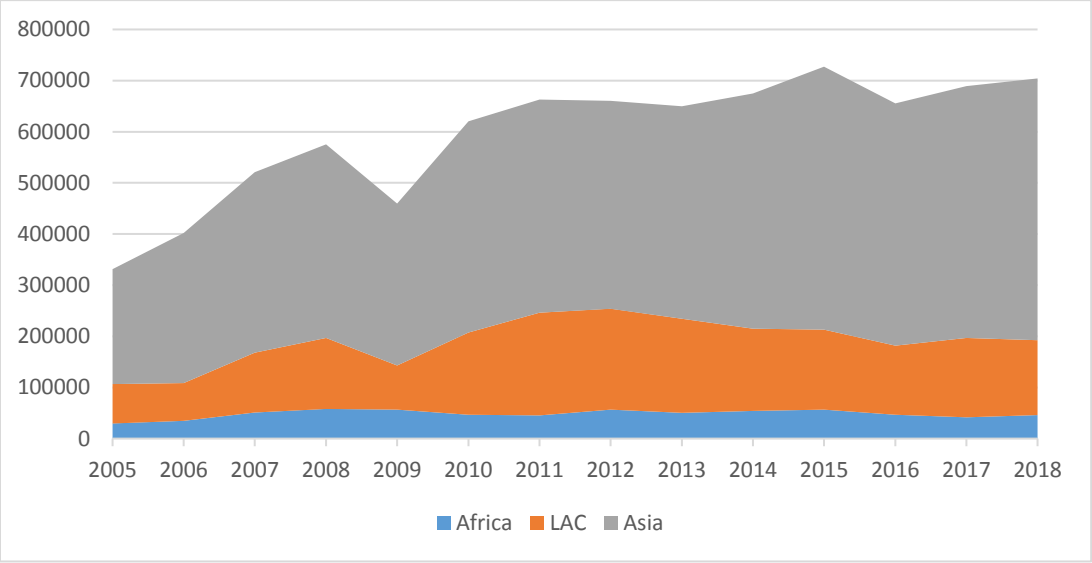
Source: Author, using UNCTAD (2019)

FDI inflows to Africa has increased significantly since 1970. FDI inflows to Africa was anaemic for 20 to 30 years despite a substantial increase of the world FDI from about US$13.3billion in 1970 to 54.1 billion in 1980. It shows that Africa was in the sidelines from the FDI boom during this period. As evidenced from Figure 2.9, FDI increased significantly during the 1990s partly due to financial liberalisation of the African markets. Since then, FDI continued to increase until it reached its peak of US$58.1 billion in 2008. It fell by 2.4% for the first time in 5 years due to the global financial crisis. This further led to a continuous decline until 2011. However, the trend was reversed in 2012 when FDI rose by 24.6% to USD56.8 billion. This was attributed to investments in the extractive minerals sector (UNCTAD, 2013). The level was not sustained as FDI fell by

11.9% to US$50.1 billion in 2013. FDI then rose for two consecutive years until its current significant decline, due to weak commodity prices (especially crude oil) and slowing of the global economic growth (UNCTAD, 2019b).

Figure 2.10 compares the evolution of FDI to Africa and to other Less Developing Countries (LDC). It is evident that Africa share of the FDI to LDCs is incomparable to Asia and LAC. Africa's share of global FDI to LDCs has been small since the 1970s. In this period Africa share of LDC was 34%, second after LAC with Asia receiving 10%. This shifted in the early 1980s as Asia share increased to an average of 61% whilst LAC and Africa share reduced to 30% and 9% respectively, during 1980 to 1999. It should be noted that Africa FDI inflows increased during the 2008/9 global financial crisis in contrast to other regions of the world.

Figure 2. 10: Share of FDI Inflows into Developing Economies from 2005 to 2018



Source: Author, using UNCTAD (2019)

Table 2.11: Average FDI inflows to Africa by Regions, 1970 – 2018

Period	1970 – 79	1980 – 89	1990 – 99	2000 – 09	2010 – 18
Africa	1,124	2,202	6,636	31,007	49,304
Northern	184	895	2,014	12,084	13,023
Eastern	126	151	749	3,556	13,149
Central	174	337	704	3,909	4,872
Southern	77	114	1,041	4,960	5,136
Western	520	705	2,127	6,499	13,124

Source: Author, using UNCTAD Stat online data

Table 2.11 shows that all the sub-regions in Africa experienced growth in FDI inflows every decade. The trend in FDI inflows varies greatly among the five Africa sub-regions. An accelerated growth in FDI inflows was experienced in the 2000s. It is observed that Central Africa has attracted the least cumulative FDI followed by Southern Africa. On the other hand, Northern Africa tops the cumulative FDI inflows with West Africa being the next highest.

Table 2.12: Top 20 Recipient of FDI inflows into Africa, 2009 – 2018

Africa	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Algeria	6	8	5	12	10	11	–	8	12	10
Angola	7	–	–	–	–	5	1	–	–	–
Cameroon	–	–	–	–	–	20	18	17	18	19
Chad	–	–	–	–	–	–	–	–	–	20
Congo	13	17	–	–	–	10	4	10	2	3
Congo DR	–	4	9	5	8	9	11	12	10	11
Côte d'Ivoire	–	–	–	–	–	–	–	20	15	16
Egypt	3	1	–	2	4	4	2	1	1	1
Ethiopia	–	–	–	–	12	8	8	3	3	5
Equatorial Guinea	11	5	7	18	–	–	–	–	–	–
Gabon	–	20	18	–	18	17	15	11	9	17
Ghana	5	7	4	6	6	7	6	4	5	6
Guinea	–	–	15	–	–	–	–	9	–	–
Kenya	12	15	10	15	14	19	20	16	11	9
Liberia	–	–	–	19	17	–	19	–	–	–
Libya	4	10	–	13	–	–	–	–	–	–
Madagascar	14	18	20	–	–	–	–	–	–	–
Mali	20	–	–	–	–	–	–	–	–	–
Mauritania	–	–	–	14	13	–	–	–	20	–
Morocco	8	13	6	7	5	6	5	7	6	4
Mozambique	16	6	3	3	2	2	3	5	7	7
Namibia	18		19	17	19	–	16	–	–	–
Niger	19	16	14	20	20	18	–	–	–	–
Nigeria	1	2	1	1	3	3	7	2	4	8
Sierra Leone	–	–	16	–	–	–	–	–	–	–
South Africa	2	3	2	4	1	1	9	6	8	2
Sudan	9	9	8	8	11	14	10	13	14	13
Tanzania	15	11	11	9	9	13	12	15	16	14
Tunisia	10	14	12	11	15	15	14	14	17	15
Uganda	17	19	17	16	–	16	17	19	19	12
Zambia	–	12	13	10	7	12	13	18	13	–
Zimbabwe	–	–	–	–	–	–	–	–	–	18

Source: Author, using UNCTAD (2019)

The data also shows that West Africa dominated the FDI recipient regions in the 1970s, accounting for almost 50% of the average inflows. This shifted to Northern Africa in the 1980s and 2000s. However, West Africa was again the highest in the 1990s but currently Eastern Africa is leading within the last 8 years. Increasing FDI inflows in Africa is mainly attributed to population growth and the abundance of natural resources in the Africa sub-regions. Other reasons are: political stability, absence civil wars, privatisation and good governance (Mijiyawa, 2015; Adams & Opoku, 2017).

Table 2.12 presents the top destination of FDI in African countries over the recent decade. Currently, Egypt ranked first destination for three consecutive years. This is a result of the stability of the country after the Arab spring. South Africa and Nigeria are next on the rank at the apex for two or more times. This is due to investment in minerals and oil sector in South Africa and Nigeria respectively. Countries like Congo DR, Ghana, Morocco, Mozambique, Sudan and Tanzania have ranked higher consistently during the period.

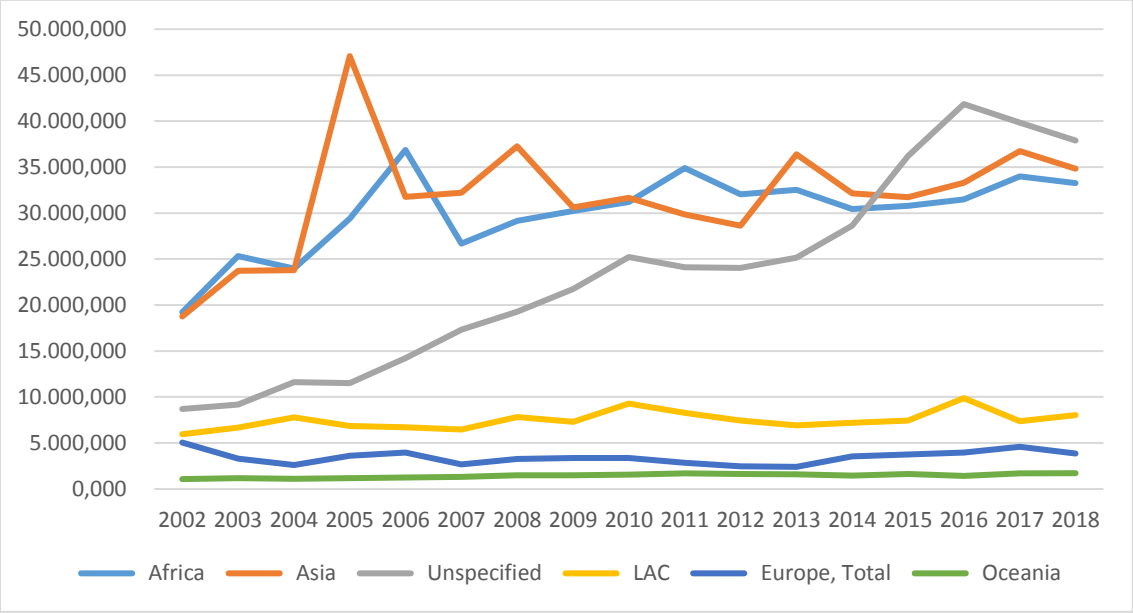
2.6.3 OFFICIAL DEVELOPMENT ASSISTANCE (ODA)

Official Development Assistance (ODA) is an important source of financial flows to Africa due to the inability of many countries to attract private direct investment, especially for countries emerging from conflicts. Africa has therefore relied mostly on the declining FDI and ODA to meet its development challenges over the years. While FDI is credited with generation of employment, increasing government revenue, filling foreign exchange gap, technology transfer, improving efficiency, developing of local enterprises, developing skills among others, ODA is primary focused on the socio-economic development of recipient countries (Anyanwu & Yaméogo, 2015; Onyeiwu, 2015; Adams & Opoku, 2017).

Data suggested that Africa has been the largest recipient of ODA in the world followed closely by Asia (Figure 2.11). Africa has accounted for an average of 30 % of overall aid to developing countries from 1980 to 2018. There was an estimated ODA of USD41 billion in 1990 to developing countries, which increased to almost USD59 billion in 2012 to Africa. ODA has since been on an upward trajectory with an estimated value of USD119 billion in 2018, with USD33 billion flowing to African countries. Observation of ODA flows from 2002 to 2018 to Africa indicates that the overall highest foreign aid has been disbursed to East Africa ($185.5 billion) followed by West Africa ($120.9 billion) and North Africa ($70.6 billion, driven by recent inflows to Sudan and

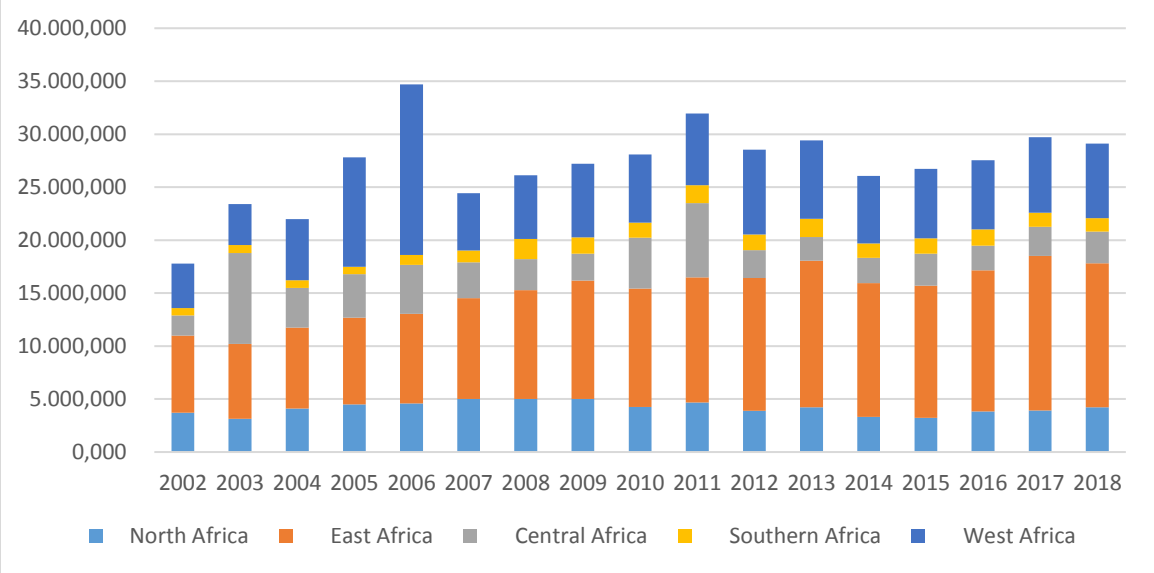
South Sudan) (see; Figure 2.12). In contrast, only $70 billion and $21.6 billion have been disbursed to Central and Southern Africa respectively.

Figure 2.11: Total ODA Flows to Developing Nations, 2002-2018



Source: Author' computation using WDI, 2020

Figure 2.12: Total ODA Flows to Africa by Region, 2002-2018



Source: Author' computation using WDI, 2020

Table 2.13 presents the largest destination of ODA to countries in Africa from 2009 to 2018. It can be observed that the largest recipients of foreign aid to Africa are Ethiopia, Kenya, Tanzania, Democratic Republic of Congo (Congo, DR) and Mozambique. It should be noted that countries like Somalia and South Sudan are recently attracting ODA, since they are emerging from conflict.

Table 2.13: Top 20 Recipient of ODA into Africa, 2009 – 2018

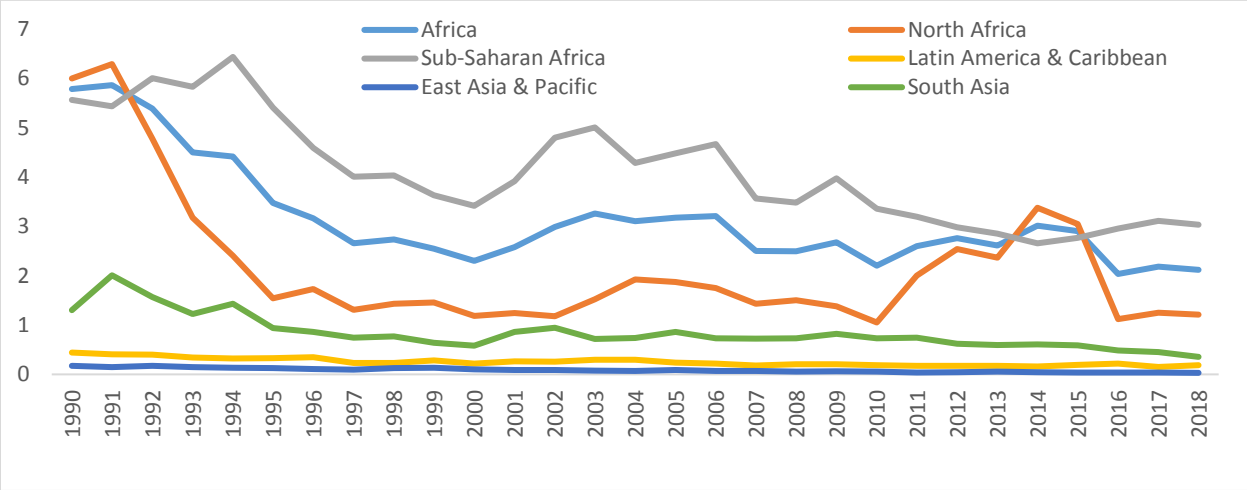
Africa	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Burkina Faso	–	–	–	–	–	17	–	–	–	–
Burundi	–	–	–	–	–	–	–	17	–	–
Cameroon	–	–	–	–	–	–	–	19	19	17
Congo	–	7	–	–	–	–	–	–	–	–
Côte d'Ivoire	3	–	16	1	5	–	–	20	16	20
Congo DR	8	1	1	5	8	7	3	10	10	6
Ethiopia	2	2	2	3	3	1	1	1	1	1
Ghana	12	12	11	12	15	16	15	16	18	19
Kenya	5	6	3	2	1	2	2	2	3	3
Liberia	–	15	17	–	–	–	13	18	–	–
Malawi	–	–	–	20	19	19	17	13	13	14
Mali	16	14	12	15	16	14	11	14	15	13
Mozambique	6	5	5	6	4	5	6	8	9	7
Nigeria	13	11	10	9	7	8	8	6	2	2
Rwanda	19	17	19	–	20	–	19	–	–	–
Senegal	18	19	20	16	18	11	16	–	20	18
Sierra Leone	–	–	–	–	–	–	20	–	–	–
Somalia	20	–	14	19	17	13	14	12	8	10
South Africa	10	9	7	11	9	10	7	7	11	11
South Sudan	–	–	–	8	11	3	5	5	4	5
Sudan	1	4	6	13	10	18	–	–	–	–
Tanzania	4	3	4	4	2	4	4	3	5	4
Uganda	9	8	9	10	12	9	10	9	7	9
Zambia	14	16	15	17	14	12	18	15	14	16
Zimbabwe	15	20	–	18	–	20	–	–	–	–
Egypt	7	10	13	14	13	15	12	11	12	8
Morocco	11	13	8	7	6	6	9	4	6	12
Tunisia	17	18	18	–	–	–	–	–	17	15

Source: Author, using OECD-CRS database Online

Figure 2.13 reports the Net ODA received as a percent of Gross National Income (GNI) between 1990 and 2018. The figure indicates that Net ODA to GNI ratio is highest for Africa compared to other regions. This is driven by the high ratio in SSA. It can also be observed that the Net ODA/GNI ratio in Africa peaked in the early 90s but has significantly declined to an average of

2.1 % compared to 0.35 %, 0.18 % and 0.03 % in South Asia, LAC and East Asia & Pacific respectively.

Figure 2.13: Net ODA Received as a Percentage of GNI, 1990-2018



Source: Author' computation using WDI, 2020

The largest donors to Africa continent include the United States, European Union, United Kingdom and Japan[13]. ODA can take several forms, such as grants, concessional loans, and technical assistance; and can take the form of bilateral agreements or multilateral organisations[14]. An upsurge in mitigating climate change has ensured increases in ODA, especially to middle income countries that were expected to wean off foreign aid. This is ensuring the ODA is directed to dealing with global public goods such as climate change instead of traditional poverty alleviation and bridging on development gaps. However, recent global financial and economic instabilities is resulting in a decline of aid to African economies.

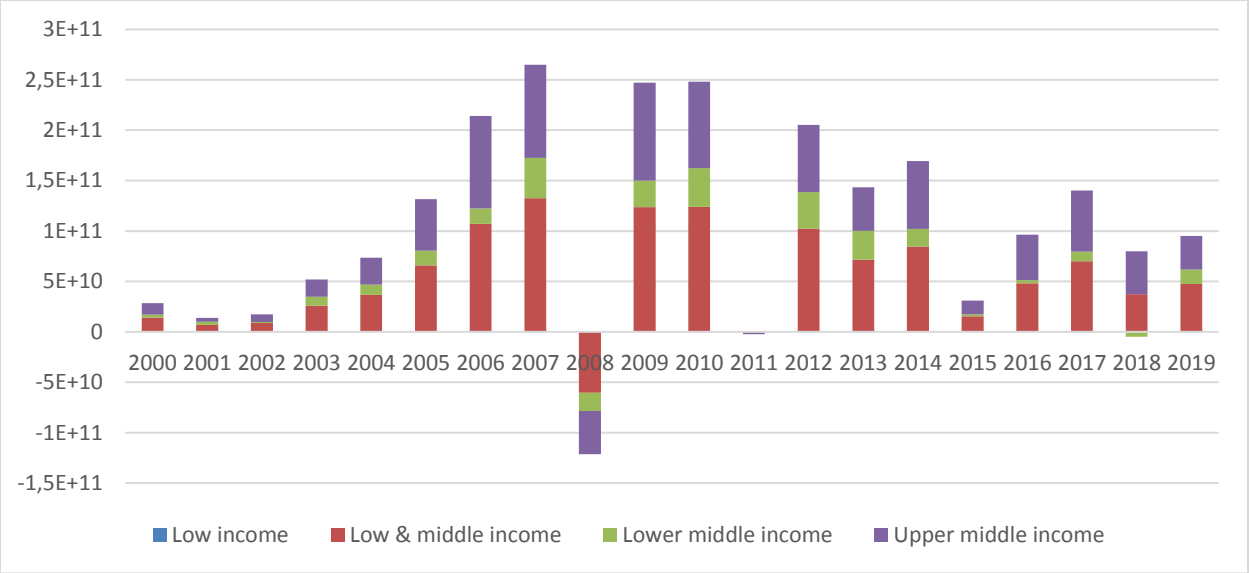
2.6.4 PORTFOLIO FLOWS

Portfolio flows are net inflows of local equity securities as a result of investments carried out by foreign investors. These inflows are known to promote financial sector development and a stable economic growth through investment in SMEs. Although, portfolio flows tend to be short term and volatile in nature, presenting some level of risk. Normally speculations and arbitrage

[13] Even though, financial inflows from China continues to increase, surpassing most ODA donors, they are often in a form of bilateral programmes intended for project financing that is integrated into commercial transactions involving trade, investment and loans hence not reported as ODA (Economic Commission for Africa, 2017).
[14] Onyeiwu (2015) reviews several institutions and agencies that are donors to the continent.

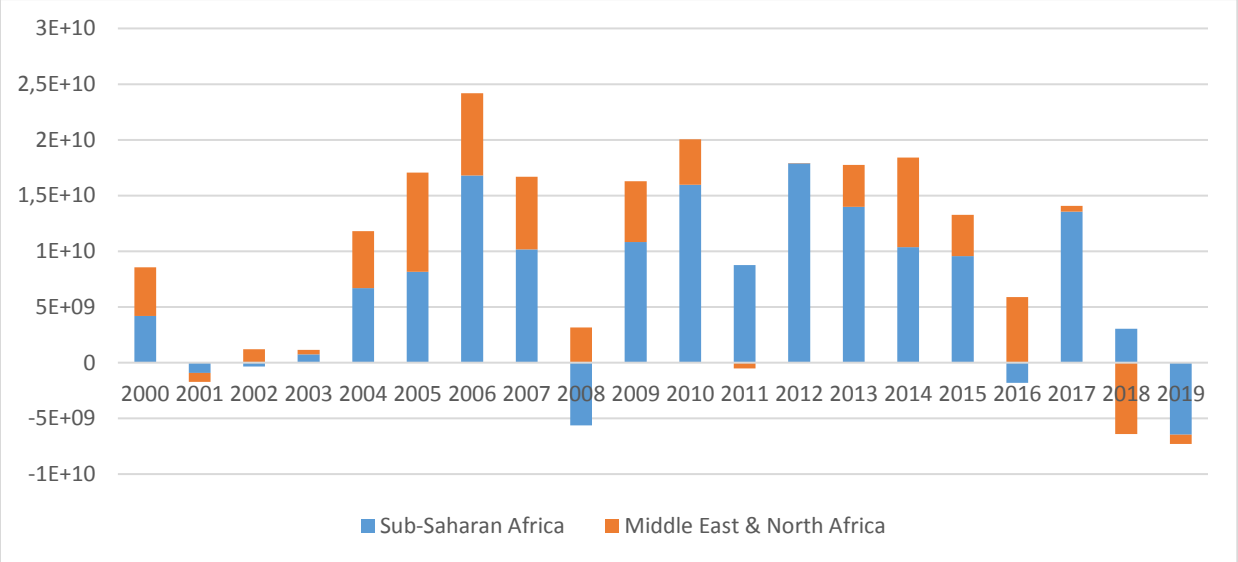
opportunities attract portfolio flows, which have been associated with asset bubbles and financial crisis in developing economies. This is basically because of the small size of such markets. Figure 2.14 shows that portfolio flows are either non-existent or very small in low income countries.

Figure 2.14: Portfolio Flows to Developing Economies, 2002-2019



Source: Author' computation using WDI, 2020

Figure 2.15: Portfolio Flows to SSA and MENA from 2002 to 2019



Source: Author' computation using WDI, 2020

The flows are relatively small in lower middle income countries but very large in upper middle income countries. Even though there has been a substantial increase in capital inflows to emerging markets, Africa share of portfolio flows remains low.

Portfolio flows have undergone several stages when examined in Africa for the recent decades (Figure 2.15). It can be seen that portfolio flows was lower in in the early 2000s but increased to its peak in 2006. As expected, portfolio flows into SSA and MENA declined sharply in 2008 as a result of the GFC. After the 2008 GFC, global investors increased their participation into the African markets as a means of diversifying their investments. This saw a continual increase in portfolio inflows up to 2015. Currently, there are reversal in these growth because of global economic instabilities. The portfolio flows are mostly concentrated in few markets, such as South Africa, Morocco and Mauritius while the rest of African countries have minimal or no foreign participation.

2.6.5 REMITTANCES

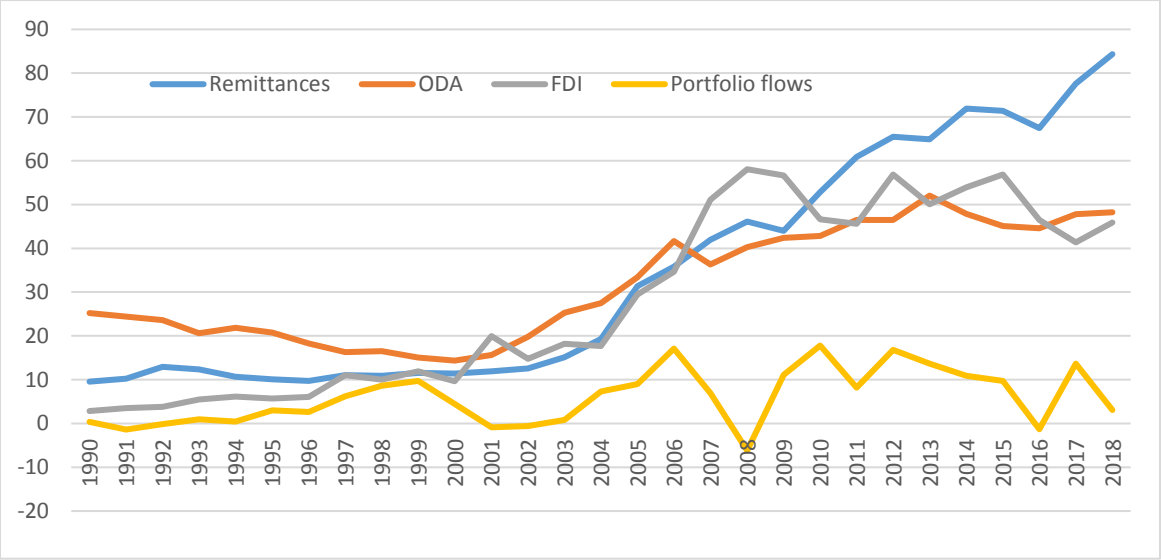
Remittances are private transfers from migrant workers to households of the workers' country of origin. Remittances have been documented to be one of the largest sources of funding development in low and middle income countries[15]. Specifically in Africa, although the rate of growth in international remittances has muted over the years, it has surpassed both FDI and ODA inflows since 2010 (Figure 2.16). It can be seen that remittances recovered from decline after the 2008 GFC and now leading FDI by a 7 percentage point in 2018. In was estimated to hit USD 86.2 billion in 2019 from USD 82.8 billion recorded in 2018 (AfDB, 2020b).

Figure 2.17 shows the international remittances as a percentage of GDP to various regions. Africa is the region with the highest remittances GDP ratio after South Asia. In 2008, remittances to Africa were 2.6% as compared to 4.7% for South Asia. This has significantly changed as remittances amounted to about 3.8% in both Africa and South Asia. There is an exception in countries such as Senegal, Liberia, Lesotho, Gambia, Comoros, and Cabo Verde whose remittances accounts for more than 10% GDP from 2008 to 2018. Hence, remittances are

[15] It should be noted that reporting of remittances was broadened to include non-banking financial institutions engaged in remittances services with the introductions of new regulations in 2002. Hence remittances data prior to these regulations was underrated. (Clemens & McKenzie, 2014). Also, remittances data do not include the lost output of migrant labour in their home country.

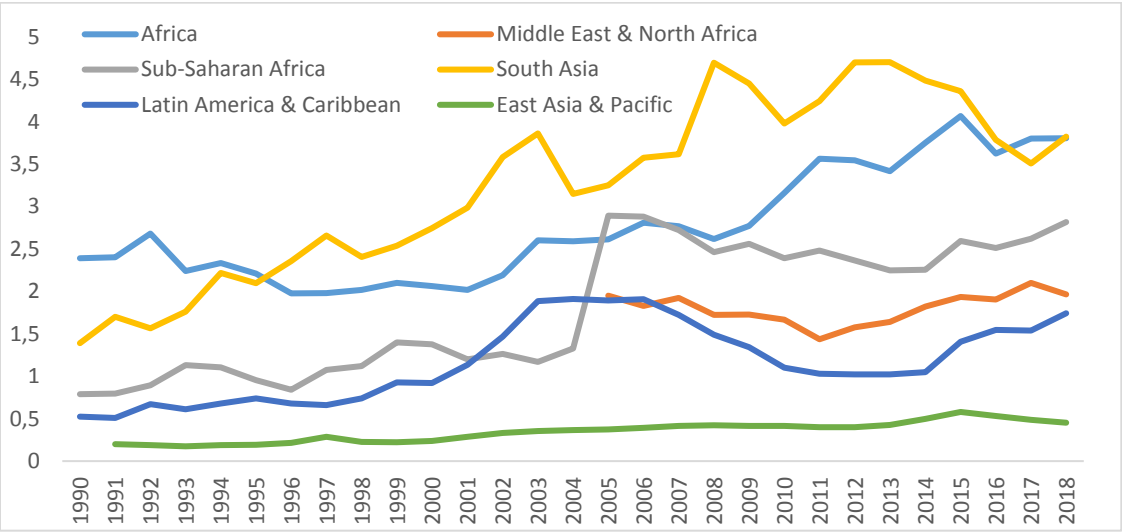
important sources of foreign exchange earnings in these countries and are likely to be affected in the COVID-19 era. The least recipient of remittances relative to GDP are East Asia and Pacific followed by LAC.

Figure 2.16: Foreign Inflows into Africa, 1990-2018 (in billion dollars)



Source: Author' computation using WDI, 2020

Figure 2.17: Remittances as a percentage of GDP, 1990-2018



Source: Author' computation using WDI, 2020

In value terms, Table 2.14 presents the rank of top 20 recipient of international remittance in Africa from 2009 to 2018. In particular, Nigeria, Egypt, Morocco, Ghana, Tunisia and Senegal rank highest in receiving international remittances in Africa. Interestingly, three of these are North Africa countries and three are from West Africa. Thus, it is not out of place to conclude that North Africa and West Africa have the highest inflows of remittances when compared to other regions of Africa.

Table 2.14: Top Ranked 20 Recipient of Remittances in Africa, 2009-2018

Country Name	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Algeria	18	19				4	6	5	8	9
Benin	20	20								
Burkina Faso						18	18	19	16	17
Cabo Verde	19									
Cameroon	17									
Congo, Dem. Rep.			9	11	9	14	10	15	11	8
Cote d'Ivoire	14	15	18	18	18					
Egypt, Arab Rep.	2	2	2	2	2	2	2	2	1	1
Ethiopia	16		15		13	9				19
Ethiopia		14		13			12	13	20	
Ghana			5	5	6	6	4	4	4	4
Kenya	10	10	10	8	8	10	9	9	6	5
Lesotho	11	11	14	15	15	19	19	17	15	15
Liberia		18	16	15	16	15	16	16	18	16
Madagascar	15	13	19	20	20					20
Mali	12	12	13	12	12	11	15	12	12	13
Morocco	3	3	3	3	3	3	3	3	3	3
Nigeria	1	1	1	1	1	1	1	1	2	2
Senegal	6	5	7	7	7	7	8	6	5	6
South Africa	8	8	8	9	10	12	14	14	13	14
South Sudan							11	11	14	
Sudan	5	6	11	14	14	16				
Tanzania		16	17	17	19	20	17	18	19	
Togo	13	17	20	19	17	17	20	20	17	18
Tunisia	4	4	5	4	4	5	7	8	7	7
Uganda	9	9	12	10	11	13	13	10	10	11
Zimbabwe	7	7	6	6	5	8	5	7	9	10

Source: Author' computation using WDI, 2020

The importance of remittances to developing economies are not without challenges. A key challenge often highlighted and reported is the transaction cost of remittances causing migrants to sometimes use informal channels. In fact, the Sustainable Development Goals target cost of

remittance to be 3 % by 2030. The cost of remittances continues to decline in all the regions of Africa even though the overall average is still above the global average of 6.94% in 2018 (World Bank, 2019). Whilst cost of remittances are still high in Southern and North Africa, East Africa continues to decline to an average of 5.83% in 2018 (Table 2.15). This has largely been attributed to the success of mobile money banking in the region. There is however ongoing adoption of technologies and the promotion of competition among service providers in mitigating the cost of remittances throughout Africa.

Table 2.15: Cost of Remittance to Africa by Region, 2011-2018

	2011	2012	2013	2014	2015	2016	2017	2018
North Africa	8.88	8.59	8.44	7.75	7.66	6.95	9.91	7.26
West Africa	10.23	9.21	10.72	9.10	7.35	8.26	6.10	6.46
Central Africa	12.72	11.34	12.80	10.89	9.94	8.11	6.33	6.15
East Africa	11.39	11.05	10.13	9.25	9.12	8.21	8.26	5.83
Southern Africa	15.33	17.76	17.12	17.62	14.21	14.67	9.78	9.11
Africa	11.71	11.59	11.84	10.92	9.66	9.24	8.07	6.96

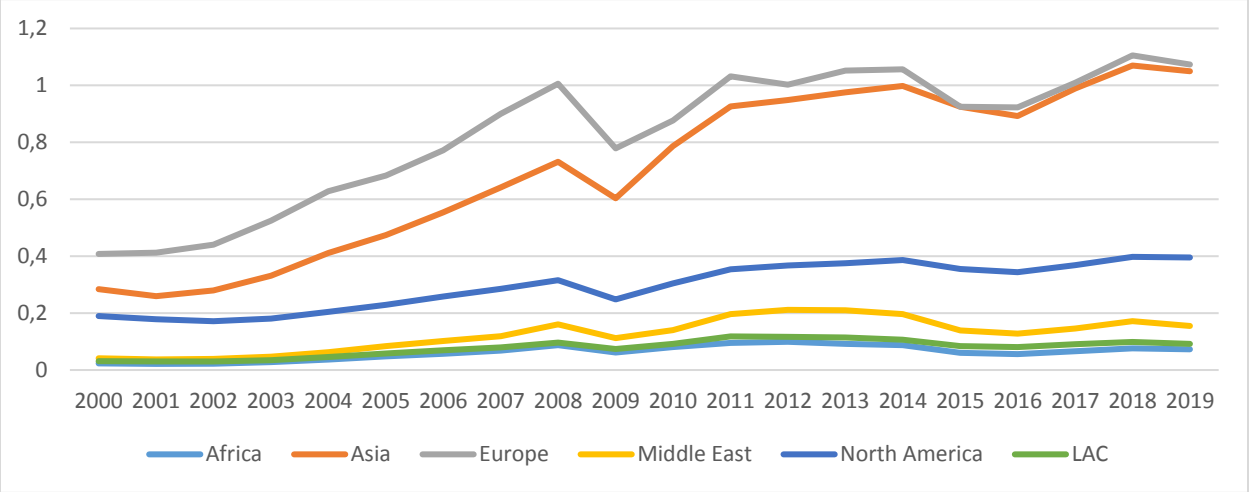
Source: Author' computation using WDI, 2020

2.6.6 TRADE

Trade is identified as a catalyst for economic growth by world organisations, scholars and practitioners. However, Africa is confronted with how to grow its volume of trade (both internationally and intra-Africa) and how to shift from trading raw materials[16] into manufactured goods and services. Even though progress have been made in all fronts, it has stagnated in recent years. Figure 2.18 shows that Africa share of global merchandise exports remains low when compared to other regions. Africa share of global merchandise exports increased consistently from 3 % in the 2004 to 9 % in 2012-2014. This has since reversed to current 7 % in 2018 and 2019.

[16] For instance in 2012, the share of primary products (mainly food, raw materials and oil) accounted for 82% and 90% of African exports to developed economies and Asia respectively (Economic Commission for Africa, 2017).

Figure 2.18: Merchandise exports by product group, 2000-2019



Source: Author' computation using WDI, 2020

Historically, Africa share of global total trade has declined on the average. From Table 2.16, Africa share of merchandise has decreased from 5.1% in the 1960s to 3.14% in the period of 2010 – 2019. On regional levels, it can be seen that; Northern (Central) Africa contributed the highest (lowest) share to Africa total merchandise trade over the period.

Table 2.16: Share of Global Total Trade by Region

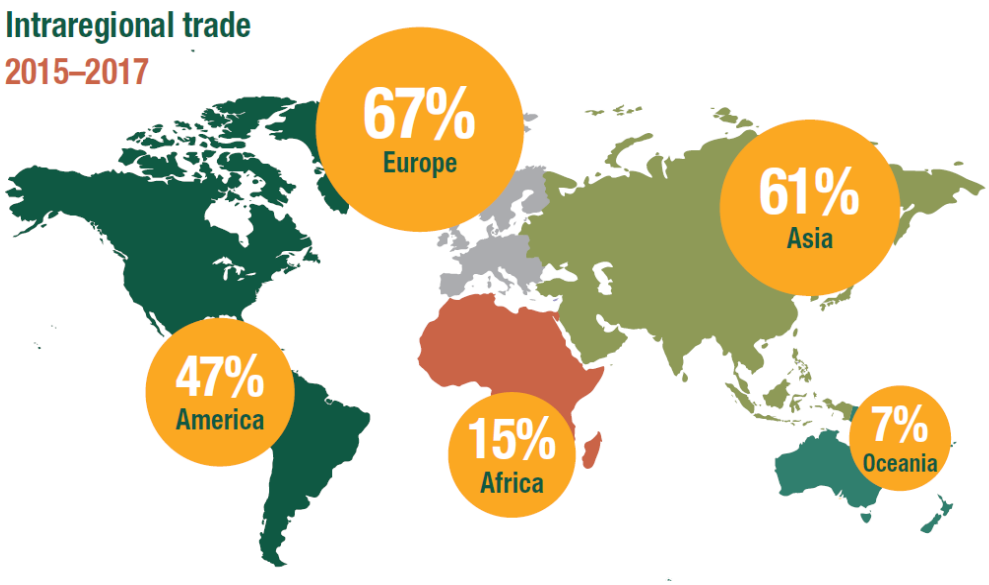
Period	1960 – 69	1970 – 79	1980 – 89	1990 – 99	2000 – 09	2010 – 19
Africa	5.10	4.37	3.99	2.40	2.41	3.14
Northern	1.53	1.51	1.62	0.91	0.87	1.13
Eastern	1.04	0.65	0.41	0.32	0.30	0.47
Central	0.36	0.26	0.26	0.14	0.19	0.26
Southern	1.17	0.89	0.88	0.64	0.63	0.72
Western	1.00	1.06	0.82	0.40	0.41	0.56

Source: Author, using UNCTAD (2019)

Although, there have been an increase in intra-trade from 13.5% during 2000 to 2010 to 15% during 2015 to 2017, It still remains low when compared to other regions as seen Figure 2.19. In order to boost trade and address challenges that limit intra-trade such as high tariffs, tedious customs procedures and inadequate infrastructure, African Union and the various regional blocs have agreed on free trade agreement known as the African Continental Free Trade Area (AfCTA). It is expected that the AfCTA will be fully operationalize in 2021. The primary aim of the AfCTA

is to harmonize the several regional blocs, eliminate current high tariffs, generate employment and the overall promotion of intra-Africa trade (UNCTAD, 2019c).

Figure 2.19: Merchandise Exports by Product Group



Source: UNCTAD, (2019c)

2.7 CHAPTER SUMMARY

This chapter surveys the nature, trend and growth of African financial market. In particular, it highlights the growth of the banking, insurance, microfinance, financial technology and capital market sector of the African countries. It was observed that African financial sector has undergone massive improvement, yet it has not peak signifying the urgent need to improve the channels of financial growth in order to stimulate economic growth. The chapter also outlines the channels of financial flows to African economies by analysing the trends and challenges associated with the flows. In conclusions, this chapter provides the starting point of the study by detailing the nature of African market, setting the tone for disposition of the study.

CHAPTER THREE

LITERATURE REVIEW

3.0 INTRODUCTION

In this chapter, literature on major topical issues concerning the study are reviewed. Literature on the link between financial development and economic growth are first presented with the analysis of relevant studies. The variables used to establish the link, the methodology, the period as well as the sample used in each studies are shown. Also, the determinants of stock market volatilities are reviewed by tracing the economic, corporate and non-economic factors that influence stock prices. Then the study then focus on empirical studies related to political uncertainties and stock market returns. In particular, the role of several political events are examined to determine how they affect stock market returns. Then the existing gaps in the literature reviewed are highlighted. Finally, the theoretical justification of how market participants react to uncertainties are introduced with the aid of several behavioural theories in finance.

3.1 ECONOMIC GROWTH AND FINANCIAL DEVELOPMENT

There is a large volume of literature on the role of financial sector development and economic growth. The finance-economic growth nexus dates back to Bagehot (1873), who attributed the industrial growth in England to finance thanks to its role in mobilizing capital. This was popularized by Schumpeter seminal work in 1911 who highlighted the importance of finance to the growth of capitalist economy. Schumpeter, Becker and Knudsen (2002) indicated that the financial sector promotes growth by providing credit to entrepreneurs, who invest in innovative and productive sectors. Subsequently, earlier works confirm a positive relationship between economic growth and financial sector development (see for instance: King & Levine 1993; Levine 1997; Levine & Zervos, 1998; & and Levine, 2004 among others).

There are numerous theoretical literature addressing the relationship between finance and economic growth. One strand of theoretical contributions based on endogenous growth model cited five main channels[17]. First, finance improves the allocation of resources by reducing information cost and channels household savings into productive corporate sector (Greenwood & Jovanovic, 1990; Bencivenga & Smith, 1991; Pagano, 1993; Wu, Hou, & Cheng, 2010). Second, financial

[1717] Levine (2005) provides a detailed review of finance and economic growth.

sector growth improves asset allocation through reduction of risk, portfolio diversification and transparency (Levine, 1991; Saint-Paul, 1992). Third, finance promotes good corporate governance and thus, improves efficiency and productivity in firms (Demirguc-Kunt & Levine, 1996; Jensen & Murphy, 1990). Fourth, greater financial development improves financial intermediation making it flexible to boost transactions (Arestis, Demetriades & Luintel, 2001; Rousseau & Wachtel, 2000). Finally, financial development enhances specialization in entrepreneurship and promotion of innovations (Greenwood & Smith, 1997).

Another strand of theoretical literature is based on the exogenous growth model, which emphasises how the indirect financial channels development plays in driving economic growth. These indirect channels include the development of domestic financial sector, prudent macroeconomic policies, improved regulations and institutional development. The Neo-classical growth (Solow) model sees labour and capital as the main protagonist in economic growth. Capital accumulation through, for instance, household savings is considered to generate economic growth (Solow, 1956). A related classical model like Mankiw-Romer-Weil (MRW) have similarly been used to examine the role financial sector development, proxied by stock market, plays in economic development (see Atje & Jovanovic, 1993; Cooray, 2010).

A summary of recent empirical studies on the nexus between economic growth and financial development related to these studies are presented below:

Table 3.1: Summary of Related Empirical Studies

Author(s)	Variables (finance and economic growth)	Control variables	Sample	Period	Methodology
Bittencourt (2012)	M2, private bank credit over bank deposits, deposit money bank claims over deposit money bank and central bank claims, stock market capitalisation, real GDP per capita	Government's share in the real GDP, Trade Openness, ratio of investment to real GDP, structural development, institutional quality, macroeconomic instability, Inflation	4 LAC countries	1980–2007	Pooled OLS, FE, RC, FE-IV
Bhatti, Haque & Osborn (2013)	Log of the product of Private Credit and Trading Value, sum of Private Credit and Market Capitalisation, real per capita GDP	Openness, government size, inflation, average years of schooling and investment share of GDP	36 OECD and non-OECD countries.	1980-2006	FE, GMM
Narayan & Narayan (2013)	Market capitalisation / GDP, domestic credit provided by the banking sector/ GDP, and stocks traded/GDP, GDP growth	Gross fixed capital formation, inflation, trade openness	65 developing countries	1995-2011	GMM
Akinci, Akinci & Yilmaz (2014)	Domestic credits, ratio of broad money, ratio of total bank deposits, financial system deposits, percentage of GDP		OECD countries	1980-2011	Pedroni and Kao Cointegratio, Granger Causality
Beck, Georgiadis, & Straub (2014)	Ratio of private credit by deposit money banks relative to GDP, real GDP per capita	Inflation, years of secondary schooling, government consumption and openness	132 countries	1980-2005	System GMM
Ductor & Grechyna (2015)	Private credit to GDP, Private credit by banks to GDP, Liquid liabilities to GDP, Real GDP growth per capita, Growth of the industrial value added, R&D expenditures to GDP	Trade openness, Human capital inflation, Government expenditure	101 developed and developing countries	1970-2010	OLS, IV, first differenced GMM
Mishra & Narayan (2015)	Market capitalisation, domestic credit provided by banking sector, domestic credit provided by private sector, stocks traded, GDP growth	Inflation, gross fixed capital formation, volume of trade	43 countries	1986-2012	Non-parametric panel data model
Durusu-Ciftci, Ispir & Yetkiner (2017)	Domestic credit to private sector/GDP, Value traded, real GDP per capita		40 countries	1989-2011	AMG, CCE

Table 3.1: Summary of Related Empirical Studies – Continued

Ibrahim & Alagidede (2018)	Domestic credit to GDP ratio, excess finance, industrial output, real GDP per capita	Government expenditure, inflation, investment, trade openness, labour	29 SSA countries	1980–2014	GMM, FE-IV
Ibrahim & Alagidede (2018b)	Domestic credit to GDP ratio, excess finance, industrial output, real GDP per capita	Government expenditure, inflation, investment, trade openness, labour, Secondary school enrolment, Primary pupil teacher ratio	29 SSA countries	1980–2014	Panel threshold regression
Mollaahmetoğlu & Akçalı (2019)	Domestic credit to private sector, bank overhead costs to total assets, loans from non-resident banks, Stock price volatility GDP growth	Financial Innovation Expenditures, gross savings, financial system deposits to GDP	15 high-income and upper-income countries	2003-2016	FE with Driscoll and Kraay standard errors
Botev, Egert & Jawadi (2019)	Domestic credit to GDP, private domestic credit to the GDP, stock market capitalisation to GDP, bank branches per capita and financial liberalisation index	Investment ratio, inflation, population growth human capital	100 countries	1995-2012	Dynamic OLS, GMM, Panel threshold regression
Raghutla & Chittedi (2020)	Domestic credit to private sector, money supply, GDP per capita	Industrial value-added, research and development expenditure, Inflation, exchange rate	BRICS countries	2000–2016	Pedroni panel cointegration test, Heterogeneous panel causality test
An, Zou & Kargbo (2020)	M2, M3, Domestic credit to the private sector by banks financial, interest rate spread liberalisation index, Income per-capita	Inflation, gross investment, gross national savings	30 SSA countries	1985–2015	FE

Notes: OLS represents Ordinary Least Square; FE: Fixed effect; RC: Random Coefficients; IV: Instrumental Variables; GMM: Generalized Method of Moments; AMG: Augmented Mean Group; CCE: Common-Correlated Effects

3.2 DETERMINANTS OF STOCK MARKET VOLATILITY

The determinants of stock market volatility have been a subject of enquiry in recent past. Key among the determinants of stock market volatility can be grouped into economic and non-economic factors. Daily fluctuations in the stock markets emanate from the economic and other events that affect the affairs of a country. The subsequent sections provide the theoretical linkage between the variables and stock market volatility.

3.2.1 ECONOMIC FACTORS

The nexus between stock returns and macroeconomic variables was first proposed by Ross (1976) in his APT model, which argued that there is a linear relationship between a range of macroeconomic variables and stock market returns. This was an extension of other risk factors, besides the notion of equity market risk premium, introduced in the Capital Asset Pricing Model (CAPM) by Sharpe (1964). However, the Arbitrage Pricing Theory (APT) model failed to identify the specific macroeconomic variables responsible for explaining the changes in stock market returns. The first attempt was made by Roll and Ross (1980), who empirically established industrial production, unanticipated changes in inflation, the term structure of interest rates and risk premiums as the determinants of stock market returns.

Fama (1981) conducted extensive studies to affirm the evidence of a strong positive relationship between equity returns and real economic activities, such as industrial production, capital expenditures and Gross National Product (GNP). This was built upon by Chen, Roll and Ross (1986), who found that prices react sensitively to economic news, especially to unanticipated news. The authors documented the evidence that economic variables, such as exchange rates, interest rates, inflation, industrial production and money supply, have major impact on stock market returns.

Further studies by Hamao (1988) replicated the Chen, Roll and Ross (1986) study in the multi-factor APT framework. He concluded that the Japanese stock returns are significantly influenced by changes in expected inflation, and the unexpected changes in both the risk premium and slope of the term structure of interest rate. Since then, a number of researchers have investigated influence of macroeconomic variables and stock return. Subsequently, numerous empirical studies have been conducted to examine the relationship between stock market returns and a host of macroeconomic variables.

Also, Efficient Market Hypothesis (EMH) by Fama (1970), provides a theoretical framework of a linkage between stock market returns and macroeconomic variables. The EMH asserts that relevant information about changes in macroeconomic variables are fully reflected in the current stock prices, and therefore investors will not earn abnormal profits in such markets. However, empirical studies by Fama and Schwert (1977), Nelson (1976) and others confirmed the influence of stock returns due to macroeconomic variables by affecting the prices. In a study, Schwert (1989)

confirmed that changes in real economic activity can explain the volatility of stock market return. Moreover, Chandra (2004) noted that 30-35% of changes in stock price can be attributed to 'economy-wide factors'.

Paddy (1992) argues that macroeconomic and fiscal environment is one of the building blocks which determine the success or otherwise of securities market. Conducive macroeconomic environment promotes the profitability of business which propels them to a stage where they can access securities for sustained growth. So, the dynamic relationship between stock prices and macroeconomic variables can be used to guide a nations' macroeconomic policies (Maysami, Howe & Hamzah, 2004). Also, Saeed Ozra and Meysam (2012) argues that decision-makers could determine behaviour of stock prices more precisely by knowing effective factors influencing stock return and thus, make more proper decisions. Other comprehensive studies on the relationship between stock returns and macroeconomic variables were conducted by Asprem (1989), Abdullah and Hayworth (1993), Muradoglu, Taskin, and Bigan (2000), Diacogiannis, Tsiritakis and Manolas (2001), Wongbampo and Sharma (2002) and Mukhopadhyay and Sarkar (2003), among others.

From the preceding studies, macroeconomic variables were established to be critical in predicting the variability of stock market returns. Hence, investors must monitor and forecast some key macroeconomic variables in order to accurately predict stock market returns. Major macroeconomic variables that are usually mentioned include inflation, exchange rate, interest rate, money supply, industrial production, GDP, balance of payments, unemployment rate, fiscal balance and Foreign Exchange Reserves. On the whole, studies are many with inconsistent and inconclusive underpinnings. In general, the sign of macroeconomic variables established to influence stock market returns are mixed in both developed and emerging economies. These may be due to the use of different variables and proxies in modelling. Moreover, some conclusions are country or period specific. In addition, various econometric models have been adopted in modelling the dynamic relationship between macroeconomic fundamentals and stock market returns.

3.2.1.1 Inflation

It is contended that inflation cannot be limited to monetary phenomenon which mirrors the quantity of money per unit of output but also has a profound influence on stock market volatility (Suhaibu, Harvey & Amidu, 2017). The Generalized Fisher Hypothesis, (Fisher, 1930) postulated that equity market returns are independent of inflation expectations, albeit stock market returns and inflation are positively related. Hence, equities representing claims against the real assets of a business serve as a hedge against inflation. Investors will sell financial assets in exchange for real assets once expected inflation is pronounced. This means, Fisher effect' postulates that stock prices in nominal terms fully reflect expected inflation, signifying a positive relationship between stock return and inflation. This suggests that real stock market returns are not affected by inflation.

Positive relationship between stock market and inflation has been confirmed by authors like; Choudhry (2001), Engsted and Tanggaard (2002), Maysami, Howe and Hamzah (2004), Luintel and Paudyal (2006), among others. Alagidede (2009b) investigated whether stock market provide hedge against inflation for these six African countries: South Africa, Nigeria, Egypt, Morocco, Tunisia, and Kenya. These countries were chosen for their importance in economics and finance. The author tested Fisher Hypothesis for these African countries. Kenya was the only country that the Fisherian hypothesis was not rejected.

Bodie (1976) claimed that stock market is immune to inflation pressures. This is because stock market serves as a hedge against inflation, which implies that investors are fully compensated for increases in the general price level through corresponding increases in nominal stock market returns. Thus, the real returns remain unchanged and the real value of the stock market should remain unaltered in the long run. This means that there is an indirect relationship between inflation and stock stocks returns. This assertion has been confirmed by authors like Anari and Kolari (2002).

However, another strand of literature contradicts the Fisher hypothesis. From the Gordon (1962) model, equity prices partly depend on the expectation of dividends to be paid in its lifetime. As such, a rise in money supply may cause inflation but stimulate expectations of economic which would lead to increases in stock prices. Hence a negative relationship between inflation and stock prices is postulated. An example is an expansionary monetary policy will lead to a rise in expected inflation, which increases long-term interest rate. This will cause a fall in stock prices due to the

fall in the present value of future dividends (Sargant, 1999; Cogley & Sargant, 2002). Adam and Tweneboa (2008) also posit that high inflation increases the cost of living and thus result in shifting of resources from investments to consumption. The monetary policy that authorities may respond by increasing the nominal risk free rate and hence the discount rate in the valuation model. This therefore result in the lower stock prices caused by the increased rate of inflation.

Also, Fama and Schwert (1977) demonstrated the ambiguity of the Fisher hypothesis. They presented evidence that stock prices are negatively related to both the expected and the unexpected component of Consumer Price Index or the inflation rate. This was again concluded by Fama (1981), who found a negative relationship between stock returns and inflation. This same result has been concluded by some studies, such as Amihud (1996), Chatrath et al. (1997), Ralph and Eriki (2001), Boyd, Levine, & Smith (2001), Sharpe (2002), and Ratanapakorn and Sharma (2007). Ralph and Eriki (2001) as well as Apergis and Eleftheriou (2002) studies showed that inflation influences stock prices negatively in an economy with high inflationary pressures in Nigeria and Greece respectively.

The Fisher hypothesis continues to be significant in finance today because it offers a cogent explanation of the expected nominal stock market returns. The Fisher hypothesis suggest that the expected value of nominal assets have a unitary effect on expected inflation. Economic theory amplifies the importance of inflation in explaining volatilities of stock returns. However, there is no consensus on the direction of this relationship and whether the causality is unidirectional or bidirectional. These studies therefore includes inflation in the estimation to test the consistency of Fisher hypothesis on the African economies and the extent to which ASMs serves as a hedge to inflation or otherwise.

3.2.1.2 Interest Rate

Several theories link interest rate and stock market returns. The Neoclassical theory of interest rate states that a rise in interest rate results in a higher cost of loans. Thus, an increases in the interest rate causes a decrease in private investment and in the price of shares (Mok, 1993). From the Fisher hypothesis, the nominal interest rates on financial assets are expected to move one-to-one with expected inflation (Fisher, 1930). Also, from the Dividend Discount Valuation model, interest rate

fluctuation has an impact on the present value of dividends and hence on stock prices (Chen, Roll & Ross, 1986).

Another possible explanation of the relationship between interest rate and stock prices is the fact that many governments use interest rates as a monetary policy tool to control other macroeconomic fundamentals. As Therefore stock markets do not only respond to monetary policy decisions but provides a valuable feedback to central bank regarding the private sector's expectations of future macroeconomic variables (Bernanke & Gertler, 1999; Bjornland & Leitemo, 2009). All the above theoretical underpinnings suggest a negative relationship between stock market returns and interest rate.

Mukherjee and Naka (1995) believe that changes in both short-term and long-term interest rates are expected to affect the discount rate in the same direction, through their effect on the nominal risk-free rate. Therefore, interest rates are expected to be negatively related to market returns either through the inflationary or discount factor effect (Abugri, 2008). Such expectation is also consistent with Chandra (2004) conclusion, who states that a rise in interest rate decreases corporate profitability and also leads to an increase in the discount rate applied to equity investors. Both of them have adverse impact on stock prices, and vice-visa. Therefore, a rise in interest rate is expected to impact negatively on the performance of the organisation.

If interest rate falls, investors react by transferring their investment to the stock market, leading to high demand for shares resulting in increased stock prices. On the other hand, an increase in interest rate makes investors channels their current investments to the money markets thereby starving the stock exchange of the needed new investments. Therefore trading activities are reduced as there are more shares on sale than what buyers want, leading to fall in prices. According to Chandra (2004), interest rate varies with time, default risk, inflation rate, and productivity of capital, among others. A change in interest rate therefore encourages substitution between stock market and money market instruments, as well as speculative activities. There are also other studies that have reported that it is not interest rate itself which is relevant but the yield and default spreads that are more likely to influence equity returns (Chen, Roll & Ross, 1986). They however concluded that effect of nominal interest rates on stock prices is expected to be negative. Also, authors like Adam and Tweneboah (2008), Humpe and Macmillian (2009), Hussain, Rafique,

Khalil, and Nawaz (2013) and Alam (2017) found that interest rate affect stock prices negatively both in a direct and indirect manner.

Few economists found positive effects between interest rate and stock prices. For instance, Elton and Gruber (1988) discovered that there exists a positive relationship between stock prices and short-term interest rates. Ratanapakorn and Sharma, (2007) also reported positive relationship between S&P 500 and short-term interest rate in United States. However, they found a negative relationship between stock prices and long-term interest rate. Other authors who concluded a positive relationship between interest rate and stock market returns are Goswami and Jung (1997), Hasan and Samarakoon (2009) and Narayan and Narayan (2012).

3.2.1.3 Economic Activity (GDP or Industrial Production)

Ikoku (2010) traces four theoretical linkages between stock prices and economic activity of a country. First, stock prices account for investors' expectations about future economic performance, since stock prices reflects and adjust to firms expected profitability. Second, an increase in stock prices lowers the investment funds available to firms, whereas funds are shifted to real investment and thus increases economic activity. Third, a higher stock prices increases shareholders assets and thus, their creditworthiness. This leads to a rise in borrowing capacity of shareholders and an increase in future economic activity. Fourth, an increase in stock prices makes shareholder worthy thereby increasing their purchasing power. Shareholders tend to spend more, leading to more economic activity (Camilleria, Sciclunaa & Baib, 2019).

Moreover, the flight-to-quality theory suggests that investors will withdraw their equities from economies that are experiencing perceived instability or general decline in economic activity, leading to a fall in stock prices. Hence economic activity proxied by either GDP or industrial production has a positive relationship with stock market returns.

Empirical literature confirms the direct relationship between stock market returns and country's aggregate economic activity. For example, Fama (1981) concluded that there is a positive relationship between stock market returns and real economic activity. This was replicated by Chen, Roll and Ross (1986), who came to the same conclusion. Also, Fama (1990) indicates that about 43% of changes in the annual returns of the NYSE are attributed to real activity. Specifically, he found that aggregate economic output was responsible for approximately half of the total variation

of the NYSE stock return. Since then, almost every author, including Chen (1991), Wongbangpo and Sharma (2002) and Humpe and Macmillian (2009); concluded a positive relationship exist between stock returns and the overall economic activity.

3.2.1.4 Exchange Rate

Exchange rate plays an important role in mobility of capital due to increase in globalization. Cash flows of corporate entities are directly and indirectly affected by fluctuations in foreign exchange rate. Hence exchange rate is an important risk for investors (Tursoy, Gunsel & Rjoub, 2008). According to the purchasing power parity (PPP) conditions, fluctuations in exchange rate is adjusted to reflect relative inflation levels. Under perfect PPP, exchange rate is adjusted to reflect the law of the single price. Hence, exchange rate movements should not be different from rate of inflation. However, many authors have reported short-to-medium term deviations from the PPP theory (Frenkel, 1981; Adler & Lehmann, 1983). Jorion (1991) and Dumas and Solnik (1995) report that these deviations are expected to be borne by investors. This could be daunting to investors interested in the African economies, which are known to experience significant currency risk exposures.

Depreciation of local currency influences the sales, prices and profits of importers and exporters. This may lower corporate earnings, which are a determinant of stock prices according to the Dividend Discount Model. Hence theory suggests that increases in exchange rate will lead to a rise in stock prices. Bilson, Brailsford, and Hooper (2001) tested whether local macroeconomic variables (money, goods prices and real activity), have explanatory power over stock return of 20 exchange emerging markets for the period 1985-1997. According to Geske and Roll (1983), the exchange rate has been shown to influence stock prices through the effect of the terms of trade effect. The results show that the exchange rate is the most influential macroeconomic variable. Bahmani-Oskooee and Payesteh (1993) reported a bi-directional causality between stock prices and exchange rate, at least in the short-run. This has also been verified by Qiao (1996) for the Tokyo Stock Exchange.

Also, in export-oriented economies, a local currency appreciation reduces the competitiveness of their exports. This will in turn have a negative impact on the domestic stock market. Companies in export-oriented companies becomes less profitable and unattractive to investors when the local

currency frequently appreciates (Muthike & Sakwa, 2012). Other empirical evidence that reached a positive relationship between exchange rate and stock returns includes; Mukherjee and Naka (1995), Aggarwal (1981), Bilson, Brailsford & Hooper (2001) and Maku and Atanda (2010).

Another strand of literature believes that depreciation increases the cost of production in local firms, thus lowering corporate profits and stock market returns. Such studies established a negative relationship between exchange rate and stock returns. For example, Solnik (1987) found a negative relationship between real stock returns and exchange rates after using monthly and quarterly data for eight major western industrial countries from 1973-1983. Banny and Enlaw (2000), using single and multi-index models also revealed the relationship between the exchange rate of the Malaysian Ringgit in terms of the USD and stock prices in Kuala Lumpur Stock Exchange (KLSE). They concluded that there was a negative relationship between exchange rate and KLSE stock prices.

3.2.1.5 Crude Oil Price

The effect of crude oil price on stock returns has been a matter of debate among academicians. The channels of transmission of crude oil price shocks and their impact on macroeconomic and financial variables continue to be a matter of discussion with contrasting conclusion (see Kilian, 2014; Serletis & Elder, 2011). Some assume the crude oil price as exogenous variable and therefore the causes underlying crude oil price shocks are not identified (Chen, Roll & Ross, 1986; Huang, Masulis & Stoll, 1996). Other authors believe that the crude oil price is an endogenous variable and that changes in the price of oil are driven by innovations and changes in both demand and supply (e.g. Kilian, 2008; Hamilton, 2013; Bastianin & Manera, 2018). In order words, stock price volatility depends on the origin of crude oil price shock.

An increase in oil price leads to an increase of revenues to the oil exporting countries and firms at the detriment of oil-importing countries and firms. An increase in crude oil price in oil-importing country, leads to a lower real economic activity in all sectors of the economy making stock returns to fall. This suggests an inverse relationship between stock returns and crude oil prices as most African countries are mostly net importers of crude oil and therefore these economies will be negatively affected by increases in oil prices.

Chen, Roll and Ross (1986) found that stock prices are significantly affected by oil prices after running a regression of portfolios of 20 US stocks from 1958-1984. This has been confirmed by studies like Gjerde and Saettem (1999), Achsani and Strohe (2002), Basher and Sadorsky's (2006), Nandha and Faff (2008). However, this has been contradicted by studies that found no significance impact between crude oil price and stock market returns. Some of these authors are Gay and Nova (2008), Kuwornu and Owusu-Nantwi (2011) and Saeed, Ozra and Meysam (2012).

3.2.1.6 Money Supply

Money supply is linked to stock market returns in several ways. First from the monetary portfolio theory, an increase in money supply alters the equilibrium position of money, as investors will adjust their portfolio holdings causing changes in asset prices, including equities. The portfolio substitution caused by an increase in money supply shifts holdings of money to financial assets (Rozeff, 1974; Abdullah & Hayworth, 1993; Cheung & Lai, 1999). Second, changes in money supply may increase real economic activities leading to increased earnings to firms and an overall rise in stock prices (Rogalski & Vinso, 1977; Seyed, Zamri & Yew, 2011). Third, from the dividend valuation model, a rise in money supply leads to adjustment of factors (the risk-free rate, earnings expectations and risk premium) that determine stock prices. This creates excess money supply of money balances and in turn, increased demand for equities (Keran 1971; Hamburger & Kochin, 1972; Homa & Jaffee, 1971).

Also, another possible explanation is that an increase in money supply causes excess liquidity, which reduces interest rate and consequently leads to a rise in stock prices (Thorbecke, 1997; Sellin, 2001). All these suggest a direct relationship between stock returns and money supply. Chen (2007) used money supply (M2) growth rate and change in the Federal fund rate to study how monetary policy variables affect stock return. Their results revealed that monetary policy hugely affects monthly returns of the Standard & Poor's 500 price in bear markets. Maysami and Koh (2000) showed a positive relation between money supply innovation and stock market returns in Singapore.

In contrast, an increase in money supply causes a rise in unanticipated inflation, as well as inflation uncertainty. This may result in a higher interest rate thereby causing a fall in stock prices. Hence money supply is related negatively with stock returns (Mukherjee & Naka, 1995; Humpe &

Macmillian, 2009; Seyed, Zamri & Yew, 2011). In addition, there will be a rise in discount rate since money supply is directly linked to inflation. Thus, prices falls because of the increase in discount rate. According to Fama (1981) a rise in real activity increases the demand for money, which in turn generates an upward relationship between stock market returns and money supply. Increases in money supply boosts inflation and the discount rate thus reducing stock prices, which in this case has a sizeable magnitude to overcome the economic stimulus effect of money supply increases. Wongbangpo and Sharma (2002) also showed that in the ASEAN-5 countries, high inflation in Indonesia and Philippine leads to a long run negative relationship between stock prices and the money supply. This is affirmed by Frimpong (2009), who concluded that increasing money supply in the economy significantly reduces stock returns in the long run.

3.2.2 NON ECONOMIC EVENTS

3.2.2.1 Corporate Events

Finance literature has been interested in examining the impact of corporate events on stock market returns. Corporate events such as IPOs, earnings growth, dividend payments, mergers and acquisitions announcements and capitalisation issues have been investigated by different authors. Recent studies on corporate events and stock market returns are as follows: Suwanna (2012) investigation of dividend announcement of 60 Thai financial firms listed on Stock Exchange of Thailand; Chatterjee and Dutta (2017) analysis of 210 dividend announcements on National Stock Exchange of India; Bodhanwala (2015) examination of 719 stock splits and its impact on Indian stocks prices, trading volume and value; Li, Sun and Tian (2018) studies on IPO announcements in Chinese market; Rahman, Ali and Jebran (2018) analysis of effect of mergers and acquisitions on banking sector in Pakistan; among others.

3.2.2.2 Country Risk

Political, financial and economic risks have been found to affect financial markets. For instance, stock markets respond to new information concerning political news, financial downturns as well as economic conditions. EMH suggests that such new information have effects in stock prices. As such country risk is essential in determing the movement of stock prices. The literature has analysed how country risk affects stock market fluctuations (see: Erb, Harvey & Viskanta, 1995; Erb, Harvey & Viskanta, 1996; Bilson, Brailsford & Hooper, 2002; Hassan *et al.*, 2003; Suleman

& Randal, 2016; Sulemana, Guptac & Balcila, 2017; among others). These authors either used in their analysis the composite country risk or its components, such as political risk, economic risk and financial risk as a proxy in predicting stock market volatilities in both developed and emerging markets. They concluded that country risk is relevant in explaining stock market volatilities. For example, Erb *et al.* (1995) investigated the nexus between country risk and stock market returns relying on institutional investors' semi-annual survey of banker's country credit ratings. They found that countries with a higher credit ratings are associated with a high expected return and vice versa. Their findings suggest that country credit ratings can be used to predict the expected returns from investing in a country. Also, Erb *et al.* (1996) studies on the four components of International Country Risk Guide (ICRG) and one from Institutional Investors' rating concludes that higher expected returns are associated with higher risk components.

3.2.2.3 Economic Policy Uncertainty

Literature has put forward different sources and interpretations of policy uncertainty. In finance, investors are considered to make decisions under uncertainty. Bansal and Yaron (2004) shows that investors aversion to unpredictability in policy uncertainty results in large equity premium, high risk free rate, the low predictive power of price-dividend ratio and the continual existence of market volatility. There is abundant literature that studies the relationship between economic policy uncertainty and stock price volatility. Early authors like, David (1997) and Veronesi (1999) asserts that investors forms an impression about the present state of the economy by allocating greater expected asset prices to situations where there is higher uncertainty. Investors that are risk-averse will therefore have a higher expectation in asset prices to compensate for a higher return. Since then, several other researchers have investigated about a number of sources of policy uncertainties and its effect on stock prices (see: Wang & Lin 2008; Pástor & Veronesi, 2013; Luo, Chen & Wu, 2017; Shahzad *et al.*, 2017; Trabelsi Mnif, 2017; among others). Baker, Bloom, and Davis (2013) developed indicators that depict economic policy uncertainty. These indicators were articles on policy uncertainties in leading newspapers, lost revenue due to expiring tax code provisions and disagreements among experts about future levels of some macroeconomic variables, like government expenditures and inflation levels.

3.2.2.4 Religious Practices

Behavioural finance posit that actions of humans are motivated by how they feel, which may not always be rational (Elliot & Echols, 1976). This suggests that financial decisions of investors and corporate managers are not fully rational (Al-Khazali *et al.*, 2017). Nofsinger (2005) indicates that social moods can influence the decisions of managers and investors. Different authors have linked social moods or emotions and stock returns (Wright & Bower, 1992; Bagozzi, Gopinath & Nyer, 1999; Hirshleifer & Shumway, 2003; Chang *et al.*, 2012). However, few studies have examined social moods emanating religious practices and its effect on volatility of stock returns. Among these authors are Stulz and Williamson (2003), Hilary and Hui (2009), Bialkowski, Etebari and Wisniewski (2012), Canepa and Ibnrubbian (2014), Mazouz et al. (2016), *Al-Khazali et al.*, (2017) among others.

Stulz and Williamson (2003) revealed that differences in religion matters in why investor protection differs across nations. Also, Hilary and Hui (2009) confirmed that firm level religiosity influence corporate behaviour and investment decisions. Bialkowski *et al.* (2012) studies on 14 Islamic countries revealed that stock returns are higher whiles volatility of returns are low in the month of Ramadan and different from the other 11 months. They suggest that Ramadan influences investors' psychology, resulting optimistic feelings that are extended to the markets. Similarly, *Al-Khazali et al.* (2017) established that volatility of stock returns reduced in the month of Ramadan than during the rest of the year. They attributed religious practice to be responsible for stock returns and volatility fluctuations in the month of Ramadan. Canepa and Ibnrubbian (2014) examination on the effect of religious beliefs on stock price found that stock returns and volatility of Shariah-compliant stocks are higher than the non-Shariah compliant stocks.

3.2.2.5 Global Events

Recent literature is focusing on the effect of global events on specific stock markets and indices, aside the traditional factors like betas, macroeconomic factors and corporate events. Global events effect on stock market returns such as financial crisis, trade wars, terrorism and wars have attracted significant attention (see: Brounrn & Derwall, 2010; Berkman, Jacobsen & Lee, 2011; Essaddam & Karagianis, 2014; Wisniewski, 2016; Yeung & Aman, 2016; among others). In particular, Yeung and Aman (2016) state that such studies assist investors in knowing the direction of the

movement of stock prices as well as to identify the magnitude of the impact in such circumstances. Investors are thus able to explain the unsystematic risk in such global event.

African markets are not isolated from the global markets. However, they are characterized by a seemingly high uncertainty which make them unfavourable to attract foreign portfolio investors. This has resulted in little investments from portfolio investors to the Africa market. Yet, the recent global events stemming from financial crisis has led to crashes in various markets calling for an alternative market with which global investors can diversify their investments (Boako & Alagidede, 2016; 2017). Recent literature on African stock markets is focused on whether they are integrated with domestic as well as the international stock markets.

3.3 POLITICAL UNCERTAINTIES

3.3.1 INTRODUCTION

According to Brogaard and Detzel (2015), political uncertainties; either political shocks or policy changes, has more profound implications on financial markets as compared to other sources of uncertainty. Equity prices are responsive to news from government policies. Risk generated by unstable political environment echoes in financial markets and ultimately diminishes shareholder's wealth (Antonakakis, Chatziantoniou & Filis, 2013). Selmi and Bouoiyour (2020) regards political uncertainty as indispensable determinant of investment decisions as well as equity prices. Thus, political uncertainty exerts significant pressures on a country's macroeconomic fiscal and monetary policies. These signals are then sent to financial markets, which are reflected in prices. Hence, investors revise their portfolios after political events. Several other studies confirms that certain political events are closely linked to stock market volatilities.

Over the years, attempts have been made by several researchers to construct models, instruments and indicators to measure political uncertainties. One significant theoretical model of political uncertainties is the one developed by Pástor and Veronesi (2012, 2013). They came out with the channel through which political uncertainties influence equity prices. In their model, political uncertainties generate a risk premium whose magnitude change with the different economic conditions. Hence equity prices drop in relation to the risk premia as a result of political uncertainties. They identified three different shocks to stock prices. These are capital shocks, impact shocks and political shocks. According to Pástor and Veronesi (2012), capital and impact

shocks are considered as economic shocks driven by shocks to aggregate capital. However, political shocks were found to be orthogonal to economic shocks and hence have a risk premium. Pástor and Veronesi (2013) found that political risk premium is less pronounced in developed economies than in the less developed economies.

Political uncertainty is considered an exogenous variable (Bittlingmayer, 1998). Indicators of political risk has been constructed and maintained in ICRG database by Political Risk Services over a couple of decades now. There is data for political risk for several countries measuring indicators like corruption, external conflicts, role of military in politics, political terrorism among others (Wisniewski, 2016).

Political events directly influence political risk either positively or negatively, which in turn affect volatility of stock return. Political uncertainty can take various forms and shapes. These includes elections, wars, civil unrest, governmental process and transitions, changes in fiscal policies, changes in tax laws and changes in competition regulations, among others. The rest of the section examines the various political events and their influence on stock prices.

3.3.2 ELECTION UNCERTAINTY AND STOCK VOLATILITY

Political elections and opinion polls have significant effect on equity prices. In this regard, there is literature that shows the influence of elections and its outcomes on stock price volatility (see *inter alia* Floros, 2008; Oehler, Walker & Wendt, 2013; Smales, 2015; Liew & Rowland, 2016; Shaikh, 2017; Bowes, 2018; Darby & Roy, 2019). These studies confirms that market volatility tends to be higher when elections outcomes are uncertain (see earlier evidence in Niederhoffer, Gibbs & Bullock, 1970; Nordhaus, 1975 among others). Li and Born (2006) found that during the 3-month period before U.S. elections, stock market volatility is higher when the elections outcome is uncertain than when the incumbent party is expected to remain in power. Shaikh (2017) contends that the US presidential election contains relevant information that explains investors trading strategy. The stock markets exhibit a bullish rally during election year. Specifically, the stock market rallied 28 times and slumped 12 times over the last 28 elections in the U.S.

According to Shaikh (2017), the U.S. presidential elections is important to both domestic and global investors. For instance, the 2016 U.S. presidential election results sent turbulence in global markets. It was reported that equity markets in the BRICS (Brazil, Russia, India, China and South

Africa), Australia, India and Mexico among other markets lost significantly. The stock markets started to respond to the uncertainty as of January of the election year. The higher the uncertainty of the winner of elections, the lesser the performance of the market. Hence, political uncertainty is more pronounced in close contest election. The market stabilises once the winner has been confirmed (Floros, 2008; Shaikh, 2017).

Similarly, Goodell and Vähämaa (2013) and Smales (2015) revealed that a rise in political uncertainty leads to increase in market volatility as measured by implied volatility. Using a sectoral level approach, Bouoiyour and Selmi (2017) tested the Uncertain Information Hypothesis (UIH) by examining abnormal return behaviour during 2016 U.S. presidential elections. The UIH postulates that political uncertainty is higher in pre-elections period and is resolved in post-election period after the winner is known. They did not confirm the UIH hypothesis but found that political uncertainty is sector specific.

The uncertainty of the future makes expectation more difficult to incorporate in current prices, creating an increase in market volatility (Bowes, 2018). The attitudes of investors towards the stock market change during election periods. Smales (2015) suggests that political uncertainty as a result of election outcomes may reduce uncertainty in financial market if political parties announce their economic policies well in advance, especially when the market believes in elections promises.

Presidential candidates normally have opposing views on policies, laws and regulations, which come out during election campaigns. These signals are picked up by market participants, who may have different views of the future of the economy depending on the eventual winner. This will, of course, lead to greater volatility of stock returns during election periods. In addition, in periods of elections, market participants translate their expectations of election results into stock prices and continuously adjust them according to opinion polls results until the final result. Hence, the probability of a candidate wining is reflected in stock prices already before the elections. Since election results are not a matter of certainty, volatility of stock prices intensifies as election activities gets closer (Oehler, Walker & Wendt, 2013; Bowes, 2018).

3.3.3 CIVIL UPRISING AND STOCK VOLATILITY

Recent world events have caused large fluctuations in the prices of financial assets that have astonished economist and financial analyst for decades, especially due to the extreme volatility seen in stock markets lately. One of those political events that has especially influenced stock prices is civil unrest. Sudden political events, such as civil unrest cannot be predicted by scientist in any way. Stocks experience high levels of volatility on major civil unrest throughout the world sending signals of potential policy shift. This may stimulate changes in market-wide valuation (Karolyi, 2006). Chan and Wei (1996) show that stock prices is sensitive to a country undergoing changes in its political structure. Using data from the Hang Seng index in Hong Kong, they revealed that equity prices are negatively related to civil unrests. Also, political uncertainty due to civil unrest is firm-specific and that blue-chip companies are the most affected in terms of price fluctuations.

Strikes is an example of a civil unrest that cannot be over emphasised. Even though there is literature on industrial relations and the justifications of economic strikes, few studies have analysed the impact of strikes on stock prices. Strikes occur when employees are dissatisfied with the actions or inactions of their superiors. Strikes may occur either on firm-level or the general workforce of a country. It is important to distinguish strike action against employers and that mounted against the government. Empirical studies suggest that there has been a considerable decline in strike against employers but strikes against governments have been on the rise in recent decades (Kelly & Hamann, 2010; Vandaele, 2011; Gall, 2013; Hamann, Johnston & Kelly, 2013). Considering the fact that national strikes have a far reaching effect on the economy and financial markets, it is important that economists pay attention to the spikes in strikes and its consequence on the stock markets.

A study by Wisniewski, Lambe, and Dias (2020) examined the effect of major strikes organized against government on stock market volatility. They established that general strikes have a negative effect on stock markets. They show that shareholders holding a passive portfolio invested locally are subjected to a loss of up to 6.11% in the year of a sustained strike. This loss was independent of the general macroeconomic variables, financial or political arena. Hence, dissatisfaction in employees can aggravate political uncertainty which can lead to a rise in discount rate.

The Arab spring is one of the significant civil unrest in modern history. This started in Tunisia when a vegetable vendor set himself on fire because of what he described as ill treatment and police corruption. This ignited the feeling of injustice and political, economic and social exclusion that was deeply ingrained throughout the entire region. A revolution therefore commenced with protests spreading through the entire MENA region against increased poverty, unemployment and political repression. This civil unrest leads to several changes in governments, as well as changes in both domestic and foreign policies. Understandably, a major political event like the Arab spring caused significant volatility in the stock market as confirmed by several authors (Chau, Deesomsak & Wang, 2014; Jeribi, Fakhfekh & Jarboui, 2015; Trabelsi Mnif, 2017). Jeribi, Fakhfekh and Jarboui (2015). The authors attributed the extreme volatility of the Tunisian stock market index during the revolution to market participants responding to the continual downgrading of the country sovereign rating.

Apart from its impact on stock market volatility, civil unrest tends to radically change the governance, social and economic structure of a country for the better. On the other hand, ongoing civil unrest erodes international portfolio investors' confidence in an economy, thereby hindering investment. Again, political scandals create unnecessary nervousness and instability in financial markets. Therefore governments should resolve civil unrests as soon as possible to restore business confidence that will estimulate financial stability and economic growth (Chau, Deesomsak & Wang, 2014)

3.3.4 TERRORISM ATTACKS AND STOCK VOLATILITY

Terrorism is a global threat affecting many stock markets. The risk that terrorism now pose is a significant new business risk considered by international portfolio investors and MNCs in assessing the stability of any market. As cited in Wisniewski (2016), Title 22 of the US Code, Section 2656f(d2) defines terrorism as "*premeditated, politically motivated violence perpetrated against non-combatant targets by subnational groups or clandestine agents*". Terrorism raises the level of uncertainty in markets, since it affects investment decisions and subsequently influence the volatility of stock prices. Investors and managers should therefore understand the dynamics of terrorism and its effect on stock market (Essaddam & Karagianis, 2014).

One of the significant terrorism acts that shook the world was the 9/11 attacks in the U.S. The effect of 9/11 attacks spread to all parts of the world and stimulated attention of research on how terrorism affects the stock market. Studies in the U.S. includes Carter and Simkins (2004) who examined how American airline stock reacted to the attacks of 9/11. They found that small airlines suffered a negative abnormal returns after the 9/11 and various air transport companies reacted differently to the attacks. Chaudhry (2005) assessed the return and time-varying beta effect of 9/11 on firms in U.S. He found that the impact of the attack to firms were in different directions. Essaddam and Karagianis (2014) examined the interaction between terrorism and stock volatility of U.S. firms targeted by terrorists. They found a significant association between terrorist attacks and volatility of stocks.

Another strand of literature looks at the effect of terrorism on global capital markets. For instance, Chen and Siems (2004) assessed the effect of terrorism on global equities by analyzing 14 terrorist and military attacks. They concluded that U.S. capital markets are recovering faster than global capital markets in part because the US system responds by providing the liquidity that an exceptional situation requires. Hon, Strauss and Yong (2004) also tested the contagion effect of 9/11 attack. Their results shows that global capital markets, especially Europe, move closely together with the U.S. stock markets, making it difficult to diversify portfolios during the crisis. Also, Chesney, Reshetar and Karaman (2011) examined the effect of terrorism on capital markets in 25 countries from January 1994 to September 2005. Their findings suggest that terrorism affects the global stock markets they analysed.

In a study on stock markets in Spain and U.K., Kollias, Papadaumou and Stagiannis (2011) assessed two different terrorist attacks in Madrid (11 March 2004) and London (7 July 2005). Findings suggest that the two markets reacted in a similar way on the day of the attack but significantly differs in their recovery. These authors state that the stock market crash did not last long. On the other hand, Graham and Ramiah (2012) used an adaptive expectations hypothesis and event study methodology to examine the effect of terrorist attacks on Japanese industries. They found that the industrial stocks were negatively affected on the day of the 5 terrorist attacks studied. About half of these industries were negatively impacted for five days after the terrorist attack.

Karolyi and Martell (2010) examined the impact terrorist attacks have on stock price volatility. They concluded that losses are more severe on terrorist targeted in democratic or developed

countries than undemocratic or less developed countries. On the other hand, Johnston and Nedelescu (2006) investigation of terrorist attacks on New York and Madrid found that a well-instrumented response to the crisis increases the market´s ability to absorb and recover after the shocks caused by terrorist attacks. Corbet (2018) analysed the impact of domestic and international terrorist attacks on stocks volatility of domestic European markets. Their segregation of domestic and international terrorism revealed conflicting effect on European stock market. Whilst domestic terrorism events significantly increase volatility of European domestic stock market, international terrorism events did not present significant volatility of stock markets in Spain and Ireland. Also, bombings and explosions within Europe significantly affected volatility of stock markets in all exchanges however, infrastructure attacks, hijackings and hostage events do not affect stock market volatility in all exchanges in Europe.

3.3.5 POLITICAL REGIME CHANGES AND STOCK VOLATILITY

A change in government is associated with changes in policies. This is motivated by the promised changes the new government intends to pursue. Existing literature reveals that firms' investments, cash flows and stock prices can be affected by political regime changes (Diamonte, Liew & Stevens, 1996; Erb, Harvey & Viskanta, 1996). For example, Oehler, Walker & Wendt, (2013) analysed the effects of U.S. presidential election results on eight industrial indices. They concluded that a change from one party to another strongly affected stock market returns than a re-election or if the same party candidate wins power. This shows that a change in government contains relevant information that signals participants to change their expectations of the market. Also, firms that are more politically exposed will experience severe volatility during political regime changes than firms that are not (Acemoglu, Hassan & Tahoun, 2018).

Similarly, revolutions and military coups leading to regime changes have been found to influence stock return volatility. Ahmed (2017) and Acemoglu, Hassan & Tahoun, (2018) provides evidence of political turmoil in Egypt from 2011 to 2014 and its influence on the stock markets. During this period, Egypt experienced the removal of a long-time leader, two quick presidential elections and a military *coup d´état*. Ahmed (2017) findings indicates that political uncertainty, especially one caused by the military coup, significantly affected the market return of almost all sectors with varying intensity. He found that stock market volatility was more profound in banks, financial services and chemical sectors, but mild in sectors like food and beverages, construction and

materials sectors. On the part of Acemoglu, Hassan and Tahoun (2018), firms connected with groups in power will suffer lower stock market valuation after intense protestation than firms that are independent of the government. Their results suggest that political tensions are duly recognized by the stock markets and are reflected differently in firms in different sectors.

3.3.6 POLITICAL ORIENTATION AND STOCK VOLATILITY

The choice of macroeconomic policies a government pursues depends on its political orientation. Businesses are affected by macroeconomic policies of government as stated by Wisniewski (2016). This idea is in line with the partisan theory postulated by Hibbs (1977). The partisan theory contends that political parties have preference for different economic policies affecting the class of people that support a political party. Political parties on the right are business-oriented parties that pursues inflation-sensitive policies. As such, right-wing parties are dominated by more affluent and middle class members of the society, normally employed hence are concerned with inflation. On the other hand, left-wing parties are labour-oriented, mostly supported by lower income members of the society who are interested in employment rather than inflation policies.

In the U.S. presidential elections, Niederhoffer, Gibbs and Bullock (1970) found that, in short event windows, the stock market react positively to Republican win and negatively to Democrats victory. However, Santa-Clara and Valkanov (2003) provide evidence on the political orientation of governments in the U.S. and stock markets returns. They found that stock market return is higher under Democratic presidencies than under Republican presidencies, though there is no difference in stock market volatility under the different governments. This has recently been extended by Pástor and Veronesi (2017) who increased the dataset from 1925 to 2015. Their results indicates an overwhelming difference between a Democratic regime and Republican regime. Average excess return during Democratic presidents is about 11% a year whiles during the Republican presidents is -0.2% a year.

Some empirical studies outside the U.S also confirms the effect of political orientation on stock prices. For example, Bechtel (2009) examined the effect of democracy on systematic investment risk. Results show that, right-wing government leads to lower systematic investments risk as compared to left-wing government. The partisan effect is more profound in high inflation era. It also depends on whether the government is divided or not. In addition, the study found that

coalition governments further increase the investment risk. Stoian and Tatu-Cornea (2015) analysed the effect of political partisanship of European governments and stock markets. Similarly, the stock markets were found to perform better in right-wing governments for only advanced European economies. However, contrary to literature they found no difference in policies related to inflation, unemployment, deficit and debt of both right-wing and left-wing European governments. They suggested that the European stock market preference to right-wing or left-wing governments is not necessarily related to expectations on inflation, unemployment, deficit or public debt level.

Also, Döpke and Pierdzioch (2006) found that the stock market in Germany performs marginally better with right-wing governments than with left-wing governments. Furió and Pardo (2012) confirmed the partisan theory using evidence from Spanish stock market. They show that the stock market does not only react differently to election victories of the different political ideologies but also during the entire tenure of office of the elected government. However, Bialkowski *et al*. (2007) found no significant relationship between political orientation and stock market returns after examining 24 international stock markets and 173 different governments outside the U.S. They were sceptic about the investment strategies based on political orientation of stock markets outside the U.S.

3.3.7 SECTOR REACTION TO DOMESTIC AND GLOBAL POLITICAL EVENTS

In finance, the value of a firm is calculated as the present value of expected cash flow. The required rate of investors is normally the discount rate used in the valuation of the firm. In periods of uncertainty, the expected cash flows and the discount rate for individual firms are affected unevenly. Hence, firms do not react in the same way after a political or global turmoil (Chau, Deesomsak & Wang, 2014; Essaddam & Karagianis, 2014; Liu, Shu & Wei, 2017). These researchers state that firms which are more sensitive to political events will rise in periods of uncertainties. Investors must therefore be concern with how firms are sensitive to political events in order to mitigate against any insecurity.

3.3.8 EMPIRICAL STUDIES ON POLITICAL UNCERTAINTIES AND STOCK MARKET RETURNS

The tables below are the summary of empirical studies related to political events and volatility of stock returns. For simplicity in the presentation, the previous studies have been grouped into three economies: developed markets, developing markets and Africa stock markets.

Table 3.2: Political Uncertainty and Stock Market Volatility in Developed Markets

Author(s)	Political uncertainty variable	Methodology or model	Findings
Chesney, Reshetar and Karaman (2011)	Terrorism	• Event-study • Non-parametric methodology • Filtered GARCH–EVT approach	• The non-parametric approach was the most robust among the three. • This approach suggests several diversification strategies against risk of terrorism.
Graham and Ramiah (2012)	Terrorism	• Event-study • Parametric test • Non-parametric test • Regression	• September 11 generated the highest negative effect on Japanese market. • An initial step-change was incorporated into expectations after U.S., Bali and Madrid bombings. The subsequent London and Mumbai attacks had no impact on the Japanese market.
Furió, and Pardo (2012)	Political events	GARCH	• Partisan theory was confirmed in the Spanish market. • There are no abnormal positive returns in the second tenure of a government contradicting the opportunistic business cycle theory.
Bialkowski, Etebari and Wisniewski (2012)	Political orientation	Event study	• There are no significant different in the political orientation of governments in about 173 countries and 24 markets analysed.
Oehler, Walker and Wendt (2013)	Elections	• Event study • Regression analysis	• There is no consistent patterns in industry returns when either Democrats or Republicans wins election • Democratic wins negatively affect overall stock returns whiles it is mixed for Republican wins. • Change in political party in governments causes a stronger effect on stock market than re-election or when the party is maintained.
Essaddam and Karagianis (2014)	Terrorism	Volatility event study approach	• American firms targeted by terrorist attacks are subjected to abnormal volatility on the event day. • Volatility due to terrorism is country specific. Firms in developed democratic countries experiences a higher stock return volatility.
Smales (2014)	Elections	• Regression with Implies volatility • GARCH	• American firms targeted by terrorist attacks are subjected to abnormal volatility on the event day.

Table 3.2 Political Uncertainty and Stock Market Volatility in Developed Markets – Continued

Stoian and Tatu-Cornea (2015)	Political orientation	• Panel model with fixed effects	• European Stock markets perform better under right-wing governments. • Preferences for a particular political orientation does not depends on beliefs in size of employment, inflation, deficit or debt in European Stock markets.
Shaikh (2017)	Elections	• Event study • Regression	• U.S presidential elections significantly affect equity and foreign exchange markets across the global financial markets.
(Bouoiyour and Selmi, 2017)	Elections	Event study	• Collapsed stock returns are reversed during election results are reversed the next day except when there is a re-count of votes. • Even though U.S. was plunged into uncertainty following Trump's win, they record positive reactions of abnormal returns contradicting the UIH hypothesis. • Political uncertainty effect is sector-specific.
Bowes (2018)	Elections	GARCH	• The conditional variance in S&P 500 returns rises with Iowa Electronic Market election futures market equity prices suggesting higher uncertainty in upcoming election
Aye *et al.*, (2018)	Political risk exposure	Causality-in-quantiles test	• Political risk exposure serves as a strong predictor of bad realized volatility whiles the causal effects are non-existent in the case.
Hillier and Loncan (2019)	Political uncertainty shocks	Event study	• Political connections and foreign capital exposure are among factors that channels political risk to equity prices. This increases the cost of assets capital during periods of political instability.
Asteriou and Price (2019)	Political instability indicators	• Principal Component Analysis (PCA) • Regression • GARCH models	• There is a strong relationship between political instability and economic growth
Darby and Roy (2019)	Elections	Bivariate and univariate GARCH models	• The conditional volatilities of Scottish Index and FTSE stock returns are characterized by same GARCH parameters for sample up to 2013 but no longer holds when the referendum draws closer. • Volatility of stock returns in Scottish companies peak when polls results indicates that elections are too close to call but fell sharply after the results are declared and rose again in the lead up to publication of proposals for further devolution.
Wisniewski, Lambe and Dias (2020)	Civil uprisings	• Panel regression • Event study	• Occurrence of strikes causes a decline of about 6.11% of equity prices of affected countries. It also increases risk in equities.

Selmi and Bouoiyour (2019)	Elections	Event study	• The various U.S. sectors were significantly and varying influenced by 2016 presidential election results and continued even after inauguration of the president.
Chan, Gray, Gray and Zhong (2020)	Political honeymoons	Regression	• Presidential honeymoons proxied by first 100 days of a president, increases uncertainty and risk aversion.

Table 3.3: Political Uncertainty and Stock Market Volatility in Developing Markets

Author(s)	**Political uncertainty variable**	**Methodology or model**	**Findings**
Chau, Deesomsak and Wang (2014)	Civil uprisings	GARCH models	• The Arab Spring and the political instability in the region increased volatility of MENA stock markets especially Islamic indices but did not affect their interaction and integration with the world market.
Nazir *et al.* (2014)	Political events	Event study	• Political events significantly affect the stock market returns in Pakistan. The market however recovers after 15 days.
Luo, Chen and Wu (2017)	Change in political positions	Several regression models	• Firm risk increases in the year of prefecture-city official turnovers. It is however mitigated when officials are well connected with provincial leaders. • Regulated firms and firms residing in provinces with low market openness encounter more firm risk.
Liew and Rowland (2016)	Elections	Regression	• The study confirmed both before and after election effect in Malaysia • Political uncertainty was negatively significant with stock market return when there was close contest between two political parties.
Asteriou and Sarantidis (2016)	Political instability indicators	• Exploratory Factor Analysis • PCA • GARCH-M	• Political instability indicators exhibited significant positive and negative relationship between banking and overall stock market indices of 18 OECD countries.
Liu, Shu and Wei (2017)	Political scandal	Event study	• Stock prices drop during the Bo scandal especially firms sensitive to government policy. • Return volatility after the scandal increased for most policy-sensitive firms than least policy-sensitive firms. • Decreases in analyst earning forecast are not significantly greater for most policy-sensitive firms than least policy-sensitive firms.
Liua and Zhong (2017)	Elections	Regression	• There is a positive relationship between political uncertainty and firm-level credit risk. • Political uncertainty affects firms' credit risk through both idiosyncratic volatility and debt rollover channels.

Table 3.3 Political Uncertainty and Stock Volatility in Developing Markets – Continued

Corbeta, Gurdgiev and Meegan (2018)	Terrorism	GARCH models	• Terrorism within the targeted country increases domestic stock market volatility whiles international acts of terrorism within Europe do not significantly affect stock market volatility in Ireland and Spain • Explosions and bombings in Europe cause significant stock market volatility across all exchanges. However, hijackings, hostages and infrastructure attacks events do not generate widespread volatility effects. • ISIL motivated acts of terrorism directly affect equity prices in Germany, France, Greece, UK and Italy.
Charfeddine and Refai (2019)	Political tensions	Multivariate GARCH models	• Only recent Gulf Cooperation Council (GCC) crisis of June 2017 significantly affected stock market dependency and volatility spillovers between Qatar and other GCC countries, with the exception of Bahrain.
Wang, and Boatwright (2019)	Political shocks	HCW model	• Political crisis has a significant negative effect on Taiwan equity prices • The optimal counterfactual could be an alternative option in non-lab controlled settings.

Table 3.4: Political Uncertainty and Stock Market Volatility in ASMs

Author(s)	**Political uncertainty variable**	**Methodology or model**	**Findings**
Jeribi, Fakhfekh and Jarboui (2015)	Civil uprisings	FIEGARCH	• The impact of the civil uprisings were sector-specific. Shocks to financial services, consumer services, construction services, industries and the market index were permanent whilst persistence to other sectors were transient.
Trabelsi Mnif (2017)	Civil uprisings	Structural unobserved components time series models	• Political uncertainty generates volatility in financial markets and more pronounced stock market cycles. • Shock to Tunisian stock market was unanticipated and temporal as such the volatility and amplitude of stock cycles are amortized to achieve low frequency in the long run.
Ahmed (2017)	Regime changes	event study univariate VAR-EGARCH	• Political uncertainty has effect on the risk-return profiles of sectors of the market with different degrees of intensity. • Regime changes as a result of military coup pose a greater threat to market and sector-specific indices.
Acemoglu, Hassan and Tahoun (2018)	Civil uprisings	Event study	• Intense protests significantly reduce stock market valuations for firms connected to groups in political office relative to non-connected firms.

3.4 GAPS IN LITERATURE

The preceding section conducts a detailed review of literature relevant to the study. The is no doubt that previous authors have made valuable contributions to existing literature and are often cited in finance and economics studies, especially in quantitative and behavioural finance. Three main themes were addressed in this section. First, the nexus between financial development and economic growth. Second, the economic and non-economic determinants of stock market returns. Lastly, the nature of political uncertainties, as well as the various political events and their relationships to stock market returns. The researcher identified significant gaps that are highlighted as follows.

Firstly, finance-growth nexus has been established by several authors. Prior to 2008 GFC, there was almost consensus of a positive relationship between financial development and economic growth. However, post 2008 GFC presents conflicting results attributed to structural change in financial sector and the increased financial flows that are sometimes not directed to productive sector. This presents inconsistencies in literature that needs to be addressed, especially in African context that have not peaked in financial sector development. Also, some authors have successfully tested 'too-much' finance syndrome in some economies but empirical literature on the African markets is lacking, therefore presenting a gap in literature that must be addressed.

Secondly, literature is not lacking on the determinants of stock market returns. Several authors have found a range of macroeconomic factors as well as non-economic factors to influence stock prices in several economies including Africa markets. However, these authors mostly employed linear models that have severe limitations in modelling economic data that exhibit occasional dramatic changes because of structural breaks. Hence, literature on non-linear models is scarce and is limited to few developed economies. This thesis adopts Markov switching model that is able to establish a relationship between macroeconomic volatilities and stock market returns at various states.

Thirdly, on the subject of political uncertainties and stock market returns, it was seen that various political events have been established to directly and indirectly influence stock market volatility, both in developed and emerging economies. However, literature on political events and stock returns on African economies are scarce. Empirical studies are mostly limited to the reactions of market participants to the Arab spring. It was also established that no single theory explains

investors' reactions to anticipated and unanticipated events in all the studies reviewed. This therefore necessitates empirical research to be focused to African economies that have recently seen significant investment.

The study identifies inconsistencies, inconclusive and missing issues in literature as well as methodological gaps that need to be rectified. Also, Africa markets presents unique characteristics that requires research attention to be fully understanding the dynamics it presents. This current study therefore attempts to close the gaps identified in literature.

3.5 THEORETICAL FRAMEWORK

This section presents the relevant theories that are related to political events and stock market returns. Special attention will be paid to the behavioural finance paradigm, which suggests, from a psychological point of view, several theories to explain the reactions of market participants in anticipation or after an event has occurred.

Several empirical evidence point to certain level of predictability in future prices. Examples include event anomalies (expert recommendations, insider trading, etc.), seasonal anomalies (month-of-the-year effect, day-of-the-week effect, time-of-the-day effect, holidays, weekends, religious festivities, etc.), political events (elections, regime changes, political orientation, civil unrests, etc.), firm anomalies (institutional holdings, closed-end mutual funds, size, firm earning award, etc.) and accounting anomalies (P/E ratios, dividend yield, earnings surprises, etc.) (Levy, 2002). All these scenarios are examples of market inefficiency which leads to reactions by market participants.

3.5.1 EFFICIENT MARKET HYPOTHESIS (EMH)

The Efficient Market Hypothesis developed by Fama (1970) holds the view that relevant information and expectation about changes in factors relevant to the value of asset prices fully reflects in current prices. These findings were formally put forward after initial conceptual work of market being efficient by authors like Fama (1965) and Samuelson (1965). EMH suggests that an investor cannot use readily provided information to predict stock price movements and also cannot make profits by trading shares. If this is correct, EMH proposes that it is difficult, if not impossible for anyone, to consistently outperform the market averages. Future price uncertainty

therefore makes expectations more difficult to incorporate into current prices, creating volatility in financial markets returns.

The market efficiency was categorized into three level as weak, semi-strong and strong form of efficiency (Fama, 1970). In the weak form of market efficiency, current asset prices fully reflect all information contained in past prices. This means that no individual can earn abnormal profit from analysing previous prices (technical analyst). This can be verified from the interrelationship between current and previous prices. The presence of autocorrelation between the time series of previous prices confirms the existence of weak form of market efficiency.

The semi-strong form of market efficiency exists when current prices fully reflect previous prices and all publicly available information. This public information refers to economic factors (inflation, GDP, money supply, exchange rate, interest rate, etc.), corporate public announcement (IPOs, earnings growth, dividend payments, mergers and acquisitions, capitalisation issue, etc.) and political events (elections, regime changes, civil unrest, political orientation, etc.). In such a case, neither technical nor fundamental analyst can consistently outperform the market. Event study methodology have frequently been used to assess the semi-strong form of efficiency. This involves finding the abnormal returns during the event period. If semi-strong form of efficiency exists then prices will quickly adjust to the new information from the event such that the abnormal returns will be recorded during this period.

The strong form of market efficiency exists when current prices fully reflect both publicly and privately information. Hence, even private information cannot make one earn abnormal returns if market is strongly efficient. Private or insider information can arise from investors or market participants who frequently visits, engages or is a stakeholder in a company. Such individuals are expected to have superior knowledge than other market participants who relies on public information about the company. This is difficult to sustain since some investors continue to gain excess profits from trading with private information, although there is regulation to minimize it. Large investment fund managers are frequently studied to detect any insider trading in order to assess the strong form of efficiency.

In the light of the above, it is clear that financial markets respond to new information concerning political events that may exert significant impact on policies of a country. EMH suggests that financial markets absorb news and political events into asset prices based on expectation of results

of political uncertainty. Investors form or revise their anticipation of returns based on the outcomes of these events. Positive returns are expected when political uncertainty is resolved. However, if the outcome of political uncertainty is not resolved immediately, then the political outcome generates an uncertainty that induces surprise (Wang & Lin, 2008). Ahmed (2017) contends that international portfolio managers react swiftly to political events in panic-stricken economies (or markets) around the globe by reversing their capital flows to safer investment destinations. This results in massive currency crisis and a broader economic crisis in such economies (Durnev *et al.*, 2015; Ahmed, 2017).

Hence rational investors are expected to revise their valuation of an asset in a political event. It is extremely important to emphasise that investors only react to unexpected news, as all other factors have been incorporated into asset prices. EMH has since formed the basis for several advanced theories and empirical studies of expected security prices. Some of the relationship between unanticipated news in politics and security prices that have been researched includes the sudden death of a political figure (Roberts, 1990; Faccio & Parsley, 2009), sudden defections (Faccio & Parsley, 2009) and political donations, especially during elections (Jayachandran, 2006; Cooper, Gulen & Ovtchinnikov, 2010; Shon, 2010). Even though EMH has received numerous critiques, especially from the recent episodes of financial crises, it still remains as one of the most researched and debated theories in modern finance.

3.5.2 OVERREACTION HYPOTHESIS (OH)

The EMH points to the fact that changes in previous security prices do not predict future price movements. However, market anomalies have given rise to several new hypothesis in behavioural finance. One of such hypothesis is Overreaction Hypothesis (OH) proposed by De Bondt and Thaler (1985) to explain the reactions of investors during an unforeseen circumstances.

Market Overreaction/Contrarian Hypothesis posits that investors overvalue recent information at the expense of past information. It argues that investors overact to recent information so that good news will result in security prices moving upward too far and bad news resulting in security prices moving too downward. On the other hand, old information will result in investors undervaluing security prices such that reaction to favourable news does not lead to too high upward movement or too low downward movement to unfavourable news (Bloomfield, Libby & Nelson, 2000). According to Howe (1986), investors normally overreact to unforeseen and relevant news. This

suggests that security prices tend to decline after an overreaction to very good news and likewise, falls sharply after reaction to bad news. Hence prices increases and falls sharply at the instance of the good and bad news, respectively, but moves in opposite direction in the next period (see Figure 3.1). The higher the overreaction, the corresponding higher the reversal. This idea leads to the emergence of contrarian strategies, where buying past losers and selling past winners lead to abnormal returns.

Empirical evidence indicates that the portfolio of winners consistently outperformed the market and that of winners consistently beat the market (De Bondt & Thaler, 1985). Overreaction hypothesis have been confirmed in several stock markets, including advanced stock market like the United States (Brown-Harlow, 1988; Zarowin, 1989; Atkins & Dyl, 1990; Ferri & Min, 1996), Canada (Kryzanowsky & Zhang, 1992), Australia (Brailsford, 1992), Japanese (Chang, McLeavey & Rhee, 1995), Spain (Alonso & Rubio, 1990), Hong-Kong (Akhigbe, Gosnell & Harikumar, 1998); emerging markets like Brazilian (Da Costa, 1994), Greek (Antoniou, Galariotis & Spyrou, 2005), Turkey (Vardar & Okan, 2008; Akkoç & Özkan, 2013) and Ukraine (Mynhardt & Plastun, 2013). Other authors have replicated the overreaction hypothesis into different markets; for example, Cutler, Poterba, and Summers (1991) in gold markets, Poteshman (2001) in option markets and Choi and Jayaraman (2009) in stock and option markets, among others.

No consensus has been reached on the causes of investors' overreaction despite numerous empirical studies on the subject. Some of reasons given are psychological, technical, fundamental, liquidity, non-rational as well as a combination of them (Mynhardt & Plastun[18], 2013). Some of the criticism to OH is the improper adjustment to risk and size. Once these are adjusted, the central hypothesis put forward by DeBondt and Thaler (1985) diminishes. Also, contrary evidence to OH are recorded by authors like Davidson (1989), who found abnormal returns earned for a year was positively related to the previous years' abnormal returns. This suggests that winners always win and losers continued to lose in contrast to adjustments as suggested by OH. Additionally, Pettengill and Jordan (1990) discovered that only large firms experienced the strict reversal of gains and losses suggested by the OH. Besides, most of the reversal was accounted for only in the month of January.

[18] Mynhardt and Plastun[18] (2013) provides a detailed review of reasons assigned by different authors.

3.5.3 UNDERREACTION HYPOTHESIS (UH)

In contrast to OH, the Underreaction Hypothesis (UH) suggested by Jegadeesh and Titman (1993) posits that investors underreact to occurrence of recent information but significantly adjust their actions in accordance to the news in the next period. For example, when good news occurs, investors will not react swiftly to it but on the next day prices will increase significantly. The understanding of underreaction give rise to momentum strategies (Chan, Jegadeesh & Lakonsihok, 1996). In contrast to contrarian strategies, momentum strategies is based on buying past winners and selling past losers to earn abnormal returns.

The UH is regarded to be close to reality as it corrects the most challenging anomalies of the EMH. Significantly, Fama and French (1996) three-factor model is able to capture all the anomalies of CAPM except the momentum effect. However, the momentum effect is considered as robust and severe empirical weakness of EMH that is *attributed* to investors' underreaction to new information but are only explained by the UH. Jegadeesh and Titman (1993) explained that past winners generate short term abnormal returns greater than past losers' portfolios during the announcement of earnings. Similarly, Barberis, Shleifer and Vishny (1998) indicates that average abnormal returns following favourable news is greater than the average abnormal return following unfavourable news. Apart from Jegadeesh and Titman (1993), other empirical findings confirming the UH are; Chan, Jegadeesh, Lakonsihok (1996) and Geczy and Samonov (2016) evidence of future price predictability of firms US markets, Rouwenhorst (1998) and Doukas and McKnight (2005) evidence in European markets, Rouwenhorst (1999) examination of emerging markets, De Groot, Pang and Swinkels (2012) and Zaremba (2019) in frontier markets, Boussaidi and Dridi (2020) in Tunisian among others. Also, a combined evidence of international markets was investigated by authors like Fan, Opsal, and Yu (2015) and Zaremba and Shemer (2018).

3.5.4 UNCERTAIN INFORMATION HYPOTHESIS (UIH)

Unlike the EMH assumption that investors are assumed to be rational and accurately adjust their valuation of assets with emergence of unanticipated information, the Uncertain Information Hypothesis (UIH) holds the view that although investors are able to ascertain the direction of unanticipated news, they are unable to accurately determine the true effect or magnitude of the surprises. UIH was developed by Brown, Harlow and Tinic (1988) to explain the response of rational risk-averse investors following extreme unexpected events. UIH asserts that there is an

increase in uncertainty and risk in financial market after a release of unanticipated information, such that investors are not able to correctly respond to the unexpected news. Asset prices are therefore set below their fundamental values. UIH resembles an overreaction to bad news and an underreaction to good news as seen in Figure 3.4. Hence an upward adjustment is expected to follow a sharp fall in security prices, but no significant reversal is expected when there is a large increase in the security price. Thus, UIH assumes there will always be positive market correction following both good and bad news.

According to Musa and Morshed (2003), investors form the conditional distribution of the uncertainties from the outcome of the unanticipated news and are able to correctly estimate the true value of the conditional distribution. This increases the premium risk for investors who invests in the asset immediately after the release of the surprise news. Subsequently, those who invest in the asset would seek additional Premium as compensation for this additional risk. Realizing this additional risk, investors would set prices below the expected value of the conditional distribution of possible outcomes of the surprise news. As the uncertainty about the news disappears, price will settle on the new equilibrium levels. The result will a positive abnormal returns after both the positive and negative returns.

Several empirical studies are conducted to test UIH. Most of these are tested on the stock market response to economic and political events. One of them is Bhana (1995) investigation of firms listed in JSE reaction to unanticipated information for a time period of 1975 to 1992. The author strongly confirmed the UIH for both good and bad news. Akkoç and Özkan (2013) revealed that investors' reaction of major political and economic news arrival in Borsa Istanbul suggest equity prices are set below their fundamental value in order to mitigate against unexpected information. Also a study by Mehdian, Perry and Nas (2008) on daily equity returns in Turkey found the corrective process of positive returns after unanticipated information supports the UIH. Contrary to these studies, significant number of empirical findings have found no support of the UIH. In this respect Shacmurove (2002) confirms UIH in only four out of thirteen European stock markets. A re-examination of UIH by Corrado and Jordan (1997) found price reversal after favourable and unfavourable news. In addition, Musa and Morshed (2003) studies on Dhaka Stock Exchange do not confirm UIH.

Figure 3.1: Efficient Market Hypothesis

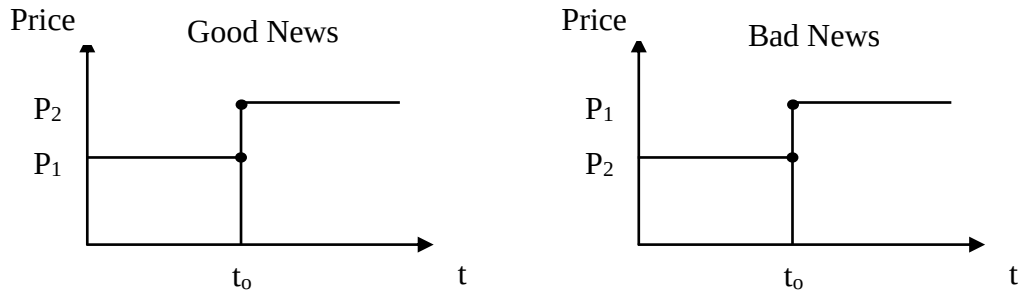


Figure 3.2: Overreaction Hypothesis

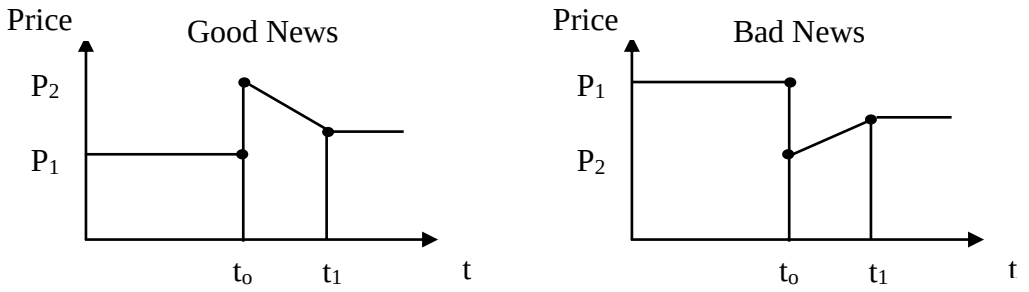


Figure 3.3: Underreaction Hypothesis

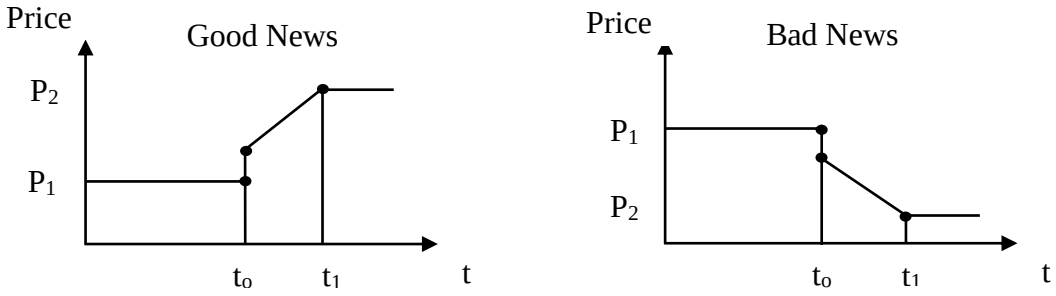
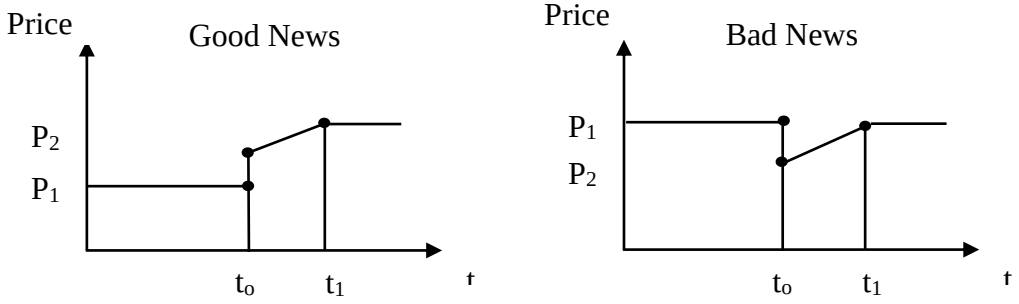


Figure 3.4: Uncertain Information Hypothesis



Adapted from: Akkoç and Özkan (2013)

A schematic representation of the four hypothesis is presented in the figures above. Note P_1 and P_2 represents the price before and after the surprise news respectively. Also, t_0 represents the initial time the news was released to the market and t_1 is the period after investor's adjustment to this news.

3.5.5 PARTISAN THEORY

The link between economics and politics is premised on the fact that political events such as elections cycles and outcomes induce significant impact on the macro-economy and stock market. These effects do not rely neither on the economy nor corporate decisions, but rather on political short and long policies (Hibbs, 1977). The partisan theory introduced by Hibbs (1977) says that political ideology matters and influences business cycles and ultimately security prices. Specifically, the partisan theory states that left-wing governments are mostly supported by lower income people and working class, who are more concerned with unemployment; while right-wing governments are supported by the majority of wealthy people with secure jobs (upper class) who are worried about inflation. Thus parties in power are more inclined to implement policies that favours its core base. This suggests that leftist parties will pursue expansionary policies characterized by low employment, high inflation and output growth over the entire term of the government. However, right parties are currently interested in employment, but the employment is more unsecured and under paid.

An extension of the partisan theory is the incorporation by Alesina (1987), Alesina and Sachs (1988) and Chappell and Keech (1986, 1988) of rational expectations, which is known as Rational Partisan Theory (RPT). According to RPT, the expectation of voters in an election influences the economy such that investors expect high inflation in left-wing government win than a right-wing government. The probability of each party winning is therefore reflected into stock prices. Hence equity prices show positive returns after a left government win since the possibility of low inflation period is dropped. The effect of RPT is however temporal and diminishes in the first half of the term of the government.

Partisan theory therefore suggests political signals are sent to financial markets as a result of the policies expected to be implemented by the political orientation of government in office. All things being equal rightist government are expected to implement contractionary polices as opposed to

high inflation, low unemployment and output growth by leftist government. However, equity prices are significantly affected depending on the extent to which elections outcomes are uncertain. These effects are anticipated and fully incorporated into equity prices. The fluctuations are however temporal and disappears once elections outcome is known, according to RPT, or permanent in the entire term of the government (Alesina, 1987; Hibbs, 1992, 1994; Furió & Pardo 2012).

3.5.6 POLITICAL BUSINESS CYCLE (PBC) THEORY

The Political Business Cycle (PBC) introduced by Nordhaus (1975) indicates that governments induce economic cycle with monetary and fiscal policies in a cyclical manner purposely to stay in office in the next election. More specifically, the government will pursue expansionary policies (for example increased public expenditure) with the view of reducing unemployment just before elections, but will not pursue the unpleasant task of tightening inflation (contractionary policies) until voting has ended. Thus, government will appear competent in the eyes of electorate thereby winning votes to be able to stay in power. The expansionary policies are reversed in the early years after a government win elections. Hence there is predictable trend in policies where relative austerity is implemented in the early years and expansionary when getting to elections period. This suggests that the economic agent who does not anticipate government actions will continue to make errors in valuation if he applies market efficiency theory. However, rational investors who fully anticipates the cyclical political pattern will fully adjust their valuation of assets reducing errors in valuation.

The PBC is based on the presumption that maximization of votes is the primary aim of parties in office and so the policies are basically aimed at obtaining electoral gains. Also, the essential aim of government is to stay in office and thus, macroeconomic cycles frequently occurs since voters are considered to have short memory. Therefore, government in office deliberately alters economic policies to create favourable economic conditions prior to elections, but reverses policies after inducing votes. MacRae (1977) tested the assumption of myopic voters in the US elections yielded mixed results. When rational expectations are incorporated into the PBC model, it is equivalent to reducing the political cycle (Alesina & Roubini, 1992; Hibbs, 1992).

Early empirical studies on PBC include Allvine and O'Neill (1980) study on the US market. They concluded that US macroeconomic policies was managed purposively to coincide election cycle and reflected in the stock market since 1960. They suggest stocks offer significant low returns in the first two years after elections but high returns in the second half of the term. They suggested the existence of a 208-week recurring cycle in which investors can earn lucrative profit if investments are properly timed. These findings were confirmed by Herbst and Slinkman (1984) using Bartels' test. Similarly, Huang (1985) found that the annualized return from the US stock markets significantly differ from the second and first half of presidential term in office by more than 24 %. He cautioned investors to pull out of the stock market during the first two years of Republican administrations. Also, Gärtner and Wellershoff (1995) and Hensel and Ziemba (1995) observe a predictable political cycle in both large and small capitalisation stocks in both Democratic and Republican administrations.

3.6 CHAPTER SUMMARY

This chapter presents the theoretical as well as empirical literature review relevant to the study. Literature on finance-growth nexus revealed a settled relationship between financial development and economic growth. However, the direction as well as the extent of the relationship are not yet perfectly defined. Also, it was established that several factors, both economic and non-economic, influences the volatility of stock returns. It was however highlighted that several authors focused on linear models which do not fully explains the discontinuity exhibited in most economic data. The study also reviewed literature on political uncertainties and stock market returns. The review highlighted the theories linking several political events to stock market volatilities. It was found that empirical studies on political events in Africa markets are scarce. Hence the need to conduct extensive studies on African markets to bridge the gap in literature. Also, this chapter summarizes all the identified gaps in literature into one section and then concludes with a review of behavioural theories that explains the reactions of market participants to uncertainties and the corresponding movement in stock prices.

CHAPTER FOUR

DEVELOPMENT OF HYPOTHESES

4.0 INTRODUCTION

As discussed in chapter one of this study, research questions are formulated to guide the researcher. In seeking to investigate the development of African financial market and the impact of political uncertainty on African stock markets, this section draws hypotheses based on the research questions with the aid of the literature discussed above. The hypotheses were developed in order to guide in answering the research questions. Thus, this study will examine how economic and financial development are related; and how economic conditions, non-economic factors, especially political events, influence volatility of stock returns in African markets. The following discussion is therefore based on formulation of hypothesis with the view of answering the research questions guiding the study.

4.1 ECONOMIC GROWTH AND FINANCIAL DEVELOPMENT

Many scholars have explored the determinants of economic growth in different economies by applying several hypothesis, theories and methodologies. The have concluded that the financial sector development is a key factor for economic development. However, the extent to which financial development affects economic growth, as well as the direction of this relationship both the short and long run, vary among authors. Botev, Egert and Jawadi (2019) noted two main sets of literature, one before 2008 GFC and other after that event. Before the 2008 GFC, it was long established that financial development and economic growth are positively liked, as a well-developed financial sector leads to economic development (Greenwood & Jovanovic, 1990; Bencivenga & Smith, 1991; Wu, Hou, & Cheng, 2010; Demirguc-Kunt & Levine, 1996; Arestis, Demetriades & Luintel, 2001; Rousseau & Wachtel, 2000).

This has however changed when the pre and post 2008 GFC period are analysed together (see for instance: Rousseau & Wachtel, 2011; Cecchetti & Kharroubi, 2012; Égert & Kierzenkowski, 2014). The shift is attributed to the structural change in financial sector and to the change in the destination of financial flows. For example, when funds from the financial sector is allocated to the real estate sector, through the granting of mortgage loans, instead of to the productive sector like manufacturing and agriculture, growth can be hampered (Égert & Kierzenkowski, 2014).

Cecchetti and Kharroubi (2012), also found an inverted U-shaped pattern between financial development and economic growth after the crisis. The positive relationship turns negative when there is 'too-much' finance syndrome.

In summary, it can be said that the positive link between financial development and economic growth seems to have been resolved. However, recent evidence suggests nonlinear relationship between the two. This study test whether the 'too-much' finance syndrome is applicable to African economies as concluded by some authors in different economies. The following hypothesis are therefore tested:

Hypothesis 1a: Financial development have a positive relationship with economic growth in Africa.

Hypothesis 1b: There is a nonlinear relationship between economic growth and financial development in Africa.

Hypothesis 1c: There is an inverted U-shaped relationship between financial development and economic growth.

4.2 MACROECONOMIC FACTORS

Macroeconomic variables have been documented to influence stock market returns by different authors. The notion of Sharpe-Lintner-Black (CAPM) model assumed that market betas is the single factor that is significant in explaining stock market movements. CAPM emanated from Markowitz (1952) model of a simple relationship between risky assets and stock market returns given the risk-free asset. This assertion was corroborated by authors like Sharpe (1964), Black, Jensen, and Scholes (1972), Fama and MacBeth (1973), among others. However, the introduction of APT by Ross (1976) suggested that certain macroeconomic variables are essential in explaining stock returns of capital markets in United States of America. Also, the Efficient Market Hypothesis (EMH) developed by Fama (1970) further provided a theoretical framework of a linkage between stock returns and macroeconomic variables.

Since then, lots of empirical studies have been conducted to back this assertion. The earliest was Fama (1981), who conducted extensive studies to affirm the evidence of a strong positive relationship between equity returns and real economic activities such as industrial production, capital expenditures and GNP. Others include Nelson (1976), Fama and Schwert (1977), Chen,

Roll and Ross (1986), Hamao (1988), Fama and French (1989). These authors have progressively moved from the single factor to multifactor approach in explaining volatilities of stock returns. Since then, various multifactor approaches in studying movement of stock prices have continuously been published. Few among them are as follows: Maysami, Howe and Hamzah (2005), Rapach, Wohar and Rangvid (2005), Abugri (2008), Kyereboah-Coleman and Agyire-Tettey (2008); Sohail and Hussain (2009), Frimpong (2009), Hosseini, Ahmad and Lai (2011); Owusu-Nantwi and Kuwornu, (2011); Boako *et al.* (2015) and Vychytilová *et al.* (2019).

There is overwhelming literature on the nexus between macroeconomic variables volatility of stock prices. This study therefore tests the following hypothesis based on selected macroeconomic variables from the literature:

Hypothesis 2a: Exchange rate have significant effect on volatilities of stock market returns in Africa.

Hypothesis 2b: Domestic interest rate have significant effect on volatilities of stock market returns in Africa.

Hypothesis 2c: Money supply have significant effect on volatilities of stock market returns in Africa.

Hypothesis 2d: Inflation have significant effect on volatilities of stock market returns in Africa.

Hypothesis 2e: Crude oil prices have significant effect on volatilities of stock market returns in Africa.

4.3 DOMESTIC POLITICAL EVENTS AND STOCK MARKET VOLATILITY IN AFRICA

Since Bittlingmayer (1998) assertion that of volatility of stock prices is influenced by the combined effects of political factors, Pástor and Veronesi (2012) were the authors who paid attention to the influence that political events have on stock price fluctuations. Since then, some researchers have studied the interaction between politics and the stock market. Among these are Pástor and Veronesi (2013), Chau, Deesomsak and Wang (2014), Smales (2015) and Wisniewski (2016). These authors established that politics have a striking impact on the volatility of stock returns. Also, recent authors have focused on specific political events like elections, civil uprisings, regime changes, political orientation and the political stability of a country in predicting returns of the stock market.

Based on the literature review, this study will test the following hypotheses within the African context:

Hypothesis 3a: Elections have significant effect on abnormal stock market return in African.
Hypothesis 3b: Political regime changes have significant effect on abnormal stock market return in African.
Hypothesis 3c: Political events have significant effect on abnormal stock market return in African.

Similarly, in order to check the effect of political events on volatility of stock returns in the African context, the following hypothesis are considered:

Hypothesis 4a: Elections have significant effect on volatilities of stock market returns in African.
Hypothesis 4b: Political regime changes have significant effect on volatilities of stock market returns in African.
Hypothesis 4c: Terrorism have significant effect on volatilities of stock market returns in African.
Hypothesis 4d: Political orientation have significant effect on volatilities of stock market returns in African.

In order to understand the combined effect of several political events on annual stock returns, the underlying hypothesis are tested:

Hypothesis 5a: Macroeconomic variables have significant influence on stock markets returns in Africa.
Hypothesis 5b: Political events have significant influence on stock markets returns in Africa.

4.4 CHAPTER SUMMARY

This chapter put forward hypotheses of the study. It reviews empirical studies related to the study and uses it as a yardstick for formulating the hypothesis. Specifically, it first narrows the finance-growth nexus by using prior findings as a lead to set the hypotheses. It first proposes a test of the direct relationship between financial development and economic growth, then checks the nonlinearity in addition to the inverted U-shaped assumption. In addition, the chapter links the volatility of macroeconomic variables to stock market returns to understand how stock prices respond to government policies and management of the economy. Also, this chapter relates political events like elections, regime changes, political orientation and terrorism to the abnormal

returns and to volatilities of stock market returns in African. Overall, the study employs extensive use of hypothesis testing to answer the research questions. This forms the basis of the subsequent chapters which can be grouped as the finance-growth nexus, macroeconomic volatilities and stock returns and, finally, political uncertainties and stock market returns.

CHAPTER FIVE

FINANCE AND ECONOMIC GROWTH IN AFRICA

5.0 INTRODUCTION

The growth and development of the financial sector allows resources to be allocated to the most efficient sectors and businesses. The relationship between economic growth and financial development is more profound in developing economies like Africa, which are mostly in an early stage of development. It has been argued that poor countries whose financial systems are underdeveloped are in a vicious cycle, where stunted financial sector growth leads to poor economic growth (Asongu & Nwachukwu, 2017). Evidence suggests that inability to access funds results in income inequality, poverty traps and underdevelopment (see for instance: Demirgüç-Kunt, Beck & Levine, 2007; Demirgüç-Kunt & Levine, 2009; Sehrawat & Giri, 2018). Hence, finance reduces poverty and promotes economic growth simultaneously. On the other hand, countries with a well-developed financial sector enjoys rapid growth.

This section examines the development of African financial sector and its implications to economic growth using several measures of financial development indicators. Static and dynamic panel linear and threshold models are used to determine the linear and nonlinear finance-growth nexus. The positive relationship between financial development and economic growth are tested with 37 African economies. Also, it analysed the 'too-much' finance syndrome, which suggests that high levels of financial development results in a fall of economic growth *ceteris paribus*. Hence, the study adopts threshold model to test the nonlinearity relationship between economic growth and finance. The various states of financial development are then observed to determine whether this assumption holds for the African economies.

5.1 DATA

In order to study the relationship between financial development and economic growth, the study designed a panel dataset consisting of 37 African countries from the period of 1980 to 2019[19]. The

[19] The countries analyzed in the study are: Algeria, Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Chad, Congo Republic, Congo Democratic Republic, Cote d'Ivoire, Egypt, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

choice of the countries is influenced by the availability of data for the time periods considered. The study used real GDP per capita to proxy economic growth. Financial development was represented by five indicators, namely domestic credit provided by the private sector as a percent of GDP, broad money as a percent of GDP, ratio of stock market capitalisation to GDP, bank overhead cost to total assets and ratio of bank deposits to GDP. Based on the empirical review, the following variables are used as control variables (either as exogenous or endogenous): trade openness (measured as sum of exports and imports as percent of GDP), investment (gross capital formation), government consumption, inflation, interest rate spread, exchange rate, labour, gross savings (% of GDP) and education (total primary school completion rate). Data were extracted from the World Development Indicators and Global Financial Development databases of the World Bank.

5.2 EMPIRICAL MODEL

The main hypothesis in this section is to examine the link between economic growth and financial development as follows:

Hypothesis 1a: Financial development have a positive relationship with economic growth in Africa.

Hypothesis 1b: There is a nonlinear relationship between economic growth and financial development in Africa.

Hypothesis 1c: There is an inverted U-shaped relationship between financial development and economic growth.

This can be represented as follows (from the empirical model examined above):

$$y_{it} = f(FD_{it}, CONS_{it}, OPEN_{it}, INF_{it}, INV_{it}, HC_{it}) \quad \textbf{(5.1)}$$

where y_{it} is the economic growth of country *i* at time *t*, *FD* is the financial development, *CONS* is the government expenditure, *OPEN* is trade openness, *INF* is the inflation rate, *INV* is the investment, HC_{it} is human capital measured by the percent of population participating in the labour force. The empirical model is related to the Barro (1991) growth model estimated with economic growth as a factor of financial development and a set control variables as follows:

$$y_{it} = \beta_1 FD_{it} + \beta_2 CONS_{it} + \beta_3 OPEN_{it} + \beta_4 INF_{it} + \beta_5 INV_{it} + \beta_6 HC_{it} + \mu_i + \varepsilon_{it} \quad \textbf{(5.2)}$$

where β_i are the estimated coefficients, μ_i and $\varepsilon_{i,t}$ represents the individual effect and idiosyncratic error term, respectively.

The economic modelling of Equation 5.2 presents unique features that are present in panel time-series analysis, since the study uses 37 African countries. Hence, not only is non stationarity a concern but also the problem of homogeneity and endogeneity a serious concern in modelling panel data. In order to overcome this, the researcher used a range of estimators namely dynamic pooled OLS, fixed effect and system GMM, and Panel Threshold regressions.

5.2.1 DYNAMIC POOLED OLS

The baseline equation is a simple OLS equation 5.2, where economic growth depends on itself with one period lag, on financial development and a set control variables known as dynamic POLS. This model disregards differences in time and individual countries, thus ensuring homogeneity in the model. The first difference eliminates the endogeneity problem in simple OLS. This model can be represented as follows:

$$y_{it} = \beta_1 \Delta y_{it} + \beta_2 FD_{it} + \beta_3 CONS_{it} + \beta_4 OPEN_{it} + \beta_5 INF_{it} + \beta_6 INV_{it} + \beta_7 HC_{it} + \varepsilon_{it} \quad \textbf{(5.3)}$$

where Δy_{it} is the first difference of economic growth. Thus, the individual country effect is eliminated in the model. However, the presence of the lagged dependent variable results in heterogeneity bias, as the error term may be correlated with the explanatory variables.

5.2.2 FIXED EFFECT

The Fixed Effect (FE) model assumes that the slope coefficients do not vary over time and the error term captures the differences in individual countries and time. A dummy variable can be added to capture the fixed effect of each country in Equation 5.2. An OLS estimation of the resulting equation is known as least squares dummy variable estimator or fixed effect estimator. The dynamic POLS assumes homogeneity of the slopes which can cause heterogeneity bias. This is eliminated in the fixed effect estimator since individual intercepts are considered as heterogeneity. This can be given as:

$$y_{it} = \beta_1 FD_{it} + \beta_2 CONS_{it} + \beta_3 OPEN_{it} + \beta_4 INF_{it} + \beta_5 INV_{it} + \beta_6 HC_{it} + \mu_i + \gamma_i + \varepsilon_{it} \quad \textbf{(5.4)}$$

where γ_i represents the country effect in the model. The consistency of the estimator must ensure that the error term should be uncorrelated with the regressors. In another estimation, a lagged dependent variable is introduced in this model. However, the presence of y_{it-1} or any other variable that is dependent on y will violate this assumption. This bias may be severe for heterogeneous slopes hence, FE estimates must be taken cautiously (Baltagi, 2008).

5.2.3 GENERALISED METHOD OF MOMENTS (GMM)

As noted above, the dynamic fixed effect estimator may be biased. The heterogeneity bias caused by the lagged dependent variable and unobserved γ_i in the growth model can be resolved by GMM estimator (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998). GMM estimator may be solved with difference or system GMM. This study adopts the system GMM since the difference GMM exhibits large biases in the standard errors, especially in small samples. In addition, system GMM exploits the information in the level equation by making use of valid instruments in the level equations and moment conditions (Arellano & Bover, 1995; Blundell & Bond, 1998). System GMM proposes one additional moment condition and uses one period lagged difference as instruments relying on the stationarity properties of the variables. The additional condition imposed by the system GMM requires deviations from long run estimates to be uncorrelated with the fixed effects. This condition holds for the study since most of the African countries in the sample have similar economic condition. The moment conditions of the system GMM are:

$$E\left[y_{it-s} - y_{it-s-1}\left(\gamma_i + \varepsilon_{i,t}\right)\right] = 0 \qquad \text{for } s = 1 \quad \textbf{(5.5)}$$

$$E\left[X_{it-s} - X_{it-s-1}\left(\gamma_i + \varepsilon_{i,t}\right)\right] = 0 \qquad \text{for } s = 1 \quad \textbf{(5.6)}$$

where X_{it} is a set of explanatory variables. The moment conditions in Equations 5.5 and 5.6 yield a consistent and efficient estimates of the parameters of Equation 5.3. This can however results in overfitting of the instrumental variables, which may not solve the endogeneity issue. Hence the Sargan/Hansen test may be biased towards rejecting the null hypothesis. To address these issues, the collapsed method of matrix instrumentation is used, which creates an instrument for each variable and lag distance instead of time periods, variables and the lag distance (Roodman, 2009).

Thus, this study adopted the two-step system GMM, which involves the estimation of two distinct equations: the first-differenced equation and the level equation. This method effectively deals with validity of additional instruments and the absence of second-order autocorrelation.

5.2.4 PANEL THRESHOLD MODELS

To capture the nonlinear relationship between economic growth and financial development below and above a given thresholds, this study adopts the panel threshold regression model propose by Hansen (1999). The threshold model is estimated in a two-step process. First is the evaluation of the threshold variables and threshold values by the minimization of the residual sum of squared errors. The threshold variables correspond to each threshold values for the different groups in all the samples. Second is the determination of the threshold effect with an appropriate confidence level. There is evidence of a nonlinear relationship when the null hypothesis of $\beta_1 = \beta_2$ is rejected as against the alternative hypothesis of $\beta_1 \neq \beta_2$. A two-regime threshold model based on Hansen (1999) is a fixed effect estimator given by:

$$y_{it} = \beta_1 X_{it} + \mu_i + \varepsilon_{it} \qquad \text{for } q_{it} \leq \gamma \tag{5.7}$$

$$y_{it} = \beta_2 X_{it} + \mu_i + \varepsilon_{it} \qquad \text{for } q_{it} > \gamma \tag{5.8}$$

where q_{it} represents the threshold variable, γ is the threshold value to be estimated and β_1 and β_2 measures the impact of X_{it} on y_{it}. In this study, the term coefficients in Equation 5.7 and 5.8 are estimated using dynamic OLS estimator. This is suggested to correct endogeneity of the regressors and autocorrelation in the residuals when compared to the standard OLS estimator (Stock & Watson, 1993). The resulting static threshold regression equation is given as:

$$y_{it} = \beta_0 + \sum_{j=1}^{n} \beta_n X_{jit} + \sum_{j=1}^{n} \sum_{l=-k_1}^{k_2} \gamma_{j,l} \Delta X_{jit-l} + \varepsilon_t \tag{5.9}$$

where j represents the individual regressors and $k_1$and k_2 are the lead and lags respectively. Endogeneity is evident in finance-growth literature, as it is clear that financial development is an endogenous variable. This is corrected by either using initial values of financial development (King & Levine, 1993; Levine & Zervos, 1998) or the legal origins of country as instruments (Levine, Loayza and Beck, 2000; Ductor & Grechyna, 2015; Ibrahim & Alagidede 2018). For the robustness of our estimation, the first difference GMM estimator of dynamic panel threshold model proposed by Seo and Shin (2016) is implemented. This model allows for the endogeneity

of the regressor in addition to the threshold variable. The resulting dynamic threshold regression equation is given as:

$$y_{it} = \beta_1 y_{it-1} + \sum_{j=2}^{n} \beta_n X_{jit} + \left(\delta_0 + \delta_1 y_{it-1} + \sum_{j=2}^{n} \delta_1 X_{jit} \right) I_{q_{it}>\gamma} + \mu_i + \varepsilon_{it} \quad \textbf{(5.10)}$$

where $I_{q_{it}>\gamma}$ represents a binary term that takes the value of unity when $q_{it} > \gamma$ and zero otherwise. The solution of the model is estimated endogenously by minimizing the GMM criterion function through a grid search above the threshold values (Seo, Kim and Kim, 2019; Botev, Egert & Jawadi, 2019).

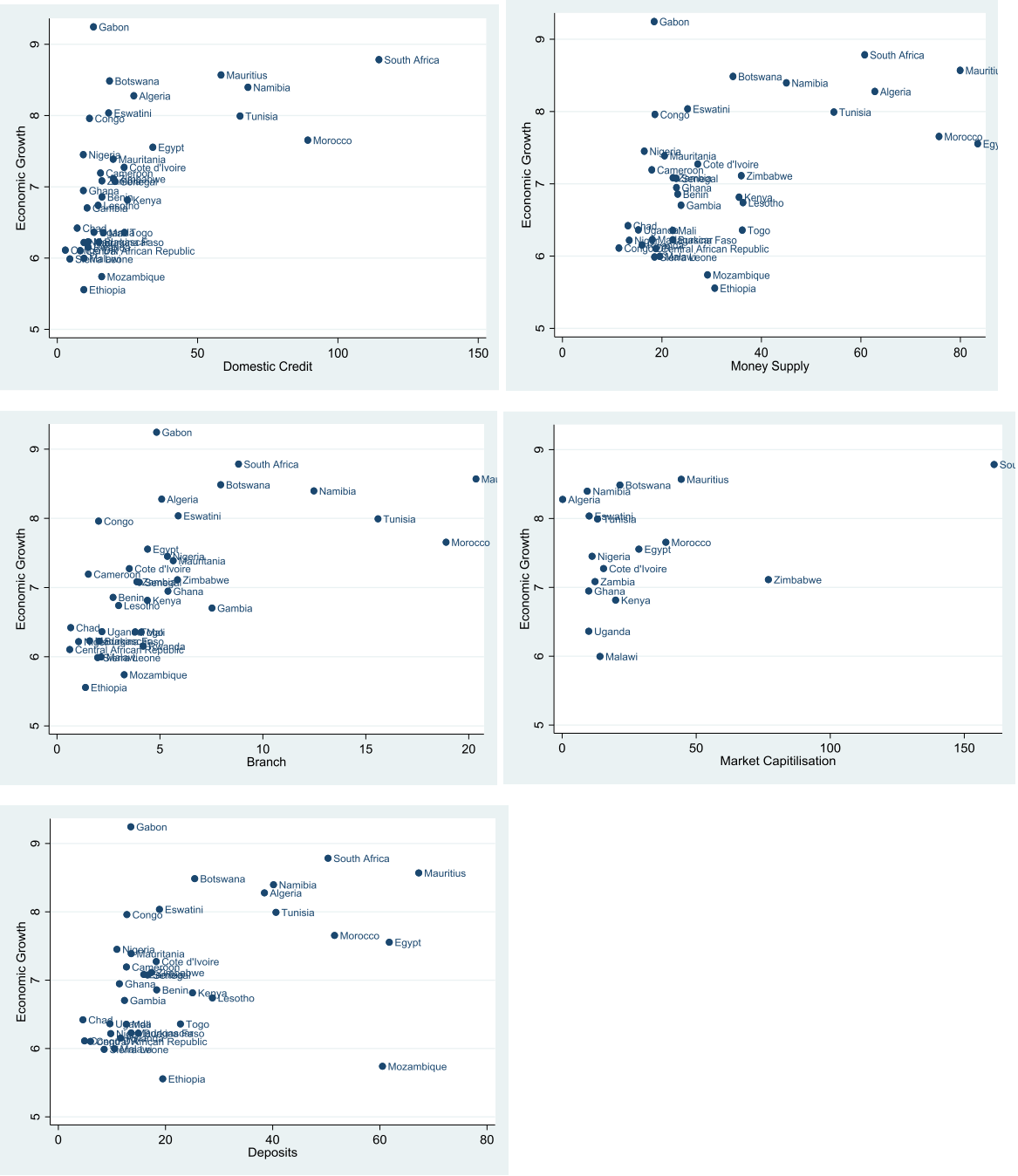
5.3 RESULTS

This section outlines the empirical findings of the exact relationship between finance and economic growth. Graphs are first used to depict the movement of economic growth and financial development indicators over the study period in a preliminary analysis. Descriptive statistics and unit root tests are then generated to examine the nature of data used in the study. The main results from the models are then presented and analyzed to give a clear meaning of the findings.

5.3.1 PRELIMINARY ANALYSIS

Figure 5.1 shows scatter plots of the mean economic growth and financial development indicators of African countries in the sample. Even though, there exist homogenous groups of observations in the finance-growth nexus in Africa, there are significant outliers. For example, South Africa recorded the highest ratio of GDP to Domestic credit and GDP-to-market capitalisation ratio when compared to the countries in the sample. Similarly, Gabon shows a higher economic growth but relatively lower financial development as evident in lower domestic credit, money supply, number of banks branches and deposits. Preliminary observations of the relationship between economic growth and financial development does not portray a clear positive link showing signs of nonlinearity between the two. A positive relationship is observed at the low and intermediate levels of financial development, but at higher levels negative relationships are seen for all the financial development indicators except market capitalisation. This looks similar to the inverted U-shaped findings by previous authors. This gives a justification of a non-linear behaviour to fully understand the finance-growth nexus in Africa.

Figure 5.1: Financial Development Indicators and Economic Growth



Source: Author' computation using WDI, 2020

5.3.2 DESCRIPTIVE STATISTICS

The summary statistics and correlation matrix of the variables are presented in Table 5.1. The average real GDP per capita of the selected countries from 1980 to 2019 is about $1928, showing the low income status of the sample. On the other hand, there is a higher standard deviation of real GDP per capita, which highlights the disparity in the economic growth of African countries. It should be noted that most African countries are in the lower middle income and low income classification according to the World Bank. Government expenditure, trade openness, investment share of GDP and human capital do not exhibit many differences in the Africa countries, as seen in their low standard deviations. On the other hand, the standard deviation of inflation is high, which indicates the existence of hyperinflation episodes in some of the countries analysed. Furthermore, the relatively higher standard deviation of the financial development indicators shows differences in the level of financial sector growth in African countries.

Table 5.1: Summary Statistics and Correlation Matrix

	GDP	CONS	OPEN	INV	INF	HC	DC	MS	MC	BR	DEP
Mean	1927.87	15.009	66.774	21.462	36.728	67.814	21.502	31.217	34.598	5.3408	22.602
Min	164.34	0.0000	6.32	-2.424	-13.057	44.781	0.0000	2.857	0.057	0.2888	0.012
Median	1042.56	14.633	59.436	20.365	6.4264	70.856	14.419	23.18	15.64	4.1104	15.595
Max	12724	51.975	188.648	93.547	23773	92.453	160.12	163.33	328.36	24.665	883.4
Std	2247.16	6.074	29.534	10.06	685.41	12.07	24.273	22.151	52.733	5.0308	32.249
Obs	1477	1363	1384	1353	1258	1110	1291	1411	381	491	1318
GDP	1										
CONS	.513***	1									
OPEN	.329***	.358***	1								
INV	.240***	.123*	.090	1							
INF	-.320***	-.355***	-.146**	.002	1						
HC	-.263***	-.167**	.024	-.258***	.412***	1					
DC	.687***	.417***	.036	-.032	-.329***	-.196***	1				
MS	.581***	.316***	.088	.208***	-.344***	-.444***	.646***	1			
MC	.553***	.295***	-.134**	-.102	-.133**	-.026	.842***	.362***	1		
	.580***	.408***	.547***	.272***	-.445***	-.241***	.626***	.711***	.175**	1	
DEP	.647***	.309***	.141**	.151**	-.350***	-.371***	.689***	.973***	.396***	-.670	1

Source: Author' computation

The correlation matrix in the lower part of the table revealed that all the independent variables are significantly related to real GDP per capita. This shows that there is evidence of low to medium

association of the selected variables as confirmed in literature. All the variables are positively linked to economic growth except inflation and human capital. This satisfies the preliminary assumption of a positive relationship between finance and economic growth, as concluded in literature. Also, there is low correlation among the explanatory variables, which indicates the absence of multicollinearity.

5.3.3 UNIT ROOT TEST

Before the main estimation, the study checked the panel unit root test of all the variables using the Levin-Lin-Chu (LLC), Im, Pesaran, and Shin (IPS) and Fisher-Augmented Dicker Fuller unit root test proposed by Levin et al. (2002), Im, Pesaran, and Shin (2003) and Choi (2001), respectively. Unit root test is based on the assumption that variables tend to drift towards long-run equilibrium in their respective periods. Since the data used in the study span over a long period of time with periods of instability, spurious regression is likely to be encountered. Moreover, the threshold panel regression requires the variables in the model to be stationary, hence the relevance of unit root test. Results of the unit root test are presented in Table 5.2. From the results the null hypothesis of the presence of unit root is rejected for all the variables except money supply at their level. However, at first difference all the variables became stationary at 1% level of significance.

Table 5.2: Panel Unit Root Test

Index	LLC		IPS		ADF-Fisher	
	Constant	Constant with trend	Constant	Constant with trend	Constant	Constant with trend
LGDP	0.5550	-1.4665*	6.0195	1.0575	53.624	82.435
CONS	-7.0394***	-5.3014***	-5.8020***	-3.6236***	169.125***	127.29***
OPEN	-2.5126***	-2.3343***	-2.9912***	-2.4940***	108.681***	112.86***
INV	-3.5531***	-3.6531***	-3.9083***	-3.1899 ***	126.94***	128.20***
INF	-16.396***	-17.978***	-15.108***	-13.491***	390.70***	406.82***
HC	-4.8003***	-1.2844*	80.556	-0.8606	0.9885	81.625
DC	-1.4688*	0.3748	0.2490	2.0004	68.248	48.998
MS	1.76910	1.2874	2.16349	1.6457	54.0231	59.178
BR	-2.6623***	-1.4458*	2.4067	2.8697	71.712	66.308
MC	4.6852	-2.4720***	-1.1035	-1.8015**	46.693*	51.205***
DEP	3.0363	-7.0880***	3.1328	-4.0783***	47.564	325.89***

5.3.4 LINEAR MODELS

This section examines the results of both static and dynamic linear growth panel models with different measures of financial development. Appendix 5a presents the dynamic pooled OLS estimator. Financial development indicators are all statistically significant with positive sign in all the models except market capitalisation. This confirms that financial development plays a positive role in economic development in the selected African countries in line with literature (Ibrahim & Alagidede 2018; An, Zou & Kargbo, 2020). Similar to the standard Barro growth model, the lagged real GDP per capita is considered as an independent variable. Consistent with literature, a significant positive relationship is established with the lagged economic growth, which indicates that African countries eventually converge towards the level of economic growth in the long-run (Ibrahim & Alagidede 2018; Botev, Egert & Jawadi, 2019). All the control variables were significant, with their correct signs, except for investment. Specifically, government consumption is negatively related to market capitalisation and bank deposits. This means that increased government spending rather than investment tends to be detrimental to economic growth (Bittencourt, 2012). Trade openness reflects the extent to which a country opens up its market to the rest of the world. A positive trade openness increases competitiveness and security of markets thus creating more financial development and economic growth (Durusu-Ciftci, Ispir & Yetkiner, 2017). Also, macroeconomic instability proxied by inflation rate is negatively related to economic growth in line with the Fisher hypothesis (Fisher, 1993). From the model, government investment seems not to be related to economic growth whiles human capital proxied by labour force participation is related to economic growth.

Since there are differences in the behaviour of the cross-section elements in our data, random or fixed effect estimator can be used to determine whether the unobserved country-specific effects are correlated with the explanatory variables. A Hausman (1978) test, not reported, revealed that the fixed effect estimator is the preferred choice. The results are similar to the dynamic POLS in direction and magnitude, even though this corrects for heterogeneity bias introduced by the latter (Appendix 5b).

Since the baseline equation is dynamic in nature, a lagged dependent variable is introduced into the fixed effect estimator. Results from the model (Appendix 5c) shows that market capitalisation is now statistically significant at 5% level. Hence economic growth is not only related to credit

market and bank based financial growth but also to stock market. The model also revealed that domestic credit provided by the private sector is not related to economic growth, contrary to several empirical evidence. Moreover, the sign of the human capital variable is reversed in this model, contrary to literature. Interestingly, each percentage increase in the explanatory variables results in a greater percentage increase in economic growth in the dynamic fixed effect estimator, similar to Bittencourt (2012) findings when endogeneity was controlled for.

System GMM estimator was adopted in order to correct the endogeneity introduced by the lagged dependent variable in the dynamic fixed estimator. DC and MS are positively related to economic growth at 5% level of significance, highlighting the role of financial development on economic growth. However, BRANCH is unrelated to economic growth whiles MC and DEPOSITS are marginally related to economic growth in a reverse direction. Again, the impact of financial development on economic growth is amplified when endogeneity is controlled in the GMM model. Results of GMM growth model are presented in Table 5.3. With respect to the control variables, OPEN and INV maintained their expected signs whilst CONS and LABOUR are with mixed signs. For the first time, INV became significant with a positive sign. The positive sign is expected as significant government investments stimulates growth in the real sector of an economy.

Table 5.3: GMM Growth Model

VARIABLES	(1)	(2)	(3)	(4)	(5)
GDP_{it-1}	0.957***	0.928***	1.574**	1.049***	0.984***
CONS	0.0004	0.0015	0.1070	-0.0049**	0.0026*
OPEN	0.0010**	0.0014**	0.0143	-0.0005	0.0009**
INF	-0.0000	0.0000	-0.0473	-0.0003	-0.0002***
INV	0.0027*	0.0038**	0.0545	-0.0036	0.0007
HC	0.0023**	0.0036**	0.1410	-0.0025*	0.0008***
DC	0.0012**				
MS		0.0024**			
BR			-0.0429		
MC				-0.0004*	
DEP					-0.0020*
Constant	0	0	-19.11	0	0
Country FE	NO	NO	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
AR(1) test p-value	0.001	0.001		0.044	0.001
AR(2) test p-value	0.813	0.988		0.607	0.840
Sargan test	0.000	0.000	0.003	0.434	0.010
Hansen test	1.000	1.000	1.000	1.000	1.000
Observations	844	896	448	332	838
Number of id	35	35	35	16	35

To examine the robustness of the estimates, the Arellano and Bond test for autocorrelation and Sargan test was examined to check the consistency of our model with Arellano and Bond (1991) estimator. The second-order serial correlation shows that all the models are free from autocorrelation. Also, the Sagan test do not reject the null hypothesis of the instruments as exogenous. This suggests that the instruments used in the estimate are valid in all the models.

5.3.5 THRESHOLD MODELS

Panel linear regression assumes that the relationship between finance and economic growth occurs linearly and symmetrically. However, several authors have established a non-linear finance-growth effect. To examine this assumption, threshold regressions are employed to determine if there exist a non-linear asymmetric dynamics between the two variables. However, the explanatory variables in this model are included whiles ensuring the financial development variable is endogenous in the equation as proposed by Seo and Shin (2016). Two threshold models are considered. First is the static panel threshold model developed by Hansen (1999), where depending on the stationary variables regression coefficients take on small number of different values. Second is the first-differenced GMM or the dynamic threshold model, which also control for cross sectional heterogeneity in the modelling process.

The static threshold regression results are presented in Table 5.4. The first question that arises is to check whether there is nonlinearity in the growth model. The bootstrap test of linearity confirms the threshold effect throughout the model. However, the threshold estimate is statistically significant only when money supply, deposits and domestic credit (in the order of magnitude) are used as the endogenous variables.

As shown in Table 5.4, DC and DEP are statistically significant in both regimes, while MS is significant only in the first regime. Also, the low regimes are characterized by positive significant relationship whilst the high regimes have opposite directions. This suggests that at periods of strong financial development, economic growth slows in the selected African countries. It is in line with the hypothesis that economic growth declines beyond a certain level of financial development. Also, the findings confirm the inverted U-shaped finance-growth nexus established by authors like Cecchetti and Kharroubi (2012). However, bank branch and market capitalisation

do not exhibit threshold effect in this model. The control variable in the static model shows mixed results in the low and high regimes.

Table 5.4: Static Threshold Model

lgdp2		(1)	(2)	(3)	(4)	(5)
	Regime 1	0.0059*	0.0093**	0.0106***	-0.0208	0.0015
CONS	Regime 2	-0.0154***	-0.0308***	-0.0039	0.0181***	-0.0070
	Regime 1	0.0012**	0.0005	0.0006	0.0025	-0.0006
OPEN	Regime 2	-0.0026**	-0.0006	-0.0002	-0.0010	-0.0026***
	Regime 1	-0.0053***	0.0012	0.0008	0.0083**	0.0031***
INV	Regime 2	0.0114***	-0.0010	-0.0050***	-0.0021	0.0033*
	Regime 1	0.0000***	0.0000*	0.0000**	0.0000	0.0000***
INF	Regime 2	0.0001**	-0.0001**	0.0000**	0.0000	0.0000***
	Regime 1	-0.0001	0.0049***	0.0041***	-0.0028	0.0023***
HC	Regime 2	0.0007	-0.0116***	-0.0059***	0.0086**	-0.0055***
	Regime 1	0.0029**				
DC	Regime 2	-0.0036**				
	Regime 1		0.0059***			
MS	Regime 2		-0.0011			
	Regime 1			0.0107		
BR	Regime 2			-0.0056		
	Regime 1				0.0002	
MC	Regime 2				-0.0002	
	Regime 1					0.0023***
DEP	Regime 2					-0.0018***
Constant		0.1981	1.3456***	0.6324***	-0.7309**	0.4512***
Threshold value		23.240***	37.988***	1.4580	-10.628	32.263***
Bootstrap test of linearity (p-value)		0.00	0.00	0.00	0.00	0.00

Results of the first difference GMM threshold model are presented in Table 5.5. Similarly, the test of nonlinearity confirms asymmetric relationship between finance and economic growth in all models. However, the threshold estimate is statistically significant when money supply and bank branches are used in the regressors. Also, domestic credit and bank branches are significant at 5% level of significance in both regimes, but with reversed signs when compared to the static model. Hence the inverted U-shaped assumption cannot be confirmed in this estimation. Also mixed results are recorded in the variables that are significant in both states of the model.

Table 5.5: Dynamic Threshold Model

lgdp2		(1)	(2)	(3)	(4)	(5)
GDP_{t-1}	Regime 1	0.8800***	1.0769***	0.6596***	0.4994***	0.8579***
	Regime 2	-0.3471***	-0.1764**	0.0227	0.0709**	0.0960***
CONS	Regime 1	-0.0036	-0.0004	0.0005	-0.0001	0.0058**
	Regime 2	0.0160*	-0.0121	0.0049	-0.0058	-0.0066***
OPEN	Regime 1	-0.0013	0.0013	0.0009*	-0.0003	0.0034***
	Regime 2	0.0044***	0.0013	-0.0010**	0.0005	-0.0028**
INV	Regime 1	-0.0007	-0.0074***	-0.0005	-0.0004	-0.0034*
	Regime 2	-0.0002	0.0100***	-0.0040**	0.0013	0.0050
INF	Regime 1	0.0000*	0.0000***	0.0000	-0.0001	0.0000
	Regime 2	0.0000	0.0000	0.0000	0.0001	0.0000
HC	Regime 1	0.0042***	-0.0009	-0.0010	-0.0021	0.0000
	Regime 2	-0.0064***	0.0111***	0.0038***	0.0030	0.0013
DC	Regime 1	-0.0028**				
	Regime 2	0.0037***				
MS	Regime 1		0.0019			
	Regime 2		-0.0026			
BR	Regime 1			-0.0043**		
	Regime 2			0.0106***		
MC	Regime 1				0.0001	
	Regime 2				0.0000	
DEP	Regime 1					-0.0011
	Regime 2					0.0014
Constant		2.3420***	0.4966	-0.4301	-0.5837	-0.4752
Threshold value		12.611	37.432***	6.211***	-5.564	16.749
Bootstrap test of linearity (p-value)		0.00	0.00	0.00	0.00	0.00

5.4 SUMMARY OF CHAPTER

This section examined the relationship between financial development and economic growth using panel data spanning from 1980 to 2019 in 37 African countries. Both static and dynamic linear and threshold panel regression was used in the estimation. The results largely confirm the positive relationship between financial development and economic growth. The results confirmed the nonlinear finance-growth nexus but failed to confirm the inverted U-shaped assumption. Hence the study successfully confirms *Hypothesis 1a* and *1b* but largely rejects *Hypothesis 1c*. Among others, these findings present crucial policy response in optimizing the assets in African countries. This is because even though there has been a significant development in the financial markets in

Africa, it has not peak yet, signifying the urgent need to improve the channels of financial growth in order to stimulate economic growth.

CHAPTER SIX

MACROECONOMIC VOLATILITY AND STOCK MARKET RETURNS UNDER REGIME SWITCHING MODEL

6.0 INTRODUCTION

The association between stock market and real economy is of prime importance to academia, policy makers as well as investors. Financial sector liberalisation and technological advancement have increased the interdependence among the real economy and the stock market. As such, the stock markets react fluidly to changes in economic fundamentals. Certainly, spillover from the real sector of the economy readily affect stock markets. Over the last two decades, financial literature has recorded numerous studies on the impact of macroeconomic volatility and the sensitivity of stock market returns. Also, studies that adopts a multifactor approach in explaining volatilities of stock returns includes macroeconomic variables as explanatory factors.

There are studies that have established links between stock market returns and a number of macroeconomic variables in different economies with several models, including OLS, vector error correction models, Cointegration and GARCH. However, there have been a recent upsurge of nonlinear time series models. This is because economic time series data exhibits occasional dramatic persistence breaks in their behaviour due to financial crisis, changes in government policies**,** disasters, wars and social unrest, among others. The most important thing to economists is the apparent propensity of economic variables to behave differently during recessions, when factors of productions are underused instead of their expected long-run growth. Similarly, a current feature of financial data is the frequent abrupt changes (Hamilton, 1989; Chauvet & Hamilton, 2005; Hamilton, 2005).

This study deviates from previous research by examining the relationship between conditional macroeconomic volatilities and its impact on stock returns with a non-linear model, since the markets react differently depending on the magnitude of shocks they are subjected to. Residual series (return innovations) are first generated from GARCH models. A Markov Switching (MS) model is then used to establish the link between the conditional macroeconomic volatilities and stock market returns.

6.1 DATA

The data for this section come from eleven (11) African stock markets (ASMs) (Cote D'Ivoire, Egypt, Ghana, Kenya, Mauritius, Morocco, Namibia, Nigeria, South Africa, Tunisia and Zambia). These countries were selected based on data availability. The stock market indexes were used in all the selected countries except Cote D'Ivoire, Ghana and Namibia, where S&P Dow Jones Broad Market Index (BMI) price index were used instead of them. Macroeconomic variables selected are exchange rate, interest rate, money supply, inflation and crude oil price. Particularly, exchange rate is represented by national currency per USD, 3 months Treasury bill as a proxy for interest rate, M3 or M2+ for money supply, Consumer Price Index (CPI) as a proxy for inflation and Brent oil price as prices for crude oil price. All the data come from monthly series that span from January 2003 to December 2019. Stock market data were gleaned from DataStream. Macroeconomic data were also obtained from DataStream and from International Monetary Fund and national sources. All the variables are transformed into returns computed as the logarithmic difference between two consecutive observations generated as follows:

$$r_t = ln\left(\frac{P_t}{P_{t-1}}\right) \quad \textbf{(6.1)}$$

where r_t is the return of the variable at time t; P_t and P_{t-1} denotes the current day and previous day observation of each variable respectively; and *ln* denote natural logarithm.

6.2 ESTIMATION MODELS

This section establishes the link between the conditional macroeconomic volatilities and stock returns. The following hypothesis will therefore be tested:

Hypothesis 2a: Exchange rate have significant effect on volatilities of stock market returns in Africa.

Hypothesis 2b: Domestic interest rate have significant effect on volatilities of stock market returns in Africa.

Hypothesis 2c: Money supply have significant effect on volatilities of stock market returns in Africa.

Hypothesis 2d: Inflation have significant effect on volatilities of stock market returns in Africa.

Hypothesis 2e: Crude oil prices have significant effect on volatilities of stock market returns in Africa.

6.2.1 GENERALIZED AUTOREGRESSIVE CONDITIONAL HETEROSCEDASTICITY (GARCH) MODEL

The ARCH models express the conditional variance as a linear function of the lagged squared error terms. Bollerslev (1986) extended this by including lagged conditional variance terms into the equation. The basic GARCH (1, 1) model by Bollerslev (1986) and Taylor (1986) is based on the assumption that conditional variance is influenced by its own lags and previous unexpected increase or decrease in returns at time *t*. This GARCH generalized form enables a more parsimonious representation in many applications. GARCH is predominantly used to capture volatility clustering effect in the stock market data, as well as in the macroeconomic variables. The GARCH (1, 1) is expressed as:

$$r_t = \mu + \varepsilon_t \quad \textbf{(6.2)}$$

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 \quad \textbf{(6.3)}$$

where $\omega > 0$, $\alpha \geq 0$, $\beta \geq 0$.
r_t = the return of the index at time *t*
μ = the mean of returns
ε_t = the error term (residuals) such that $\varepsilon_t \approx$ WN (μ, σ^2)
h_t = conditional variance of the index
ω = a constant term
ε_{t-1}^2 = the news about volatility from the previous period (the ARCH term)
h_{t-1}= the conditional variance which is the last period forecast variance (the GARCH term) must be non-negative.

Equation 6.2 represents the mean equation and Equation 6.3 is the variance equation. The ε_t is a sequence of *iid* random variables with zero mean and constant variance. If z_t is Gaussian $\varepsilon_t = \sigma_t z_t$; $z_t \sim NID(0,1)$ then the error term is conditionally Gaussian. NID refers to normal and independent distributed function. The specification allows variance to depend on the variability of recent observations. The ε_t is a Martingale Difference[20] (MD), therefore its unconditional mean is

[20] Martingale difference (MD) is given by $E|\varepsilon_t| < \infty$ and $E(\varepsilon_t|\varepsilon_{t-1}) = 0$. MDs have their means as zero and are uncorrelated over time. This series is white noise if the unconditional variance is constant over time (Xiao & Aydemir, 2007)

zero and is serially uncorrelated, which satisfies the conditional normality assumption (Xiao & Aydemir, 2007).

GARCH (1, 1) refers to the presence of a first-order autoregressive GARCH term and a first-order moving average ARCH term. The GARCH model can be interpreted as a prediction of the current period's variance by forming a weighted average of a long term (the constant), the forecast variance from last period (the GARCH term), and information about volatility observed in the previous period (the ARCH term). Usually, investors will increase the estimate of the variance for the next period if the asset´s return is unexpectedly large, either in a upward or downward direction. This model is also consistent with the volatility clustering often seen in financial returns data, where large changes in returns are likely to be followed by further large changes. GARCH models can also capture leptokurtosis and skewness observed in empirical analysis.

6.2.2 LINEAR REGRESSION MODEL

In order to analyse the nexus between conditional volatility of stock markets and macroeconomic variables, conditional volatilities are generated from the GARCH models. An OLS technique is used to estimate the following linear regression model for the ASMs in the sample:

$$h_t = \mu_t + \beta_1 \delta \mathrm{ER}_t + \beta_2 \delta \mathrm{IR}_t + \beta_3 \delta \mathrm{MS}_t + \beta_4 \delta \mathrm{CPI}_t + \beta_5 \delta \mathrm{OIL}_t + \varepsilon_t \qquad \textbf{(6.4)}$$

Where β_i are the estimated coefficients, $\delta \mathrm{ER}_t$ is the conditional exchange rate, $\delta \mathrm{IR}_t$ is interest rate volatility, $\delta \mathrm{CPI}_t$ is the changes in CPI, and $\delta \mathrm{OIL}_t$ is the volatility in crude oil price.

Although, the OLS techniques are very useful to examine the relationships between variables because of its simplicity, they are unable to capture nonlinear relationships among variables. The equations will be subjected to a stability test to determine the suitability or not of the OLS technique. Specifically, Ljung-Box Q statistic test on the squared residuals and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) test, as proposed by Brown, Durbin, and Evans (1975) will be applied.

6.2.3 REGIME SWITCHING MODEL

Financial markets react differently to large and small economic shocks. Large shocks causes a faster rate of mean reversion than smaller. Volatility adjustments follow two regimes: a faster adjustment and less volatility persistence in a high volatility state, and a slower adjustment and

more persistent volatility in a low volatility state (Poon and Granger, 2003). Sudden changes in the parameter can therefore be identified by a Markov chain. The series of models that captures this idea are referred as the regime switching models. Hamilton (1988, 1989) first suggested the MS model to detect the sudden changes in political and economic events on the properties of financial and economic time series, which are similar to GARCH model, which is strictly stationary and covariance stationary.

MS models makes the independent variables state-dependent. The estimated coefficient β_i in Equation 6.4 is allowed to change over time depending on a particular transition probability. β_i can assume different values according to the market regime or 'state' at time *t,* denoted as s_t. Following Bahloul *et al.* (2017), the transition probabilities are described by a hidden Markov chain given as:

$$h_t = \mu_t + \beta_{1s_t}\delta \mathrm{ER}_t + \beta_{2s_t}\delta \mathrm{IR}_t + \beta_{3s_t}\delta \mathrm{MS}_t + \beta_{4s_t}\delta \mathrm{CPI}_t + \beta_{5s_t}\delta \mathrm{OIL}_t + \varepsilon_{ts_t} \quad \textbf{(6.5)}$$

With $\varepsilon_t \sim N(0, \sigma^2)$, α_t is a Markov chain that is irreducible, aperiodic and has a finite state space consisting of k states (regimes) $s_1, \ldots, s_k$. The assumption is that ε_t and α_t are independent.

Specifically, s_t is assumed to follow a two-state first order Markov process with transition matrix given by:

$$P = \begin{bmatrix} P_{11} & P_{21} \\ P_{12} & P_{22} \end{bmatrix} \quad \textbf{(6.6)}$$

$Q(q_{ij})$ denotes the transition probability matrix for shifts between regimes where

$q_{ij} = \rho(\varepsilon_t = s_1 | \varepsilon_t = s_1), i, j = 1, \ldots, k$

For an irreducible and aperiodic Markov chain with a definite state space, there is a unique vector stationary probabilities denoted by $\pi = [\pi_1, \ldots, \pi_k]$. The variance is assumed to be constant but can change across regimes. The MS model is estimated using a maximum likelihood procedure[21].

[21] Some variants of Hamilton (1989) regime switching model suggested include: Cai (1994) incorporates both ARCH model and a Markov regime switching model to examine volatility persistence; Hamilton and Susmel (1994) introduces another parameterization of the switching regime ARCH model where regime changes are modelled by changes in the scale of the ARCH process; Gray (1996) proposes a generalized regime switching model of the short-term interest rates. In this study, the short rate exhibited both mean reversion and conditional heteroscedasticity and nests the GARCH and square root process specifications.

(For details on estimation methods see Hamilton, 1994; Xiao & Aydemir, 2007; Bahloul, Mroua & Naifar, 2017; Guidolin & Pedio, 2018).

Other studies have extended regime switching models so that probability of a regime does not only depends on the regime of the previous period but also a vector of observed variables. Some authors considered time-varying state transition probabilities (Diebold, Lee & Weinbach, 1994); allowed state transition probabilities to evolve as a logistic functions of observable economic variables (Filardo, 1992); allowed state transition probabilities to be dependent on seasonal indicator such as calendar months (Ghysels, 1994) and state transition probabilities to be functions of both the inferred current state and the associated number of periods (Durland & McCurdy, 1993).

6.3 EMPIRICAL RESULTS

This section presents the findings emanating from empirical examination of the model. To understand the nature of data used in this section, descriptive statistics was generated. Results of GARCH models are presented after that. Return innovations are generated from the GARCH models and then simple linear regression are used to establish the relationship between the return innovations and the macroeconomic volatilities. Finally, a Markov Switching model is used to confirm the nexus between the conditional stock market volatilities and macroeconomic volatilities.

6.3.1 DESCRIPTIVE STATISTICS

Appendix 3 depicts plots of all the series (in red) and their returns (in blue). From the graphs, plots of the series depict trends in their levels. On the other hand, returns of the index and macroeconomic variables appear to be stationary. However, time series plots may not always present valid conclusions about the stationarity of the series, hence formal unit root test (ADF) is carried out to verify the authenticity of the deductions from the line plots.

6.3.1.1 Summary Statistics of the Variables

Table 6.1 presents the summary of descriptive statistics of the indices used in the study. The mean-to-median ratio of the indices is approximately 1. This explains the low standard deviations in all the indices. The coefficients of skewness are low with both positively and negatively skewed indices. The positive skewness means that the data distribution has a long right tail and vice versa.

The value of kurtosis for all the indices are below 3, the benchmark for normal distribution, suggesting the distribution is flat (platykurtic) relative to the normal. The Jarque-Bera (JB) statistics measures whether the series is normally distributed. Due to the low probabilities recorded, the null hypothesis of a normal distribution is rejected for all the indices except NSE20. The Augmented Dickey-Fuller (ADF) test for all the indices is non-stationary, except S&P index for Ghana since the test statistics are greater than the critical values (1% level of significance).

Table 6.1: Descriptive Statistics of Monthly Africa Stock Indices

Index	Mean	STD	Skewness	Kurtosis	JB @ 1% sign. level		ADF @ 1%	CV
Cote D'Ivoire	510.48	240.66	-0.18	1.97	10.11	0.0063	-1.74	-3.46
Egypt	7395.1	4043.2	0.54	2.79	10.49	0.0052	-1.26	-3.46
Ghana	44.800	11.940	0.50	2.48	10.96	0.0042	-3.75	-3.46
Kenya	3830.6	960.13	-0.11	2.34	4.18	0.1235	-2.94	-3.46
Mauritius	1588.6	563.57	-0.77	2.18	25.90	0.0000	-2.10	-3.46
Morocco	9609.8	2941.1	-0.82	2.70	23.66	0.0000	-2.18	-3.46
Namibia	227.21	110.35	0.19	1.83	12.80	0.0017	-1.01	-3.46
Nigeria	34868	15975	-0.04	1.70	14.41	0.0007	-2.88	-3.46
South Africa	4121.5	1906.0	-0.01	2.08	7.16	0.0278	-0.87	-3.46
Tunisia	3484.2	1793.3	-0.31	1.93	13.08	0.0014	-0.78	-3.46
Zambia	71.730	27.750	0.36	2.10	11.22	0.0036	-1.82	-3.46

Notes: The sample period data is period from January 2003 to December 2019. STD denotes standard deviation. JB is the chi square statistic for testing normality. The JB rejects normality at the 0.01 significance level and ADF is the augmented Dickey-Full test for unit root. CV is the critical values for the ADF test.

Table 6.2 presents the descriptive statistics of the macroeconomic variables used in the study. Most of the variables exhibited low standard deviations as compared to its mean, except few instances in exchange rate and money supply. The countries with low standard deviations in exchange rate are Cote D'Ivoire, Kenya, Mauritius and Morocco. Moreover the money supply shown high standard deviations in most countries except Morocco, South Africa and Tunisia. The coefficients of skewness for the macroeconomic variables are low with both positive and negative skew. Kurtosis for most of the macroeconomic variables are below 3 except interest rate in Ghana, Mauritius, Morocco and Nigeria. The JB statistics for all variables rejects the null hypothesis of normality. The ADF test for all the macroeconomic variables shows that the series are non-stationary in their levels except interest rate for Ghana, Kenya, South Africa, and Zambia.

Table 6.2: Descriptive Statistics of Macroeconomic Variables

Index	Mean	STD	Skewness	Kurtosis	JB @ 1% sign. level		ADF @ 1%	CV
Cote D'Ivoire								
Exchange rate	525.56	50.30	0.037	2.09	7.12	0.0284	-2.32	-3.46
Interest rate	4.16	0.48	1.30	7.30	215.05	0.0000	-3.92*	-3.46
Money supply	4581934	2634892	0.63	2.14	19.97	0.0000	1.83	-3.46
Inflation	101.47	10.15	-0.46	1.75	20.50	0.0000	-1.52	-3.46
Egypt								
Exchange rate	8.37	4.46	1.51	3.47	79.55	0.0000	-0.38	-3.46
Interest rate	12.01	3.68	0.74	2.74	19.23	0.0001	-2.06	-3.46
Money supply	1420203	1052100	1.16	3.13	46.13	0.0000	6.62	-3.46
Inflation	45.80	25.71	0.96	2.82	31.62	0.0000	3.16	-3.46
Ghana								
Exchange rate	2.27	1.49	0.74	2.01	27.20	0.0000	2.88	-3.46
Interest rate	17.86	6.18	0.411	2.25	10.55	0.0051	-2.80	-3.46
Money supply	25629.66	25509.49	0.99	2.72	33.75	0.0000	5.76	-3.46
Inflation	50.40	28.90	0.65	2.18	20.23	0.0000	-0.99	-3.46
Kenya								
Exchange rate	85.27	12.17	0.19	1.81	13.31	0.0013	-1.01	-3.46
Interest rate	7.60	3.27	0.93	6.87	157.14	0.0000	-3.58*	-3.46
Money supply	1627695	1008007	0.42	1.76	19.25	0.0001	2.97	-3.46
Inflation	123.84	45.36	0.21	1.74	14.92	0.0006	0.87	-3.46
Mauritius								
Exchange rate	31.41	2.81	0.13	2.04	8.38	0.01515	-1.66	-3.46
Interest rate	4.95	2.78	0.93	2.90	29.56	0.0000	-1.95	-3.46
Money supply	327273.5	129964.0	0.37	2.08	11.80	0.0027	2.75	-3.46
Inflation	81.72	16.59	-0.37	1.83	16.31	0.0003	-1.77	
Morocco								
Exchange rate	8.83	0.71	-0.06	2.01	8.34	0.0154	-2.09	-3.46
Interest rate	2.93	0.43	-0.73	1.83	29.73	0.0000	-0.01	-3.46
Money supply	877664.1	292134.8	-0.18	1.89	11.65	0.0029	-1.40	-3.46
Inflation	100.41	7.49	-0.28	1.93	12.53	0.0019	-1.53	-3.46
Namibia								
Exchange rate	9.59	2.99	0.62	1.93	22.86	0.0000	-0.56	-3.46
Interest rate	7.57	1.54	0.92	3.59	31.86	0.0000	-2.76	-3.46
Money supply	2369.41	1307.11	0.29	1.48	22.47	0.0000	-0.45	-3.46
Inflation	93.67	25.66	0.19	1.76	14.43	0.0007	0.58	-3.46
Nigeria								
Exchange rate	181.18	66.85	1.15	2.68	46.12	0.0000	-0.13	-3.46
Interest rate	9.81	3.68	-0.41	2.34	9.30	0.0095	-2.85	-3.46
Money supply	12859478	8162852	0.22	1.84	13.03	0.0015	0.84	-3.46
Inflation	137.24	71.88	0.73	2.46	20.76	0.0000	5.37	-3.46

Table 6.2: Descriptive Statistics of Macroeconomic Variables – Continued

South Africa								
Exchange rate	9.55	2.99	0.60	1.88	23.04	0.0000	-0.54	-3.46
Interest rate	7.23	1.72	1.22	4.33	66.06	0.0000	-3.50*	-3.46
Money supply	2179838	886587.3	0.013	1.95	9.35	0.0093	-0.20	-3.46
Inflation	75.87	20.60	0.21	1.78	14.14	0.0008	3.02	-3.46
Tunisia								
Exchange rate	1.70	0.52	1.16	3.12	45.83	0.0000	0.92	-3.46
Interest rate	4.93	0.94	1.41	5.44	118.21	0.0000	0.48	-3.46
Money supply	45971.46	19563.37	0.27	1.92	12.23	0.0021	4.57	-3.46
Inflation	102.90	20.40	-0.19	1.50	20.37	0.0000	-1.03	-3.46
Zambia								
Exchange rate	6.38	2.81	1.11	2.95	42.34	0.0000	0.97	-3.46
Interest rate	12.70	6.54	1.50	5.68	137.78	0.0000	-3.60*	-3.46
Money supply	25338221	19078536	0.66	2.17	20.41	0.0000	2.64	-3.46
Inflation	114.01	50.46	0.46	2.11	13.81	0.0010	2.58	-3.46
Crude oil								
Brent oil	510.48	240.66	-0.18	1.97	10.11	0.0064	-2.58	-3.46

Notes: The sample period data is period from January 2003 to December 2019.

6.3.1.2 Summary Statistics of Returns

Table 6.3 presents the mean daily index returns of the series. As expected, the mean of the returns is close to zero. The highest (lowest) mean of the sample in the period is Zambia (Ghana). The high standard deviation is indicative of high volatility in market returns and the risky nature of the exchange. Egypt (Tunisia) has the highest (lowest) standard deviation in the sample. There is also a positive and negative skewness, which suggest that the data distribution have different tails. This is an indication that returns are both symmetric and asymmetric. Also, the kurtosis is greater than the normal value of 3, which indicates a leptokurtic distribution. This shows that the indices exhibit high peaks in their distribution. The skewness and kurtosis show how the equity returns deviate from the normality assumption. Similarly, returns also rejects the null hypothesis of the JB statistics. The ADF test shows possible unit roots in the return series. The low ADF test statistics compared to the critical values suggest stationarity at the 1% level of significance.

Table 6.3: Descriptive Statistics of Monthly Stock Returns

Index	Mean	STD	Skewness	Kurtosis	JB @ 1% sign. level		ADF @ 1%	CV
Cote D'Ivoire	0.0079	0.0659	0.34	4.48	22.53	0.0000	-13.61	-3.46
Egypt	0.0163	0.0931	-0.20	4.13	12.20	0.0022	-12.31	-3.46
Ghana	0.0001	0.0684	0.12	4.38	16.55	0.0002	-9.88	-3.46
Kenya	0.0031	0.0614	-0.45	5.20	47.91	0.0000	-5.70	-3.46
Mauritius	0.0082	0.0415	-0.10	8.05	216.14	0.0000	-5.22	-3.46
Morocco	0.0068	0.0410	0.49	5.60	65.38	0.0000	-12.20	-3.46
Namibia	0.0093	0.0525	-0.27	3.71	6.70	0.0350	-16.55	-3.46
Nigeria	0.0033	0.0693	-0.02	4.39	16.45	0.0003	-10.89	-3.46
South Africa	0.0092	0.0445	-0.2071	3.81	7.00	0.0301	-14.98	-3.46
Tunisia	0.0094	0.0355	-0.2314	5.22	43.71	0.0000	-12.40	-3.46
Zambia	0.0126	0.0507	0.1829	5.98	76.20	0.0000	-5.39	-3.46

Notes: The sample period data is period from January 2003 to December 2019. STD denotes standard deviation. JB is the chi square statistic for testing normality. The JB rejects normality at the 0.01 significance level and ADF is the augmented Dickey-Full test for unit root. CV is the critical values for the ADF test.

Table 6.4 shows the return series of the macroeconomic variables. All macroeconomic variables possessed positive returns except interest rate and exchange rate in some countries in the sample. Interest rate (Exchange rate) shows a negative (positive) return in all countries except Egypt and Tunisia (Cote D'Ivoire and Morocco). All the series exhibited high standard deviation as compared to the mean except inflation in most countries in the sample. The returns also showed both symmetric and asymmetric distribution according to the skewness of series. All returns of the macroeconomic variables unveil a leptokurtic distribution. Similarly, returns of the macroeconomic variables also rejects the null hypothesis of the JB statistics. Non-stationarity was observed in inflation (Ghana, Namibia and Tunisia) and money supply (Morocco, Namibia and South Africa). The rest of the series were all stationary at the level of the returns.

Table 6.4: Descriptive Statistics of Macroeconomic Variables Returns

Index	Mean	STD	Skewness	Kurtosis	JB @ 1% sign. level		ADF @ 1%	CV
Cote D'Ivoire								
Exchange rate	-0.0002	0.0222	0.20	3.96	9.22	0.0099	-10.49	-3.46
Interest rate	-0.0014	0.0261	1.96	59.43	27070	0.0000	-14.18	-3.46
Money supply	0.0074	0.0311	-2.05	16.13	1600	0.0000	-4.31	-3.46
Inflation	0.0015	0.0075	1.02	9.94	443.0	0.0000	-12.62	-3.46
Egypt								
Exchange rate	0.0062	0.0551	10.23	131.01	142185	0.0000	-14.81	-3.46
Interest rate	0.0043	0.0857	1.84	18.70	2200	0.0000	-12.15	-3.46
Money supply	0.0120	0.0137	7.40	85.69	59693	0.0000	-14.21	-3.46
Inflation	0.0088	0.0105	0.29	4.75	28.69	0.0000	-9.65	-3.46
Ghana								
Exchange rate	0.0092	0.0277	-1.90	32.70	7582	0.0000	-5.70	-3.46
Interest rate	-0.0029	0.0612	-0.17	8.92	297.1	0.0000	-6.89	-3.46
Money supply	0.0200	0.0397	0.08	29.02	5727	0.0000	-18.80	-3.46
Inflation	0.0106	0.0127	1.78	16.31	1606	0.0000	-2.39	-3.46
Kenya								
Exchange rate	0.0013	0.0191	-0.49	8.66	279.2	0.0000	-9.79	-3.46
Interest rate	-0.0008	0.1627	-0.60	7.94	219.1	0.0000	-6.10	-3.46
Money supply	0.0106	0.0117	0.31	4.94	35.20	0.0000	-15.14	-3.46
Inflation	0.0064	0.0097	0.83	6.20	110.3	0.0000	-9.46	-3.46
Mauritius								
Exchange rate	0.0013	0.0244	1.19	9.76	434.0	0.0000	-14.51	-3.46
Interest rate	-0.0058	0.1247	0.68	8.64	284.6	0.0000	-13.25	-3.46
Money supply	0.0080	0.0135	2.90	34.15	8493	0.0000	-15.14	-3.46
Inflation	0.0034	0.0073	0.34	5.94	77.22	0.0000	-10.12	-3.46
Morocco								
Exchange rate	-0.0002	0.0225	0.47	5.32	53.14	0.0000	-14.69	-3.46
Interest rate	-0.0018	0.0148	-4.50	35.10	9400	0.0000	-14.36	-3.46
Money supply	0.0063	0.0101	-0.25	4.48	20.69	0.0000	-1.28	-3.46
Inflation	0.0013	0.0059	-0.05	3.68	4.000	0.13	-11.87	-3.46
Namibia								
Exchange rate	0.0024	0.0444	0.67	4.40	31.63	0.0000	-14.83	-3.46
Interest rate	-0.0023	0.0424	-0.18	8.47	254.0	0.0000	-13.84	-3.46
Money supply	0.0090	0.0488	-0.79	4.11	31.46	0.0000	-2.42	-3.46
Inflation	0.0043	0.0053	1.58	8.55	344.5	0.0000	-2.59	-3.46
Nigeria								
Exchange rate	0.0042	0.0258	5.85	45.49	16428	0.0000	-9.37	-3.46
Interest rate	-0.0058	0.1915	0.87	14.32	1109	0.0000	-10.63	-3.46
Money supply	0.0137	0.0504	1.34	24.16	3849	0.0000	-17.57	-3.46
Inflation	0.0094	0.0116	0.73	9.08	330.8	0.0000	-10.90	-3.46

Table 6.4: Descriptive Statistics of Macroeconomic Variables Returns – Continued

South Africa								
Exchange rate	0.0026	0.0477	0.50	3.37	9.620	0.0081	-15.77	-3.46
Interest rate	-0.0027	0.0345	-1.17	6.22	134.3	0.0000	-10.07	-3.46
Money supply	0.0081	0.0110	0.65	4.16	25.71	0.0000	-1.32	-3.46
Inflation	0.0042	0.0032	0.56	5.78	75.72	0.0000	-9.74	-3.46
Tunisia								
Exchange rate	0.0037	0.0180	0.30	3.31	3.89	0.1431	-9.91	-3.46
Interest rate	0.0014	0.0305	0.44	17.88	1878	0.0000	-13.75	-3.46
Money supply	0.0076	0.0093	0.54	3.61	13.11	0.0014	-13.28	-3.46
Inflation	0.0029	0.0154	-0.12	4.32	15.32	0.0005	-2.78	-3.46
Zambia								
Exchange rate	0.0060	0.0504	0.36	10.30	455.4	0.0000	-12.58	-3.46
Interest rate	-0.0034	0.1466	-0.82	9.88	423.1	0.0000	-6.67	-3.46
Money supply	0.0146	0.0365	0.12	3.88	7.030	0.0296	-16.42	-3.46
Inflation	0.0084	0.0076	2.75	16.72	1849	0.0000	-7.66	-3.46
Crude Oil								
Brent Oil	0.0038	0.0998	-0.6421	4.21	26.32	0.0000	-11.79	-3.46

Notes: The sample period data is period from January 2003 to December 2019.

6.3.2 GARCH RESULTS

Results of the GARCH models are presented in Appendix 4. The conditional mean model was estimated based on the best Autoregressive Moving Average Models (ARMA) model. The ARMA (p, q) specification was added to the mean equation to ensure a white noise error term. Next a combination of information criteria (AIC and LL values) is used to select the volatility model that best estimates the conditional variance for the study period.

The results show presence of volatility clustering in the stock return series (exception is S&P index for Cote D'Ivoire) and most of the macroeconomic variables. The macroeconomic variables that do not show volatility persistence are CPI and interest rate for Cote D'Ivoire, exchange rate for Egypt and Namibia and money supply for Ghana and Morocco.

The results of the EGARCH model shows that most of the Africa stock returns asymmetry coefficient (γ) are negative and non-significant. Leverage effect was confirmed only in Egypt and South Africa. This indicates that African stock market returns exhibit symmetric and insignificant leverage effects. With respect to macroeconomic variables, most of the asymmetry coefficient are insignificant. These are exchange rate (Kenya, Mauritius, Namibia, South Africa and Tunisia),

interest rate (Egypt, Morocco, Namibia, and South Africa), money supply (Kenya, Mauritius, Nigeria and Tunisia), CPI (Ghana, Mauritius, Morocco and South Africa) and crude oil price. This shows that macroeconomic news and volatilities of stock market returns in Africa are mixed.

6.3.3 LINEAR REGRESSION ANALYSIS

In order to capture the volatilities in the stock market returns and the macroeconomic variables, conditional volatilities were generated from the appropriate GARCH model. An OLS equation was estimated for each countries using the innovations from each variable and presented in Table 6.5.

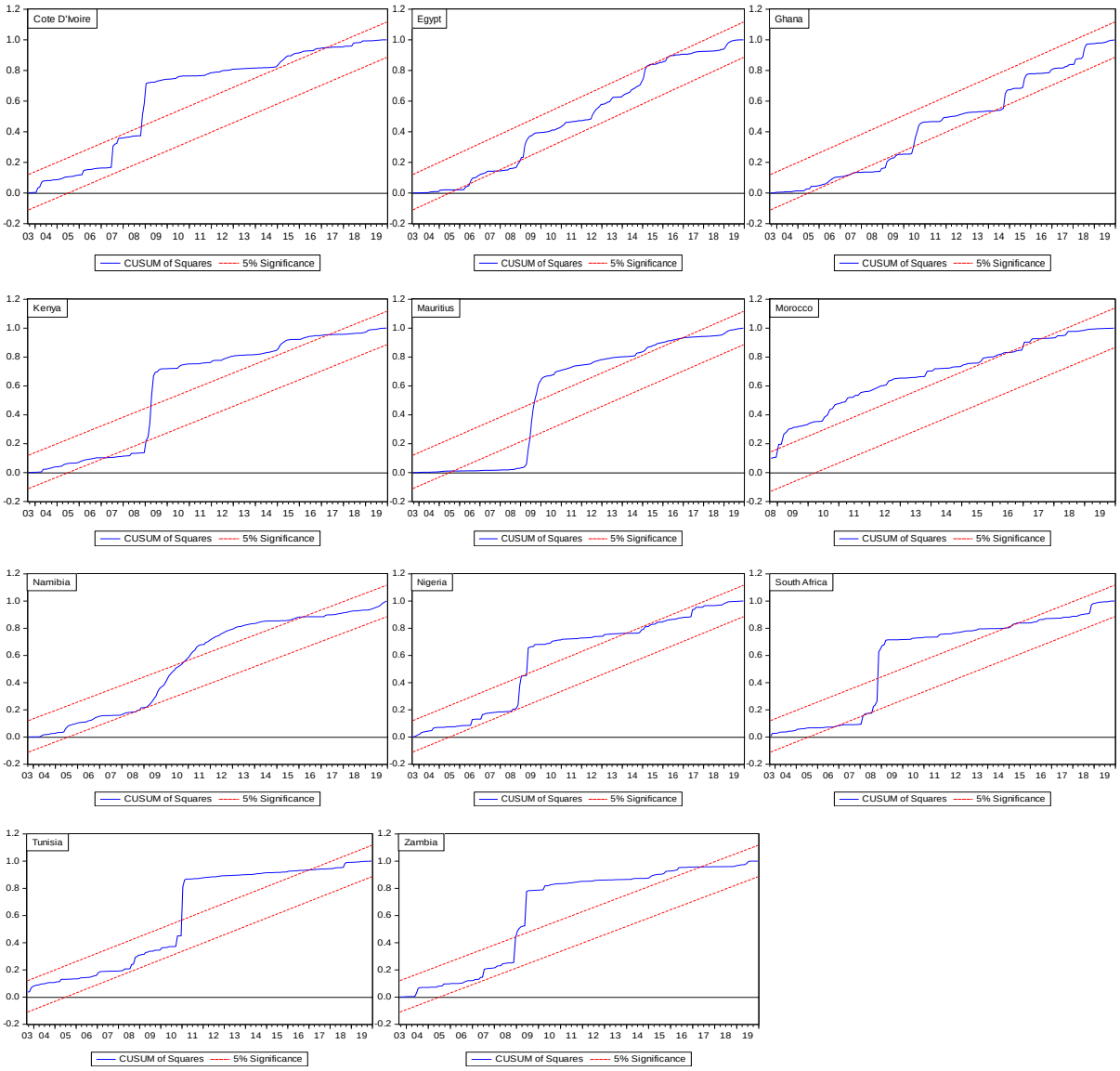
Table 6.5: Results of OLS

	μ	ER	IR	MS	CPI	OIL	R^2	Log(L)
Cote D'Ivoire	0.0024	1.6597	0.5739	-0.1485	-0.6167	0.0883	0.25	1081
	3.73***	1.24	1.51	-0.17	-1.54	2.26**		
Egypt	0.0056	2.0508	0.0447	-27.333	-4.9927	0.3385	0.45	912
	6.38***	1.62	1.31	-1.62	-1.69*	4.04***		
Ghana	0.0045	0.1136	0.0029	-0.3221	-1.2516	0.0230	0.05	935
	8.16***	0.97	0.10	-2.23**	-2.18**	0.76		
Kenya	0.0010	0.2934	-3.31E-05	4.9291	2.7879	0.1712	0.19	922
	1.53	1.60	-0.03	2.06**	1.93*	2.18**		
Mauritius	0.0018	0.8202	-0.0056	0.87	-25.606	0.0383	0.29	970
	2.91***	2.08**	-1.06	1.59	-3.65***	1.18		
Morocco	0.0011	0.1522	-0.8119	0.8148	8.3007	-0.0136	0.23	1264
	5.41***	1.10	-1.27	2.60**	4.71***	-1.57		
Namibia	0.0038	-0.1371	0.0014	0.0195	-36.77	-0.0196	0.06	1151
	5.66***	-3.29***	0.04	0.34	-1.64	-1.36		
Nigeria	0.0028	1.1105	0.0014	-0.0307	0.3770	0.1328	0.18	947
	3.87***	0.93	0.51	-3.04***	0.26	2.69***		
South Africa	-0.0014	1.3994	-0.1326	-1.6309	4.9574	0.0510	0.36	1055
	-1.73*	2.61***	-0.61	-1.17	0.36	2.48**		
Tunisia	0.0011	1.7060	-0.7011	1.6176	0.0809	0.0084	0.20	1211
	4.38***	3.27***	-3.58***	1.60	0.32	1.07		
Zambia	0.0016	0.0050	0.0077	-0.2616	9.0812	0.0589	0.16	1095
	0.43	3.44	2.32	-1.16	1.28	2.13**		

Notes: Coefficients and Standard errors are represented respectively. *,**,*** denote statistical significance at the 10%, 5%, and 1% levels respectively.

Results show that exchange rate is significant in Mauritius, Namibia, South Africa and Tunisia, while CPI have a significant effect in Egypt, Ghana, Kenya and Morocco. Moreover crude oil price has significant effect in almost all African countries except Ghana, Morocco, Namibia and Tunisia. It was observed that money supply does not have influence on stock volatilities in Africa except Ghana, Kenya, Morocco and Nigeria. For all the countries, interest rate was found to be irrelevant in determining the short run fluctuations in Africa stock markets except Tunisia.

Figure 6.1: Plot of CUSUMSQ Test Results



In order to understand the robustness of OLS in capturing the innovations of stock market returns and macroeconomic variables and stability in the model, Ljung-Box Q statistic test on the squared residuals (not reported) and CUSUMSQ test were performed.

The results, shown in Figure 6.1, indicate instability in the coefficients over the sample period, since the coefficients are not confined within the 5% critical bounds of parameter stability. This suggests that the OLS is unable to address the parameter instability or variance instability over the study period for African stock markets. It could be argued that African stock indices may have a regime specific behaviour.

6.3.4 MARKOV SWITCHING REGRESSION ANALYSIS

This section presents the results of the MS model for the selected countries. Table 6.6 contains the conditional mean returns and volatility of the MS model in each ASM. All the conditional means in the state 1 are significant except Cote D'Ivoire and Kenya. Also, the conditional means in state 2 are significant, with the exception of South Africa and Tunisia. Both regime 1 and 2 have positive significant conditional mean. Regime 1 is less volatile than regime 2 in ASMs, except Cote D'Ivoire, Kenya, Mauritius and Nigeria, in which case the reverse is true. Hence regime 1 is characterized as economic expansion or tranquil state with less volatility, while regime 2 as an economic decline or crisis state with high volatility.

Table 6.6: Conditional Mean and Volatility of MS Model

	μ_1	μ_2	σ_1	σ_2
Cote D'Ivoire	-0.0006	0.0035***	0.0014***	0.0003***
Egypt	0.0036***	0.0086***	0.0009***	0.0023***
Ghana	0.0029***	0.0053***	0.0005***	0.0025***
Kenya	-0.0131	0.0016***	0.0034***	0.0010***
Mauritius	0.0043***	0.0013***	0.0024***	0.0005***
Morocco	0.0010***	0.0022***	0.0000***	0.0002***
Namibia	0.0007**	0.0038***	0.0002***	0.0006***
Nigeria	0.0034***	0.0031***	0.0024***	0.0005***
South Africa	0.0006**	-0.0015	0.0005***	0.0020***
Tunisia	0.0007***	0.0005	0.0002***	0.0005***
Zambia	0.0012***	0.0021***	0.0002***	0.0009***

Notes: *,**,*** denote 10%, 5%, and 1% levels of significance respectively.

Table 6.7 presents the transition probabilities and mean duration of states of the conditional volatilities MS model. The transition probabilities depict the likelihood of remaining in one regime in a specified duration before moving to a second state in a given time. The regime is then switched back to the first state (as there are only two states used in this study). A regime is a hidden (latent) state suggesting that the true state cannot be revealed even with unlimited time series data. The MS model thus, assist us to reveal the unobservable state of affairs (Guidolin & Pedio, 2018).

Table 6.7: Transition Probabilities and Mean Duration of States

	P_{11}	P_{22}	$E(d_1)$	$E(d_2)$	Log(L)
Cote D'Ivoire	0.7894**	0.9279***	4.75	13.86	1208
Egypt	0.9583***	0.9424***	24.01	17.35	1019
Ghana	0.8714***	0.9268***	7.78	13.67	995
Kenya	0.8807***	0.9874***	8.38	79.16	1062
Mauritius	0.9337***	0.9827***	15.07	57.67	1191
Morocco	0.9922***	0.9958***	127.5	238.8	1482
Namibia	0.9814***	0.9872***	53.62	77.97	1296
Nigeria	0.8841***	0.9256***	8.63	13.44	1081
South Africa	0.9660***	0.8110**	29.4	5.29	1182
Tunisia	0.9116***	0.8779***	11.32	8.19	1302
Zambia	0.9634***	0.9757***	27.33	41.17	1230

Notes: *,**,*** denote 10%, 5%, and 1% levels of significance respectively.

P_{11}, the probability of staying in regime 1(low volatilities), range from 0.7894 to 0.9922 with a mean duration of 4.75–127.5 months, which occurs in Cote D'Ivoire and Morocco, respectively. On the other hand, the estimates of P_{22}, the probability of staying in regime 2 (high probability), range from 0.8110 to 0.9958 with a mean duration of 5.29–238.8 months in South Africa and Morocco, respectively. The means of state 1 and state 2 are 0.9211and 0.9400, with a duration of 28.89 and 51.51 months, respectively. Thus, the mean probabilities of staying in state 1 is not different in state 2, but differs in the time of remaining in one state. Also, the high probabilities indicates that both states are persistent. However, regime 2 is more persistent than regime 1 in all the African stock market of the sample, except Egypt, South Africa and Tunisia. It can be concluded that ASMs experience more extended crisis episodes than tranquil episodes.

The results of MS regression of the conditional stock market volatility and macroeconomic volatilities generated from the GARCH process are presented in Table 6.8. The macroeconomic variables are more significant in the MS model than the OLS regression. Moreover, the coefficients estimates are more significant in the crisis state than in the tranquil state. It can be inferred that investors' behaviour in Africa is better explained by crisis situations than by economic fundamentals. Furthermore, all the macroeconomic variables have an impact on the ASMs in all the regimes.

Table 6.8: Results of Markov Switching Regression Model

		ER	IR	MS	CPI	OIL
	Regime 1	0.4116	3.4312***	3.8038	7.6700	0.1078***
		(0.90)	(0.00)	(0.15)	(0.45)	(0.00)
Cote D'Ivoire	*Regime 2*	0.7483*	0.0277	-0.0567	-0.5308***	-0.0026
		(0.06)	(0.87)	(0.77)	(0.00)	(0.77)
	Regime 1	-1.6311***	0.0989***	23.006***	1.6780	0.1408***
		(0.00)	(0.00)	(0.00)	(0.15)	(0.00)
Egypt	*Regime 2*	-1.4531	0.0586*	16.841	-19.804**	0.3452***
		(0.24)	(0.08)	(0.29)	(0.02)	(0.00)
	Regime 1	0.0137	-0.0766***	-0.2953*	-0.1863	0.0424***
		(0.37)	(0.00)	(0.07)	(0.38)	(0.00)
Ghana	*Regime 2*	0.2961***	-0.0071	-0.3944*	-0.4835	0.0068
		(0.00)	(0.85)	(0.06)	(0.85)	(0.89)
	Regime 1	-2.8427	-0.0012	132.43	40.451**	0.1934
		(0.39)	(0.96)	(0.22)	(0.03)	(0.12)
Kenya	*Regime 2*	0.5013***	0.0012	6.2938***	1.9733***	0.0210
		(0.00)	(0.12)	(0.00)	(0.00)	(0.19)
	Regime 1	0.2044	0.3944***	-0.1915	-48.441**	-0.0165
		(0.41)	(0.00)	(0.89)	(0.04)	(0.74)
Mauritius	*Regime 2*	0.5580***	-0.0024	0.3330	-14.131***	-0.0106
		(0.00)	(0.18)	(0.00)	(0.28)	(0.30)
	Regime 1	0.2017	-5.1849***	0.026590	0.1350	0.0016*
		(0.13)	(0.00)	(0.79)	(0.84)	(0.09)
Morocco	*Regime 2*	-0.2700***	-3.1346***	-0.0204	4.2573***	-0.0053
		(0.00)	(0.00)	(0.93)	(0.00)	(0.14)
	Regime 1	-0.0783***	-0.0013	0.0332**	34.673***	-0.0078**
		(0.00)	(0.83)	(0.01)	(0.00)	(0.03)
Namibia	*Regime 2*	-0.1505**	0.0764**	0.1058**	-26.913**	-0.0364***
		(0.03)	(0.01)	(0.02)	(0.02)	(0.00)
	Regime 1	5.6074***	0.0010	-0.0385	1.2701	0.0589
		(0.00)	(0.74)	(0.75)	(0.44)	(0.15)
Nigeria	*Regime 2*	0.0550	0.0001	-0.0084*	-0.8947**	0.0355**
		(0.72)	(0.84)	(0.09)	(0.01)	(0.03)
	Regime 1	0.4690***	-0.0110	-0.6936	-10.301*	0.0115
		(0.00)	(0.89)	(0.43)	(0.06)	(0.35)
South Africa	*Regime 2*	3.1191***	-0.0035	-6.4269	-5.0831	-0.0948*
		(0.00)	(0.99)	(0.63)	(0.92)	(0.09)
	Regime 1	0.6147**	-0.3350***	1.3609***	0.0068	0.0129***
		(0.04)	(0.00)	(0.00)	(0.95)	(0.00)
Tunisia	*Regime 2*	2.3446**	-0.4671	3.6668*	0.4462	0.0664***
		(0.04)	(0.14)	(0.07)	(0.43)	(0.00)
	Regime 1	-0.0016	0.0070***	0.0823	-4.7585**	0.0021
		(0.42)	(0.00)	(0.18)	(0.03)	(0.77)
Zambia	*Regime 2*	0.0204***	0.0098***	0.0538	-4.3221	0.0660***
		(0.00)	(0.00)	(0.81)	(0.46)	(0.00)

Notes: *,**,*** denote 10%, 5%, and 1% levels of significance respectively. P-values in parenthesis.

Results of the conditional volatilities of inflation (CPI) in the tranquil regime are mixed. Whilst the Fisherian hypothesis is rejected in Mauritius, South Africa and Zambia, it was not rejected in Kenya and Namibia. Alagidede (2009b) also reached a similar conclusion, as Kenya was the only stock market in his sample that did not reject the Fisherian hypothesis. In the crisis state inflation is negatively related to stock market return in Africa except Kenya, which maintained the rejection of the Fisherian hypothesis as well as Morocco. Only Ghana and South Africa did not establish a relationship between stock market return and inflation in either regime 1 or regime 2. Thus, the above results on inflation and stock market returns are mostly explained by the Gordon (1962) model and Bodie (1976) assertion. The authors state that inflation serve as a hedge against inflation and therefore investors are fully compensated for increases in prices. The negative relationship can also be explained simply because an increase in inflation decreases the purchasing power of investors who divert their funds to invest in the stock markets, which creates market pressures with the consequent fall in prices. The negative findings are consistent with authors like Ralph and Eriki (2001), Boyd, Levine and Smith (2001), Sharpe (2002), Apergis and Eleftheriou (2002), Ratanapakorn and Sharma (2007), Frimpong (2009) and Tandoh and Tewari (2011).

The conditional volatilities of interest rate were significant for most countries in the tranquil regime than the crisis state. The direction of the results is also mixed in regime 1. Whereas Cote D'Ivoire, Egypt, Mauritius and Zambia exhibit positive relationship between interest rate and stock market return, Ghana, Tunisia and Morocco record a negative relationship in the periods of economic expansion. In the crisis state, a direct relationship was established between interest rate and stock market return in ASMs, except Morocco that maintained a negative relationship in both regimes. On the contrary, Kenya, Nigeria and South Africa did not establish a significant relationship between interest rate and stock market return in both the tranquil and crisis states. Results clearly depict that in periods of crisis, an increase in interest rate immediately leads to increase in stock prices, but the results are mostly reversed in period of economic expansion, since stocks are substituted for interest bearing assets resulting in decline in stock prices. It should be noted that the positive relationship has been confirmed by few authors like Elton and Gruber (1988) and Ratanapakorn and Sharma (2007).

Exchange rate was the only variable that was established to have an impact on conditional stock returns in all the countries in the sample for at least one regime. The exchange rate variable of

Egypt, Namibia, Nigeria, South Africa and Tunisia had a significant impact in the low volatility regime, whereas exchange rate was statistically significant in the high volatilities regime in all the ASMs except Egypt and Nigeria. The sign of the coefficient of exchange rate was positive except for Egypt and Namibia in regime 1 and Morocco and Namibia in regime 2. The expected positive sign recorded indicates that there is significant impact of currency fluctuations on ASMs. As noted, depreciation of local currency will go a long way to decrease corporate profits that forms part of equity valuation. Also, profits of export oriented firms are significantly reduced when there is depreciation of the local currency. This conclusion was reached by Mukherjee and Naka (1995), Aggarwal (1981), Kyereboah-Coleman and Agyire-Tettey (2008), Frimpong (2009) and Maku and Atanda (2010).

For money supply, the impact is significant in Ghana, Egypt, Namibia and Tunisia in regime 1. In regime 2, money supply is statistically significant in Ghana, Kenya, Namibia, Nigeria and Tunisia. The sign of the coefficient of money supply is positive, except Ghana in regime 1 and regime 2 and Nigeria in regime 2. The direct relationship between conditional stock returns and the conditional money supply can be explained by the portfolio theory, as a rise in money supply leads to a portfolio change from noninterest bearing money to financial assets including equities. Also, a general increase in money supply creates excess liquidity that leads to increase in real economic activities, leading to increased earnings of firms. Hence, an increase in money supply leads to a rise in stock prices in periods of economic expansion as well as periods of crisis in African markets. A positive relationship between the two variables has also been confirmed by earlier studies like Abdullah and Hayworth (1993), Thorbecke (1997), Cheung and Lai (1999), Sellin (2001), Seyed Zamri and Yew (2011) and Maysami and Koh (2000), among others.

Finally, it was found that the conditional volatilities of Brent oil price have an impact on stock market volatilities, both in periods of low and high volatility. Only Kenya and Mauritius recorded a negligible in the crude oil variable in either regime 1 or regime 2. The sign of the coefficient was positive in all the countries except Namibia in both regimes and South Africa in regime 2. Even though African countries are a net importers of crude oil, a positive relationship was established. It was expected that since crude oil is an essential input for production, an increase in crude oil prices was expected to lower real economic activity in all sectors and a subsequent fall in stock returns. However, a positive relationship is confirmed between conditional crude oil volatilities

and conditional stock market returns volatilities. These results were also concluded by studies like Gjerde and Saettem (1999), Achsani and Strohe (2002), Basher and Sadorsky's (2006), Nandha and Faff (2008).

6.4 CHAPTER SUMMARY

This section considered the nexus between the conditional volatilities of stock market returns and macroeconomic variables for ASMs over the period of January 2003 to December 2019. Conditional volatilities were obtained from stock market returns and macroeconomic variables after estimating GARCH models. A general Markov switching model is then used to assess the link between the conditional stock market volatilities and macroeconomic volatilities. The study confirmed the existence of two regimes: an economic expansion or 'tranquil' state with less volatility and an economic decline or 'crisis' state with high volatility. It was observed that ASMs experience more extended crisis episodes than tranquil episodes. In addition, the estimated coefficients are more significant in the crisis state than in the calm state, arising interesting opportunities for prudent investors during periods of turmoil. Specifically, *Hypothesis 2* of the study was confirmed in this section. Thus, it can be concluded that macroeconomic volatilities significantly affect volatility of stock market returns in Africa. Findings of the study are consistent with macroeconomic theory and points out policy implications for policy makers.

CHAPTER SEVEN

THE IMPACT OF POLITICAL EVENTS ON STOCK MARKET VOLATILITY

7.0 INTRODUCTION

The importance of predicting stock markets returns and its volatility should not be overemphasized (Sulemana, Guptac & Balcila, 2017). However, predicting stock market fluctuations is very challenging considering the fact that it contains nonlinear components in addition to its stochastic components (Bekiros, Gupta, & Majumdar, 2016). Authors have therefore used multifactor approaches and models in predicting stock market fluctuations. Most importantly, the predictors of stock price movement consist of a mix of institutional factors, macroeconomic factors, domestic and international financial conditions, country specific risks, behavioural as well as economic uncertainties (Rapach & Zhou, 2013; Aye, Balcilar & Gupta, 2017; Sulemana, Guptac & Balcila, 2017).

The impact of political uncertainty on asset prices has recently attracted a sustained interest by academicians, policy makers and investors. It is well noted that political uncertainty is a 'prevalent phenomenon' inherent in the political process. Political uncertainty is referred as the lack of assuredness in political science literature (Bouoiyour & Selmi, 2017). Extreme volatility of stock prices after major events in recent years have led researchers to be drawn to how world events affect equity prices. This uncertainty arises because of economic agent's inability to forecast the probability of future events (Bloom, 2014; Jurado, Ludvigson & Ng, 2015). Furthermore the failure of conversional econometric models to capture all market fluctuations, led to some researchers to pay attention to political uncertainty as a possible root cause of large volatilities in equity prices. Previously other researchers had established significant stock market volatility due to political shocks (see Pástor & Veronesi, 2013; Chau, Deesomsak & Wang, 2014; Smales, 2015; Wisniewski, 2016; Liu, Shu & Wei, 2017; Selmi & Bouoiyour, 2020, among others).

This chapter examines how political events affects stock market returns within the African context. Political uncertainties are structured into events such as elections, civil uprising, regime changes, political orientation and terrorism. An event study methodology is first used to assess the influence of each political event on the abnormal stock market returns. Secondly, GARCH models are used to address how political events affects volatility of stock returns in Africa. Lastly, the overall effect of political events on annual stock returns are tested in order to answer the research questions.

Hence the study adopts robust methodology in order to assess the relationship between political uncertainties and stock market returns in Africa.

7.1 EVENT STUDY METHODOLOGY

An event study is a statistical tool used to measure the impact of an economic event on the value of firms (MacKinlay, 1997). Event studies are mostly used to infer how an economic activity are immediately reflected in security prices. This is normally observed in a relatively short time in contrast with other determinants of stock prices which requires a longer period of observations. The first known use of event study in finance is Fama *et al*. (1969) study to analyze the effect of stock splits on the reaction of stock markets. This study basically observes how information flow to investors immediately have influence on stock price movements. Event study is now widely used in finance, economics, accounting, law and was extended to various disciplines that assess how 'events' influence changes in certain sensitive variables.

The event study methodology is based on certain assumptions that must be met before its application. First, the events under consideration should be of importance to the firm and its shareholders, as well as understandable to the market participants so they can estimate its price movements and performance implications. Second, occurrence of the economic event must release new information to the market. Third, the economic event must be unexpected and thus not taken into account by participants in pricing. Fourth, the stock market must exhibit some form of market efficiency that allows for a timely capitalisation process. Fifth, no other events should cause stock price movements during the event window (Fama *et al.*, 1969; Bromiley, Govekar and Marcus, 1988; Brown and Warner, 1980; MacKinlay, 1997; Oler, Harrison and Allen, 2008; Schimmer, Levchenko, and Müller, 2014). Also, Peterson (1989) exerts that stock must be traded in significant volumes to avoid distortions in stock price movements. According to Schimmer, Levchenko, and Müller (2014), these assumptions raise significant questions that the researcher must answer, such as: Are the stock being analysed traded frequently? Is there a reference index that represents the market being analysed? Does the market exhibit significant volume of trading? Does the date of the series of stock prices match the event window? Do we have information leakage prior to the event window? Could another event apart from the event being analysed responsible for stock price movements? Has there been a change in the relationship between the reference index and the stock price over the estimation period?

7.1.1 EVENT STUDY PROCEDURE

When conducting an event study, an analysis procedure must be followed. The first step is to describe certain specific *event(s)* that are of interest to the researcher and the time in which the events occur. The next is to identify the time period in which the security prices will be studied, namely the – *event window*-. The event window is normally larger than the event date in order to examine in detail the period surrounding the occurrence of the event of interest. In practice, the period of interest is expanded to multiple of days including at least a day before and after the event day. After selecting the event date and event window, it is important to select *firms or indexes* that will be included in the study. The sampling process will introduce biases base on factors like market capitalisation, industry representation and distribution of events periods (MacKinlay, 1997).

7.1.2 MODELS FOR ESTIMATING NORMAL RETURNS

There are several models for measuring the normal return of a security. These models can be classified into two general categories: statistical and economic models.

7.1.2.1 Statistical models

These models follow statistical assumptions concerning the characteristics of security returns, without taking into account economic arguments. Statistical models assume that asset returns are jointly multivariate and *iid* (independent and identically distributed) through time. These assumptions are sufficient for statistical models to be specified correctly. According to MacKinlay (1997), the distributional assumption is empirically reasonable and inferences are robust from deviations. In addition, statistical models can easily be adjusted to correct for any autocorrelation or heteroscedascity that is associated with abnormal returns when using generalized method-of moments approach.

1. Constant Mean Return Model

The simplest model is the constant mean model given by:

$$R_{i,t} = \mu_i + \zeta_{i,t} \qquad \textbf{(7.1)}$$

where μ_i is the mean return for asset *i* and $\zeta_{i,t}$ is the disturbance term for asset *i* for time *t*. The disturbance term is assumed to have expected mean of zero and a constant variance.

In all its simplicity the constant mean model often yields results consistent with the sophisticated models (Brown and Warner, 1980). The lack of sensitivity of this model is attributed to the fact that the variance of abnormal return is normally not reduced by selecting complex model. The constant mean model is applied to nominal returns in daily data but can also be applied to excess returns, real returns or nominal returns in a monthly data (MacKinlay, 1997).

2. Market Model

The market model relates the normal return of an asset to the market portfolios' return. Therefore this model takes into account the sensitivity of individual firms to systematic risk. The market model also follows the joint normality of asset returns and is represented by:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \qquad \textbf{(7.2)}$$

where $R_{m,t}$ is the return of the market portfolio and $\varepsilon_{i,t}$ is the disturbance term with an expected mean of zero and a constant variance. α_i and β_i are the parameters to be estimated in the market model.

This model is widely used and accepted as the standard model in estimating normal returns. This is an improvement in the constant mean return model in the sense that by eliminating the part of the return that is associated with the market return, the variance in the abnormal return is greatly reduced. However, its limitation is that it assumes that the risk-free rate or the α_i term does not vary, which contradicts the presumption that market returns change over time (Schimmer, Levchenko & Müller, 2014).

3. Market Adjusted Model

The market adjusted model assumes that expected return of an asset equals the return of the market index. Hence, this model does not take into account the idiosyncratic risk of the firm. In the market adjusted model, the market return observed in time *t* is subtracted from the firm return. This is simply given as:

$$AR_{i,t} = R_{i,t} - R_{m,t} \qquad \textbf{(7.3)}$$

4. Other Statistical Models

There exists a number of statistical models proposed for modelling normal returns based on certain factors. A general type is the *factor model*. This model is based on reducing variance in the abnormal returns by highlighting the variation in the normal returns. These factors are portfolios

containing securities traded on the market. Technically speaking the market model and market adjusted model are examples of one factor model. There are other models that considers multiple factors known as the multifactor models, which are not normally used in event studies. According to Brown and Warner (1980) and MacKinlay (1997) little benefits are accrued when we employ multifactor models other than the market model in event studies. This is because the marginal explanatory power of factors in addition to the market factor is relatively small (MacKinlay, 1997).

7.1.2.2 Economic models

In these models, assumptions are fully based on of investor's behaviour with no reference to statistical assumptions. In practice, statistical assumptions are combined with economic models in their estimations. Besides, economic models provide the opportunity to make accurate estimates under economic restrictions, which is an advantage over statistical models. Two common economic models for modelling normal returns are the CAPM and the APT.

1. Capital Asset Pricing Model (CAPM)

The CAPM introduced by Sharpe (1964) is an equilibrium theory in which the expected return of a security is related to its covariance with the portfolio of the market. The model includes specific risk-free rate in the estimation of the market model. This is represented by

$$R_{i,t} = \alpha_i + \beta_i\left(R_{m,t} - R_f\right) \qquad \textbf{(7.4)}$$

where R_f is the risk free rate and β_i is a factor that measures the sensitivity of an asset with respect to the market risk.

This model was used extensively in event studies during the 1970s until certain weaknesses related to the validity of the restrictions imposed by CAPM on the market model. The beta of a firm assumption has come under several criticism. It is suggested that the beta only provides an imperfect correlation to market risk and α_i parameter is deemed as biased for post-event predictions. Even though there are weaknesses in the CAPM model, it is an improvement of the market model although its sensitivity makes it problematic.

2. Arbitrage Pricing Model (APT)

The APT model proposed by Ross (1976) is an asset pricing model that argues that expected return of an asset is a linear relationship between a range of risk factors. Hence APT is a multifactor

model which has motivated several other studies. The general principle is that the multiple factors included in APT reduces the variance of the abnormal return while increasing the explained normal return. Specifically in APT model, the main factor acts like the market factor while the other factors add additional explanatory power to the model. As noted earlier, these gains are relatively small (Brown and Warner, 1980; MacKinlay, 1997). The main potential benefit of the APT model is the elimination of biases imposed by the CAPM. However, the statistical models also remove these biases, making them frequently used models in event studies. Recently, the Fama-French 3 Factor Model and the Fama-French-Momentum 4 Factor Model are multifactor models frequently applied in event studies.

7.1.3 MODELS FOR ESTIMATING ABNORMAL RETURNS

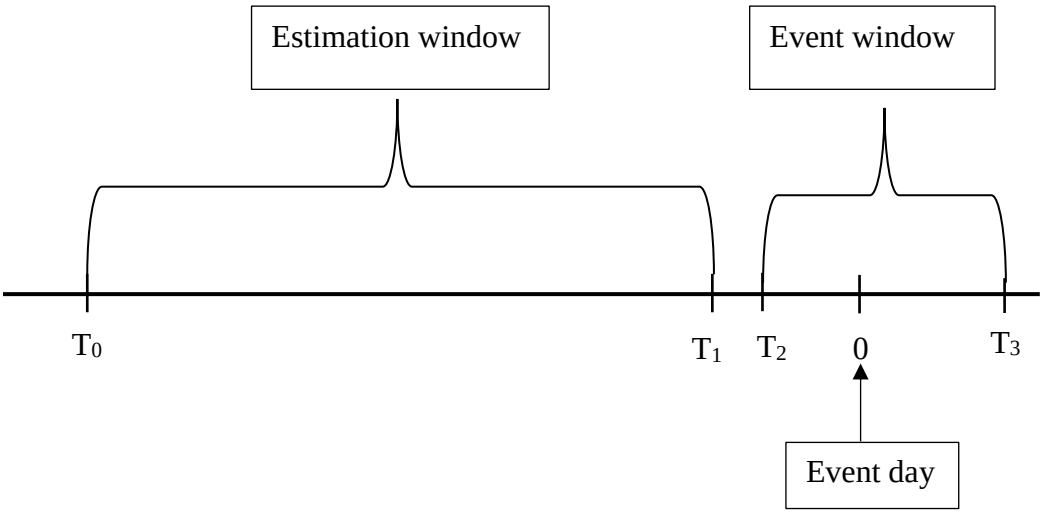
In order to assess the impact of the event, it is necessary to estimate an *abnormal return*. The abnormal returns are just the deviations of expected returns from actual returns of the security prices under consideration. This can be represented as:

$$AR_{i,t} = R_{i,t} - E\left|R_{i,t}\right| \qquad \textbf{(7.5)}$$

where $AR_{i,t}$, $R_{i,t}$ and $E\left|R_{i,t}\right|$ are abnormal returns, actual returns and expected returns respectively for time period t.

There are several options for modelling the expected returns, as shown above. This study adopts the market model to estimate the normal returns of ASMs. Equation 7.2 is estimated under the general conditions of OLS. After selecting a modelling option for expected returns, the next decision is to set the *estimation window*, which is the period considered in estimating the normal returns without the influence of the event. The period chosen for the estimation window does not include the occurrence of the event in order to avoid any biased estimation. The most preferred option is to select estimation period prior to the event date (MacKinlay, 1997). Below is a simplified representation of dates in event study.

Figure 7.1: Event Study Windows



Source: Adapted from MacKinlay (1997)

Where '0' is the event day, T_1-T_0 is the estimation window, which provides the time frame to estimate the normal return before the event days being monitored and T_2-T_3 is the actual event window under observation, which is expected to capture the abnormal returns as a result of the event. Typically, the estimation window and the event window do not overlap so that the estimation period captures only normal returns that is not influenced by returns around the event date. The post event period is the period beyond T_3 which captures the normal returns after the event period.

Each return is indexed with the event date defined as t = 0, the length of the estimation period being T_1-T_0 and the event days as T_2-T_3. The estimates of the market model are measured to enable us to analyse the abnormal returns. Hence the abnormal return is computed as:

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t}) \quad \textbf{(7.6)}$$

where $R_{i,t}$ represents the actual return recorded in country i at day t and $(\alpha_i + \beta_i R_{m,t})$ is the expected return estimated with the market model assuming expected mean of zero and a constant variance. The abnormal returns from the event study may be used as a dependent variable in a regression analysis or simply, a hypothesis testing is applied to determine whether the abnormal effects emanating from the events are significantly different from zero. In this study, the following hypothesis will be tested: the event window has no abnormal returns, which is the null hypothesis;

compared to the alternative hypothesis that the event window has an abnormal returns. This can be represented as follows:

$$H_0: \mu = 0$$

$$H_1: \mu \neq 0$$

Significance tests are then used to determine which hypothesis to be rejected. A t-statistic is calculated for each asset and for each day in the event window. This is given as:

$$t_{AR_t} = \frac{AR_t}{SE_{AR}} \quad \textbf{(7.7)}$$

where AR_t is the average abnormal return and SE_{AR} is the standard error from the regression residuals. This is the standard deviation of the abnormal returns in the estimation window.

The abnormal returns generated from the event study are cumulated over time as Cumulative Abnormal Returns (CARs). Hence the CAR is just the aggregation of the individual ARs:

$$CAR = \sum_{T_3}^{T_2} AR_t \quad \textbf{(7.8)}$$

Thus, the corresponding t-statistic is given by:

$$t_{CAR_t} = \frac{CAR_t}{SE_{CAR}} \quad \textbf{(7.9)}$$

Where SE_{CAR} represents the standard deviation of the cummulated abnormal returns computed as the product of SE_{AR} and number of days in the event period (Mackinlay, 1997).

The significance tests in this study comprise of both parametric (Patell test and Cross-Sectional test) and non-parametric (Generalized rank test) tests[22]. Whilst the parametric assumes abnormal returns of the firms are normally distributed, the non-parametric test are independent from assumptions of normal distributions. In order to achieve robust results, researchers normally complement parametric with non-parametric test to mitigate outliers that may be present in the data (Schipper and Smith, 1983; MacKinlay, 1997; Schimmer, Levchenko and Müller, 2014).

[22] Schimmer Levchenko, and Müller (2014) provides a comprehensive representation the various significance test (both parametric and non-parametric) giving its assumptions, pros and cons.

In a series of related events, an average of the cumulated abnormal returns are estimated, which are known as Cumulative Average Abnormal Returns (CAARs). The purpose of this analysis is to determine whether the combined effect of the assets was significantly affected by the event. This can be represented as:

$$CAAR = \frac{1}{N}\sum_{i=1}^{N} CAR_i \qquad \textbf{(7.10)}$$

where *i* represents the individual asset or each defined event. For example, the corresponding cross-sectional t-statistic is given by:

$$t_{CAAR_t} = \sqrt{N}\frac{CAAR_t}{SE_{CAAR}} \qquad \textbf{(7.11)}$$

SE_{CAAR} is the standard deviation of the cummulated average abnormal returns computed as

$$SE_{CAAR}{}^2 = \frac{1}{N-1}\sum_{i=1}^{N}(CAR_i - CAAR_t)^2 \qquad \textbf{(7.12)}$$

(Schimmer, Levchenko and Müller, 2014).

7.2 DATA SOURCES AND DESCRIPTIVE STATISTICS

Data used are daily stock prices spanning from 2 January 2002 to 19 December 2019, which total 4695 observations. This duration enabled the researcher to observe enough political events necessary to reach adequate conclusions. The data are sourced from DataStream. Specifically, nine largest African stock markets (Botswana, Egypt, Ghana, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia) were used. To eliminate the effect of non-trading days and holidays in the study, we dropped all data points that contained missing values.

Figure 7.2 provides a diagrammatic representation of the fluctuations of the ASMs indices over time. It is observed that prices exhibited short but frequent fluctuations with minimal incidence of structural breaks during the sample period. Overall, the indices assumes upward and downward trends over time. The plots show the presence of stochastic trends. Therefore all the variables in

Figure 7.2: Time Plots of Daily African Stock Market Prices

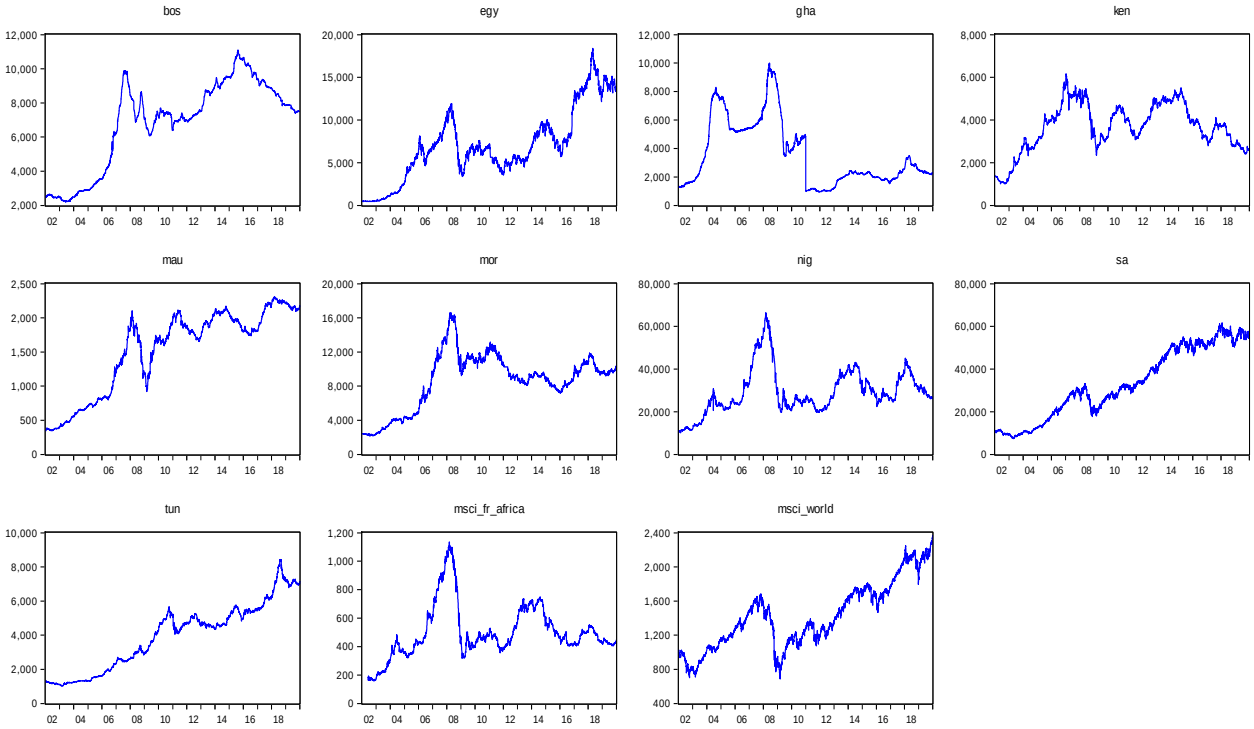
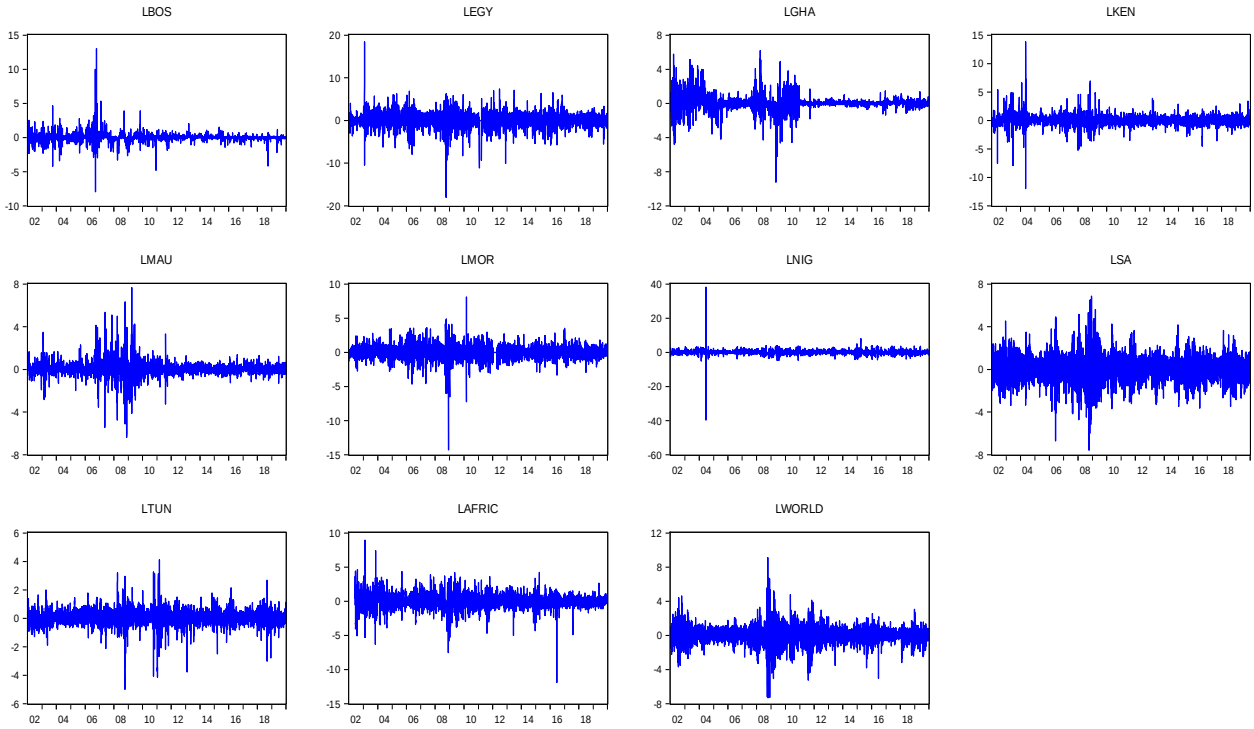


Figure 7.3: Time plots of daily African stock market returns



their log levels are non-stationary as changing means and variances could be observed and thus integrated of order one, I (1).

Figure 7.3 provides a diagrammatic representation of the fluctuations of ASM returns over time. The mean-reverting characteristic depicted by the return series is indicative of the possibility of volatility clustering of the returns. From the graph, the plots of all the returns do not appear to have trend. It can then be suggested that the first difference of the variables exhibit some stationary trend and thus integrated of order zero I (0) hence suitable for the estimation. As noted earlier, time series plots are not conclusive in determining the stationarity of the return series, hence formal unit root was carried out in addition to the line plots.

Table 7.1 presents a summary of descriptive statistics of the indices used in the study. The mean-to-median ratio of the indices is approximately 1. This explains the reason for the low standard deviations in all the indices. The coefficients of skewness are low with both positively and negatively skewed indices. The positive skewness means that the data distribution has a long right tail and vice versa. The value of kurtosis for most of the indices are below the benchmark for normal distribution of 3, suggesting the distribution is flat (platykurtic) relative to the normal. The exceptions are Ghana, Nigeria and the MSCI for Africa. The Augmented Dickey-Fuller (ADF) tests of all the indices are non-stationary since the test statistics are greater than the critical values. The ARCH test was significant in all the indices, which suggest that temporal dependencies in higher moment exist in the series. Hence in modelling the data, ARCH models will be preferred to simple models like ARMA.

Table 7.1: Descriptive Statistics of Daily Africa Stock Indices

Index	Mean	STD	Skewness	Kurtosis	Jarque-Bera	ADF @ 1%	ARCH test
Botswana	6854.4	2578.1	-0.5815	2.0666	435.01	-1.71(0.43)	68.32(0.00)
Egypt	7029.8	4206.4	0.4550	2.6435	186.85	-0.97(0.77)	182.6(0.00)
Ghana	5500.3	1662.9	-0.5195	4.0287	418.21	-2.76(0.06)	9.260(0.00)
Kenya	3682.2	1112.2	-0.4079	2.7190	145.65	-2.08 (0.25)	951.6(0.00)
Mauritius	1523.8	611.63	-0.6695	1.9702	558.23	-1.63(0.47)	1125(0.00)
Morocco	8629.1	3317.5	-0.3322	2.5992	117.78	-1.81(0.37)	84.27(0.00)
Nigeria	29329	10699	0.8923	4.0203	826.63	-2.00(0.29)	1175(0.00)
South Africa	33394	16472	0.0346	1.6503	357.29	-0.71(0.84)	125.2(0.00)
Tunisia	3944.8	1959.1	0.0450	1.9492	217.59	-0.10(0.95)	1170(0.00)
Africa	501.69	187.58	1.0460	4.4068	1214.9	-1.96 (0.31)	374.8(0.00)
World	1425.4	390.88	0.3166	2.2432	190.49	-0.25(0.93)	144.7(0.00)

Table 7.2: Descriptive Statistics of Daily Stock Returns

Index	Mean	STD	Skewness	Kurtosis	Jarque-Bera	ADF @ 1%	ARCH test
Botswana	0.0238	0.5065	4.6697	154.46	4503859	-10.48 (0.00)	87.33 (0.00)
Egypt	0.0711	1.5872	-0.4500	14.348	25345.88	-58.13 (0.00)	394.8 (0.00)
Ghana	0.0122	2.4500	-57.284	3698.0	2.67E+09	-68.43 (0.00)	0.000 (0.98)
Kenya	0.0143	0.8858	0.3117	34.731	196999.8	-38.09 (0.00)	543.9 (0.00)
Mauritius	0.0395	0.6170	0.3055	29.416	136554.7	-29.05 (0.00)	871.9 (0.00)
Morocco	0.0305	0.8974	-1.029	22.725	76928.73	-59.14 (0.00)	86.62 (0.00)
Nigeria	0.0192	1.2790	-0.6097	367.10	25928048	-42.97 (0.00)	1198 (0.00)
South Africa	0.0357	1.1354	-0.1473	6.7309	2739.392	-66.86 (0.00)	181.9 (0.00)
Tunisia	0.0369	0.5049	-0.4659	15.145	29017.19	-40.20 (0.00)	1208 (0.00)
Africa	0.0222	1.0097	-0.4326	12.626	17852.53	-47.17 (0.00)	153.0 (0.00)
World	0.0181	0.9734	-0.4277	12.132	16453.12	-48.12 (0.00)	208.8 (0.00)

Table 7.2 presents the mean daily index returns of the series. As expected, the mean of the returns is close to zero. The high standard deviation is indicative of high volatility in the Africa market returns and the risky nature of the market. There is also both positive and negative skewness. Thus, the data distribution has different tails, indicating that returns are both symmetric and asymmetric. Also, the kurtosis is very large, greater than the normal value of 3, which indicates a leptokurtic distribution. This shows that the indices exhibit high peakedness in their distribution. The skewness and kurtosis show how the equity returns deviate from the normality assumption. The ADF test determines possible unit roots in the return series. The high absolute ADF tests statistic above the critical values suggest stationarity at the 1% level of significance. The ARCH test is significant in all the return series, thus justifying the use of ARCH models.

7.3 ELECTIONS AND STOCK MARKET RETURNS

Table 7.3 presents a summary of the sample of countries and each one of the elections used in the study. This table distinguishes between countries with presidential and parliamentary elections, which are crucial events in determining the political atmosphere of that country. The difference in the type of elections is relevant since countries in the sample have heterogeneous political system with different constitutional features. The countries with presidential systems have a president as both the head of state and head of government. On the other hand, a country with parliamentary system has a prime minister as the head of government and a monarch or a president as the head of state. The monarch or president in the parliamentary system is usually merely

symbolic. From that table, most of African countries elections are presidential or somewhat presidential in nature. Parliamentary system of elections is recorded in Botswana and Mauritius. The rest of the countries in the sample uses presidential system of elections.

Table 7.3: Election Events Used in the Study

Country	Election type	First election included	Last election included	Number of elections
Botswana	Parliamentary	30-Oct-04	23-Oct-19	4
Egypt	Presidential	07-Sep-05	26-Mar-18	5
Ghana	Presidential	07-Dec-04	07-Dec-16	4
Kenya	Presidential	27-Dec-02	08-Aug-17	4
Mauritius	Parliamentary	03-Jul-05	07-Nov-19	4
Morocco	Presidential	27-Sep-02	07-Oct-16	4
Nigeria	Presidential	19-Apr-04	23-Feb-19	5
S. Africa	Presidential	14-Apr-04	08-May-19	4
Tunisia	Presidential	25-Oct-04	15-Sep-19	4

7.3.1 EVENT STUDY RESULTS OF ELECTIONS AND STOCK RETURNS

In order to understand the impact of elections on ASMs, an event study methodology was applied. Event study attempts to measure the response of the stock prices to unanticipated events. The event study monitors the appearance of abnormal stock returns caused by the analysed event(s). This is precisely what is suggested by the EMH, which states that current prices fully reflect all available information underlying the value of an asset. Hence, new information is fully and swiftly reflected in current price of the asset. Changes in asset prices therefore emanates from new relevant information that is released on the market. The new information is immediately transmitted and reacted to by market participants. Since political events such as elections can significantly affect stock prices, it is important to capture how sensitive ASMs react to these events.

The event study results are presented below. First the UIH by Brown et al. (1988) is tested on ASMs. From UIH, stock returns are dependent on the uncertainty of market players about an event. Higher returns are observed when there is no event-induced uncertainty. Also, positive returns are recorded when uncertainty is resolved (for example when elections results are confirmed or results are announced). Again, the stock market needs time to re-adjust the elections results before returning to its normal or stable state. Hence, higher positive returns should be expected when uncertainties are greatly reduced.

Figure 7.4: Cumulated Average Abnormal Returns of ASMs over a 21-Day Window

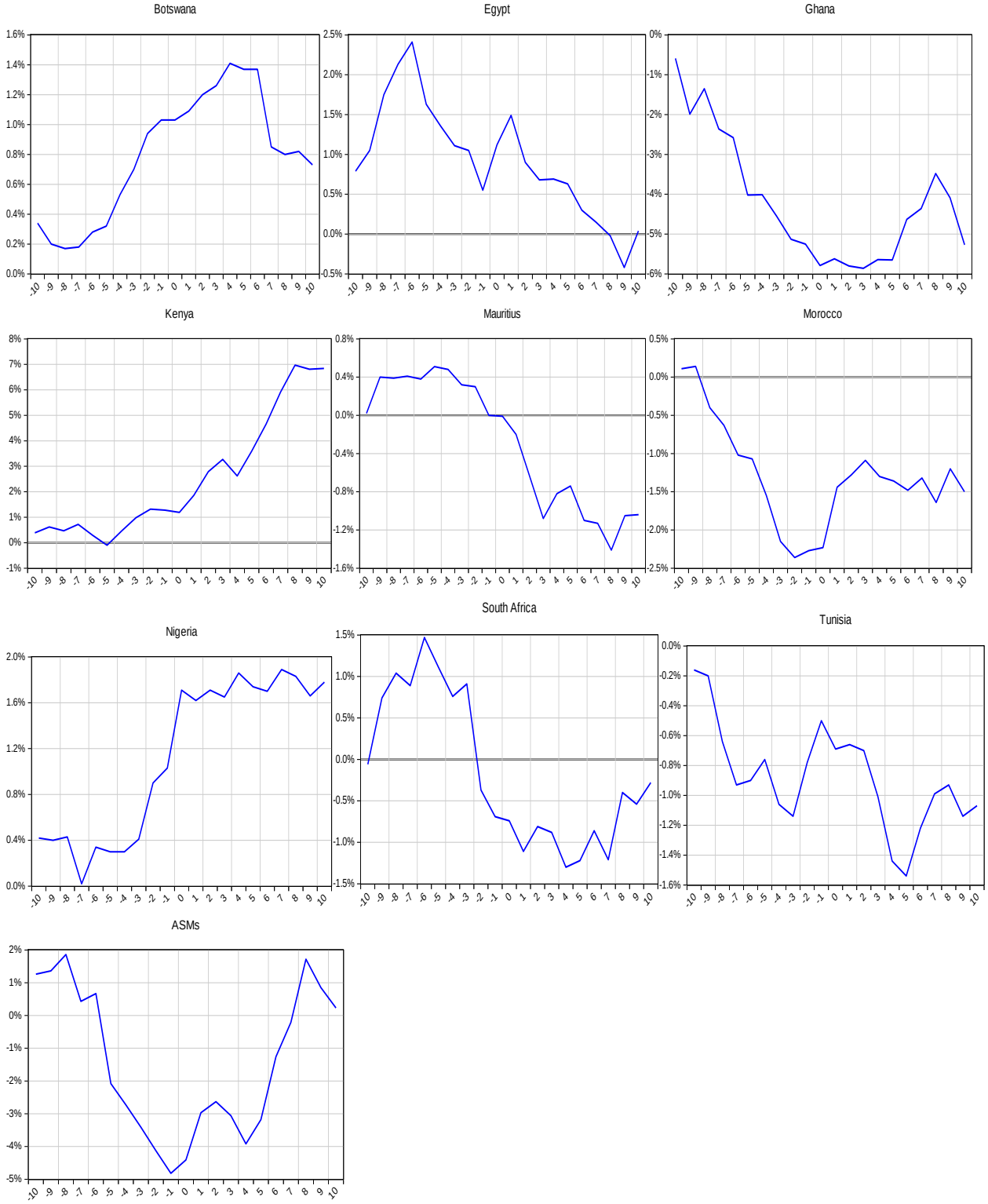


Figure 7.4 depicts cumulated average abnormal returns of ASMs over a 21-day event window. This event window extends from 10 days before the event to 10 days after the event. It indicates the responses of ASMs prior to Election Day, on Election Day and after election outcomes are known. From the figure, ASMs assume positive abnormal returns prior to Election Day (except Ghana and Tunisia). There is however a sharp decline towards the Election Day in most ASMs indicating information uncertainty. The exceptions are Botswana, Nigeria and Kenya; which have a positive trend towards Election Day. The sharp decline in abnormal returns is however reversed from 3 to 5 days, except Egypt and Mauritius that take approximately 8 days. This shows that resolution of uncertainty in elections are resolved for ASMs after a week when elections outcomes are known. Hence the findings of the event study of elections in ASMs shows that the CAR performance are in line with the UIH hypothesis. On the contrary, the abnormal returns of Bostwana and Egypt elections depicts overreaction to good news where stock prices increase and fall sharply at the initial instance of election day, but moves in opposite direction in the next period. On the other hand, elections in Nigeria are consistent with the EMH; while Kenya elections reflects that of underreaction to good news, where prices move swiftly after an event. From the pooled sample results of ASMs, it can be seen that positive stock returns are recorded prior to Election Day and then a sharp decline after election period. However, a higher increase in abnormal returns after the 4th day confirms the UH.

7.3.1.1 Elections and Stock Returns in Botswana

Appendix 6 presents the individual average abnormal returns of each day in the 21 days event window. Only 5 out of the 21 days show negative abnormal returns. This suggests positive abnormal returns are associated with elections in Botswana. However, the test statistics proved that only day -3, -2, 1, 7 and 10 shows significant abnormal returns. Whilst day -3, -2 and 1 shows positive significant abnormal returns, day 7 and 10 shows positive significant returns. When compared with the cumulative abnormal returns for different event window (Table 7.4), it became clear that the null hypothesis of no abnormal returns in the event window cannot be rejected for Botswana. Hence the UIH was not confirmed for elections in Botswana.

Table 7.4: Elections in Botswana CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	Pos:Neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	0.44%	0.003	3:1	4	0.720	1.409	0.826
(-5,5)	1.10%	0.008	3:1	4	1.237	1.626	0.695
(-10,10)	0.74%	0.005	2:2	4	0.637	1.067	-0.318
(-15,15)	1.88%	0.015	3:1	4	1.455	1.451	0.695
(-20,20)	1.90%	0.016	2:2	4	1.544	0.839	-0.201

7.3.1.2 Elections and Stock Returns in Egypt

Results for the average abnormal returns for event window [-10, 10] for Egypt are reported in Appendix 6. Positive abnormal returns are recorded from day -10 but decreases sharply to negative abnormal returns from day -5 onwards. Only the event day as well as day 1, 4 and 10 recorded positive abnormal returns from the day -5 onwards. From the significance test, only the parametric cross-sectional test was significance for day -10 and -5. Table 7.5 presents the CAAR of different event windows. Results from the significant tests shows that none of the event windows' CAAR are significantly different from zero. Hence the null hypothesis of no abnormal returns in the event cannot be rejected.

Table 7.5: Elections in Egypt CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	-0.22%	-0.001	3:2	5	-0.088	-0.412	0.485
(-5,5)	-1.78%	-0.013	1:4	5	-0.653	-1.531	-1.304
(-10,10)	0.02%	0.008	3:2	5	0.294	0.009	0.485
(-15,15)	1.31%	0.029	3:2	5	0.897	0.395	0.485
(-20,20)	-1.17%	0.011	2:3	5	0.283	-0.226	-0.409

7.3.1.3 Elections and Stock Returns in Ghana

Appendix 6 and 7.7 presents the Average Abnormal Returns (AAR) of event window [-10, 10] and CAAR of event windows for various lengths of elections in Ghana. From the AAR table, only six days shows positive average abnormal returns. This indicates that elections in Ghana are associated with negative returns. From the significance test, 5 days before and after elections are mostly significant except the Election Day and day -2. This suggests a longer periods before and after elections in Ghana has a significant impact on stock returns. This is confirmed by the CAAR

table where Patell test was significant for the [-15,15] and [-20,20] event windows. Hence negative abnormal returns are associated with elections in Ghana when the time for evaluation is longer.

Table 7.6: Elections in Ghana CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	-1.25%	-0.005	1:3	4	-0.595	-1.186	-0.815
(-5,5)	-3.08%	-0.017	2:2	4	-1.359	-1.415	0.189
(-10,10)	-5.26%	-0.024	2:2	4	-1.459	-1.210	0.189
(-15,15)	-8.23%	-0.043	2:2	4	-2.132***	-1.436	0.189
(-20,20)	-10.37%	-0.053	2:2	4	-2.284***	-1.421	0.189

7.3.1.4 Elections and Stock Returns in Kenya

From Appendix 6, the average abnormal returns associated with Kenya elections are mostly positive except seven days in the 21 event window. A significant number of days in the event window have significant average abnormal returns. These are day -6,-4, 1, 2, 3, 5, 6, 7 and 8. All of these shows positive AAR except day -6.

Also, the CAAR table of different event windows (longer and shorter) are all significant with a high positive CAAR value. Hence the null hypothesis of no abnormal returns in the event window can be successfully rejected. As such it can be suggested that elections in Kenya are associated with positive abnormal returns. The high positive CAAR results further confirm the UH hypothesis.

Table 7.7: Elections in Kenya CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	1.81%	0.018	5:0	5	2.653***	1.945*	2.289***
(-5,5)	3.29%	0.038	4:1	5	3.762***	1.774*	1.394
(-10,10)	6.83%	0.064	5:0	5	4.604***	1.407	2.289***
(-15,15)	6.21%	0.059	3:2	5	3.513***	1.346	0.500
(-20,20)	8.43%	0.086	4:1	5	4.415***	1.524	1.394

7.3.1.5 Elections and Stock Returns in Mauritius

From Appendix 6, the AAR due to elections in Mauritius are mostly negative. Only six out of the 21 days reported a positive AAR. The parametric and non-parametric tests however confirmed

three days (Day -9, -1 and 2) to have a significant AAR. From the significance test it can be inferred that a positive AAR recorded nine days prior to elections significantly falls until the Election Day up to two days after elections. Table 7.8 confirmed that CAAR of the shorter event window [-2, 2] are significant. This shows that a negative abnormal return is associated with elections in Mauritius during the 2 days before and after elections. UIH is also rejected in elections in Mauritius.

Table 7.8: Elections in Mauritius CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	-0.96%	-0.007	1:3	4	-1.883*	-2.128***	-0.894
(-5,5)	-1.12%	-0.005	1:3	4	-0.867	-0.987	-0.894
(-10,10)	-1.03%	-0.002	2:2	4	-0.252	-0.660	0.108
(-15,15)	-1.56%	-0.006	2:2	4	-0.614	-0.843	0.108
(-20,20)	-1.36%	-0.005	2:2	4	-0.518	-0.721	0.108

7.3.1.6 Elections and Stock Returns in Morocco

Results from AAR associated with Morocco elections in Appendix 6 indicate that both positive and negative AAR are evenly recorded. From the significance test, six days out of the 21 days were significantly different from zero using the cross-sectional test and generalized rank test. These are days -8, -6, -4, -3, 1 and 8. All the significant AAR were negative except day 1. From the significance test, only the Cross-Sectional test was significance for event window [-15, 15] with a negative CAAR value of 3.5%. This indicates that a negative abnormal return is associated with elections in Morocco rejecting the UIH.

Table 7.9: Elections in Morocco CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	0.86%	0.010	3:1	4	1.010	1.246	1.059
(-5,5)	-0.36%	-0.002	1:3	4	-0.113	-0.593	-0.942
(-10,10)	-1.52%	-0.013	2:2	4	-0.605	-1.219	0.058
(-15,15)	-3.50%	-0.028	1:3	4	-1.124	-2.130**	-0.942
(-20,20)	-2.42%	-0.019	2:2	4	-0.665	-1.156	0.058

7.3.1.7 Elections and Stock Returns in Nigeria

From Appendix 6, the AAR associated with Nigeria elections are mixed. However, only the parametric test confirmed significant AAR for days -10, -7, -6, -2, 0 and 2. All these have positive AAR. Also the CAAR for different event windows confirmed only event window [-2, 2] to be significant. A CAAR value of 1.3% suggests positive abnormal returns are associated with elections in Nigeria when the periods are short.

Table 7.10: Elections in Nigeria CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	1.30%	0.011	3:2	5	1.646*	0.782	0.531
(-5,5)	1.41%	0.012	3:02	5	1.214	0.819	0.531
(-10,10)	1.78%	0.016	4:1	5	1.179	0.961	1.426
(-15,15)	0.96%	0.008	4:1	5	0.477	0.559	1.426
(-20,20)	0.89%	0.008	3:2	5	0.392	0.457	0.531

7.3.1.8 Elections and Stock Returns in South Africa

Appendix 6 and 7.11 presents the AAR of event [-10, 10] and CAAR of event windows of various lengths of elections in South Africa. Appendix 6 shows that AAR are both positive and negative for South Africa. However, only event days -5, -2, 0 and 7 are significantly different from zero. The significant AAR are all negative. Also, Table 7.11 confirmed that CAAR of the shorter event windows [-2, 2] and [-5, 5] are significant with negative CAAR value. This indicates that a negative abnormal return is associated with elections in South Africa during the 5 days before and after elections.

Table 7.11: Elections in South Africa CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	-1.72%	-0.018	0:4	4	-1.429	-2.146***	-1.977**
(-5,5)	-2.69%	-0.023	1:3	4	-1.233	-2.523***	-0.977
(-10,10)	-0.30%	-0.014	2:2	4	-0.550	-0.105	0.023
(-15,15)	-1.21%	-0.021	2:2	4	-0.668	-0.453	0.023
(-20,20)	-1.22%	-0.027	1:3	4	-0.715	-0.312	-0.977

7.3.1.8 Elections and Stock Returns in Tunisia

From Appendix 6, the AAR due to elections in Tunisia are mixed. The parametric and non-parametric tests however confirmed days -10, -8, -7, -2,-1, 4, 6, 7 and 9 to have a significant AAR. All the significant AAR have negative values except days 2, 6 and 7. This shows elections in Tunisia are mostly associated with negative equity returns. However, this was contradicted by the CAAR results. All the event windows' CAAR except [20, 20] were not significantly different from zero. The CARR value of [20, 20] is 1.43% which is consistent with the UIH. Thus, elections outcome resolves uncertainty in stock returns in the [20, 20] event window.

Table 7.12: Elections in Tunisia CAAR over different Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	0.44%	0.006	2:2	4	1.414	1.439	0.119
(-5,5)	-0.64%	0.002	2:2	4	0.350	-0.430	0.119
(-10,10)	-1.08%	-0.005	1:3	4	-0.549	-1.010	-0.882
(-15,15)	-0.45%	-0.003	1:3	4	-0.230	-0.678	-0.882
(-20,20)	1.43%	0.023	3:1	4	1.789*	0.722	1.121

7.3.2 REGRESSION-BASED APPROACH OF ELECTIONS AND STOCK RETURNS

Following a regression-based approach of Abidin, Old and Martin (2010) and Liew and Rowland (2016), the before and after elections effect on ASMs returns were investigated. This involves estimating the following equation:

$$r_t = \mu + \beta_1 B_t + \beta_2 A_t + \varepsilon_t \quad \textbf{(7.13)}$$

Where B_t and A_t represents before and after election dummy variables. The dummy variable takes a value of 1 for N trading days before and after elections and 0 otherwise. The number of trading days used in the study are 15, 30, 60 and 90 days. In order to determine whether daily stock returns in Africa can be linked to elections, Equation 7.13[23] is estimated for the different trading days windows (15, 30, 60 and 90). A significant $\beta_1$and β_2 implies elections have a significant on ASM returns before or after the elections. Similarly, if none of the estimated coefficients are significant then general elections do not affect stock market returns in Africa.

[23] Note: All regressions in this section are adjusted for heteroscedasticity bias by using HAC option in the OLS estimations

Also, macroeconomic variables and MSCI Frontier Markets Africa Index, a proxy representing Africa stock market index, are included as control variables. Thus, Equation 7.13 can be extended as:

$$r_t = \mu + \beta_1 Africa\ stock\ return + \beta_2 Exchange\ rate + \beta_3 Interest\ rate + \beta_4 CPI + \beta_5 GDP + \beta_6 B_t + \beta_7 A_t + \varepsilon_t \quad \textbf{(7.14)}$$

Where Africa stock return is the log difference of MSCI Frontier Markets Africa Index, Exchange rate is the local currency exchanged per USD, interest rate is the Treasury bill rate, CPI is the consumer price index and GDP is the gross domestic product of the respective African country. The CPI data are in monthly series whilst the GDP are annual. The rest are daily data.

7.3.2.1 Before and After Election effect in Botswana

Results for before and after election effect for Botswana is presented in Table 7.13. From this table, election effect is confirmed for all elections in Botswana. Hence before and after elections periods have a significant effect on Botswana daily stock returns. The effect however is different for each election. Whereas the impact of before elections is positive for 2009 and 2019 elections, the after elections effect is negative for 2004 and 2014 and positive for 2009 and 2019. Also, the duration differs in all the elections. The 15 and 30 days trading window are significant for 2009, 2014 and 2019, the 60 days trading is significant for 2004, 2009 and 2014 whilst the 90 days trading window is significant for 2009 and 2014. Hence on the average, election effect in Botswana last for at least 60 days either before or after general elections.

Table 7.13: General Election Effect in Botswana

N	2004			2009			2014			2019		
	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2
15	0.04	-0.03	-0.05	0.06	0.02	0.19	0.04	0.02	-0.08	-0.04	0.10	0.04
	2.62**	-0.68	-0.84	2.03**	0.14	1.65*	3.77***	0.54	-4.00***	-1.79*	2.06**	1.94*
30	0.05	-0.02	-0.05	0.04	0.07	0.17	0.05	0.00	-0.07	-0.05	0.09	0.04
	2.79**	-0.29	-0.92	1.26	0.77	1.70*	3.72***	0.16	-3.24***	-1.85*	2.61**	1.54
60	0.06	-0.04	-0.07	0.04	0.12	-0.00	0.06	-0.00	-0.07	-0.03	0.02	
	2.99**	-0.10	-2.03**	1.06	1.94*	0.99	3.73***	-0.11	-3.51***	-1.37	1.54	
90	0.08	-0.06	-0.05	-0.05	0.21	0.16	0.87	-0.04	-0.08	-0.04	0.02	
	2.56**	-1.60	-1.33	-1.45	3.74**	2.08**	3.29***	-1.34	-2.95***	-1.09	0.46	

The magnitude of $\beta_1$and β_2 suggest an increase or decrease to daily stock returns due to general elections as compared to ordinary days without general elections. In 2004 elections, the after election coefficient of -0.07 is significant at 5% level of significance. It suggests that Botswana daily stock return fell because of the general elections by an average of 0.07% during the 60 days after the elections. However, the 2009 elections present contrary findings. Positive daily stock return is associated with the 2009 general elections. The estimated coefficients of 0.12 and 0.21 in the 60 and 90 trading days' windows respectively suggest an average increase of 0.21% to daily stock return during the 90 trading days before elections, decreased to 0.12% in the 60 days trading window. The positive trend continued after the elections but with a decreasing trend. Whereas the 15 trading days after the election saw an average increase of 0.19%, this reduced slightly to 0.17% and further to 0.16% during the 30 and 90 trading days respectively.

For 2014 general elections, the coefficients of all the trading days' period (15, 30, 60 and 90) after the election are statistically significant at 1% level of significance. This suggests a decrease in daily stock returns as a result of elections as compared with days without elections. This decrease is sustained for at least 90 days after the elections. On the contrary, the index is reversed upward in 2019 elections. The before election effect is significant for the 30 and 15 trading days and the after the election effect is significant for the 15 trading days. This election records positive elections effect for both before and after election trading days.

In summary, the stock market reaction to elections in Botswana was positive (indicated by the positive significant β_1 in 2009, 2014 and 2019). The stock market reaction after election has been either a slight decrease in the positive effect or a decrease to stock returns. From EMH, it can be suggested that the Botswana stock exchange has not been information efficient from election events, since the after election effect did not significantly improve.

The election effect of Botswana stock return is further investigated by adding macroeconomic variables and an index that represents African market index. The results of the regression analysis are summarized in Appendix 7 for 2004, 2009 and 2014 election, respectively. From this table, the before election effect was confirmed for only the 2009 election in the 90 days trading window. On other hand, the after election effect was confirmed for 2004 election in 60 days trading window, and for 2009 in the 90 days trading window and 2014 for both 15 and 90 days trading window. In the 2004 elections, the daily Botswana stock return decreased on average of about 0.08% during

60 trading days after the elections when compared to normal days without elections. On the contrary, the 2009 elections saw an increase of about 0.23 % 90 days before the election. The increasing trend continued but at a reduced rate of 0.18 % during the 90 days after the elections. The before and after election effects were not observed in other elections or trading periods. However, in the 2014 elections, the after election effect saw a decreasing trend from 0.04% in the 15 day trading window to 0.14% in the 90 day trading window.

Furthermore, only exchange rate and interest rate were statistically significant from the regression results. Whilst the impact of exchange rate was positive in the 15 trading days period in 2004 election, it reversed to negative in the 30 days trading period. Also the impact of interest rate was negative in both the 15 and 30 trading days period in 2014 election and exchange rate was negatively related to daily stock return during the 30 trading days window in the same election. It can be suggested that investors are interested in exchange rate and interest rate during the 30 days period around elections in Botswana.

7.3.2.2 Before and After Election Effect in Egypt

The election effect for Egypt is presented in Table 7.14. The election effect is confirmed for two out of the five elections (2012 and 2018) studied on Egypt. The effects of general elections in Egypt are mixed. Whereas the 2012 elections confirm before election effect in the 60 days trading window and after election effect in the 15 days trading window, the 2018 elections confirm before election effect in the 15, 30 and 90 days trading windows.

Table 7.14: General Election Effect in Egypt

N	2005			2010			2012			2014			2018		
	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2
15	0.16	0.14	0.36	-0.07	0.04	0.17	0.21	-0.32	-0.93	0.17	0.19	-0.33	-0.03	0.63	0.23
	1.29	0.36	0.98	-0.65	0.15	0.69	1.65	-1.03	-4.00***	1.83*	0.83	-0.46	-0.44	1.87*	1.20
30	0.19	-0.04	0.08	-0.10	0.06	0.29	0.15	0.07	-0.15	0.18	0.18	-0.34	-0.06	0.51	0.14
	1.31	-0.16	0.28	-0.80	0.31	1.62	1.17	0.25	-0.27	1.77*	1.07	-0.86	-0.76	2.68***	0.68
60	0.21	-0.03	-0.06	-0.00	0.07	-0.31	0.29	-0.41	-0.23	0.19	-0.05	-0.08	-0.01	0.22	-0.07
	1.15	-0.10	-0.23	-0.03	0.43	-0.97	1.88*	-1.72*	-0.65	1.59	-0.24	-0.33	-0.14	1.34	-0.45
90	-0.02	0.21	0.37	-0.06	0.18	-0.18	-0.11	0.36	0.32	0.08	0.17	0.05	-0.07	0.30	-0.06
	-0.06	0.66	1.15	-0.37	0.97	-0.61	-0.64	1.31	1.17	0.38	0.70	0.19	-0.50	1.76*	-0.32

The 2012 elections are associated with negative daily returns 60 trading days before the elections and 15 trading days after the elections. The estimated coefficient of -0.41 and -0.93 are statistically significant at 10% and 1 % respectively. This shows that during the 60 trading days before the

2012 elections, an average decline of 0.41% was recorded in the daily stock returns. This declining trend continued further to 0.93 % 15 trading days after the elections. On the contrary, the 2018 elections are associated with positive daily stock returns before the elections. As far as 90 days before the elections, daily stock returns increased by 0.30% as a result of the impending elections. This improved significantly during the 30 and 15 trading days prior to elections to approximately 0.51% and 0.63% respectively. However, other general elections did not show any significant effect on daily stock returns in Egypt.

When extended to include macroeconomic variables, only after election effect in 2010 was significant in addition to 2012 and 2018 elections (Appendix 7). Specifically, the 2010 elections were associated with significant positive daily returns of about 1.27% during the 30 trading days after the election. In the 2012 elections, positive daily stock returns were recorded in the 90 and 30 trading days before the elections, but this was reversed significantly to negative returns 15 trading days after the elections. Again the 2018 elections present a different picture, a 0.56% increase in daily stock returns 30 days prior to elections saw an increase to 0.67% in the 15 days trading window. From EMH, Egypt stock exchange cannot be said to be information efficient.

All the macroeconomic variables in addition to the African stock index included as control variables were significant in at least one of the elections. This suggests macroeconomic variables are significant during elections periods in Egypt. Africa stock return index had a positive effect on the 2005 elections in all the trading days' window. In subsequent elections, the index had no impact of daily stock return in Egypt. Exchange rate had positive impact on 2005 and 2012 elections in all the trading days' window but had a negative effect in 2010 and 2014 for the 30 and 15 trading day's period respectively. For interest rate, positive effect was observed in 2010 for 30, 60 and 90 days trading period and 2014 for 15 day period. The effect of inflation is mixed. Whereas it is positively related to daily stock returns in 2005 and 2010 for 15 and 30 days trading window, it has a negative impact during the 2012 elections for all the trading windows. Economic growth proxied by GDP is positively related to daily stock return during the 2010 and 2012 election. This

suggests that macroeconomic variables are considered as important by investors during elections in all the trading window under study.

7.3.2.3 Before and After Election Effect in Ghana

Table 7.15 presents the election effect on Ghana Stock Exchange. It can be seen that election effect is confirmed in all the elections in the sample. The before election effect is confirmed in 2008 for 90 days event window, 2012 for 15 days event window and 2016 for all the event windows. Also, the after election effect is significant in 2004 for 15 and 30 days event window, in 2012 for 60 and 90 days event window and in 2016 for 30, 60 and 90 days event window. It can also be seen that the magnitude of the election effect is small to daily stock returns in all event windows. The 2004 election effect was positive, indicating a marginal increase in daily stock return 30 days after the 2004 election. Similarly, there were an increase in daily stock returns in GSE, 90 days before the 2008 general elections. In 2012 elections, the negative daily stock returns 15 days prior to elections were reversed 60 and 90 trading day's period. This was repeated in 2016 elections, as negative effect to stock returns 90 days before the elections was reversed from 30 days onwards after the elections. This indicates that the GSE has been information efficient according to the EMH.

Table 7.15: General Election Effect in Ghana

N	2004			2008			2012			2016		
	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2
15	-0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00
	-1.61	-0.52	2.29**	-4.36	0.79	0.19	4.77***	-4.03***	0.09	0.87	-2.76***	1.45
30	-0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00
	-1.76*	-0.31	1.75*	-3.91***	0.71	0.63	4.17***	-0.15	0.15	0.92	-3.46***	1.98**
60	-0.00	0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00
	-1.49	0.20	1.11	-3.15***	1.75	0.29	2.77***	-0.07	2.79***	1.18	-3.55***	2.50**
90	-0.00	-0.00	0.00	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	-0.00	0.00
	-1.04	-0.01	0.19	-3.08***	2.67***	1.21	1.93*	0.25	3.96***	1.09	-2.08**	2.27**

When the individual elections were regressed with the control variables, the before election effect was confirmed in 2008 for 30 and 60 trading days window, in 2012 for 15 days event window and in 2016 for event windows 30, 60 and 90 (Appendix 7). The after election effect was confirmed only in the 2016 election during the 60 day event window. The signs were negative for the before

election effect and positive for the after election effect further confirming the information efficiency of investors according to the EMH.

The African stock index, exchange rate and interest rate were the control variables that are significant in at least one of the regressions. The African stock index was negatively significant during the 2012 elections for all the event windows. The impact of exchange rate was negative in 2004 and 2012 general elections during the 15 and 30 days event window respectively. On the other hand, the effect of interest rate was positive in 2008 elections for 30 and 60 trading day's window and negative for 30 days event window. This suggest that exchange rate and interest rate are significant determinants of stock returns during election periods in Ghana.

7.3.2.4 Before and After Election Effect in Kenya

In Kenya, election effect was confirmed for the 2002, 2007 and 2017 elections and not for the 2013 elections. The before election effect was confirmed in the 2002 election for 15 days event window and in 2017 election for 60 days event window. Also, the after election effect was found in the 2007 elections for 30 days event window. The before election effect was positive in both 2002 and 2017 elections, indicating that daily stock returns in Kenya significantly rose before 15 and 60 days respectively as a result of general elections. However, daily stock return fell by 0.59 % 30 days after 2007 general elections as compared to other days without general elections. It can also be inferred that elections effect in Kenya did not last for more than a 90 trading days.

Table 7.16: General Election Effect in Kenya

N	2002			2007			2013			2017		
	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2
15	0.16	0.55	0.75	0.02	0.22	-0.45	0.09	-0.20	0.23	0.07	0.21	0.31
	1.46	2.40**	0.94	0.26	1.17	-0.95	1.78*	-1.03	0.48	1.17	1.53	0.89
30	0.20	-0.07	0.36	0.06	0.16	-0.59	0.06	-0.05	0.28	0.10	0.07	-0.13
	1.71*	-0.22	0.78	0.61	1.16	-1.97*	1.11	-1.30	1.04	1.98**	0.59	-0.44
60	0.13	0.26	0.18	0.06	0.12	-0.24	0.06	0.17	0.14	0.08	0.20	-0.12
	0.86	1.01	0.61	0.71	0.11	-0.82	0.23	1.21	0.83	1.50	2.03**	-0.66
90	0.12	0.21	0.40	-0.01	0.07	-0.02	0.17	-0.08	-0.16	0.09	0.14	-0.11
	0.07	0.73	1.32	-0.06	0.39	-0.07	2.83***	-0.69	-1.15	1.29	1.56	-0.78

When the role of macroeconomic variables and African stock market were examined to determine its role in influencing the daily stock return in conjunction with the election effect, it was found

that election effect was confirmed for all elections in Kenya (Appendix 7). Contrary to earlier findings, the before election effect was negative whiles the after elections effect was generally positive. For instance in 2002, there were a 0.62% decline in daily stock returns 30 trading days before the general elections. The fall was significantly reversed to an increase of 1.34% to daily stock return 90 trading days after elections. This indicates an information efficiency in Kenya stock exchange.

All the macroeconomic variables and African stock market were significant in at least one of the general elections, indicating a major determinant of stock return during elections period. The African stock index is positively related to stock return in 2013 and 2017 elections for all the event window except 90 trading days in 2013. Also, exchange rate is positively related to daily Kenyan stock return during elections in 2002 and 2013 for the 30 trading day and 2017 for the 15, 30 and 60 trading days. Likewise interest rate is positively related to daily stock return in 2002 for the 30 trading days and 2017 for the 15, 30 and 60 trading days. The impact of inflation and GDP are mixed. Inflation and economic growth are both positively (in 2002 and 2007 for CPI, 2007 and 2013 for GDP) and negatively (2013 for CPI, 2002 for GDP) related to daily stock return during election period.

7.3.2.5 Before and After Election Effect in Mauritius

Table 7.17 presents election effect in Mauritius Stock Exchange. Election effect is confirmed in all the elections under study except 2019 elections. Before election effect was confirmed in 2014 elections for the 30 trading days' window. On the other hand, the after election effect was confirmed in 2005 for the 60 trading days window, in 2010 for 15 days event window and in 2014 for 30 and 90 trading days windows. Whilst the impact of before election effect was negative, that of the after election effect is positive in 2005 election but negative in 2010 and 2014 elections. In general the after election effect suggests information inefficiency in the Mauritius Stock Exchange.

Similarly, the inclusion of macroeconomic variables and African stock index indicates the before and after election effect occurs in 2005, 2010 and 2014. A negative before election effect is recorded in 2014 for the 30 days event window. However, a positive after election effect was recorded in 2005 for 15, 30 and 60 event windows but negative 2014 for 30 and 90 trading day windows.

Table 7.17: General Election Effect in Mauritius

N	2005			2010			2014			2019		
	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2
15	0.04	0.03	0.08	0.06	0.02	-0.40	-0.02	-0.01	-0.03	0.01	0.01	0.00
	0.97	0.60	0.77	1.33	0.20	-2.38**	-0.95	-0.17	-0.49	0.19	0.14	0.05
30	0.02	0.04	0.16	0.05	0.01	-0.15	-0.00	-0.06	-0.11	-0.01	0.04	0.06
	0.48	0.91	1.41	1.07	0.10	-1.16	-0.05	-1.65*	-2.32**	-0.37	0.61	1.11
60	0.05	-0.09	0.25	0.07	-0.10	-0.04	0.00	-0.03	-0.07	0.03	-0.07	
	1.17	-1.48	2.76***	1.20	-1.09	-0.40	0.09	-0.67	-1.60	1.12	-1.41	
90	0.02	-0.03	0.11	0.10	-0.09	-0.09	0.03	-0.03	-0.10	0.02	-0.03	
	0.33	-0.52	1.38	0.98	-0.73	-0.77	0.77	-0.69	-2.22**	0.59	-0.61	

As shown in Appendix 7, African stock index, exchange rate, interest rate and inflation are the determinants of daily stock returns during elections periods in Mauritius. African stock index is positively related to daily stock returns during the 2010, 2014 and 2019 elections for all the trading days' windows. Exchange rate and interest rate were significant only during the 2005 (in the 30 day event window) and 2019 (all the event window) elections respectively. Moreover, the inflation was negatively related to daily stock returns in the 2005 elections for the 30 days event window and in the 2019 for the 60 and 90 days event windows.

7.3.2.6 Before and After Election Effect in Morocco

Election effect in Morocco Stock exchange is confirmed in 2002, 2007 and 2011 elections but not in 2016 elections. The before election effect is confirmed in 2002 and 2007 elections for the 15 trading days window. The after election effect is significant for 2002, 2007 and 2011 elections for the 90 trading days window.

Table 7.18: General Election Effect in Morocco

N	2002			2007			2011			2016		
	$\boldsymbol{\beta_0}$	$\boldsymbol{\beta_1}$	$\boldsymbol{\beta_2}$	$\boldsymbol{\beta_0}$	$\boldsymbol{\beta_1}$	$\boldsymbol{\beta_2}$	$\boldsymbol{\beta_0}$	$\boldsymbol{\beta_1}$	$\boldsymbol{\beta_2}$	$\boldsymbol{\beta_0}$	$\boldsymbol{\beta_1}$	$\boldsymbol{\beta_2}$
15	0.04	-0.42	-0.07	0.12	0.51	-0.09	-0.13	-0.21	0.14	0.06	0.01	0.03
	0.64	-2.40**	-0.55	1.47	2.53**	-0.61	-2.34**	-1.57	0.66	0.84	0.12	0.21
30	0.02	-0.12	0.03	0.10	0.35	0.03	-0.13	-0.12	0.08	0.06	-0.01	0.01
	0.31	-0.75	0.28	1.12	1.61	0.23	-2.18**	-0.99	0.47	0.77	-0.09	0.04
60	-0.04	0.03	0.18	0.15	0.08	-0.11	-0.14	-0.05	0.11	0.01	0.05	0.15
	-0.45	0.17	1.49	1.18	0.47	-0.72	-1.95*	-0.43	0.96	0.11	0.43	1.05
90	-0.08	0.03	0.22	0.33	-0.27	-0.22	-0.30	0.20	0.28	-0.05	0.08	0.21
	-0.72	0.16	1.68*	3.30***	-1.39	-1.66*	-3.25***	1.52	2.54**	-0.37	0.60	1.19

The signs for the before and after election effect are mixed. Whilst the before election effect is positive in 2002, it became negative in 2007. Similarly, the after election effect is positive in 2002 and 2011, but turned negative in 2007. The daily stock returns decreased 0.42 % 15 trading days before the 2002 elections but increased 0.22 % 90 trading days after the elections. On the contrary, in 2007 elections, daily stock returns rose 0.51% during 15 days before the election but was reversed to a decline of 0.22% during the 90 days after election.

In Appendix 7, after including the macroeconomic variables and African stock index, the before election effect in Morocco was significant in 2002 and 2007 elections whilst the after election effect was significant only in 2011 elections. The before elections effect was negatively related to stock returns in 2002 elections for the 15 days event window but assumed a positive relationship in 2007 for the 15 and 30 event windows. On the other hand, the after election effect is positively related to stock return in 2011 for 30, 60 and 90 trading days event window. All the control variables influence daily stock returns except the 2011 elections. In the 2011 elections, exchange rate, interest rate, inflation and GDP were significant in determining the stock return. Whilst exchange rate, interest rate and GDP are negatively related to daily stock returns, inflation is positively related to daily stock returns.

7.3.2.7 Before and After Election Effect in Nigeria

Election effect on the Nigerian Stock Exchange is presented in Table 7.19. For the elections in the sample, election effect is confirmed in all the elections except 2011. The before election effect was found in all the trading day windows but the after election was only significant in the 2019 elections for the 30 trading day window.

Table 7.19: General election Effect in Nigeria

N	2003			2007			2011			2014			2019		
	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2
15	0.00	-0.00	-0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00
	2.75***	-2.50**	-1.20	2.10**	3.25***	-1.36	-1.38	1.52	0.34	-1.40	0.18	1.16	-1.74*	2.36**	-1.29
30	0.00	-0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.01	-0.00	0.01	-0.00
	2.59**	-2.31**	-0.31	1.36	2.46**	0.94	-1.49	0.50	1.42	-1.85*	1.82*	1.36	-1.61	2.30**	-1.75*
60	0.00	-0.00	-0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00
	2.51**	-1.19	-1.02	0.73	2.00**	0.51	-0.41	-0.88	-0.35	-1.06	-0.05	1.12	-1.96*	1.48	-0.20
90	0.00	-0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00
	1.90*	-0.02	-0.05	0.29	2.10**	0.21	-1.30	1.17	0.14	-1.13	0.38	0.83	-2.22**	1.47	0.71

Whilst the sign of the before election effect was negative in the 2003 elections, it is positive for subsequent elections (2007, 2014 and 2019). Since election effect is not significant positively after general elections, it can be concluded that Nigerian Stock Exchange is not information efficient. It can also be seen that the magnitude of election effect is small. Hence election effect has a little impact on daily stock returns in Nigeria.

When extended to include macroeconomic variables and African stock index, election effect was confirmed in 2007, 2011 and 2019 elections (Appendix 7). Specifically, the 2007 elections were associated with significant negative daily returns of about 0.003% during the 15 trading days after the election, while the 2011 elections were related with negative returns in both the before and after election effect in the 60 trading day window. In addition, the 2019 elections had a positive effect on daily stock returns in the 60, 30 and 15 days before the general elections was held. From Table 7.35, all the macroeconomic variables included as control variables were significant in at least one of the elections. However, the African stock index was not a determinant of daily stock return during elections in Nigeria. Interest rate had a negative effect on the 2003 elections but positive in the 2011 elections in all the trading days' window. Inflation and exchange rate were only significant during the 2011 (in all event windows) and 2014 (in the 15, 60 and 90 day event windows) elections, respectively. Also, GDP was positively related to daily stock returns in the 2007 elections for the 15, 60 and 90 days event windows and negative in the 2011 elections for the 60 days event windows.

7.3.2.8 Before and After Election Effect in South Africa

The election effect for South Africa is presented in Table 7.20.The election effect was confirmed for the 2004, 2009 and 2019 elections and not the 2014 elections. The before election effect was confirmed in only the 2004 election for 60 day event window. However, the after election effect was found in the 2004 elections for 15, 30 and 60 days trading windows, 2009 elections for 30 trading day window and 2019 elections for 15 trading day window. Whilst the before election effect is positive, the after effect is mixed. The after election effect had a negative effect in the 2004 and 2019 elections but positive during 2009 elections. It shows information inefficiency in the Johannesburg Stock exchange.

Table 7.20: General Election Effect in South Africa

N	2004			2009			2014			2019		
	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2
15	0.10	0.10	-0.35	0.10	-0.29	0.39	0.02	0.14	0.08	0.06	-0.16	-0.42
	1.58	0.64	-1.93*	0.70	-0.55	0.99	0.39	1.47	0.93	1.22	-1.26	-2.02**
30	0.16	-0.21	-0.40	0.02	0.19	0.49	0.01	0.10	0.11	0.01	0.13	0.02
	2.66***	-1.25	-1.99**	0.16	0.44	1.93*	0.14	1.24	1.42	0.18	1.03	0.09
60	0.23	-0.23	-0.38	0.10	-0.17	0.19	-0.03	0.14	0.12	0.01	0.11	-0.05
	3.33***	-1.79*	-2.72***	0.51	-0.50	0.73	-0.40	1.40	1.33	0.21	1.04	-0.38
90	0.19	-0.07	-0.22	0.17	-0.28	0.09	-0.03	0.09	0.08	0.01	0.10	-0.04
	2.19**	-0.53	-1.57	0.56	-0.74	0.28	-0.26	0.68	0.67	0.08	0.88	-0.33

When extended to include macroeconomic variables and African stock index, election effect was significant only for 2004 (Appendix 7). In the 2004 elections, negative daily stock returns were recorded 60 trading days before the elections and further decreased significantly during the 30 and 60 trading days after the elections. From the control variables, African stock index, exchange rate and inflation were significant in influencing stock returns during the 2004 and 2009 elections. All the variables had a negative impact on daily stock returns.

7.3.2.9 Before and After Election Effect in Tunisia

Election effect on the Tunisian Stock Exchange is presented in Table 7.21. Election effect is confirmed in all the elections analysed under this study. The before election effect was confirmed in only 2004 elections for the 90 trading days window. However, the after election effect was confirmed for all the elections.

Table 7.21: General Election Effect in Tunisia

N	2004			2009			2014			2019		
	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2	β_0	β_1	β_2
15	0.04	0.05	0.05	0.15	-0.09	-0.19	0.10	-0.01	-0.17	0.03	-0.12	-0.12
	1.14	0.43	0.99	4.27***	-0.42	-1.07	2.95***	-0.05	-2.75***	1.45	-1.19	-2.97***
30	0.06	-0.05	-0.11	0.15	0.05	-0.16	0.07	0.19	0.01	0.04	-0.09	-0.06
	1.69*	-0.57	-1.66*	3.92***	0.40	-1.67*	2.43**	0.98	0.05	1.46	-0.99	-1.34
60	0.08	-0.07	-0.09	0.08	0.12	0.08	0.08	0.02	0.03	0.05	-0.05	-0.07
	1.58	-0.95	-1.40	2.15**	1.51	0.79	2.28**	0.20	0.48	1.38	-0.86	-1.38
90	0.17	-0.16	-0.20	0.11	0.03	0.02	0.14	-0.07	-0.07	0.02	-0.05	
	2.04**	-1.76*	-2.20**	2.37	0.42	0.26	3.47***	-0.83	-1.05	0.99	-0.81	

Specifically, the after election effect occurred in 30 and 90 trading days windows during the 2004 elections, the 30 trading days window in the 2009 election and the 15 days event window during the 2014 and 2019 elections. The sign of the election effect was negative, which indicates general elections are associated with fall in daily stock returns in Tunisia.

Similarly, the inclusion of macroeconomic variables and African stock index indicates negative election effect occurs in all the elections studied in Tunisia (Appendix 7). However, the before election was confirmed in 2014 elections in the 15 days event window, as opposed to the 2004 election. Nevertheless the after election effect was confirmed in all the elections. From Table 7.39, all the macroeconomic variables and the African stock index included as control variables were significant in at least one of the elections. The African stock index is negatively related to stock return during the 2014 elections for all the event window except 30 trading days. Exchange rate was negatively related to daily stock returns only during the 2004 (in the 90 days event windows) and 2014 (in all event windows) elections. Interest rate (during 2014 elections in the 15 days event window) and GDP (during 2004 elections in the 30 and 60 days event windows) are positively related to daily stock returns. Inflation had a positive effect on the 2004 and 2014 elections but negative in the 2009 elections.

7.3.3 VOLATILITY AND ELECTIONS IN AFRICA

In order to answer the question of how elections influence the volatility of stock returns in ASMs, a VAR-GARCH specifications (similar to Ahmed, 2017) are used to elections events in a two-step methodology. The first step involves estimating a number of VAR-GARCH specifications to identify the best model similar to Cappiello, Engle and Sheppard (2006) process. This involves the estimation of both symmetric and asymmetric univariate GARCH models to determine the form of conditional volatility equation that fits the series well. It ensures that the problem of 'non-convergence' associated with most univariate GARCH models are resolved. The study limits this model selection to three alternative specifications frequently used to capture the stylized characteristics of financial time series variance. These are the standard symmetric GARCH model (Bollerslev, 1986; Taylor, 1986), the exponential GARCH (EGARCH) by Nelson (1991) and the asymmetric GARCH (GJR-GARCH) model of Glosten, Jaganathan and Runkle (1993).

The mean equation of the univariate VAR-GARCH model is given by:

$$r_t = \mu + \beta_1 r_{t-1} + \beta_2 r_{afric} + \varepsilon_t \quad \textbf{(7.15)}$$

Where r_t is the country specific daily stock return, r_{t-1} is the country specific lagged daily stock return and R_{afric} is the log difference of MSCI Frontier Markets Africa Index, a proxy for Africa country's stock index. Also, μ, β_1 and β_2 represents the coefficients to be estimated whiles ε_t is the stochastic error term that is assumed to be normally distributed. The Equation 7.15 is modelled as an autoregressive process of order 1 to remove any possible autocorrelation that may be present in stock return series.

The variance equations are given by the following specifications:

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 \qquad \text{[GARCH]} \quad \textbf{(7.16)}$$

$$lnh_t^2 = \omega + \beta lnh_{t-1}^2 + \alpha \left|\frac{\varepsilon_{t-1}}{h_{t-1}}\right| + \gamma \frac{\varepsilon_{t-1}}{h_{t-1}} \qquad \text{[EGARCH]} \quad \textbf{(7.17)}$$

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 + \gamma \varepsilon_{t-1}^2 \eta_{t-1} \qquad \text{[GJR-GARCH]} \quad \textbf{(7.18)}$$

After estimating the parsimonious GARCH models, the best performing model is selected with the help of several information criteria. These include Akaike Information Criterion (AIC), Bayesian Information Criteria (BIC) and Log-Likelihood Function (log L).

The second step involves introducing dummy variables, which represent the immediate days in an elections period to assess its impact on volatility of stock market returns. This is in line with authors like Goodell and Vähämaa (2013), Chau, Deesomsak and Wang (2014), Ahmed (2017), Corbet (2018), among others, who added dummy variable to GARCH specifications to assess the impact of distinct political events on volatility of asset returns. The [-2, 2] event window is used to capture the sentiments of the immediate election period. The second moment conditional variance equation is therefore given by the following:

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 + \sum_{j=1}^{n} \lambda_{ELEC} D_t \qquad \text{[GARCH]} \quad \textbf{(7.19)}$$

$$lnh_t^2 = \omega + \beta lnh_{t-1}^2 + \alpha \left|\frac{\varepsilon_{t-1}}{h_{t-1}}\right| + \gamma \frac{\varepsilon_{t-1}}{h_{t-1}} + \sum_{j=1}^{n} \lambda_{ELEC} D_t \qquad \text{EGARCH]} \quad \textbf{(7.20)}$$

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 + \gamma \varepsilon_{t-1}^2 \eta_{t-1} + \sum_{j=1}^{n} \lambda_{ELEC} D_t \qquad [\text{GJR} - \text{GARCH}] \qquad \textbf{(7.21)}$$

Where D_t is the event dummy variable that take the value of one in the election event window and zero otherwise and *n* represents the number of elections in the selected ASMs over the sample period. A significant parameter estimate, λ_{ELEC} suggests elections have effects on volatility of stock return.

Table 7.22 shows the parameter estimates along with the p-values of the best parsimonious VAR-GARCH specification with the dummy variables. The coefficients for the autoregressive return and African stock market index, not reported, are statistically significant for all the selected ASMs. This suggests stock returns in ASM are dependent of previous day price and the contemporaneous returns of African stock index respectively.

Table 7.22: General Elections Effect on ASM Volatility

	Model	ω	α	β	γ	λ_{ELEC1}	λ_{ELEC2}	λ_{ELEC3}	λ_{ELEC4}	λ_{ELEC5}
Botswana	GJR-GARCH	0.2208	0.1292	0.5820	-0.0844	-0.2059	-0.2043	-0.2293	-0.2382	–
		15.5***	16.4***	23.3***	-8.00***	-4.28***	-5.68***	-9.51***	-8.72***	
Egypt	GJR-GARCH	1.3434	0.0520	0.5547	0.0420	-1.4561	-1.0667	0.2915	-0.8253	-1.4486
		7.59***	11.5***	10.1***	2.91***	-10.4***	-3.04***	0.25	-2.51**	-12.6***
Ghana	EGARCH	-0.0954	0.1448	0.9991	-0.0119	0.0921	0.2450	0.0772	-0.0138	–
		-31.8***	48.2***	3652***	-8.28***	2.93***	3.80***	1.75*	-0.36	
Kenya	GARCH	0.0104	0.0946	0.8910	–	0.5492	1.3242	0.3124	0.2610	–
		12.2***	26.9***	459***		1.66*	2.68***	1.88*	1.79*	
Mauritius	GARCH	0.0043	0.1578	0.8398	–	0.0118	0.1004	-0.0048	-0.0005	–
		15.2***	31.9***	257***		0.60	1.03	-0.48	-0.04	
Morocco	GARCH	0.0079	0.0481	0.9424	–	-0.0741	-0.0038	0.0073	-0.0422	–
		19.6***	22.6***	565***		-2.75***	-0.05	0.09	-2.58**	
Nigeria	EGARCH	-0.8448	0.4351	0.9415	0.1418	-0.0892	-0.5270	-0.0256	0.6341	-0.2417
		-19.6***	39.8***	226***	19.2***	-0.48	-1.84*	-0.14	3.79***	-0.99
S. Africa	GJR-GARCH	0.0158	0.0005	0.9265	0.1164	0.0541	0.3410	-0.0454	0.1188	–
		6.61***	0.10	147***	11.8***	0.52	0.77	-1.75*	1.38	
Tunisia	GJR-GARCH	0.0164	0.1383	0.7640	0.0624	-0.0352	0.2150	-0.0330	-0.0254	–
		19.0***	15.1***	129***	5.20***	-1.02	1.15	-0.97	-1.25	

The results above present interesting findings. First, the ARCH effect is highly positively significant in all the selected ASM except South Africa. This means that the information on contemporaneous conditional volatility of ASMs is significantly affected by its own previous

period shocks. Second, the GARCH component is also highly positively significant in all the selected ASMs. This is an indication of volatility clustering in ASM return series. The coefficients of the GARCH parameter are high, which means persistence in episodes of volatility. The strength of the persistence ranges from 0.5547 (Egypt, the lowest) to 0.9991 (Ghana, the highest). Third, the asymmetry parameter is significant for all the selected ASMs but with mixed signs. This shows leverage effect is associated with ASMs and negative and positive news are responded to differently by the selected markets.

Fourth, all the selected countries experienced significant volatility of stock returns during immediate election period in at least one elections episode except Tunisia. Whilst general elections have a negative impact on the conditional volatility of stock return in Botswana, Egypt, Morocco and South Africa, they have a positive effect on Ghana and Kenya. Nigeria is the only country in the sample in which general election periods had a mixed effect on conditional volatility. Specifically, the 2007 general election in Nigeria resulted in the decline of 0.53% fluctuations in daily stock returns, but the 2014 general elections led to a rise of 0.63% fluctuations in daily stock returns during the election periods. From the magnitude of the impact, Egypt experienced the most shock from general elections whiles South Africa experienced the least shock on stock returns during election periods.

In order to test the overall effect of general elections on volatility of stock returns, this study follows a three step methodology of Gulen and Mayhew (2000), which has been used in other studies such as Chau, Deesomsak and Wang (2014) and Corbet (2018). Table 7.23 presents results of multiplicative dummy introduced into the volatility model. It can be seen that; the asymmetric model was identified as most appropriate in all the ASMs except Botswana and Nigeria. Specifically, the asymmetric GJR-GARCH model was selected for Egypt, Kenya, Mauritius, South Africa and Tunisia whilst the asymmetric EGARCH was selected for Ghana and Morocco. The usual GARCH parameters describing the conditional variance ω, α, β and γ are highly significant in most of the series. High persistence and asymmetric stock market volatility are confirmed in the return innovations in line with (Engle and Ng (1993) and Bauwens, Laurent and Rombouts (2006) assertions.

From the dummy variables, representing overall election effect in the selected ASMs, Nigeria and Botswana became insignificant to volatility of daily stock returns in addition to Tunisia. Thus, five

out of the nine selected ASMs are responsive to volatility of stock returns during elections periods. The direction of the volatility is positive in all the significant ASMs except Morocco that maintained a negative sign in each election as well as the overall election effect. The magnitude suggests a severe impact from general election event. This is evident by the high values of λ_{ELEC} in the results. Hence, during elections periods ASMs experience a large increase in volatility of stock returns.

Table 7.23: Overall Effect of General Elections on ASM Volatility – Multiplicative Dummy

Variable	Model	ω	α	β	γ	λ_{ELEC}
Botswana	GARCH	-11.605	0.3796	0.5448		-2.2490
		-47.2***	22.8***	18.5***		-0.16
Egypt	GJR-GARCH	-2.3982	0.3357	0.5523	0.0484	1.4615
		-9.27***	15.0***	17.2***	1.98**	4.99***
Ghana	EGARCH	-1.5249	-0.0134	0.8397	0.6131	-0.1624
		-5.93***	-0.9	30.1***	32.4***	-1.10
Kenya	GJR-GARCH	-2.3944	0.3683	0.5410	0.0207	1.5279
		-9.84***	15.9***	18.4***	0.83	3.51***
Mauritius	GJR-GARCH	-2.3437	0.3602	0.5376	0.0291	1.4078
		-10.20***	16.2***	18.3***	1.17	2.71***
Morocco	EGARCH	-0.0454	-0.0096	0.8620	0.5826	-0.4534
		-6.51***	-0.66	30.4***	30.5***	-2.89***
Nigeria	GARCH	-11.214	0.4646	0.4509		-0.0899
		-83.6***	23.8***	17.3***		-0.74
S. Africa	GJR-GARCH	-2.2506	0.3608	0.5255	0.0319	1.5821
		-10.8***	15.5***	17.9***	1.26	1.74*
Tunisia	GJR-GARCH	-2.3571	0.3626	0.5389	0.0293	1.2178
		-9.99***	16.0***	18.3***	1.18	1.00

To check the robustness of the findings, a different specification was used in the GARCH model. Instead of a multiplicative dummy, an additive dummy was introduced into the best GARCH specification similar to earlier estimation. Even though, findings of the GARCH parameters were similar to earlier findings and the overall election effect was confirmed for only Ghana, Kenya and Mauritius. According to the additive specification, election effect has a positive effect on conditional volatility.

Table 7.24: Overall Effect of General Elections on ASM Volatility – Additive Dummy

Variable	Model	ω	α	β	γ	λ_{ELEC}
Botswana	GARCH	-1.1786	0.4483	0.9110	0.0336	-0.0111
		-17.2***	33.5***	138***	4.46***	-0.07
Egypt	TGARCH	0.0678	0.2935	0.6880	-0.0564	0.0027
		12.62***	24.85***	52.3***	-3.43***	0.06
Ghana	EGARCH	-1.1508	0.4295	0.9125	0.0331	0.1487
		-16.7***	33.9***	140***	4.48***	1.94*
Kenya	TGARCH	0.0638	0.3131	0.6751	-0.0472	0.3093
		11.9***	25.4***	50.9***	-2.74***	2.70***
Mauritius	TGARCH	0.0699	0.3138	0.6716	-0.0609	0.2463
		12.5***	25.3***	50.6***	-3.58***	1.72*
Morocco	EGARCH	0.0726	0.3075	0.6717	-0.0562	0.0099
		12.7***	25.1***	49.4***	-3.36***	0.20
Nigeria	GARCH	-1.1581	0.4433	0.9151	0.0324	-0.0826
		-17.2***	32.1***	144***	4.36***	-0.70
S. Africa	TGARCH	0.0678	0.3093	0.6784	-0.0619	-0.0562
		12.9***	24.7***	53.1***	-3.81***	-0.58
Tunisia	TGARCH	0.0713	0.3195	0.6663	-0.0606	0.1647
		13.2***	25.1***	50.4***	-3.52***	0.62

7.3.4 SUMMARY OF ELECTIONS EVENT AND STOCK MARKET RETURNS

The graphs of CAR over a 21-day window suggest that African stock market largely agrees with the UIH and that decreases in abnormal returns are rectified after more than a week of election event. It was also found that elections events were mostly associated with negative abnormal returns. However, the formal test of the CAAR over different event windows suggest that only Tunisia and Kenya confirms the UIH over [-20, 20] event window and UH in all event windows respectively. This suggests that the EMH is essentially verified to African stock markets. The findings are partly consistent with Bouoiyour and Selmi (2017) who did not confirm UIH in the US stock markets during 2016 Trump win, in contrast with authors like Akkoç and Özkan (2013), Mehdian, Perry and Nas (2008) and Shacmurove (2002).

The regression based model also revealed that election effect is confirmed in almost all stock exchanges analysed in the study. Also, when the model was extended to include macroeconomic variables and African stock index, many of the election effect were still significant. This suggests that elections are important determinants of African stock market returns. Election effect was confirmed by Li and Born (2006), Smales (2015), Liew and Rowland (2016), Bowes (2018) and Darby and Roy (2019); although was rejected by Abidin, Old and Martin (2010), who did not find

enough evidence in support of election effect in New Zealand stock market returns. The macroeconomic variables and the African stock index included were significant but with mixed signs. Similar findings have been concluded by several other authors, such as Smales (2015), Liew and Rowland (2016) and Shaikh (2017), among others. This is consistent with *Hypothesis 3a* thus elections have a significant effect on African stock market returns.

In order to test whether elections have significant effect on volatilities of stock returns in Africa, the study adopted a GARCH approach. The individual election events exerted at least one significant effect on stock market volatilities in all the African countries except Tunisia. The directions of these events were mixed. On the other hand, the general election effect had a positive effect on volatilities of stock returns in Africa except Nigeria and Morocco. Findings that are similar to this study are Białkowski, Gottschalk and Wisniewski (2008), who attributed the volatility of national elections in OECD countries to the margin of victory, no formal laws regulating elections, and changes in political orientation of incumbent government or inability to form government with parliamentary majority. Also, Smales (2015) found Australian federal elections to be significant to stock market volatilities. He suggested the media attention sparked by elections induces apprehension to market participants and causes uncertainties in investment decisions in financial markets as well as the real economy. Moreover, Shaikh (2017) found US presidential elections to influence global stock market volatilities. The author indicates that stock markets are inefficient in the short-run during US election year. This suggests that elections contain important information that informs investors about trading strategies. Hence *Hypothesis 4a* cannot be rejected, thus elections exerts a higher instability in Africa stock prices causing a marked difference in returns from the market.

7.4 POLITICAL REGIME CHANGES

The study examines the changes to stock prices and volatility as a result of political regime changes in Africa. This study defines a political regime change to be change in government from one party to another or from one administration to another. Political Regime changes in Africa are mainly due to elections, presidents being forced to resign or the death of the head of state. Table 7.25 below summarizes this kind of events included in the analysis.

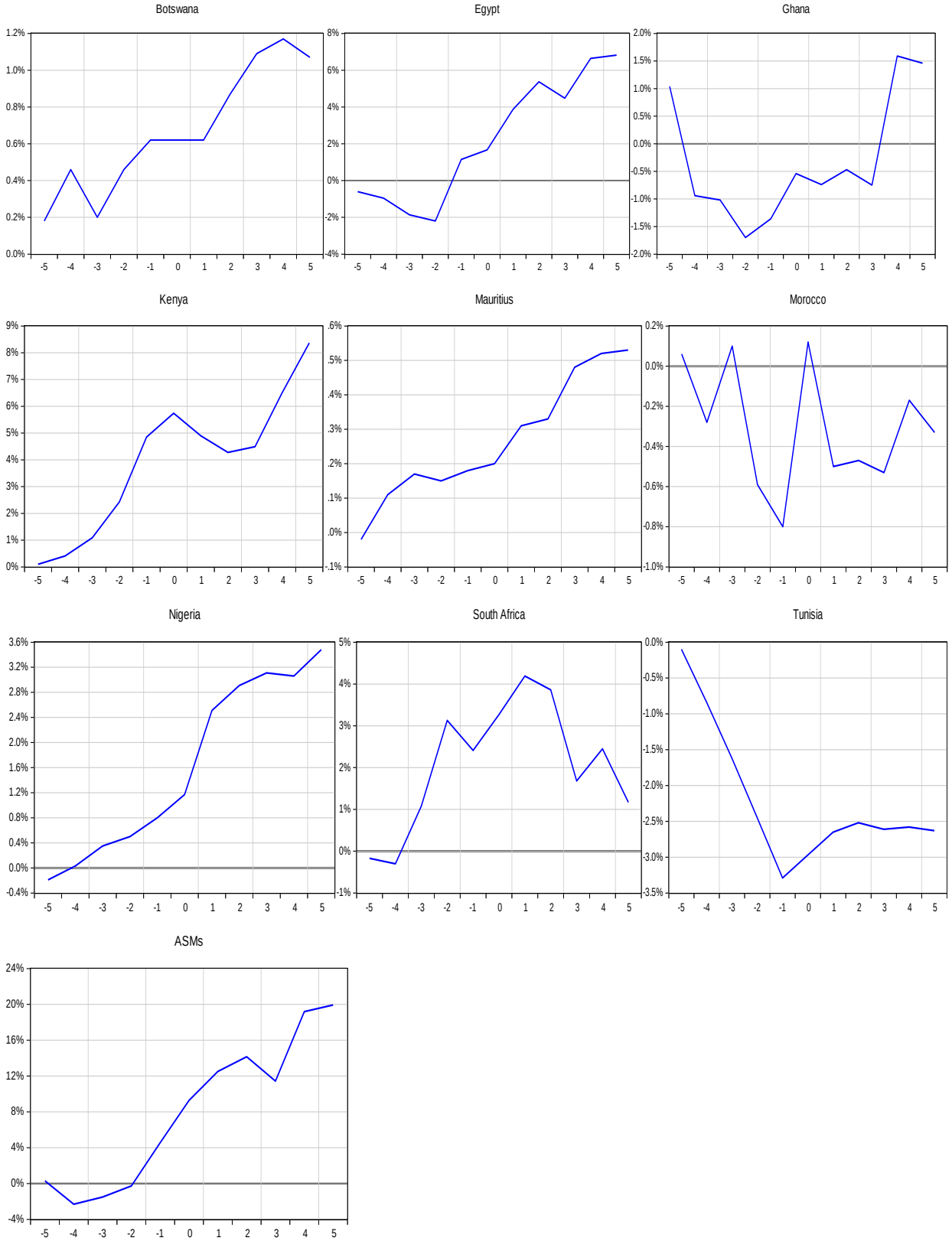
Table 7.25: Political Regime Changes Used in the Study

Country	First regime change included	Regime changes type	Last regime change included	Regime changes type	Number of regime changes
Botswana	01-Apr-08	President resigns	01-Apr-18	President resigns	2
Egypt	11-Feb-11	President resigns	03-Jun-14	Elections	4
Ghana	30-Dec-08	Elections	09-Dec-16	Elections	3
Kenya	29-Dec-02	Elections	09-Mar-13	Elections	2
Mauritius	25-Feb-02	Elections	02-Dec-19	Nomination	11
Morocco	30-Sep-02	Elections	12-Apr-17	President resigns	4
Nigeria	23-Apr-07	Elections	31-Mar-15	Elections	3
S. Africa	20-Sep-08	President resigns	14-Feb-18	President resigns	3
Tunisia	14-Jan-11	President resigns	14-Oct-19	Elections	5

7.4.1 EVENT STUDY OF REGIME CHANGE AND ASMs RETURN

In order to study the effect of political regime changes on ASM returns, an event study is first used to understand the abnormal returns generated during the event period. Figure 7.5 illustrates country specific responses, in addition to the overall ASMs, to political regime changes over an 11-day event window. It is evident that ASMs show significant price sensitivity during political regime changes. The 11-days event window is mostly characterized by positive returns except Ghana and Morocco. The country specific markets show persistent increased stock returns after political regime changes occur except Morocco and South Africa. The movement of stock prices around political regime changes likely confirms the EMH and the UH of good news. However, that of Morocco and South Africa reflects that of OH of good news whiles that of Tunisia portrays that of UIH of good news. The pooled CAR of ASMs shows that negative returns five days before regime change is sharply reversed a day before the event. It further positively increases after political regime change supporting the EMH and UH.

Figure 7.5: ASMs Response to Political Regime Changes Over an 11-Day Event Window



7.4.1.1 Regime Changes and Stock Returns in Botswana

The direction and the magnitude of daily stock returns prior to and after political regime changes are examined in each country. Appendix 8 and 7.26 presents the price reactions depicted by average abnormal returns and cumulative average abnormal returns of Botswana Stock Exchange to political regime changes. A review of the results shows that positive AAR returns 5 days prior to regime changes are changed to negative returns three days to a political regime change. This change significantly to positive AAR until 5 days after regime change. In terms of statistical significance, only the 4^{th} and 5^{th} day after the event is significant at 1 percent level of significance, which indicates that response to regime change is prolonged in Botswana. Hence, the arrival of new information to the market seems to have a significant effect on stock returns, as confirmed by an 11-day CAAR. Specifically, the [0, 10] event window has a negative CAAR 6.23%, which is statistically significant at 1% level. Also, the 5-day event window had a CAAR of -3.66%, also significant at 1% level. So the above the null hypothesis of abnormal returns in the event window can be rejected. It can therefore be suggested that negative abnormal returns are associated with regime changes in Botswana, specifically after the event has taken place.

Table 7.26: Political Regime Changes in Botswana CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	-3.66%	-0.016	0:2	2	-4.139***	-1.113	-1.305
(-5,5)	1.06%	0.014	1:1	2	1.002	0.572	0.068
(0,10)	-6.23%	-0.034	0:2	2	-5.998***	-1.397	-1.305

7.4.1.2 Political Regime Changes and Stock Returns in Egypt

Appendix 8 indicates the average abnormal returns for event window [-5, 5] for Egypt. It can be seen that negative abnormal returns are recorded from day -5, although reversed sharply to positive abnormal returns from day -1 onwards. The rest of the periods exhibited positive abnormal return except day 3. From the significance test, only days -1, 1, 2 and 4 shows positive statistically significance. Similarly, all the event windows recorded a positive significant CAAR of 7.24%, 6.84% and 3.65% in the [-2, 2], [-5, 5] and [0, 10] period, respectively. Thus, the Egyptian Stock Market reacted positively to release of new information from political regime changes.

Table 7.27: Political Regime Changes in Egypt CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	7.24%	0.069	4:0	4	4.134***	1.957*	1.857*
(-5,5)	6.84%	0.063	3:1	4	2.529**	1.323	0.854
(0,10)	3.65%	0.036	4:0	4	1.467	3.489***	1.857*

7.4.1.3 Political Regime Changes and Stock Returns in Ghana

Appendix 8 presents the AAR of [-5, 5] and CAAR [-2, 2], [-5, 5] and [0, 10] event windows of political regime changes in Ghana for the period 2002 to 2019. From the AAR table, the direction of the average abnormal returns is mixed. Also, the significance level shows both before and after the regime changes are significantly different from zero. Specifically, whiles negative returns are associated with the four and two days before political regime changes, both negative and positive returns are associated with the third and fourth day after regime changes respectively. Also, the event day leads to significant positive daily returns in the Ghana Stock Exchange. Moreover, the CAAR for the event windows [-5, 5] and [0, 10] reinforce the positive effect invoked by regime changes in Ghana. The [-5, 5] and [0, 10] event window posted a statistically significant positive CAAR of 1.52% and 2.37% respectively.

Table 7.28: Political Regime Changes in Ghana CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	0.57%	0.012	2:1	3	1.172	0.426	0.541
(-5,5)	1.52%	0.030	2:1	3	1.986*	0.484	0.541
(0,10)	2.37%	0.040	2:1	3	2.633**	0.701	0.541

7.4.1.4 Political Regime Changes and Stock Returns in Kenya

From Appendix 8, the average abnormal returns associated with regime changes in Kenya are positive except day 1 and 2 after the event in the [-5, 5] window. A substantial number of days in the event window has significant average abnormal returns. This shows that the market reacts significantly when there are political regime changes in Kenya. The positive impact to stock prices is confirmed by the CAAR in all the event windows. Hence, the null hypothesis of no abnormal returns in the event window can be rejected. Thus, political regime changes in Kenya are associated with positive abnormal returns.

Table 7. 29: Political Regime Changes in Kenya CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	3.20%	0.030	2:0	2	3.105***	2.623**	1.641
(-5,5)	8.38%	0.074	2:0	2	5.222***	1.532	1.641
(0,10)	6.62%	0.046	1:1	2	3.301***	0.624	0.211

7.4.1.5 Political Regime Changes and Stock Returns in Mauritius

Table 7.30 shows that the AAR due to political regime changes in Mauritius are mostly positive. Only two days (-5 and -2) out of the 11 days reported a negative AAR. Even so they are negligible from the significance test. However, the parametric and non-parametric tests confirmed two days (3 and 4) to have a significant AAR. Table 7.53 confirmed that CAAR of the post-event window [0, 10] are significant. This shows that a positive response is sent to the asset prices in Mauritius after political regime changes.

Table 7.30: Political Regime Changes in Mauritius CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	0.15%	0.001	4:5	9	0.236	0.625	-0.147
(-5,5)	0.52%	0.004	6:3	9	0.956	1.349	1.189
(0,10)	0.59%	0.006	6:3	9	1.619	1.829*	1.189

7.4.1.6 Political Regime Changes and Stock Returns in Morocco

Appendix 8 presents the AAR associated with political regime changes in Morocco. Results shows that the direction of AAR are varied. Both positive and negative AAR are evenly recorded. From the significance test, only the event day and day 1 are significantly different from zero with mixed signs. The results from the CAAR (Table 7.31) reinforce the inconclusiveness of the impact of a regime change. None of the event windows shows statistically significant price responses to political regime changes. Hence, the null hypothesis of no abnormal returns in the event window cannot be successfully rejected.

Table 7.31: Political Regime Changes in Morocco CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	-0.58%	-0.005	2:2	4	-0.452	-0.376	0.089
(-5,5)	-0.32%	-0.004	1:3	4	-0.256	-0.536	-0.912
(0,10)	0.44%	0.006	3:1	4	0.355	0.435	1.090

7.4.1.7 Political Regime Changes and Stock Returns in Nigeria

From Appendix 8, the AAR associated with political regime changes in Nigeria are positive except day -5 and 4. However, tests confirmed significant positive AAR for only day 1 and 5. Also, the CAAR for different event window confirmed significant positive price response to changes to political regime. A CAAR value of 2.56%, 3.49% and 3.22% suggests that positive abnormal returns are associated with regime changes in Nigeria during the immediate, longer and post event day horizons.

Table 7.32: Political Regime Changes in Nigeria CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	2.56%	0.023	2:1	3	2.514**	1.012	0.591
(-5,5)	3.49%	0.032	3:0	3	2.419**	1.458	1.746*
(0,10)	3.22%	0.029	3:0	3	2.155**	1.768*	1.746*

7.4.1.8 Political Regime Changes and Stock Returns in South Africa

Appendix 8 and 7.33 presents the AAR of event [-5, 5] and CAAR of event windows for the immediate, longer and post event day horizons of political regime changes in South Africa. Appendix 8 shows evenly positive and negative AAR from regime changes. However, only event days -2, 1 and 3 are significantly different from zero. Also, Table 7.33 confirmed that CAAR of the immediate event window [-2, 2] is significant with positive CAAR value. This indicates that a positive abnormal return is associated with political regime changes in South Africa during the 2 days before and after the event contrary to the null hypothesis.

Table 7.33: Political Regime Changes in South Africa CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	2.77%	0.033	2:1	3	2.321**	0.932	0.582
(-5,5)	1.16%	0.014	2:1	3	0.666	0.322	0.582
(0,10)	-2.42%	-0.021	2:1	3	-0.974	-0.347	0.582

7.4.1.9 Political Regime Changes and Stock Returns in Tunisia

From Appendix 8, the negative AAR are mostly associated with political regime changes in Tunisia. The parametric and non-paramedic tests confirmed all four days before political regime changes, the event day and a day after the event to have a significant AAR. The significant AAR before political regime change had a negative price response whilst the event day and a day after

the event had a positive price response. This was confirmed by the CAAR results. The shorter event windows during the political regime changes had a significantly negative CAAR but the post event day horizons had a positive price response. This can signify information efficiency as postulated by the EMH.

Table 7.34: Political Regime Changes in Tunisia CAAR Over Event Windows

Event Window	CAAR Value	Precision CAAR Value	pos:neg CAR	No. CARs considered	Patell Z two-sided	Csect T two-sided	Generalized Sign Z
(-2,2)	-0.89%	-0.007	3:2	5	-1.397	-0.520	0.383
(-5,5)	-2.62%	-0.022	3:2	5	-2.874***	-0.941	0.383
(0,10)	0.52%	0.005	4:1	5	0.645	2.621**	1.278

7.4.2 VOLATILITY AND POLITICAL REGIME CHANGES IN AFRICA

On the other hand, a univariate Vector Autoregressive EGARCH, VAR-EGARCH model is employed to explore how volatilities at ASMs respond to political regime change events. The following subsections provide a brief description of this approach. In order to understand the magnitude and impact of political regime changes on volatility of stock returns, all the political regime changes in the selected countries over the period is introduced as a dummy variable into the most appropriate VAR-GARCH specification and expressed as follows:

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 + \sum_{j=1}^{n} \lambda_{RC} D_t \qquad \text{[GARCH]} \qquad \textbf{(7.22)}$$

$$lnh_t^2 = \omega + \beta lnh_{t-1}^2 + \alpha \left|\frac{\varepsilon_{t-1}}{h_{t-1}}\right| + \gamma \frac{\varepsilon_{t-1}}{h_{t-1}} + \sum_{j=1}^{n} \lambda_{RC} D_t \qquad \text{[EGARCH]} \qquad \textbf{(7.23)}$$

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 + \gamma \varepsilon_{t-1}^2 \eta_{t-1} + \sum_{j=1}^{n} \lambda_{RC} D_t \qquad \text{[GJR-GARCH]} \qquad \textbf{(7.24)}$$

where λ_{RC} is the coefficient of the regime changes event.

Table 7.35 shows the results VAR-GARCH with political regime change dummy variable in the selected ASMs. The coefficient of the autoregressive term, not reported, is highly significant in all ASMs return innovations, indicating returns are dependent on previous day prices. The African stock index is also significant in most of the series suggesting its influence on country specific stock markets. As expected, the GARCH parameters are all significant in all the return innovations. Political regime change was confirmed to influence on the volatility of daily stock returns in all the ASMs with the exception of South Africa. The direction of the effect of political regime change

on the conditional volatility of ASMs is mixed. It has a negative effect in Egypt, Ghana, Morocco and Tunisia, but exhibits a positive effect in Botswana, Kenya, Mauritius and Nigeria.

Table 7.35: Political Regime Changes Effect on ASM Volatility

	Model	ω	α	β	γ	λ_{RC1}	λ_{RC2}	λ_{RC3}	λ_{RC4}
Botswana	TGARCH	0.0023	0.0815	0.9271	-0.0248	0.2281	-0.0030	–	–
		47.8***	43.3***	867***	-13.4***	4.48***	-1.01		
Egypt	TGARCH	1.2413	0.0492	0.5544	0.0745	-1.3160	5.6327	5.5794	1.3989
		8.52***	12.5***	11.5***	4.87***	-17.9***	1.15	1.10	0.52
Ghana	EGARCH	-0.1022	0.1534	0.9988	-0.0157	-0.4228	-0.3523	-0.0083	–
		-30.0***	48.4***	3244***	-10.2***	-4.10***	-4.12***	-0.22	
Kenya	GARCH	0.0104	0.0993	0.8892	–	0.6201	0.5021	–	–
		11.9***	26.8***	450***		1.66	1.94*		
Mauritius	GARCH	0.0047	0.1604	0.8365	–	0.135	0.242	-0.0584	-0.092
		15.7***	31.9***	255***		0.36	3.78***	-0.21	-0.16
Morocco	GARCH	0.0075	0.0481	0.9433	–	-0.0936	-0.2196	0.0005	-0.0610
		18.9***	22.7***	565***		-2.93***	-4.03***	0.01	-2.23***
Nigeria	EGARCH	-0.8499	0.4374	0.9412	0.1422	-0.4601	-0.3095	0.5418	–
		-19.7***	40.0***	226***	19.2***	-1.48	-1.44	3.17***	
S. Africa	EGARCH	-0.0823	0.1060	-0.0947	0.9848	0.0000	0.0000	0.0000	–
		-11.4***	11.7***	-14.3***	449***	0.00	0.00	0.00	
Tunisia	TGARCH	0.0188	0.1180	0.0725	0.7673	-1.0211	-0.0336	-0.0401	–
		20.3***	15.9***	20.9***	106***	-32.5***	-1.01	-2.74***	

Table 7.36: Overall Political Regime Changes and ASM Volatility – Multiplicative Dummy

Variable	Model	ω	α	β	γ	λ_{RC}
Botswana	GARCH	-11.476	0.3846	0.5277		-107.49
		-52.7***	23.0***	17.9***	–	-41.8***
Egypt	EGARCH	-0.0467	0.0027	0.8703	0.5821	-0.3135
		-6.68***	0.18	30.8***	29.9***	-1.80*
Ghana	EGARCH	-1.4368	-0.0119	0.8492	0.6068	-0.4603
		-5.53***	-0.80	30.2***	32.1***	-1.59
Kenya	TGARCH	-2.3073	0.3658	0.5346	0.0203	1.8723
		-10.3***	15.9***	18.0***	0.82	2.39**
Mauritius	TGARCH	-2.2373	0.3649	0.5255	0.0274	-1168.8
		-10.7***	16.2***	17.9***	1.10	-61.5***
Morocco	TGARCH	-2.3470	0.3438	0.5506	0.0321	-122.46
		-9.73***	15.3***	17.9***	1.32	-61.9***
Nigeria	TGARCH	-11.252	0.4535	0.4537	0.0162	-616.08
		-85.7***	15.2***	17.6***	0.51	-319***
S. Africa	GARCH	-2.3010	0.3732	0.5357		1.5557
		-10.5***	22.3***	18.3***	–	4.12***
Tunisia	TGARCH	-2.3574	0.3617	0.5393	0.0303	1.3089
		-9.97***	16.0***	18.3***	1.22	0.79

The overall effect of regime changes to volatility of stock returns is presented in Table 7.36. The asymmetric GARCH model is the one more selected. The overall regime change is found to impact on conditional volatility of stock returns in seven out of the nine selected ASMs. Specifically, Ghana and Tunisia are the ASMs in the sample that do not show changes to volatility of stock returns during regime change. Political regime changes results in a negative impact on the conditional volatility of ASMs except Kenya and South Africa. Significantly, results also reviews an explosive effect of stock returns volatility in most ASMs in the sample. This indicates how market participants are responsive to political regime changes in Africa.

The alternative methodology of additive dummy variable confirmed negative overall regime changes effect on stock market return volatility in Egypt, South Africa and Tunisia. Even though all the values of the overall regime changes variable were negative, except Kenya, and most of them were not significantly different from zero. Generally, it can be confirmed that regime changes lead to negative effect in volatility of stock returns in Africa.

Table 7.37: Overall Political Regime Changes and ASM Volatility – Additive Dummy

Variable	Model	ω	α	β	γ	λ_{RC}
Botswana	EGARCH	-1.1836	0.4484	0.9104	0.0338	-0.3601
		-17.2***	33.3***	137***	4.48***	-1.49
Egypt	TGARCH	0.8344	0.0862	0.5848	-0.0042	-0.9055
		4.72***	3.47***	7.02***	-0.17	-7.12***
Ghana	EGARCH	-1.1604	0.4319	0.9116	0.0323	-0.0154
		-16.8***	33.4***	140***	4.41***	-0.18
Kenya	TGARCH	0.0703	0.3157	0.6648	-0.0471	0.4131
		12.8***	25.4***	49.2***	-2.69***	1.26
Mauritius	TGARCH	0.0686	0.3077	0.6776	-0.0563	-0.0453
		12.3***	25.3***	51.6***	-3.38***	-1.23
Morocco	TGARCH	0.0724	0.3065	0.6727	-0.0558	-0.0313
		12.7***	24.9***	49.6***	-3.32***	-0.71
Nigeria	EGARCH	-1.1581	0.4433	0.9127	0.0324	-0.0825
		-17.2***	32.1***	142***	4.36***	-0.70
S. Africa	TGARCH	0.0666	0.3053	0.6827	-0.0609	-0.0996
		12.9***	24.8***	54.3***	-3.80***	-1.79*
Tunisia	TGARCH	0.6626	0.0771	0.5737	-0.0004	-0.7803
		8.40***	324***	13.0***	-0.05	-12.8***

7.4.3 SUMMARY OF POLITICAL REGIME CHANGES EVENT AND STOCK MARKET RETURNS

From the CAR graph of each country as well as the pooled ASM, it can be concluded that stock prices are subjected to EMH and/or UH after political regime changes in Africa. This confirms that African markets are information efficient, as opposed to uncertainties in market participant's actions. A formal test of the political regime changes under three event windows indicated that abnormal stock market returns of all the ASM, except Morocco, were significant to regime changes event. They all experienced positive abnormal returns except Botswana and Tunisia. Hence *Hypothesis 3b* cannot be rejected, thus political regime changes influence abnormal stock returns in ASMs. The finding confirms literature on the link of political regime changes with stock returns (Oehler, Walker & Wendt, 2013; Ahmed, 2017). Even though Ahmed (2017) found a significant relationship between regime change and Egyptian Stock Exchange, his analysis of military coup and stock returns yielded a negative association between the two.

In order to test how regime change events affects stock volatility, the individual events were first introduced into a second moment GARCH equations. Results revealed that stock market volatility are affected by political regime changes. The regime change events presented mixed results with respect to direction of the volatilities. However, when the regime changes events were aggregated into one in each country all, with the exception of Ghana and Tunisia, were significant. Also, all the ASMs except Kenya had a negative reaction to regime change event. This shows that the overall regime change event has significant negative impact on ASMs. Hence Ahmed (2017) and Acemoglu, Hassan and Tahoun (2018) findings on Egypt can largely be extended to all ASMs. Thus, it can be concluded that political regime changes have significant effect on volatilities of stock market returns in African as postulated in *Hypothesis 4b*.

7.5 TERRORISM AND AFRICAN STOCK MARKET RETURN

The study makes use of terrorism events sourced from the Global Terrorism Database (GTD), an open-source database by the National Consortium for the Study of Terrorism and Responses to Terrorism (START). The database covers over 150,000 terrorist events from 1970 to 2018. Thus, this study therefore adopts the GTD definition of terrorism as "*the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation*" (Institute for Economics & Peace, 2019). This

suggest that an event is considered to be a terrorism if satisfies these three attributes: (1) is intentional; (2) involves some level of violence or immediate threat to violence; and (3) the perpetrators must be sub-national actors. In addition, the event must possess at least two of the following three criteria:

1. The event must be intended to achieving a political, economic, religious, or social purposes.
2. There must be intention to coerce, intimidate, or convey some other message to a larger audience (or audiences) than the immediate victims.
3. The action must be outside the he precepts of international humanitarian law.

Based on the number of terrorism events that occurred in the African countries, six out of the nine countries used in the previous sections namely; Egypt, Kenya, Morocco, Nigeria, South Africa and Tunisia are used. Botswana, Ghana and Mauritius were omitted because there were few or no terrorism events in the sample period. The summary of terrorist events that occurred within the period of 2002 and 2018 in the 6 selected countries are presented in Table 7.38. There were 7448 terrorist activities recorded and included in the sample. Almost 60 % of these terrorist events occurred in Nigeria. If Egypt is added, both countries account for about 87% of terrorist activities in the sample. Armed assault was the highest terrorist activity recorded in the sample, followed closely by bombings or explosions.

Table 7.38: Terrorist Events Used in the Study, 2002-2018

	Assassin	Armed Assault	Bomb	Hijack	Hostage (B.I)	Hostage (Kidnap)	Facility Attack	Unarm Assault	Uknw	Total
Egypt	62	622	1158	12	5	94	44	1	61	2059
Kenya	24	233	278	15	16	42	22	2	13	645
Morocco	–	–	12	–	–	2	–	–	–	14
Nigeria	224	2068	1178	9	24	515	267	8	171	4464
S. Africa	67	21	21	–	–	1	40	–	–	150
Tunisia	5	40	43	1	1	9	11	–	6	116
Total	382	2984	2690	37	46	663	384	11	251	7448

Source: Author' computation using GTD (2019)

Table 7.39 and 7.40 presents the number of casualties that resulted from terrorist events in the six selected African countries. According to those tables, death of 29,968 people from 4,370 terrorist attacks occurred between 2002 and 2018 in the selected countries. Majority of these death occurred

in Nigeria (about 85%) whiles Morocco and South Africa recorded the lowest number of deaths. Not surprisingly, armed assault accounted for the most deaths, followed by bombings. Also, the 2,418 terrorist events of the sample injured 17,658 people. However, bombings recorded the highest injury to humans accounting for about 66 % of the total. Although, 3,732 of the events did not result to any damage to human life, they is considered an act of terrorism since it represent a systematic attack on the constitution of a country. From the financial market point of view, these events represent new relevant information that was not anticipated. Hence, market participants consider these new information and adjust their valuation of asset prices.

Table 7.39: Death from Terrorism Events in the Selected African Countries, 2002-2018

	Assassin	Armed Assault	Bomb	Hijack	Hostage (B.I)	Hostage (Kidnap)	Facility Attack	Unarm Assault	Uknw	Total
Egypt	45	941	1959	4	1	84	–	–	187	3221
Kenya	37	679	332	8	227	150	–	6	20	1459
Morocco	–	–	75	–	–	2	–	–	–	77
Nigeria	329	15424	5961	11	186	1641	356	15	889	24812
S. Africa	62	24	1	–	–	2	–	–	–	89
Tunisia	–	–	263	–	24	8	4	–	11	310
Total	473	17068	8591	23	438	1887	360	21	1107	29968

Source: Author' computation using GTD (2019)

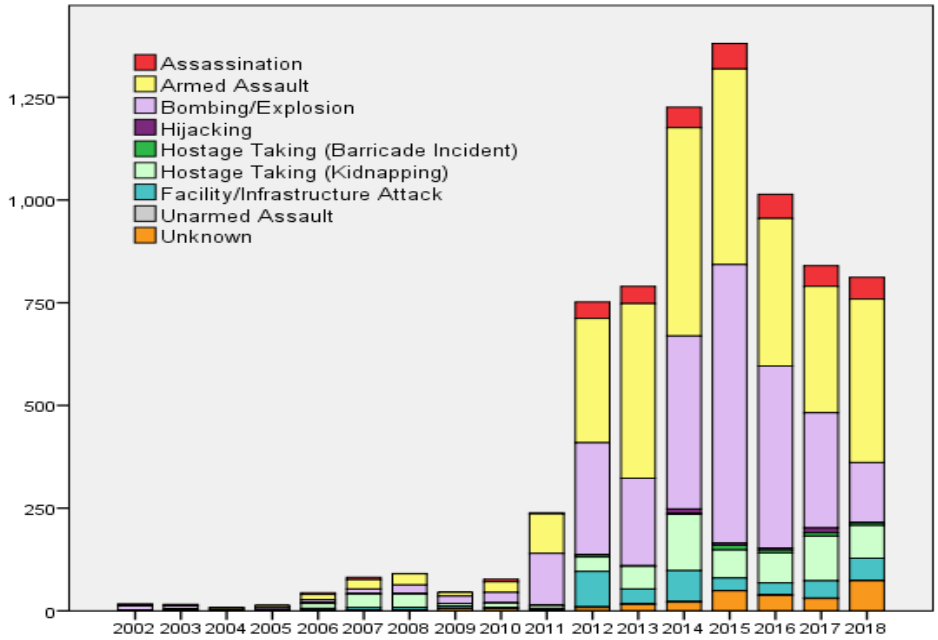
Table 7.40: Injuries from Terrorism Events in the Selected African Countries, 2002-2018

	Assassin	Armed Assault	Bomb	Hijack	Hostage (B.I)	Hostage (Kidnap)	Facility Attack	Unarm Assault	Uknw	Total
Egypt	55	786	3230	1	–	24	3	2	104	4205
Kenya	20	410	1173	8	305	74	9	–	63	2062
Morocco	–	–	150	–	–	–	–	–	–	150
Nigeria	165	3112	6759	–	22	607	59	9	64	10797
S. Africa	20	47	1	–	–	–	–	12	–	80
Tunisia	–	–	264	–	42	12	46	–	–	364
Total	260	4355	11577	9	369	717	117	23	231	17658

Source: Author' computation using GTD (2019)

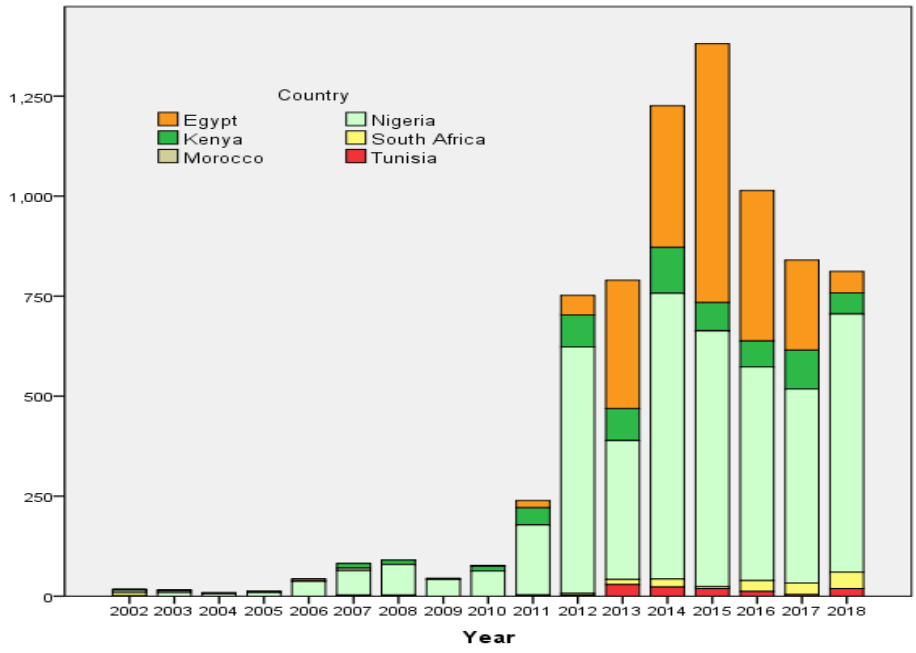
Figure 7.6 and 7.7 depict the time plots of the terrorism events of the selected African countries over the sample period. It can be seen that the relevant acts of terrorism started on the African continent as of 2011. A peak was reached in 2015 and a downward trend has emerged since then, with the exception of Nigeria, that had a significant increase in terrorist activities in 2018.

Figure 7.6: Terrorist Events by Type, 2002-2018



Source: Global Financial Development (2019); Author computation

Figure 7.7: Terrorist Events by Selected African Country, 2002-2018



Source: Global Financial Development (2019); Author computation

This study adopts a three-step empirical methodology popularized by Gulen and Mayhew (2000) and used in several studies, for instance Chau, Deesomsak and Wang (2014) and Corbet (2018), in order to calculate the volatility of ASM returns as a result of terrorism events. This methodology focused on the GARCH model framework. The first step is to remove the worldwide influence on African market and possible autocorrelation due to low market capitalisation or low liquidity. This involves generating return innovations from the estimation of the following autoregressive model:

$$R_{afric} = \omega + \sum_{j=1}^{5} \alpha_j R_{t-j} + \alpha R_{world,t-1} + \sum_{t=Mon}^{Thur} \beta_t Day_t + u_t \qquad \textbf{(7.25)}$$

Where R_{afric} is the log difference of MSCI Frontier Markets Africa Index, a proxy for Africa country's stock index, R_{t-j} is the country specific lagged daily stock return, R_{world} is the MSCI world index and Day_t are day-of-the-week dummies for Monday through Thursday[24]. From Equation 7.25, u_t was generated as the new filtered returns and used in subsequent analysis. This was done to remove the predictability associated with periods lagged returns and the influence of worldwide price movements, as well as the day-of-the-week effect.

The second step involves an extensive model selection process to identify the most suitable GARCH specification for each country return series, as employed in Cappiello, Engle and Sheppard (2006). This involves the estimation of both symmetric and asymmetric univariate GARCH models to determine the form of conditional volatility equation that fits the series well. It ensures that the problem of 'non-convergence' associated with most univariate GARCH models are resolved. The study limits this model selection to three alternative specifications frequently used to capture the stylized characteristics of financial time series variance. These are the standard symmetric GARCH model (Bollerslev, 1986; Taylor, 1986), the exponential GARCH (EGARCH) by Nelson (1991) and the asymmetric GARCH (GJR-GARCH) model of Glosten, Jaganathan and Runkle (1993).

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 \qquad \text{[GARCH]} \qquad \textbf{(7.26)}$$

$$lnh_t^2 = \omega + \beta lnh_{t-1}^2 + \alpha \left|\frac{\varepsilon_{t-1}}{h_{t-1}}\right| + \gamma \frac{\varepsilon_{t-1}}{h_{t-1}} \qquad \text{[EGARCH]} \qquad \textbf{(7.27)}$$

[24] The study excluded Fridays from the dummy variables as it was found to be insignificant.

$$h_t = \omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 + \gamma \varepsilon_{t-1}^2 \eta_{t-1} \qquad \text{[GJR-GARCH]} \qquad \textbf{(7.28)}$$

After estimating, the best performing model is selected with the help of AIC, BIC and log L.

In order to examine the effect of terrorism on the volatility of African stock market a multiplicative dummy variable is incorporated into the best conditional variance equation based on the selection process outlined:

$$h_t = (1 + \lambda_d D_t)(\omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2) \qquad \text{[GARCH]} \qquad \textbf{(7.29)}$$

$$lnh_t^2 = (1 + \lambda_d D_t)\left(\omega + \beta lnh_{t-1}^2 + \alpha \left|\frac{\varepsilon_{t-1}}{h_{t-1}}\right| + \gamma \frac{\varepsilon_{t-1}}{h_{t-1}}\right) \qquad \text{[EGARCH]} \qquad \textbf{(7.30)}$$

$$h_t = (1 + \lambda_d D_t)(\omega + \beta h_{t-1} + \alpha \varepsilon_{t-1}^2 + \gamma \varepsilon_{t-1}^2 \eta_{t-1}) \qquad \text{[GJR-GARCH]} \qquad \textbf{(7.31)}$$

Where D_t is the event dummy variable that take the value of one after a terrorist activity and zero otherwise. If the parameter estimate λ_d is significant then it can be concluded that terrorist activities affect stock return volatility.

7.5.1 Volatility and Terrorism in Africa

The first part of the analysis is to remove the effect of worldwide price movements and address the problem of autocorrelation induced by nonsynchronous trading. It is important to note that day-of-the week effect have previously been found in African markets (e.g. Tachiwou, 2010; Ndako, 2013; Toit, Hall & Pradhan, 2020 among others). Also, similar to earlier authors such as Engle and Ng (1993), Gulen and Mayhew (2000) and Chau, Deesomsak and Wang (2014), adjustments in the data were made in order to concentrate on the unpredictable part of the return innovations. Findings from Table 7.41 show that most of the autoregressive coefficients are significantly different from zero indicating the presence of autocorrelations. Day-of-the week effect is confirmed in all the selected African stock market index. This is not different from the earlier findings of small size listed firms characterized by low levels of liquidity with few shares mostly dominating total trading activity. The lagged MSCI world index is positive and significant in Egypt, Kenya, Morocco and South Africa. This shows global price movements have an influence on these selected Africa stock market.

Table 7.41: Preliminary Regressions Results

	ω	α_1	α_2	α_3	α_4	α_5	World	Mon	Tues	Wed	Thur
Botswana	0.0015	0.0334	-0.0002	0.0007	0.0006	0.0003	0.0003	-0.0020	-0.0019	-0.0013	-0.0013
	4.22***	2.11**	-0.76	2.24**	2.10**	1.05	1.06	-3.97***	-3.78***	-2.71***	-2.71***
Egypt	0.1381	3.3681	0.0490	0.0414	0.0136	0.0245	0.0266	-0.1959	-0.1820	-0.1294	-0.1325
	3.96***	2.14**	5.04***	4.20***	1.38	2.48**	2.74***	-3.98***	-3.69***	-2.63***	-2.69***
Ghana	0.0016	0.0348	-0.0322	-0.0446	-0.0342	0.0031	0.0141	-0.0020	-0.0019	-0.0014	-0.0013
	4.45***	2.20**	-1.40	-1.95**	-1.50	0.13	0.62	-3.94***	-3.83***	-2.75***	-2.69***
Kenya	0.1481	3.4839	0.0807	-0.0272	-0.0060	0.0482	0.0583	-0.1976	-0.1837	-0.1333	-0.1347
	4.24***	2.21**	4.37***	-1.42	-0.31	2.52**	3.17***	-4.00***	-3.72***	-2.70***	-2.73***
Mauritius	0.1409	3.5219	0.1156	0.0322	0.0511	0.0388	0.0413	-0.1986	-0.1875	-0.1340	-0.1341
	4.03***	2.24**	4.54***	1.23	1.95**	1.48	1.62	-4.02***	-3.80***	-2.71***	-2.71***
Morocco	0.1447	3.4003	0.0594	0.0363	0.0123	0.0282	0.0732	-0.1938	-0.1865	-0.1343	-0.1336
	4.14***	2.16**	3.47***	2.10**	0.71	1.63	4.28***	-3.93***	-3.78***	-2.72***	-2.71***
Nigeria	-0.0004	0.0675	0.0151	0.0322	0.0132	-0.0086	0.0083	0.0005	0.0005	0.0019	-0.0001
	-1.06	4.28***	1.26	2.68***	1.09	-0.72	0.69	1.10	1.01	3.77***	-0.17
S. Africa	0.1442	3.1983	0.0789	0.0297	0.0088	0.0219	0.0246	-0.1927	-0.1871	-0.1312	-0.1295
	4.13***	2.03**	5.83***	2.20**	0.66	1.62	1.82*	-3.90***	-3.79***	-2.66***	-2.62***
Tunisia	0.1473	3.3839	0.0207	0.0236	0.0007	-0.0045	0.0378	-0.1946	-0.1868	-0.1313	-0.1304
	4.18***	2.14***	0.66	0.73	0.02	-0.14	1.19	-3.92***	-3.75***	-2.64***	-2.62***

The generated return innovations are used to test the effect of terrorist activities on the conditional volatility of the selected ASMs using a number of GARCH specifications. Table 7.42 presents the summary statistics of the unpredictable returns (u_t). From that table, the average returns are low as expected from the return innovations. The excessive skewness and kurtosis are an indication of a deviation from normality assumption. Also, the insignificant Ljung-Box (LB) test statistics for the returns shows that there is no longer serial correlation in the filtered returns. Thus, the regression model was able to remove any serial correlation in the series and then all predictable part of the return series are no longer present. However, the ARCH statistics are highly significant in all the return series, which implies that temporal dependencies in higher moment still exist in the return distribution (Engle & Kroner, 1995; Campa, Chang & Reider, 1998). In summary, the statistical nature of the return innovations justifies the use of autoregressive distributed models in analysing the variance process of returns.

Table 7.42: Summary Statistics of Return Innovations

	Mean	Max	Min	Std. dev	Skew	Kurt	LB(6)	ARCH(6)
Botswana	0.0000	0.0902	-0.1187	0.0103	-0.4059	12.197	0.1237	174.29*** (0.000)
Egypt	0.0000	8.7769	-11.764	1.0214	-0.4046	12.079	0.2289	178.84*** (0.000)
Ghana	0.0000	0.0897	-0.1188	0.0103	-0.4322	12.286	0.1288	174.05*** (0.000)
Kenya	0.0000	8.9487	-11.807	1.0253	-0.4128	12.219	0.4097	179.61*** (0.000)
Mauritius	0.0000	9.0294	-11.846	1.0253	-0.4197	12.392	0.1730	171.25*** (0.000)
Morocco	0.0000	8.9026	-11.787	1.0252	-0.4021	12.007	0.1763	177.91*** (0.000)
Nigeria	0.0000	0.0899	-0.1174	0.0103	-0.4157	12.140	0.6060	178.85*** (0.000)
S. Africa	0.0000	8.9944	-11.826	1.0253	-0.4285	12.317	0.5483	176.41*** (0.000)
Tunisia	0.0000	8.9940	-11.864	1.0302	-0.4248	12.221	0.1495	177.57*** (0.000)

After justifying the need to account for conditional heteroscedasticity in the return innovations, the study proceeded to address the main research question of examining the effect of terrorist attacks on volatility of the selected ASMs returns[25]. The most appropriate univariate GARCH model is selected with the help of model specification tests.

Table 7.43: Overall Effect of Terrorism on ASM Volatility – Multiplicative Dummy

Variable	Model	ω	α	β	γ	λ_d
Egypt	GJR-GARCH	-1.8325	0.3403	0.5091	0.0435	-1.6143
		-12.3***	14.7***	16.4***	1.76*	-3.37***
Kenya	GJR-GARCH	-2.0625	0.3609	0.5226	0.0241	-1.2165
		-10.5***	15.8***	16.8***	0.96	-2.73***
Morocco	EGARCH	-0.0457	-0.0090	0.8598	0.5834	-0.9846
		-6.53***	-0.62	30.4***	30.6***	-2.39**
Nigeria	GJR-GARCH	-11.207	0.4550	0.4492	0.0159	-0.0868
		-83.7***	15.1***	17.1***	0.49	-0.71
S. Africa	EGARCH	-0.0393	-0.0127	0.8538	0.5936	-0.4920
		-5.46***	-0.86	31.0***	31.8***	-8.00***
Tunisia	GJR-GARCH	-2.3503	0.3623	0.5382	0.0304	0.0800
		-10.0***	15.9***	18.2***	1.22	0.31

[25] Some countries were dropped because of the frequency of terrorism event

Table 7.43 shows that the asymmetric GARCH models best fit for all the selected countries. The GJR-GARCH model is identified as the best model to analyse Egypt, Kenya, Nigeria and Tunisia stock market returns whiles EGARCH model is best fit for Morocco and South Africa stock market returns. This is not surprising as African markets are characterized by low liquidity and are not highly integrated into the global markets. Compared with other markets, African markets are generally affected by volatility related to domestic market itself.

After selecting the best GARCH model, a multiplicative dummy is introduced into the volatility model, as seen in Equations 7.29 to 7.31. The estimated parameters of the GARCH processes are also presented in Table 7.70. As expected, results show that the GARCH parameters describing the conditional variance ω, α, β and γ are highly significant at one percent level of significance (except γ in most cases). The $\alpha + \beta$ in all the selected countries are close to one, showing a high volatility persistence in the conditional variance. The significant γ parameter in Egypt, Morocco and South Africa confirms the leverage effect in the return innovations. This is in line with numerous evidences of highly persistence and asymmetric stock market volatility (Engle & Ng, 1993; Bauwens, Laurent & Rombouts, 2006).

The main target of the model is to estimate coefficients for the dummy variable λ_d which shows whether terrorist attacks provide a shock in stock market returns in Africa. The results shows that four out of six countries experienced significant changes in their volatility of stock returns as a result of acts of terrorism in their country. Specifically, these markets experienced significant negative volatility of stock return during terrorist events. Egypt (South Africa) shows the highest (least) significant changes in volatility of returns among the sample. Hence, it can be suggested that Egypt (South Africa) is the most (least) susceptible market to acts of terrorism. It is also evident that bombings or explosions is the type of terrorist attack that generate the most significant effect in volatility of returns.

Nigeria and Tunisia are the African countries in the sample that did not exhibit significant changes in their stock returns as a result of terrorism. Although Nigeria is the country with the most terrorist events in Africa, stock markets seem to be immune to terrorism. One possible reason is partly due to the numerous terrorism events that occurs in the country, making it unsurprising news anymore. Thus, investors have already incorporated terrorism events in their valuation of stocks in Nigeria.

Table 7.44: Overall Effect of Terrorism on ASM Volatility – Additive Dummy

	Model	ω	α	β	γ	λ_d
Egypt	GJR-GARCH	0.0947	0.3082	0.6609	-0.0549	-0.0602
		12.6***	25.4***	44.9***	-3.18***	-7.32***
Kenya	GJR-GARCH	0.0772	0.3179	0.6629	-0.0522	-0.0283
		12.6***	25.4***	48.4***	-3.03***	-3.01***
Morocco	GJR-GARCH	0.0740	0.3084	0.6694	-0.0557	-0.1466
		12.8***	25.1***	49.1***	-3.30***	-1.42
Nigeria	GJR-GARCH	0.0001	0.1500	0.6000	0.0500	0.0000
		4.23***	2.85***	6.70***	0.81	0.00
S. Africa	GJR-GARCH	0.0694	0.3024	0.6831	-0.0607	-0.0647
		12.5***	24.5***	53.7***	-3.78***	-3.16***
Tunisia	GJR-GARCH	0.0700	0.3193	0.6685	-0.0635	0.0150
		13.0***	25.1***	50.8***	-3.66***	0.85

From the results so far, terrorist events present a significant negative effect to volatility of most ASMs. This is in line with the evidence that terrorist events contribute significantly to volatility of stock returns mainly as a result of the uncertainty and panic resulting from such an event. To check the robustness of the findings, a different econometric specification and alternative assumption for the GARCH errors is implemented. The effect of terrorist attacks on stock market volatility is tested with an additive dummy variable to the most suitable GARCH specification from Equations 7.29 to 7.31 and earlier analysis is then followed. Similar findings are reported from the different econometric specification as seen in Table 7.44. The similarities include: the highly significant GARCH parameters, the preference of asymmetric to the symmetric models and the direction of the effect of terrorist events being negative. Three main slight differences are reported in this table. First, the best GARCH specification is the asymmetric GJR-GARCH model in all the series. Second, Morocco became insignificant with the additive dummy in addition to Nigeria and Tunisia. Third, the magnitude of the additive model is significantly reduced as compared to the multiplicative model. However, all these findings does not present a significant difference from the multiplicative model.

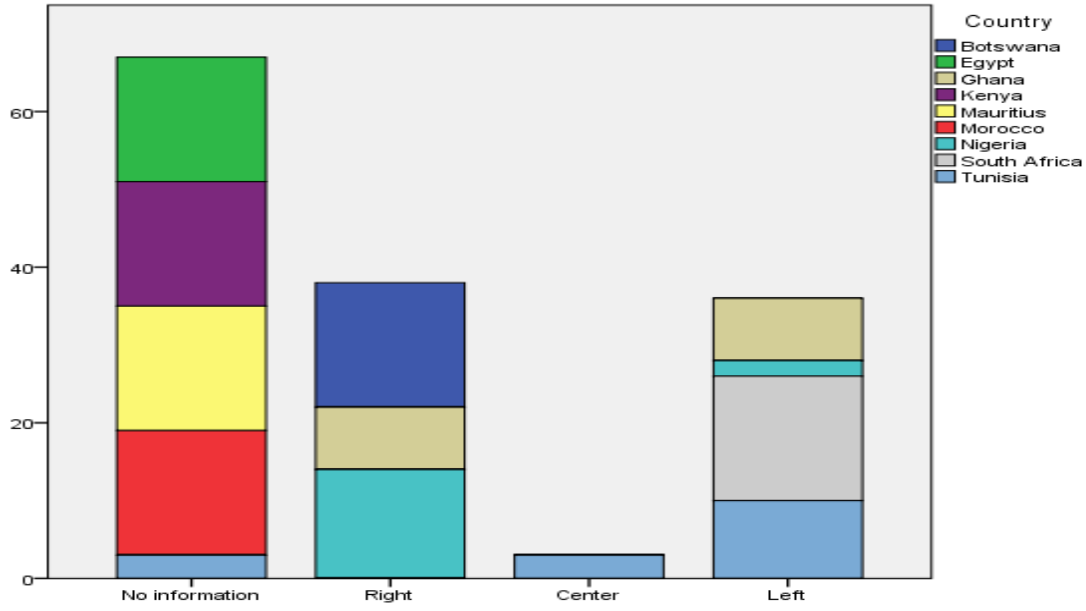
In summary, the study confirmed that terrorism have significant negative effect on stock volatility in Egypt, Kenya, Morocco and South Africa stock exchanges, in line with the findings of Carter and Simkins (2004), Chen and Siems (2004), Hon, Strauss and Yong (2004), Chaudhry (2005), Chesney, Reshetar and Karaman (2011) Essaddam and Karagianis (2014) and Corbet (2018), among others. However, the results show that terrorism do not present significant stock market

volatility within Nigeria and Tunisia exchanges. One possible reason, in the case of Nigeria, is the frequency with which terrorism event occurs in Nigeria. The Nigerian market already operates under the assumption of the frequency of terrorist events, so that such uncertainties have been incorporated into prices. Thus, the Nigerian stock market has inculcated the frequency of terrorism events in its prices, hence eliminating the element of surprise in case such event occurs. *Hypothesis 4c* can therefore confirmed that volatilities of ASMs are significantly increased during episodes of terrorism events.

7.6 POLITICAL ORIENTATION AND STOCK RETURNS IN AFRICA

The orientation of the political party in office with respect to economic policy is represented in Figure 7.8. The classification is based on groupings of party orientation proposed by Cruz, Keefer and Scartascini (2018). Parties classified as Right are defined as conservative, Christian democratic or right-wing. Left are parties in office that are classified as communist, socialist, social democratic or left-wing. Also, a party is described as center or centrist when they advocates for strengthening private enterprise in a social-liberal context. If none of the categories mentioned above fits a party in office, it is labelled as 'No information'. This happens when the party in office does not focus on economic issues or there are competing wings within the party itself.

Figure 7.8: Type of Political Orientation of Incumbent Government

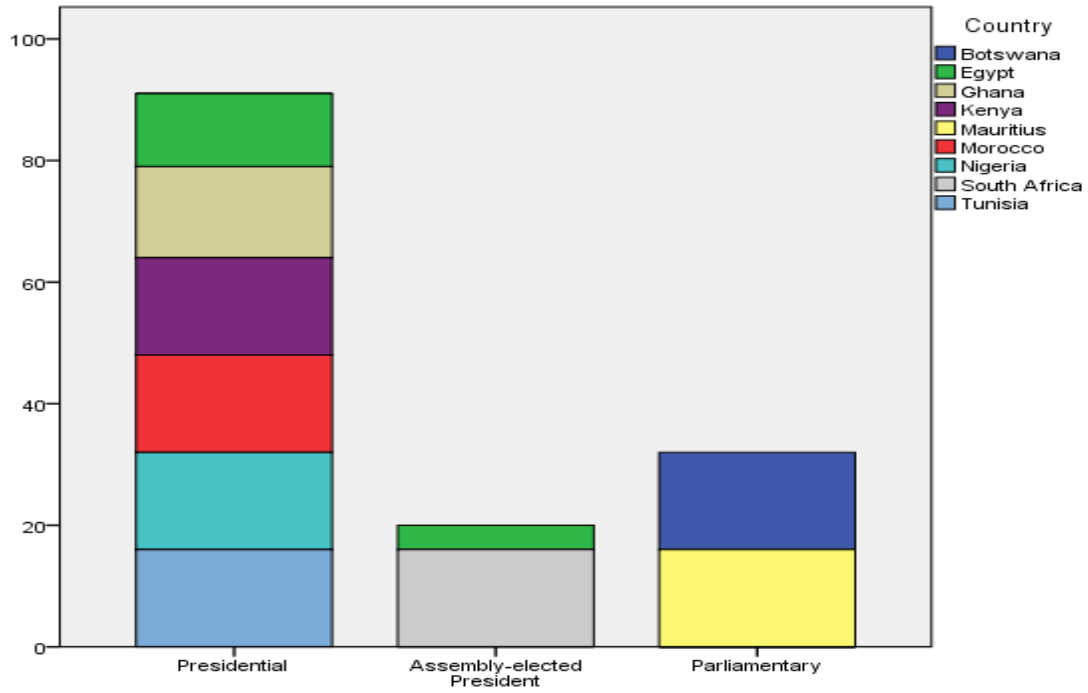


Source: Cruz, Keefer and Scartascini (2018)

As shown in Figure 7.8, most of Africa political parties in office cannot be described as either right or left governments. Specifically, political parties in office in Egypt, Kenya, Mauritius, Morocco and some periods in Tunisia do not fit as either right or left government during the study period. On the other hand, Botswana governments is right-wing and South Africa governments is left-wing in the entire period of the study. However, political parties in office in Ghana and Nigeria alternate between right and left governments whilst that of Tunisia alternate among centre, left and "no information".

Following Cruz, Keefer and Scartascini (2018), the system with which a head of state or president is elected in office is illustrated in Figure 7.9. From this figure, about six out of the nine selected countries uses presidential system to elect their head of state or president. Botswana and Mauritius have parliamentary system in which the legislature power elects the head of state. On the other hand, South Africa uses the assembly-elected system, in which the legislature power cannot easily overthrow the president unless a two-thirds majority or the legislature is dissolved before a president can be forced out.

Figure 7.9: System of Election of the Selected ASMs



Source: Cruz, Keefer and Scartascini (2018)

7.6.1 OPPORTUNITY PBC THEORY IN ASMs

To test the political business cycle theory on ASMs, this study combines the methodology of Furió and Pardo (2012), Chau, Deesomsak and Wang (2014) and Ahmed (2017) in a VAR-GARCH model. The first step is to remove the influence of global effect on ASMs in an International Market Model within a GARCH framework. This involves incorporating MSCI World Index into the best GARCH model. The second step is to include an AR (1) in the first moment equation to eliminate possible serial correlation that may be present. The third step is to include dummy variables to capture day-of-the week effect. The next step is estimating different GARCH specifications in order to select the most appropriate model with the help of several information criteria. The mean equation in the model is given by:

$$r_t = \mu + \alpha_1 r_{t-1} + \alpha R_{world} + \sum_{t=Mon}^{Thur} \beta_t Day_t + \varepsilon_t \qquad \textbf{(7.32)}$$

Then the model is completed with a dummy variable that represents the political cycle in order to check the opportunistic political business cycle in Africa. The dummy variable captures the second term in office of a government. Thus, the mean equation becomes:

$$r_t = \mu + \alpha_1 r_{t-1} + \alpha R_{world} + \sum_{t=Mon}^{Thur} \beta_t Day_t + Term2 + \varepsilon_t \qquad \textbf{(7.33)}$$

Where $Term2$ represent a dummy which take the value of unity in the second half of the government and zero otherwise. A significant $Term2$ variable indicates the acceptance of the opportunity PBC hypothesis.

Based on the results (Table 7.45), evidence of opportunistic PBC can be confirmed in three out of the eight selected countries (Botswana, Ghana and Tunisia), since the $Term2$ coefficient is statistically different from zero. This means the incumbent government uses either monetary or fiscal policies on a cyclical manner in its attempt to maintain power in these countries. The direction of $Term2$ in Botswana and Tunisia is positive, whilst that of Ghana is negative. This means that government policies to influence votes lead to excess return in Botswana and Tunisia, but result in decline of stock returns in Ghana. However, as suggested by Furió and Pardo (2012), we cannot conclude that the opportunistic PBC is not followed by governments to gain votes in countries where $Term2$ coefficient is not statistically significant. Rather, the rational expectation

of investors might have accurately anticipated such policies and have duly adjusted their valuations of the market. Hence, the use of economic policies by governments to influence voters is limited in Africa.

Table 7.45: Opportunity PBC and Volatility of ASM

	Model	α_1	World	Mon	Tues	Wed	Thur	Term2	ω	α	β	γ
Botswana	EGARCH	-0.0634	1.1006	0.0212	0.0304	0.0092	0.0118	0.0442	-1.2804	0.0100	0.0100	0.0100
		-6.50***	1.11	0.71	1.02	0.31	0.37	2.15**	-6.07***	3.79***	0.06	5.83***
Egypt	TGARCH	0.2002	23.609	-0.0723	0.1338	-0.0023	0.1978	-0.0124	0.1211	0.0940	0.8283	0.0667
		11.9***	13.6***	-1.12	2.17**	-0.04	3.30***	-0.27	25.8***	18.1***	162***	6.42***
Ghana	EGARCH	-0.0607	-0.0059	0.0001	-0.0001	0.0002	0.0002	-0.0004	-0.0993	0.1590	0.9992	-0.0148
		-4.35***	-1.66*	0.91	-1.34	2.14**	1.79*	-4.93***	-22.4***	44.3***	2525	-10.2***
Kenya	GARCH	0.3205	0.1102	-0.1084	-0.0518	-0.0229	-0.0642	-0.0122	0.0127	0.1283	0.8671	
		20.6***	0.12	-3.80***	-1.98**	-0.84	-2.27**	-0.63	11.1***	30.7***	437***	
Morocco	TGARCH	0.1164	9.7283	-0.0554	-0.0511	0.0207	-0.0328	0.0109	0.0080	0.0403	0.9470	0.0078
		7.78***	8.23***	-1.52	-1.40	0.56	-0.89	0.16	17.8***	13.3***	589***	1.71*
Nigeria	EGARCH	0.3035	-0.0166	-0.0018	-0.0011	-0.0011	-0.0013	-0.0001	-0.8389	0.4924	0.9462	0.1644
		17.8***	-2.96***	-6.92***	-4.09***	-3.79***	-4.95***	-0.33	-18.6***	38.1***	216***	19.3***
S. Africa	TGARCH	0.0118	62.340	0.0768	-0.0146	-0.0115	0.0536	0.0213	0.0091	0.0175	0.9270	0.0923
		0.90	48.1***	2.06**	-0.39	-0.32	1.45	1.02	4.67***	2.41**	138***	7.91***
Tunisia	TGARCH	0.2496	-0.4589	-0.0490	-0.0683	-0.0385	-0.0093	0.0254	0.0145	0.1299	0.7815	0.0608
		15.4***	-0.88	-2.96***	-3.70***	-2.15**	-0.53	2.07**	17.2***	14.0***	121***	4.94***

7.6.2 PARTISAN PBC THEORY IN ASMs

This study proceeds to examine the extent to which ideological composition of a party can influence the performance of ASMs in the tenure of the government as proposed by the partisan PBC theory. Left-wing governments are assumed to pursue full-employment policies and right-wing governments are more concerned about supply side policies. It is suggested by Leblang and Mukherjee (2005) that the rational expectation of an increased inflation under a left-wing government causes a decline in the demand of stocks which in turns leads to fall in equity prices and vice versa. Of course, there are several indicators that could gauge the performance of stock market under the left or right government. The general expectation is that stock returns increase in the term of right-wing governments as compared to left-wing governments. In order to capture the political orientation of parties in power, the dummy in Equation 7.33 is replaced as follows:

$$r_t = \mu + \alpha_1 r_{t-1} + \alpha R_{world} + \sum_{t=Mon}^{Thur} \beta_t Day_t + P_0 + \varepsilon_t \qquad \textbf{(7.34)}$$

Where P_0 is a dummy variable which take the value of one over the term of a right-wing, left-wing and centrist governments. A significant P_0 variable indicates the acceptance of the partisan PBC hypothesis.

Results in Table 7.46 indicates that all the political orientation variables in Ghana and Nigeria are statistically significant but only left-wing party is statistically significant for Tunisia. It can be observed that positive excess return is associated with right-wing governments whiles negative excess returns are observed in left-wing governments except Tunisia. These findings are consistent with Leblang and Mukherjee (2005) model and confirmed by Furió and Pardo (2012). It is however, important to note that conclusive findings should be tested with larger samples when available on African countries. *Hypothesis 4d* cannot be rejected because political orientation has significant effect on volatilities of stock market returns in African.

Table 7.46: Partisan PBC and Volatility of ASMs

	Model	α_1	World	Mon	Tues	Wed	Thur	P_o	ω	α	β
		-0.0141	-0.0078	0.0001	0.0000	-0.0001	0.0003	0.0006	-0.1034	0.1601	0.9991
Ghana	Right	-0.89	-3.22***	0.65	0.23	-1.28	2.86***	13.1***	-22.0***	40.5***	2509***
		-0.0166	-0.0093	0.0001	0.0001	-0.0001	0.0003	-0.0005	-0.1029	0.1600	0.9991
	Left	-1.04	-3.79***	0.69	0.55	-1.28	2.76***	-12.9***	-21.4***	40.8***	2398***
		0.2952	-0.0222	-0.0021	-0.0011	-0.0010	-0.0015	0.0008	-0.8436	0.5059	0.9469
Nigeria	Right	18.0***	-4.04***	-7.46***	-4.39***	-3.76***	-5.62***	3.90***	-19.0***	40.1***	221***
		0.2980	-0.0218	-0.0019	-0.0011	-0.0011	-0.0015	-0.0007	-0.8410	0.5029	0.9469
	Left	17.9***	-3.96***	-7.59***	-4.41***	-3.83***	-5.62***	-2.90***	-18.9***	40.2***	221***
		0.2501	-0.4266	-0.0490	-0.0681	-0.0385	-0.0091	-0.0178	0.0145	0.1305	0.7808
Tunisia	Center	15.5***	-0.82	-2.96***	-3.68***	-2.14**	-0.52	-1.12	17.1***	14.2***	122***
		0.2493	-0.4184	-0.0491	-0.0683	-0.0384	-0.0093	0.0285	0.0145	0.1299	0.7811
	Left	15.4***	-0.81	-2.97***	-3.69***	-2.15**	-0.53	2.27**	17.2***	14.0***	121***
		0.2494	-0.4371	-0.0492	-0.0685	-0.0386	-0.0100	-0.0243	0.0145	0.1304	0.7810
	Unknown	15.4***	-0.84	-2.98***	-3.70***	-2.16**	-0.56	-1.60	17.2***	14.2***	122***

7.7 POLITICAL EVENTS AND AFRICAN STOCK MARKET RETURN

Moving away from individual events, the combined effect of all the political happenings is investigated in this section. Macroeconomic variables are also included to fully understand how political uncertainties interplay with stock market returns from 2002 to 2017. This duration is motivated by data availability. Macroeconomic data were gleaned from WDI, elections and political orientation data from Database of Political Institutions 2017 and country risk indicators

from ICRG. Annual stock return, volatility and Value at Risk (VaR) of the stock data were estimated in a similar manner to Wisniewski, Lambe and Dias (2019).

Table 7.47 catalogues the joint summary statistics of the selected ASMs. The continuously compounded stock return is a high 10.6% per annum accompanied by 15.0% annualized volatility of return and an annualized VaR of 21.0 cents. The average annual inflation was 7.70%, with some hyperinflation episodes experienced in some countries, as seen in the maximum of about 30% recorded in the data. The selected African markets experienced upward pressure on exchange rate and interest rate with an average of 34.4% and 13.9% respectively. Average government consumption over the period was 17. 9 billion dollars, with high variations among the selected countries. The percentage of market capitalisation of domestic firms to the GDP in the selected countries reached an average value of 62.9%. This shows that capital market plays an important role in the economies of the selected countries. GDP in the selected economies was 24.7 billion dollars which is also similar to the money supply in these countries.

Table 7.47: Descriptive Statistics of the Panel Data

Variable	Observations	Mean	Minimum	Median	Maximum	STD
Return	144	10.578	-166.730	11.167	175.125	35.245
Volatility	144	15.040	2.878	12.106	175.625	15.790
VaR	144	21.000	2.581	17.899	75.680	12.955
Inflation	144	7.696	-0.692	6.736	29.507	5.401
Exchange rate	144	34.411	0.792	8.406	305.790	53.645
Interest rate	96	13.891	6.875	13.618	24.771	3.948
Government Consumption	136	1.79E+10	1.14E+09	7.45E+09	8.60E+10	2.24E+10
Capitalisation to GDP	103	62.919	2.489	28.064	352.156	81.076
GDP	144	24.730	22.300	24.660	27.066	1.309
Money Supply	144	26.540	21.234	26.948	30.980	2.171
Election	144	0.1944	0.0000	0.0000	1.0000	0.3972
Years in Office	144	7.3681	1.0000	4.5000	30.0000	7.3368
Regime Changes	144	0.1736	0.0000	0.0000	1.0000	0.3801
Political Stability	144	-0.3410	-2.2111	-0.2709	1.1185	0.9440
Government Stability	128	8.2204	5.2083	7.9167	11.0000	1.5758
Internal Conflict	128	8.5309	4.5833	8.8333	11.0833	1.5656
Left	144	0.2500	0.0000	0.0000	1.0000	0.4345
Right	144	0.2639	0.0000	0.0000	1.0000	0.4423
Military	144	0.1667	0.0000	0.0000	1.0000	0.3740
System	144	0.6389	0.0000	1.0000	1.0000	0.4820

The mean of election variable is 0.1944, suggesting elections are held at least once every five years in the selected African countries. This is a very relevant piece of information that serves to challenge the general view that Africa is mostly undemocratic region. The average years spent in office by executive is also impressive, with an average of 7 years. However, it should be noted that the data recorded an executive power being in power for a maximum of 30 years and a minimum of 4 and half years. The average of a change in power variable is 0.1736, which indicates an average regime change of once every five years in the selected countries. The political stability index that measures the perceptions of political instability or politically motivated violence including terrorism shows a weak governance performance in the selected countries. Also, the extent to which government can implement its declared program and its ability to stay in power is proxied with government stability. An average of 8.22 suggest low risk in the selected countries. Moreover, the extent to which political violence can impact on the economy is proxied with internal conflict. The high average rating of 8.53 indicates there are no armed or civil opposition to governments in the selected countries, as well as the governments do not engage in arbitral use of violence against its own people.

The executive power in the selected countries from 2002 to 2017 consisted of 25.0% left-wing governments, 26.4% right-wing governments and 16.7% of military governments. As noted earlier, most of the governments in office do not fit into either being a leftist or a rightist (centrist) in those countries. A military government is characterized by having a military man in charge, who is usually also head of state, who had not retired when he came to power. Results show that on the average one out of six chief executives in the sample is led by a military person. Finally, the system variable shows that about 63.9% of the selected countries adopts the presidential system to elect their chief executives.

Preliminary analysis to assess the extent to which the dependent and explanatory variables are related are investigated with a Pearson correlation coefficients. Results show low to moderate correlations among all the variables, eliminating the possibility of collinearity between the variables. Also, it can be observed that inflation, exchange rate, GDP, years in office, regime change and military in office are somewhat related to at least one of the dependent variable. However, this is not conclusive since correlation analysis is too simplistic since other related

variables that affect risk and returns are not simultaneously controlled. Consequently, panel regression analysis is used to confirm the findings.

Table 7.48: Correlation between the Dependent and Explanatory Variables

	Return	Volatility	VaR
Inflation	-0.2646*	0.2260	0.2063
Exchange rate	-0.0268	-0.1662	-0.2869**
Interest rate	-0.0195	0.0075	-0.1910
Government Consumption	0.0369	-0.1043	0.0849
Capitalisation to GDP	0.1063	-0.1337	-0.0326
GDP	-0.0440	0.0338	0.2573*
Money Supply	-0.0736	-0.1897	-0.0800
Election	-0.0268	-0.0358	0.0004
Years in Office	-0.2402*	0.2842**	0.4099***
Regime Changes	-0.0096	0.1634	0.2706*
Political Stability	0.0380	0.0363	0.1443
Government Stability	0.1357	0.2255	0.1263
Internal Conflict	0.0671	0.0585	0.0310
Left	0.0779	-0.1424	-0.0326
Right	-0.0778	-0.0435	-0.1727
Military	-0.0724	0.3984***	0.5045***
System	-0.0622	0.1251	0.0231

The joint effect of political events on the selected African Markets is tested with the help of a panel regression analysis. The panel model allows the researcher to estimate the data with great flexibility and formulate the differences in the behaviour of the cross-section elements. First, the small number of years and number of cross sections (countries) limited the panel regression to either adopt fixed or random effect. In order to deal with this issue, the Hausman (1978) test was used. According with these estimations, the null hypothesis of random effect being independent of the regressors was not rejected. This means that fixed effect specification will not provide the appropriate estimates, hence the random effect was used. The random panel regression was specified as follows:

$$Ret_{it} = \mu_i + \sum_{t=1}^{n} \alpha_t Macro_{it} + \sum_{t=1}^{n} \beta_t Pol\_events_{it} + \varepsilon_{it} \qquad \textbf{(7.35)}$$

Where $Ret_{i,t}$ represents the return for country *i* at year *t*, μ_i is random and independent of $\varepsilon_{i,t}$ and α_t and β_t are the estimated coefficients. The explanatory variables are $Macro_{i,t}$, representing macroeconomic variables (Inflation, Exchange rate, Interest rate, Government Consumption, Capitalisation to GDP, GDP and Money Supply) and $Pol\_events_{i,t}$ is the political events indicators (Election, Years in Office, Regime Changes, Political Stability, Government Stability, Internal Conflict, Left, Right, Military in Politics and System). The Equation 7.35 is repeated with Volatility and Value at Risk as the dependent variables in order to investigate certain aspects of ASM behaviour.

Table 7.49 reports the estimates of the random effect panel regression explaining the variation in annual stock returns in Africa. The results indicates that a change in inflation and money supply imposes a significant decline in the annual return of ASMs. On the other hand, exchange rate and stock market capitalisation of domestic firms as a percentage of GDP causes a significant positive change to annual stock returns in Africa. Stock market capitalisation to GDP ratio is significant in line with Levine and Zervos (1996) assertions that development in equity markets propels economic growth through channels like efficient resource allocation, improved corporate control and better risk management practices. In specification (2) only macroeconomic variables were regressed with stock returns. Results show that only interest rate and inflation were statistically significant at 10% level. This suggests an increase in interest rate leads to gains in annual stock returns. Consistent with the above, government consumption and GDP are not a significant determinant of annual stock return in Africa.

Also, from specification (1), years in office, left and right are the political events indicators that are significantly different from zero. These indicators result in a decline to stock market returns. This shows that the longer the chief executive stays in office, the higher it erodes gains from the stock market. Also, it can be inferred that African markets, both left-wing and right-wing governments, have a negative impact on stock returns. This is in contrast with Wisniewski, Lambe and Dias (2020), as well as Bohl and Gottschalk (2006), who found no significant effect of leftist and rightist governments and stock returns. When annual stock returns were regressed on political event indicators, only government stability was significantly different from zero. This suggests the extent to which the government can stay in office and implement its policies is a key determinants of stock returns in Africa. This is not surprising as investors takes into consideration the credibility

and acceptability of governments, especially in developing economies like Africa, before their investments are committed.

Table 7.49: Determinants of Annual Stock Returns

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
inf	-2.776***	-1.623**					
	(1.015)	(0.781)					
exr	0.879*	0.0224					
	(0.510)	(0.169)					
len_ir	5.906	2.157*					
	(3.688)	(1.128)					
cons	1.28e-09	-5.56e-10					
	(1.38e-09)	(5.67e-10)					
mktcap	0.307**	0.143					
	(0.150)	(0.119)					
lngdp	43.05	8.142					
	(26.50)	(7.968)					
lnms	-53.46*	-4.264					
	(32.16)	(11.85)					
election	-9.359		11.74	8.544			
	(12.37)		(8.942)	(7.413)			
yrsoffc	-2.130***		-0.522		0.0644		
	(0.696)		(0.489)		(0.404)		
rc	-7.404		-2.420		-2.377		
	(15.02)		(9.822)		(7.806)		
polstability	-23.93		-3.753			-6.379	
	(32.34)		(8.097)			(7.005)	
govstability	3.357		6.758***			6.653***	
	(4.203)		(2.561)			(2.376)	
intconflict	9.432		3.553			1.423	
	(9.638)		(4.470)			(4.178)	
left	-128.2*		-11.83				-6.938
	(71.91)		(8.732)				(8.084)
right	-88.41**		-1.313				5.485
	(43.46)		(8.948)				(7.799)
militaryinpol	-2.859		-3.365				-0.568
	(16.26)		(4.091)				(2.651)
Constant	197.1	-91.26	-58.93	8.916***	10.52**	-59.52	12.90
	(484.1)	(245.6)	(42.00)	(3.269)	(4.411)	(37.69)	(10.39)
Observations	53	69	128	144	144	128	128
Number of id	4	5	8	9	9	8	8

According to the results, elections, regime changes, political stability, internal conflict, military in politics and system of electing chief executives do not affect annual stock returns in Africa. This is in contrast with the earlier findings where elections, regime changes and political orientation were found to influence daily stock returns. It can therefore be inferred that investors are not

significantly rewarded for taking election risk as concluded by authors like Białkowski, Gottschalk and Wisniewski (2008) and Wisniewski, Lambe and Dias (2020). Also, the growth in democracy, acceptance of a governance system and the gradual elimination of *coup de etat* in Africa make regime change and political orientation a normal occurrence to market participants.

Table 7.50: Determinants of Volatility of Annual Stock Returns

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
inf	0.428	0.562***					
	(0.286)	(0.205)					
exr	-0.0304	0.0740*					
	(0.144)	(0.0443)					
len_ir	-0.137	-0.126					
	(1.039)	(0.296)					
cons	-2.72e-10	0					
	(3.90e-10)	(1.49e-10)					
mktcap	-0.0164	-0.0168					
	(0.0422)	(0.0312)					
lngdp	3.700	8.595***					
	(7.466)	(2.093)					
lnms	-1.442	-10.19***					
	(9.061)	(3.114)					
election	-1.557		-3.058	-2.761			
	(3.483)		(4.087)	(3.191)			
yrsoffc	0.0300		-0.0613		0.0640		
	(0.196)		(0.223)		(0.199)		
rc	4.223		0.707		-0.837		
	(4.232)		(4.489)		(3.341)		
polstability	4.902		0.480			-4.641	
	(9.110)		(3.701)			(4.201)	
govstability	-0.0274		-0.0992			0.162	
	(1.184)		(1.171)			(1.150)	
intconflict	6.473**		1.427			1.798	
	(2.715)		(2.043)			(2.127)	
left	11.19		2.526				3.956
	(20.26)		(3.991)				(4.445)
right	10.20		-3.515				-3.463
	(12.24)		(4.090)				(4.605)
militaryinpol	-5.836		-4.645**				-2.623*
	(4.580)		(1.870)				(1.568)
Constant	-57.31	78.04	23.14	15.58***	14.71***	-3.132	25.42***
	(136.4)	(64.52)	(19.20)	(2.265)	(2.773)	(18.72)	(6.241)
Observations	53	69	128	144	144	128	128
Number of id	4	5	8	9	9	8	8

Table 7.50 presents the extent to which macroeconomic variable and political events affects the volatility of annual stock returns in Africa. This is extremely important since it affects the

magnitude of systematic risk of all the listed equities. In this model, only internal conflict is statistically significant at 5% level of significance in specification (1). This indicates that internal conflict, such as civil wars, political violence, terrorism or civil disorder significantly increase return volatilities in Africa. This is in line with earlier authors who studied certain markets in Africa (Jeribi, Fakhfekh & Jarboui, 2015; Trabelsi, 2017; Acemoglu, Hassan & Tahoun, 2018).

Table 7.51: Determinants of Annual Value at Risk

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
inf	0.893**	0.888***					
	(0.360)	(0.303)					
exr	-0.0486	0.0201					
	(0.181)	(0.0654)					
len_ir	-0.0749	-0.612					
	(1.310)	(0.438)					
cons	-1.49e-10	1.19e-10					
	(4.92e-10)	(2.20e-10)					
mktcap	-0.102*	-0.0553					
	(0.0533)	(0.0460)					
lngdp	12.07	9.794***					
	(9.415)	(3.090)					
lnms	0.201	-9.153**					
	(11.43)	(4.596)					
election	-4.053		-4.289	-1.838			
	(4.393)		(2.925)	(2.021)			
yrsoffc	0.422*		0.325**		0.239*		
	(0.247)		(0.160)		(0.133)		
rc	14.55***		4.694		1.901		
	(5.337)		(3.213)		(2.094)		
polstability	5.905		-1.251			-2.429	
	(11.49)		(2.649)			(3.730)	
govstability	0.941		0.0580			0.393	
	(1.493)		(0.838)			(0.727)	
intconflict	0.00185		-0.824			0.333	
	(3.424)		(1.462)			(1.361)	
left	-2.798		2.814				0.324
	(25.55)		(2.856)				(4.099)
right	-4.521		-1.924				0.952
	(15.44)		(2.927)				(4.992)
militaryinpol	7.078		-2.708**				-0.189
	(5.775)		(1.338)				(1.699)
Constant	-304.9*	35.71	35.21**	21.36***	18.91***	14.72	22.33***
	(172.0)	(95.23)	(13.74)	(3.374)	(3.393)	(12.81)	(7.432)
Observations	53	69	128	144	144	128	128
Number of id	4	5	8	9	9	8	8

However, when studied separately, inflation, exchange rate, GDP and money supply are the macroeconomic variables that have influence on the volatility of stock return in Africa. On the other hand, military in politics is the indicator in political event indicators that is significantly different from zero. This is not surprising, as tensions intensify during periods of government led by the military. Hence volatility in stock market erodes returns in such periods.

Table 7.51 repots the estimation results of Value at Risk and the explanatory variables. The results show that inflation and ratio of market capitalisation to GDP are determinants of VaR but with a different sign when compared to that of annual return. Similarly, years in office and regime changes variables are statistically significant with different sign. It can be inferred that annualized value at risk is increased by 0.42% and 14.6 % when a chief executive stays in power for another year and when there is a regime change respectively. Broadly speaking, specifications (2) and (3) suggest the findings of VaR are congruent with the findings of the annualized volatility above. This is because GDP, money supply and military in politics are statistically significant with the same signs in both models.

In summary, this section analysed the impact of macroeconomic factors and political events on annual stock return. It has been verified that inflation, exchange rate, market capitalisation, and money supply have a significant relationship with annual stock market return, volatility and VaR in Africa. It can be concluded that macroeconomic variables have influence on stock markets returns in Africa in line with *Hypothesis 5a*. Also, years in office, left and right governments and government stability are the political event indicator found to affect annual ASMs returns. Thus, elections, regime changes, political stability, internal conflict, military in politics and system of electing chief executives are not determinants of annual stock market returns in Africa. In terms of annual volatility of returns, only internal conflicts and military in politics are significant, whiles years in office and regime changes variables are significant to VaR. It can be inferred that several political events influence ASMs returns. Thus, *Hypothesis 5b* cannot be rejected.

7.8 CHAPTER SUMMARY

This chapter examines the impact of political uncertainties on stock market returns in Africa. The section is dedicated to answer three main research questions of the study. First, the various political events are singly investigated to determine its relationship with abnormal stock market returns or volatility of stock returns in Africa. Event study methodology is used to examine the extent to

which election and regime changes event affect abnormal stock returns. Subsequently, a series of methodology based on GARCH modelling is adopted to analyse how political events affects volatility of stock returns. It was concluded that indeed elections, regime changes, political orientation and terrorism events are major determinants of fluctuations in stock prices. A panel model was then adopted to understand how the combined political events together with macroeconomic variables interacts with the political uncertainties indicators. It was also confirmed that both indicators are essential in determining stock market returns in Africa. These findings suggest important implications for investors, managers as well as policy makers.

CHAPTER EIGHT

DISCUSSION AND CONCLUSION

8.0 INTRODUCTION

This chapter concludes the study. Summary of key findings are first presented and then conclusions are drawn from these findings. The researcher then proposes policy recommendations emanating from the studies. Also, the limitations of the studies are considered. The chapter then concludes with suggestions for future research.

8.2 CONCLUSIONS

African financial markets presents bright prospects for growth and diversification potential for institutional and global investors. However, the uniqueness of the African financial markets coupled with the absence of comprehensive research studies, requires an analysis of the prospects and challenges inherent in this market. Specifically, this research looks at the risk-return of African markets and juxtaposed with economic growth, macroeconomic changes and political events. This study examines the nature of African financial markets, the trend in its development and its future prospects. Also, the nature of the link between financial development and economic growth of African economies is verified. Furthermore, the nexus between macroeconomic instabilities and volatilities of monthly stock returns are investigated in selected African stock markets. Finally, the study examined the uncertainties resulting from political events (such as general elections, regime changes, terrorism and political orientation) and stock market returns in ASMs. The study adopted mixed approach in methodology and the use of secondary data for its empirical analysis.

The findings suggest that African financial markets have not been fully developed. However, they have experienced significant improvements in recent years. Likewise there is a potential growth in specific sectors, such as insurance and capital markets, which are still in a fledging state in most African countries. Also, the extension of financial technologies will contribute to substantially improve financial inclusion, as well as formalizing many sectors of the economy whiles overcoming the problem of transaction cost of financial services. Further, the study found that apart from tax revenues, significant financial inflows emanates from ODA and remittances to African economies. However, financial flows from portfolio investors are small or even non-

existent in most African countries. This suggests that significant steps should be taken to open up African markets for international participation.

Also, the study confirmed a link between financial development and economic growth in the 37 countries analysed in the panel study. The use of several indicators of financial development suggests that the development of each segment of the financial sector is crucial for economic growth in Africa. Hence initiatives should be taken to improve the breadth and depth of both the money and capital markets in order to maximize the returns on both short-term and long-term financing in Africa as well as the allocation of financial resources. The study also established a non-linear relationship between financial development and economic growth but did not confirm the 'too much' finance assumption. This seems to indicate that at certain levels of financial development (threshold level), economic growth declines. This can happen true when financial development are not channelled into the productive sectors of the economy like agriculture and manufacturing as suggested by Égert and Kierzenkowski (2014). However, finding the threshold levels are outside the scope of this study, unlike studies such as Ibrahim and Alagidede (2018b) who estimated the threshold level of the SSA countries they used in their sample. Hence, governments and policy makers should position the financial sector at levels that leads to overall and sustainable growth in their economies.

Moreover, the study confirmed that the instabilities in macroeconomic variables influence the stock market returns in the selected ASMs. Also, two regimes were confirmed to be significant from the MS model. The crisis state was found to be more volatile and longer than the tranquil state. Most of the macrocosmic variables were more significant in the crisis state than in the tranquil state. It can be inferred that the weaknesses of African economies make them more susceptible to macroeconomic instabilities, many of which may be caused by reckless management of the economy or by global events. When crisis occur, it takes a long period before they are reversed. However, since many macroeconomic factors were more significant in the crisis state than in the tranquil state, investor's decisions are well explained by the changes in the macroeconomic variables during the crisis state. These findings suggest policy implications for governments and other stakeholders.

Finally, this study confirmed political events to be determinants of volatility of stock market returns in the selected ASMs. This can be successfully linked to several behavioural finance theory

as well as several empirical findings. The findings suggest ASMs are information efficient as opposed to the uncertainties in investment decisions. Political events were found to exert moderate to explosive effect on stock prices in almost all the analysis conducted. This confirms Mattozzi (2008) assertion that political uncertainty is a pervasive phenomenon, a characteristic of a political process. Thus, political events tend to cause bubbles in asset prices, which may not be persistent but generates an interest on how market players react. Hence, political events contain relevant information for investors' trading strategies, since their buying and selling decisions are influenced by the scope of political events.

8.1 SUMMARY OF FINDINGS

This research aims to explore the growth of African financial markets in the midst of political uncertainties. To do this, the study was structured to answer four main sub questions: (1) How have African financial markets grown over the years; (2) To what extent is this growth in financial markets related to economic growth; (3) How do macroeconomic volatilities affect African stock markets; and (4) To what extent are political uncertainties related to stock market returns in Africa. In order to answer the above questions, mixed methodologies were adopted. The key findings of the study are presented below in this section.

African financial markets were found to have undergone immense development, even though they have not fully developed in most countries. Specifically, the banking sector has undergone several transformations driven by technological innovations and improvements in supervision and regulations. Changes have been observed in the ownership structure of banks in Africa. In this sense, the preponderance of public capital banks is being eroded as a consequence of the appearance of private banks and foreign banks. African banks invest mainly in government securities that give them high returns, although this kind of investment leads to crowding out of private investment, especially SMEs. Financial penetration remains low, as evidenced by the fact that currently two-thirds of Africa's population do not have access to a simple bank account. Likewise Africa has a low number of bank branches per 100,000 adult population. On the other hand, insurance sector is not well-developed and is dominated by non-life insurance, where auto insurance has the largest market share. Most insurance companies are privatized but governments still hold substantial stakes in some countries. Moreover, there are microfinance companies in most African countries, which target the poor people who are excluded from formal financial services.

There has been significant growth in these type of financial companies over the years despite their recent challenges.

On the other hand, the explosion of financial technology, especially mobile money services have significantly improved financial inclusion in Africa. As such, Fintech companies working together with traditional banks have introduced financial services like savings, credit, insurance, and payment services on mobile phones. However, there are some underlying challenges, notably the regulatory bottleneck and issues of fraud bedevilling these new services. It is important to note that capital markets in Africa have under an extensive development as evidenced by the proliferation of stock markets throughout African countries over the past decades. However, African stock markets are characterized by low market capitalisation, few domestic listed companies, small size of listed firms and low levels of liquidity and with few shares mostly dominating total trading activity. The exception is JSE that constitutes about 80% of total market capitalisation of all ASMs. There have been an increase of IPOs, as a result of privatization of SOEs, divestitures, enhancements to regulatory frameworks, improved infrastructure and reduced political interference in certain large markets. Moreover, the capital debt markets and derivative markets are at their infant stage and still fledging. African capital market are facing with significant level of risk as a result of low levels of liquidity, institutional barriers and information asymmetries in most countries.

The analysis of financial resources in Africa presents interesting findings. Africa is one the most tax dependent economies in the world. The level of tax revenue to GDP varies significantly among the African countries. Also, FDI inflows have risen sharply over a couple of decades though Africa is still the emerging region that receives the least FDI compared to Asia and LAC. The increased level of FDI to Africa is attributed to advances in political stability, drastic reduction of civil wars, privatisation processes, improvements in governance and the abundance of natural resources, according to Mijiyawa (2015) and Adams and Opoku (2017). On the contrary, Africa is the largest recipient of ODA, accounting for an average of 30 % of overall aid to developing countries from 1980 to 2018. United States, European Union, United Kingdom and Japan are the largest donors to Africa. Even though the inflows from China continue to rise, outpacing most ODA donors, they are not classified as ODA but rather as a form of bilateral programmes aimed at financing projects which are integrated into commercial transactions involving trade, investment and loans.

It was also revealed that most Africa countries do not attract portfolio investors. Portfolio flows are concentrated in mostly South Africa, Morocco and Mauritius. There was a gradual increase in portfolio flow prior to the 2008 GFC and then fell sharply during the GFC. This has been reversed recently because Africa presents diversification opportunities for global investors. Also, remittances flows to Africa was found to be higher than both FDI and ODA inflows since 2010. Africa has the highest remittances to GDP ratio after South Asia, indicating the importance of migrants sending money home to Africa. A key challenge identified was the high transaction cost of remittances which force migrants to use informal channels. This challenge has since been declining over recent years due to the adoption of technologies and promotion of competition among service providers. On the other hand, trade income is another important financial inflow to Africa. The continent is confronted with how to grow its volume of trade and how to shift from trading raw materials. It was found that Africa share of global merchandise exports remains low when compared to other regions. Also, even though intra-trade has improved since 2000, trade among African countries remains low when compared to other regions. These shortcomings have prompted the AfCTA agreement to harmonize African regional blocs, eliminate current high tariffs, generate employment and, overall, the promotion of intra-Africa trade. AfCTA is set to be fully operationalize in 2021.

The study continued with analysis of the relationship between financial development and economic growth with several panel models. It was revealed that domestic credit, broad money, bank overhead cost and bank deposits are positively related to economic growth in the dynamic OLS and FE models. In the dynamic FE model, market capitalisation in addition to other financial development indicators is positively related to economic growth with the exception of domestic credit. The GMM model revealed that domestic credit and money supply are positively related to economic growth but that of market capitalisation and deposits are negatively related to economic growth marginally. This shows that economic growth is highly dependent on all sectors of financial markets. With respect to control variables, it was established that trade openness and government investment are positively related to economic growth whiles government consumption and inflation are negatively related to economic growth but human capital shows mixed signs in the linear models.

Furthermore, all the threshold models established non-linear relationship between financial development and economic growth from the bootstrap test of linearity. The static threshold model revealed that domestic credit and money supply are related to economic growth in both low and high regimes (economic growth and crisis states), whiles deposits are only significant in the first regime. Whiles regime one was positive, regime two recorded negative direction. This is a typical case of inverted U-shaped finance-growth relationship, where positive relationship turns into negative in the second state, confirming the 'too-much' finance assumption. Nevertheless the first difference GMM threshold model was only significant when money supply and bank branches are used in the regressors. Also, they had a reversed sigh when compared to the static model in both regimes. Hence the inverted U-shaped assumption cannot be confirmed due to inconsistencies in the findings.

In relation to the effect of macroeconomic volatilities on ASMs returns, the GARCH model confirmed volatility clustering in almost all the monthly ASMs stock data and most of the macroeconomic variables used. The EGARCH model shows that the asymmetry coefficient was negative and non-significant in most ASMs. Also, most of the macroeconomic variables shows that the asymmetry coefficient were insignificant. This indicates that African stock market returns and macroeconomic variables exhibit symmetric and insignificant leverage effects. The OLS of the conditional volatilities shows that most macroeconomic variables were significantly related to stock market volatilities. Specifically, exchange rate, crude oil price and money supply were significantly related to short run fluctuations in prices in most ASMs, but interest rate was significant only in Tunisia.

The MS model indicated that the conditional mean is significant and positive in both regime 1 and 2 of most ASMs. The findings revealed that regime 1 (economic expansion or tranquil state) is less volatile than regime 2 (economic decline or crisis state). From the transition probabilities, the mean probability of regime 1 occurs does not differ significantly from regime 2, but the persistence and duration of remaining in state 2 is broader than in regime 1. Interestingly, the MS model found more macroeconomic variables to be significant than the OLS model. Also, more macroeconomic variables are significant in the crisis state than the tranquil state, suggesting investors' behaviour are more explained in the crisis state than the tranquil state in most African countries.

Further, the results of conditional volatilities for both regimes revealed that Fisherian hypothesis is rejected for Mauritius, South Africa and Zambia, but not Kenya and Namibia in the tranquil state, in line with Alagidede (2009b). In the crisis state, inflation is negatively related to stock market return in Africa, except Kenya and Morocco that maintained the rejection of the Fisherian hypothesis. The conditional volatilities of interest rate in regime 1 exhibited positive relationship with stock volatilities for Cote D'Ivoire, Egypt, Mauritius and Zambia, but negative relationship for Ghana, Tunisia and Morocco. However, a direct relationship was established between interest rate and stock market volatilities in the crisis state for all ASMs except Morocco. This suggests that an increase in interest rate in crisis periods immediately leads to increase in stock prices, which are mostly reversed in period of economic expansion. This is because stocks are substituted for interest bearing assets resulting in decline in stock prices.

The results further revealed that exchange rate was statistically significant with conditional stock returns for Egypt, Namibia, Nigeria, South Africa and Tunisia in regime 1, but significant for all the ASMs except Egypt and Nigeria in regime 2. The sign was mostly positive, although there are some exceptions, such as for Egypt and Namibia in regime 1 and Morocco and Namibia in regime 2. This suggests that corporate profits, which forms significant part in equity valuations, are hindered during currency fluctuations. Concerning money supply, this variable was significant for Ghana, Egypt, Namibia and Tunisia in regime 1, and Ghana, Kenya, Namibia, Nigeria and Tunisia in regime 2. The sigh was positive in all the countries except Ghana in both regimes and Nigeria in regime 2. This is in line with the portfolio theory confirmed by several authors. With respect to crude oil prices, it was established that stock market volatilities are affected by Brent oil price fluctuations in both periods of low volatility and periods of high volatility for all ASMs, except Kenya and Mauritius in both regimes. The sign of the coefficient was positive in all the regimes except Namibia in regime 1 and 2 and South Africa in regime 2. These findings are in contrast with earlier ones that concluded a negative relationship between crude oil price and stock returns.

The results about the influence of political events on stock market returns presented interesting results. Firstly, it should be underlined that of elections in the selected ASM were mostly presidential. The UIH was not confirmed in the selected ASMs. It has been found that it is the EMH that is predominantly applied to African stock markets. Before and after election effect was confirmed in the study, as concluded by Li and Born (2006), Smales (2015), Liew and Rowland

(2016), Bowes (2018), and Darby and Roy (2019). The GARCH methodology adopted confirmed that elections events have significant effect on stock market volatilities in almost all the ASMs with mixed signs. This suggests that elections events contain relevant information for investors' trading strategies.

With respect to regime changes and stock returns, the CAR graph shows that stock prices are subjected to EMH and/or UH after a regime change in the ASMs used in the study. Similarly, it can be inferred that African markets are information efficient, as opposed to uncertainties in market participant's actions. A formal test of the regime changes under three event windows revealed that abnormal stock market returns of all the ASM, except Morocco, were significant to regime change events. Positive abnormal returns were recorded, except for Botswana and Tunisia. Furthermore, individual regime changes, whether through elections, death of a leader or military coup, were found to have a significant effect on stock market volatilities with mixed directions. It was however concluded that the overall regime change event has negative effect on ASMs.

With regard to terrorism, 4,370 attacks have been recorded in the selected ASMs during the period between 2002 and 2018, with Egypt and Nigeria accounting for about 87% of the total. The result of all of these terrorist attacks was 29,968 deaths and 17,658 wounded. Terrorist events have been found to have a significant negative effect on the volatility of most ASMs, in line with earlier empirical studies. However, the results did not confirm terrorism events to have influence in stock market volatility in Nigeria and Tunisia exchanges. Since Nigeria accounted for about 60 % of terrorism events in the sample, it can be inferred that investors and market participants have already incorporated the frequency of terrorism events into equity valuation, hence prices do not significantly change when such event occurs in Nigeria.

In relation to political orientation, political parties of ASMs in the study cannot be described as either right or left governments. Only Botswana and South Africa governments are right-wing and left-wing respectively in the entire period of the study. Likewise, six out of the nine selected countries have a presidential system to elect their head of state or president of the government. On the other hand, but Botswana and Mauritius have a parliamentary system, whilst South Africa has adopted a system in which the president is elected by the legislative power. Of the eight selected countries, the opportunistic PBC was confirmed in three of them, namely Botswana, Ghana and Tunisia. This means that incumbent governments uses either monetary or fiscal policies in a

cyclical manner in their bid to maintain power in these countries. Furthermore, the political orientation variables are statistically significant in Ghana and Nigeria for both left-wing and right-wing governments, but significant for only left-wing parties in Tunisia. It was found that positive excess returns are associated with right-wing governments, whiles negative excess returns are observed in left-wing governments.

Finally, the overall impact of macroeconomic variables and political events on annual returns revealed that inflation, exchange rate, market capitalisation, and money supply have a significant relationship with annual stock market return, volatility and VaR in Africa. Also, years in office, left and right governments and government stability are determinants of annual ASMs returns. However, elections, regime changes, political stability, internal conflict, military in politics and system of electing chief executives do not influence annual stock market returns in Africa. In terms of annual volatility of returns, only internal conflict and military in politics are significant whiles years in office and regime changes variables are significant to VaR. Thus, specific political events influence annual ASMs returns.

8.3 RECOMMENDATIONS

Based on the discussions of the major findings and conclusions presented above, the researcher put forward policy implications and recommendations to several stakeholders in the following topics:

Governments, policy makers and regulators

1. As it was found that African financial market is not fully developed, laws governing the sector should be strengthened and enforced to enable growth of the sector throughout all Africa. Particularly, financial liberalisation should be strengthened to open up the African economies to international participation.
2. Fintech regulations and monitoring were found to be non-existent or not well developed due to the nature of Fintech services, which leads to a lot of fraudulent activities. It is therefore suggested as a matter of urgency that laws and regulations are improved to effectively regulate Fintech innovations, as well as improving supervisions for the sector to realize its potentials.

3. Macroeconomic instabilities were found to influence stock market volatilities. Also, the fragilities of macroeconomic variables result in extended period of crisis states in African economies. African governments and Central Banks should put in place sound macro prudential frameworks that are peculiar to the country. Hence, there should be explicit strategies and targets for managing macroeconomic factors in Africa. These include inflation targeting, reserve requirements, limits on loan concentration, caps on foreign exchange positions, among others.
4. The structure of African economies is not robust and is mostly export driven making it prone to macroeconomic instabilities, political events and global events. Resources are often exported in their primary state and are usually owned by multilateral companies, with governments only left with taxes and royalties on these resources. Governments therefore have the task of diversifying the economies of Africa to be less dependent on taxes. A robust economy with well-functioning financial sector is the way to liberate the economies of Africa to be able to withstand macro and global shocks.
5. Institutional weakness is known to be one of the great weaknesses of most African countries, causing malfunctions and distortions in all sectors, including the financial sector, as well as governments' inability to well manage macroeconomic variables. The weak institutional framework leads to adverse complications from political events that are a normal occurrence in other economies. Although there have been sustained level of developing institutional capacities of developing economies by donors and international multilateral agencies in the form of several technical assistance programmes, these abilities should be strengthened by leading local experts to drive its applicability. Public and private institutions, especially financial ones, should continue to develop their capacity to be competitive and to be able to adapt the dynamic global economy.
6. Government stability was found to be positively related to annual stock return. This suggests that in countries with a stable government or in which the system of governance is stable, investors achieve higher returns. Thus, investors are drawn to countries with stable government, especially where there is a transparent democratic form of governance. Good governance in a context of absence of democracy leads to a lack of transparency and accountability in governments, which makes mismanagement of resources inevitable. The consequences of this situation generally entail political tensions that hold back the

development of the financial sector. Thus, democratic institutions and good governance should be promoted in African countries in order to reduce political tensions.

7. Terrorism events were found to negatively influence volatility of stock market returns. Investors are exposed to considerable losses as a result of panic withdrawal from the affected markets. Obviously government should therefore improve security and surveillance of their national territories to avoid such attacks, which is also beneficial for all economic sectors. Furthermore, extremist groups guided by religious and cultural fanaticism should be identified and assisted to channel their beliefs through non-violent ways and respectful with human rights. On the other hand, it must be taken into account that there are other types of problems that can generate violent actions, among which we must highlight poverty, high income inequality, illiteracy, unemployment, corruption, and unresolved tribal disputes. In this sense, government institutions should implement policies and programmes aimed at eliminating these problems.

Investors

8. The studies carried out concluded that national elections are significantly related to ASMs returns. This has important implications for investors, as the dates on which the elections take place influence their decision making. Risk-averse investors, therefore, require a specific risk premium when investing during election periods. On the other hand, one way to hedge this risk is through portfolio diversification.
9. The opportunistic PBC was confirmed only in Botswana, Ghana and Tunisia. This suggests that political parties in government in these countries adjust their economic policies in an attempt to stay in power. Economic policies from the government in power that are communicated to the markets reduces uncertainty. This sends actionable signals to market participants, provided they believe the incumbent will be maintain in power. However, other ASMs are immune to incumbent governments' policies especially during elections.
10. It has been found that countries with right-wing governments enjoys positive excess abnormal returns in Ghana, whiles countries with left-wing governments experiences negative abnormal returns on Nigeria and Tunisia. Therefore, investors have the opportunity to adjust their portfolios according to the political orientation of the ruling political party in the country.

11. The findings of this study have far reaching consequence on investors trading strategies. Political events were found to induce significant pressures on stock price in ASMs. Hence investors, such as hedge funds, banks, traders, institutional investors should design prudent trading strategies to mitigate the level of risk emanating from political events in Africa.

Development partners

12. Donors and other development partners of Africa should work to promote the development of the financial sector. Programmes and projects of development partners of Africa are normally directed to the real sector and social programmes, leaving aside the financial sector. But this study has demonstrated that a well-developed and smooth financial sector reduces poverty, improve financial inclusion and above all boost economic growth. Therefore a part of the international collaboration, as well as national initiatives, should be addressed to the institutional development of African financial sector. Also, there should be development of programs to explore African financial institutions and markets with an adequate level of depth that are capable of providing local financing to multinational companies and local businesses.

African supranational institutions

13. It is important to eliminate obstacles that hinders international and regional integration. It was identified that trade can be the engine of economic growth in Africa. However, Africa markets are limited in international and intra-trading due to undeveloped financial sector, high tariffs, tedious customs procedure and inadequate infrastructure, among others. It is recommended that Africa supranational institutions should work to strengthen and streamline the financial sectors to be able to fully take advantage of the AfCTA.

8.4 LIMITATIONS OF THE STUDY

The study examined the development of African financial markets and the impact of political uncertainties on volatility of stock returns in Africa using daily, monthly and annual returns data on selected ASMs. The geographic scope of this study is limited to African markets. The study has selected proxy countries to depict African financial markets due to the lack availability of data for some variables. The results and conclusions of this study are only applicable to African markets

as a whole and not in any particular way to any of them, due to differences in country-specific factors, such as socio-economic, political, and economic conditions.

The study carried out three types of quantitative studies based on data availability. Regarding the first study, annual data from 37 countries have been used to analyse the relationship between financial development and economic growth. The second study was based on monthly data from eleven (11) selected ASMs in order to analyse the connection between macroeconomic volatility and stock market returns. The last study, that used daily data from nine (9) biggest ASMs, focused on the link between political events and stock market returns. These choices have been influenced by data availability. Data quality and availability was a major limitation, typical of studies conducted in developing countries. In addition, the researcher tried to extend the length of the study but faced the same limitation as just mentioned. Likewise the study was limited by the number of political events used in the event-study methodology. However, these limitations do not significantly affect the validity, purpose and findings of the study, since the sample is large enough.

8.5 SUGGESTIONS FOR FUTURE RESEARCH

African financial markets present immense opportunities for growth. However, research on this matter remains scarce and the results are inconclusive. Research attention is therefore needed to fully understand the potentials and risk of these markets. Future research should focus on the following:

1. The explosion of financial technology with new electronic means of payments among which mobile money stands out, crowdfunding initiatives, cryptocurrencies, and other blockchain applications; has created unprecedented opportunities to achieve universal access to financial services in Africa. Research should focus even much more extensively on the revolutionary role of Fintech and its impact on economic growth in Africa.
2. It is known that the strengthening of institutions has a positive impact on the socioeconomic growth of a country. Currently, there is limited research on how improving institutions will impact on economic growth in Africa, especially when they interact with financial sector development. Furthermore, there are no known studies on the role of institutions in mitigating the impact of political events. Therefore there is room to reinforce research that

analyses the relationship between institutional improvement and financial sector development.

3. The findings of this studies confirmed the nonlinear relationship between financial development and economic growth. However, this study did not establish threshold limits for this relationship. Currently, few authors like Ibrahim and Alagidede (2018b) attempts to establish these threshold limits in some SSA countries. Further studies can therefore be focused on reaching threshold limits in each country in Africa to aid informed decision making.
4. Empirical studies on political events and ASMs are scanty or non-existent. This study did not include all political events and ASMs as explained in the study. Future research can therefore be extended to include more political events and other ASMs in order to throw more light on how political uncertainties influence African markets.
5. The findings suggest actions for investors, especially to fine-tune their trading strategies during political events. It is suggested that research can be conducted on how specific trading strategies will fare during political events in Africa. Also, researchers could help in defining particular trading strategies for ASMs during political events.
6. Finally, it will be interesting to investigate the specific behaviour of a company or an industry in the face of political events in Africa. Currently, there is no known study about this matter. It is believed that firms do not react in the same way after a political or global turmoil (Chau et al., 2014; Essaddam and Karagianis, 2014; Liu et al, 2017). Investors are therefore concerned about how firms are sensitive to political events in order to guide themselves against any risk. On this basis, this study suggests a test of the sensitivity of different firms in the African market to uncertainties arising from political events.

REFERENCES

Abdullah, D.A. and Hayworth, S.C., (1993). Macroeconomics of stock price fluctuations. *Quarterly Journal of Business and Economics*, **32**(1), 49–63.

Abidin, S., Old, C. and Martin, T., (2010). Effects of New Zealand general elections on stock market returns. *International Review of Business Research Papers*. **6**(6), 1–12.

Abugri, B.A., (2008). Empirical relationship between macroeconomic volatility and stock return: evidence from Latin American markets, *International Review of Financial Analysis*. **17**(1), 396–410.

Acemoglu, D., Hassan, T. A. and Tahoun A., (2018). The power of the street: evidence from Egypt's Arab Spring, *The Review of Financial Studies*, **31**(1), 1–42.

Achsani, N. and Strohe H.G., (2002). Stock market returns and macroeconomic factors, evidence from Jakarta stock exchange of Indonesia 1990-2001. *Universitat Potsdam, Wirtschaftsund Sozialwissenchaftliche Fakultitat*, Discussion Paper.

Adam, A.M. and Tweneboah, G., (2008). Macroeconomic Factors and Stock Market Movement: Evidence from Ghana, *Munich Personal RePEc Archives*, Paper No. 14079.

Adams S. and Opoku, E.E.O., (2017). BRIC versus OECD foreign direct investment impact on development in Africa. In E. Wamboye and E.A. Tiruneh, ed. *Foreign Capital Flows and Economic Development in Africa*. New York: Palgrave Macmillan. pp. 147–161.

Adler, M. and Lehmann, B., (1983). Deviations from purchasing power parity in the long run. *Journal of Finance*, **38**(1), 1471–1487.

African Development Bank, (2020). *African Economic Outlook 2020: Developing Africa's Workforce for the Future*. African Development Bank Group.

African Development Bank, (2020b). *African Economic Outlook 2020: Supplement Amid COVID-19*. African Development Bank Group.

African Development Bank, (2021). *African Economic Outlook 2020: From Debt Resolution to Growth: The Road Ahead for Africa*. African Development Bank Group.

Aggarwal, R., (1981). Exchange rate and stock prices: A study of US capital markets under floating exchange rates, *Akron. Business Economics Review*. **12**(2), 7–12.

Agyei-Ampomah, S., (2011). Stock market integration in Africa. *Managerial Finance*. **37**(3), 242–256.

Alagidede, P., (2009a). Are African stock markets integrated with the rest of the world? *African Finance Journal*. **11**(1), 37–53.

Alagidede, P., (2009b). Relationship between stock returns and inflation, *Applied Economics Letters*. **16**(14), 1403-1408.

Alagidede, P., (2010). Equity market integration in Africa. *African Review of Economics and Finance*. **1**(2), 88–119.

Alesina. A., (1987). Macroeconomic policy in a two-party system as a repeated game. *Quarterly Journal of Economics*. **102**(1), 651–678.

Alesina, A. and Roubini, N., (1992). Political cycles in OECD economies. *Review of Economic Studies*. **59**(1), 663–688.

Alesina, A. and Sachs, J., (1988). Political parties and the business cycle in the US, 1948-1984. *Journal of Money, Credit and Banking*. **20**(1), 63–82.

Allen, A., Otchere, I. and Senbet, L., (2011). African financial systems: A review, *Review of Development Finance 1*. 79–113.

Allvine, F.C. and O'Neill, D.E., (1980). Stock market returns and the presidential election cycle: Implications for market efficiency. *Financial Analysts Journal*. **36**(5), 49–56.

Alonso, A. and Gonzalo, R., (1990). Overreaction in the Spanish equity market, *Journal of Banking and Finance*, **14**(2–3), 469–481.

Ahmed, W.M.A., (2017). The impact of political regime changes on stock prices: the case of Egypt, *International Journal of Emerging Markets*. **12**(3), 508–531.

Akhigbe, A., Gosnell, T. and Harikumar, T., (1998). Winners and losers on NYSE: A reexamination using daily closing bid–ask spreads. *Journal of Financial Research*. 21(1), 53–64.

Akkoç S. and Özkan, N., (2013). An empirical investigation of the uncertain information hypothesis: Evidence from Borsa Istanbul. *BDDK Bankacılık ve Finansal Piyasalar*. **7**(2), 101–119.

Akinci, G.Y., Akinci, M. and Yilmaz, Ö., (2014). Financial development-economic growth nexus: A panel data analysis upon OECD countries. *Hitotsubashi Journal of Economics*. **55**(1), 33–50.

Al-Khazali, O. Bouri, E., Roubaud, D. and Zoubi T., (2017). The impact of religious practice on stock returns and volatility, *International Review of Financial Analysis*. **52**(1), 172–189.

An, H., Zou. Q. and Kargbo M., (2020). Impact of financial development on economic growth: Evidence from Sub-Saharan Africa. *Australian Economic Papers*. 1–35.

Anari, A. and Kolari J., (2001). Stock prices and inflation, *Journal of Financial Research*. **24**(4), 587-602.

Andrianaivo, M. and Yartey, C.A., (2010). Understanding the growth of African financial markets. *African Development Review*. **22**(3), 394-418.

Antonakakis, N., Chatziantoniou, I. and Filis, G., (2013). Dynamic co-movements of stock market returns, implied volatility and policy uncertainty. *Economics Letters*. **120**(1), 87–92.

Antoniou, A., Galariotis, E.C. and Spyrou, S.I., (2005). Contrarian profits and the overreaction hypothesis: The case of the Athens Stock Exchange. *European Financial Management*. **11**(1), 71–98.

Anyanwu, J.C. and Yameogo, N.D., (2005). What Drives Foreign Direct Investments into West Africa? An Empirical Investigation. *African Development Review*. **27**(3), 199–215.

Arellano, M. and Bond, S., (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*. **58**(1), 277–297.

Arellano, M. and Bover, O., (1995). Another look at the instrumental variable estimation of error component models. *Journal of Econometrics*. **68(**1), 29–51.

Arestis, P., Demetriades, P.O. and Luintel, K. B., (2001). Financial development and economic growth: The role of stock markets. *Journal of Money, Credit, and Banking*. **33**(1), 16–41.

Asprem, M., (1989). Stock prices, asset portfolios and macroeconomic variables in Ten European countries. *Journal of Banking and Finance*. **13**(4/5), 589–612.

Asongu, S.A. and Nwachukwu, J.C., (2017). Quality of growth empirics: Comparative gaps, benchmarking and policy syndromes. *Journal of Policy Modeling*. **39**(5), 861–882.

Asteriou, D. and Sarantidis, A., (2016) Political instability and stock market returns: Evidence from OECD countries. *Economics and Business Letters*. **5**(4), 113–124.

Atje, R. and Jovanovic, B., (1993). Stock markets and development. *European Economic Review*, **37**(2/3), 632–640.

Atkins, A., and Dyl, E., (1990). Price Reversals, Bid-ask spreads, market efficiency. *Journal of Financial and Quantitative Analysis*. **25**(4) 535–547.

Aye, G.C., Balcilar, M. and Gupta, R., (2015). International stock return predictability: Is the role of US time-varying? *Empirica*. **44**(1), 121–146.

Aye, G.C., Balcilar, M., Demirer, R. and Gupta, R. (2018). Firm-level political risk and asymmetric volatility. *The Journal of Economic Asymmetries*. **18**(C), 1–7.

Bahloul, S., Mroua, M. and Naifar, N., (2017). The impact of macroeconomic and conventional stock market variables on Islamic index returns under regime switching, *Borsa İstanbul Review*, **17**(1), 62–74.

Bahmani-Oskooee, M. and Payesteh, S., (1993). Budget deficits and the value of the dollar: An application of cointegration and error-correction modeling. *Journal of Macroeconomeics*. **15**(4) 661–667.

Bagozzi, R.P., Gopinath, M. and Nyer, P.U., (1999). The role of emotions in marketing. *Journal of the Academy of Marketing Science*, **27**(2), 184–206.

Bagehot, W., (1873). *Lombard street*. 1962 ed. Homewood: Irwin.

Bala, D.A. and Takimoto, T., (2017). Stock markets volatility spillovers during financial crises: A DCC–MGARCH with skewed-t density approach, *Borsa Istanbul Review*. **17**(1), 25–48.

Baltagi, B., (2008). *Econometric analysis of panel data.* Chichester: John Wiley& Sons.

Baillie, R.T., Bollerslev, T. and Mikkelsen, H.O., (1996). Fractionally integrated generalized autoregressive conditional heteroscedasticity, *Journal of Econometrics*, **74**(1), 3–30.

Banny, A. and Enlaw, S.H., (2000). The Relationship between stock price and exchange rate: Empirical evidence based on the KLSE market. *Asian Economic Review*. **42**(1), 39–49.

Bansal, R. and Yaron, A., (2004). Risks for the long run: A potential resolution of asset pricing puzzles. *The Journal of Finance*. **59**(4), 1481–1509.

Barberis, N., Shleifer, A. and Vishny, R., (1998). A model of investor sentiment. *Journal of Financial Economics*. **49**(3), 307–343.

Basher, S.A. and Sadorsky, P., (2006). Oil price risk and emerging stock markets, *Global Finance Journal*, **17**(2), 224–251.

Bastianin, A. and Manera, M., (2018). How does stock market volatility react to oil price shocks? *Macroeconomic Dynamics*. **22**(3), 666–682.

Bauwens, L., Laurent, S. and Rombouts, J.V.K., (2006). Multivariate GARCH Models: A Survey, *Journal of Applied Econometrics*, **21**(1), 79–109.

Bawn, K. and Rosenbluth, F., (2006). Short versus long coalitions: electoral accountability and the size of the public sector, *American Journal of Political Science*. **50**(2), 251–265.

Beaulieu, M-C. Cosset, J-C. and Essaddam, N., (2006). Political Uncertainty and Stock Market Returns: Evidence from the 1995 Quebec Referendum. *The Canadian Journal of Economics*. **39**(2), 621–641.

Beck, R., Georgiadis, G. and Straub, R., (2014). The finance and growth nexus revisited. *Economic Letters*. **124**(3), 382–385.

Beck, T. and Levine, R., (2004). Stock markets, banks and growth: Panel evidence. *Journal of Banking and Finance*. **28**(3), 423–442.

Beck, T. and Cull, R., (2013). Banking in Africa. *Policy Research Working Paper*. WPS/ 6684.

Beck, T., Demirguc-Kunt, A. and Levine, R., (2007). Finance, inequality, and the poor. *Journal of Economic Growth*, **12**(1), 27–49.

Bekiros, S., Gupta, R. and Majumdar, A., (2016). Incorporating economic policy uncertainty in US equity premium models: A nonlinear predictability analysis. *Finance Research Letters*. **18**(C), 291–296.

Berkman, H., Jacobsen, B. and Lee, J.B., (2011). Time–varying rare disaster risk and stock returns. *Journal of Financial Economics*, **101**(2), 313–332.

Bernanke, B. and Gertler, M., (1999). Monetary policy and asset price volatility, *Economic Review*. **84**(Q IV), 17-51.

Bencivenga, V.R. and Smith, B.D., (1991). Financial intermediation and endogenous growth. *The Review of Economic Studies*, **58**(2), 195–209.

Bencivenga, V.R., Smith, B.D. and Starr, R.M., (1995). Transactions costs, technological choice, and endogenous growth. *Journal of Economic Theory*. **67**(1), 153–177.

Bhana, N., (1995). The share market reaction to the arrival of unanticipated information – a test of the Uncertain Information Hypothesis to determine the efficiency of the Johannesburg Stock Exchange. *South African Journal of Business Management*. **26**(2) 41–48.

Bhatti, A.A.M., Haque E. and Osborn D.R., (2013). Is the Growth Effect of Financial Development Conditional on Technological Innovation? *Centre for Growth and Business Cycle Research, Discussion Paper Series*. 188, Economics, The University of Manchester.

Bialkowski, J., Etebari, A. and Wisniewski, T., (2012). Fast profits: Investor sentiment and stock returns during Ramadan. *Journal of Banking & Finance*, **36**(3), 835–845.

Bialkowski, J., Gottschalk, K. and Wisniewski, T.P., (2007). Political orientation of government and stock market returns. *Applied Financial Economics Letters*. **3**(4), 269–273.

Bialkowski, J., Gottschalk, K. and Wisniewski, T.P. (2008). Stock market volatility around national elections. *Journal of Banking & Finance*. **32**(9), 1941–1953.

Bilson, C.M., Brailsford, T.J., Hooper, V.C., (2001). Selecting macroeconomic variables as explanatory factors of emerging stock market returns. *Pacific-Basin Finance Journal*. **9**(4), 401–426

Bilson, C.M., Brailsford, T.J., Hooper, V.C., (2002). The explanatory power of political risk in emerging markets. *International Review of Financial Analysis*. **11**(1), 1–27.

Bittencourt, M., (2012). Financial development and economic growth in Latin America: Is Schumpeter right? *Journal of Policy Modeling*. **34**(3), 341–355.

Bittlingmayer, D., (1998). Output, stock volatility and political uncertainty in a natural experiment: Germany, 1880-1940, *The Journal of Finance*. **52**(6), 2243–2257.

Bjørnland, H.C., and Leitemo, K., (2009). Identifying the interdependence between US monetary policy and the stock market. *Journal of Monetary Economics*. **56**(2), 275–282.

Black, F., Jensen, M., and Scholes, M.S., (1972). The capital asset pricing model: Some empirical findings. In: M. Jensen, ed. *Studies in the theory of capital markets*. New York: Praeger Publishers. pp. 79–124.

Bloom, N., (2014). Fluctuations in uncertainty. *Journal of Economic Perspectives*. **28**(2), 153–176.

Bloomfield, R., Libby, R., and Nelson, M.W., (2000). Underreactions, Overreactions and Moderated Confidence. *Journal of Financial Markets*. **3**(2), 113–137.

Blundell, R. and Bond, S., (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*. **87**(1), 115–143.

Boako, G. and Alagidede, P., (2016). Global commodities and African Stocks: A 'market of one?' *International Review of Financial Analysis*. **44**(C), 226-237.

Boako, G. and Alagidede, P., (2017). Co-movement of Africa's equity markets: Regional and global analysis in the frequency-time domains. *Physica A*. **468**(C), 359–380.

Boako, G., Frimpong, J.M, Acheampong, I.A. and Domeher, D., (2015) Economic Forces and Equity Market Returns in Ghana: Symmetric Dependence with Quantile Regressions. *Ghanaian Journal of Economics,* **3**(1), 86-108.

Boamah, N.A., (2016). Regional and global market integration of African financial markets. *African Review of Economics and Finance*. **8**(2), 235–269.

Boamah, N.A Watts, E.J. and Loudon, G., (2017). Financial crisis, the real sector and global effects on the African stock markets. *The Quarterly Review of Economics and Finance*. **65**(C) 88–96.

Bodhanwala, R.J., (2015). Stock split: A test of market efficiency on Indian Stocks, (2001-2013). *Global Business Review*. **16**(5S) 112S–124S.

Bodie Z., (1976). Common stocks as a hedge against inflation. *The Journal of Finance*, 31(2), 459–470.

Bollerslev, T., (1986). Generalized autoregressive conditional heteroscedasticity, *Journal of Econometrics*, **31**, 307–327.

Bohl, M.T. and Gottschalk, K., (2006). International evidence on the Democrat premium and the presidential cycle effect. *The North American Journal of Economics and Finance*. **17**(2), 107–20.

Botev, J., Égert and Jawadi, (2019). The nonlinear relationship between economic growth and financial development: Evidence from developing, emerging and advanced economies. *International Economics*. **160**(C), 3–13.

Boussaidi, R. and Dridi, G., (2020). The momentum effect in the Tunisian stock market: Risk hypothesis vs. underreaction hypothesis. *Borsa Istanbul Review*. **20**(2), 178–195.

Boutchkova, M., Doshi H., Durnev, A. and Molchanov, A., (2012). Precarious Politics and Return Volatility. *The Review of Financial Studies*. **25**(4), 1111–1154.

Bowes, D.R., (2018). Stock Market Volatility and Presidential Election Uncertainty: Evidence from Political Futures Markets. *The Journal of Applied Business Research*, **34**(1), 143–150.

Bouoiyour, J. and Selmi, R., (2017). The Price of Political Uncertainty: Evidence from the 2016 U.S. Presidential Election and the U.S. Stock Markets. *Working Papers*. hal-01429537, HAL.

Brailsford, T., (1992). A test for the winner–loser anomaly in the Australian equity market: 1958–1987. *Journal of Business Finance and Accounting*, **19**(2), 225–241.

Brogaard, J. and Detzel, A., (2015). The asset–pricing implications of government economic policy uncertainty. *Management Science*. **61**(1), 3–18.

Bromiley, P., Govekar, M. and Marcus, A. (1988). On using event-study methodology in strategic management research. *Technovation*. **8**(1-3), 25–42.

Brounrn, D., and Derwall, J., (2010). The impact of terrorist attacks on international stock markets. *European Financial Management*. **16**(4), 585–598.

Brown, K.C., Harlow, W.V. and Tinic, S.M., (1988). Risk aversion, uncertain information, and market efficiency. *Journal of Financial Economics*. **22**(2), 355–385.

Brown, S.J. and Warner, J.B., (1980). Measuring security price performance. *Journal of Financial Economics*. **8**(3), 205–258.

Cai, J., (1994) A Markov model of switching-regime ARCH, *Journal of Business and Economic Statistics*, **12**(3), 309–316.

Camilleria, S. J., Sciclunaa, N. and Baib Y., (2019). Do stock markets lead or lag macroeconomic variables? Evidence from select European countries North American Journal of Economics and Finance, **48**, 170‑186.

Campa, J., Chang, K. and Reider, R., (1998). Implied exchange rate distributions: Evidence from OTC options markets. *Journal of International Money and Finance*. **17**(1), 117–160.

Canepa, A. and Ibnrubbian, A., (2014). Does faith move stock markets? Evidence from Saudi Arabia. *The Quarterly Review of Economics and Finance*. **54**(4), 538–550.

Cappiello, L., Engle, R.F. and K. Sheppard, (2006). Asymmetric dynamics in the correlations of global equity and bond returns. *Journal of Financial Econometrics*. **4**(4), 537–572.

Carter, D.A. and Simkins, B.J. (2004). The market's reaction to unexpected, catastrophic events: the case of airline stock returns and the September 11th attack. *Quarterly Review of Economics and Finance*. **44**(4), 539–558.

Cecchetti, S.G. and Kharroubi, E., (2012). Reassessing the Impact of Finance on Growth. *BIS Working Papers.* No. 381.

Chandra, P., (2004). *Investment Analysis and Portfolio Management*, New Delhi: McGraw–Hill.

Chan L.K.C., Jegadeesh N., Lakonsihok, J., (1996). Momentum Strategies, *The Journal of Finance* **51**(5), 1681–1713.

Chan, Y. and Wei, K.C.J., (1996). Political risk and stock price volatility: The case of Hong Kong. *Pacific–Basin Finance Journal*. **4**(2/3), 259–275.

Chang, R., McLeavey, D. and Rhee, S., (1995). Short-term abnormal returns of the contrarian strategy in the Japanese stock market. *Journal of Business Finance and Accounting*. **22**(7), 1035–1048.

Chang, S., Chen, S., Chou, R., and Lin, Y., (2012). Local sports sentiment and returns of locally headquartered stocks: A firm-level analysis. *Journal of Empirical Finance*. **19**(3), 309–318.

Chappell, H.W. and Keech, W.R. (1986). Party Differences in macroeconomic policies and outcomes. *American Economic Review,* **76**(2), 71 –74.

Chappell, H.W. and Keech, W.R. (1988). The Unemployment Consequences of Partisan Monetary Regimes. *Southern Economic Journal,* **55**(1), 107–122.

Chatterjee, C. and Dutta, P., (2017). Price behaviour around dividend announcements in the Indian equity market in the existence of corporate dividend tax. *Global Business Review,* **18**(2), 402–415.

Chau, F., Deesomsak R., and Wang, J., (2014) Political uncertainty and stock market volatility in the Middle East and North African, (MENA) countries. *Journal of International Financial Markets, Institutions & Money*. **28**(C), 1–19.

Chaudhry, T., (2005). September 11 and time-varying beta of United States companies. *Applied Financial Economics*. 15(17), 1227–1242.

Chauvet, M. and Hamilton, J. (2006). Dating business cycle turning points. In C. Milas, P. Rothman and D. van Dijk, ed. *Nonlinear Time Series Analysis of Business Cycles*. Amsterdam: Elsevier.

Chen, A.H. and Siems, T.F., (2004). The effects of terrorism on global capital markets. *European Journal of Political Economy*. **20**(2), 349–366.

Chen, S.S., (2007). Does monetary policy have asymmetric effects on stock returns? *Journal of Money, Credit and Banking*. **39**(2/3): 667–688.

Chen, N., Roll, R. and Ross, S., (1986). Economic forces and the stock market. *Journal of Business*. **59**(3) 383–403.

Chesney, M., Reshetar, G. and Karaman, M. (2011). The impact of terrorism onfinancial markets: An empirical study. Journal of Banking & Finance. **35**(2), 253–267.

Cheung, Y.W., and Lai, K., (1999). Macroeconomic determinants of long-term stock market comovements among major EMS countries. *Applied Financial Economics*. **9**(1), 73–85.

Choi, I., (2001). Unit root tests for panel data. *Journal of International Money and Finance*. **20**(2), 249-272.

Choi, H-S. and Jayaraman, N., (2009). Is reversal of large stock-price declines caused by overreaction or information asymmetry: Evidence from stock and option markets. *Journal of Futures Markets*, **29**(4). 348–376.

Choudhry, T., (2001). Inflation and Rates of Return on stocks: Evidence from high inflation countries, *Journal of International Financial Markets, Institutions and Money*. **11**(1), 75–96.

Clemens, M.A. and McKenzie D., (2014). Why don't remittances appear to affect growth? *Policy Research Working*. Paper No. 6856. World Bank.

Çolak, G., Durnev, A. and Qian, Y., (2017). Political Uncertainty and IPO Activity: Evidence from U.S. Gubernatorial Elections. *Journal of Financial and Quantitative Analysis*. **52**(6), 2523–2564.

Cogley, T., and Sargant, T. J., (2002). Evolving post–world war II US inflation dynamics. *NBER Macroeconomics Annual 2001*. **16**(1), 331–373.

Cooper, M. J., Gulen, H. and Ovtchinnikov, A. V., (2010). Corporate political contributions and stock returns. *Journal of Finance*. **65**(2), 687–724.

Cooray, A., (2010). Do stock markets lead to economic growth? *Journal of Policy Modeling*. **32**(4), 448–460.

Corrado C. J. and Jordan B. D., (1997). Risk Aversion, Uncertain Information, and Market Efficiency: Reexamining the Evidence. *Review of Quantitative Finance and Accounting*. **8**(1), 51–68.

Corbet S., Gurdgiev, C. and Meegan, A., (2018). Long-term stock market volatility and the influence of terrorist attacks in Europe. *The Quarterly Review of Economics and Finance*. **68**(1), 118–131.

Cruz, C., Keefer P. and Scartascini C., (2018). Database of Political Institutions 2017, (DPI2017). *Inter-American Development Bank. Numbers for Development*. https://mydata.iadb.org/Reform–Modernization–of–the–State/Database–of–Political–Institutions–2017/938i–s2bw.

Cutler, D., Poterba, J. and L. Summers, (1991). Speculative dynamics. *Review of Economics Studies*. **58**(3), 529–546.

Döpke, J. and C. Pierdzioch. 2006. Politics and the Stock Market: Evidence from Germany. *European Journal of Political Economy*. **22**(4), 925–43.

Da Costa Jr., N.C.A., (1994). Overreaction in the Brazilian stock market. *Journal of Banking and Finance*. **18**(4), 633–642.

Dahou, K., Omar, H.I. and Pfister M., (2009). Deepening African financial markets for growth and investment, *Ministerial and Expert Roundtable of the NEPAD-OECD*. NEPAD-OECD Africa Investment Initiative.

Darby J. and Roy G., (2019). Political uncertainty and stock market volatility: new evidence from the 2014 Scottish independence referendum. *Scottish Journal of Political Economy*. **66**(2), 314–330.

David, A., (1997). Fluctuating confidence in stock markets: implications for returns and volatility. *Journal of Financial and Quantitative Analysis*. **32**(4), 427–462.

Davidson, W., (1989). A note on the behavior of security returns: a test of stock market overreaction and efficiency. *Journal of Financial Research*. **12**(3), 245–252.

De Bondt, W., and Thaler, R., (1985). Does the stock market overreact? *Journal of Finance*. **40**(3), 793–808.

De Groot, W., Pang, J., and Swinkels, L.A.P., (2012). The cross–section of stock returns in frontier emerging markets. *Journal of Empirical Finance*. **19**(5), 796–818.

de la Torre, A. and Schmukler, S., (2005). Small fish, big pond. *Finance & Development*. **42**(1), 1–6.

Demirguc-Kunt, A., and Levine, R., (1996). Stock markets, corporate finance and economic growth: An overview. *TheWorld Bank Economic Review*. **10**(2), 223–239.

Demirgüç-Kunt, A. Beck, T. and Levine, R., (2007). Finance, inequality, and the poor, *Journal of Economic Growth*. **12**(1), 27–49.

Demirgüç-Kunt, A. and Levine, R., (2009). Finance and Inequality: Theory and Evidence. *Policy Research Working Paper Series.* No. 4967, The World Bank, Washington DC.

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S. and Hess, J., (2018). *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*. Washington, DC: World Bank Group.

Diacogiannis, G.P., Tsiritakis E.D. and Manolas G.A., (2001). Macroeconomic factors and stock returns in a changing economic framework: The case of Athens Stock Exchange, *Managerial Finance*, **27**(6), 23–41.

Diebold, F., Lee, J. and Weinbach, G., (1994) Regime switching with time varying transition probabilities, in C. Hargreaves, ed. *Non-Stationary Time Series Analysis and Cointegration*, Oxford: Oxford University Press. pp. 283–302.

Doukas, J.A. and McKnight, P.J., (2005). European momentum strategies, information diffusion, and investor conservatism. *European Financial Management*. **11**(3), 313–338.

Ductor, L. and Grechyna, D., (2015). Financial development, real sector, and economic growth. *International Review of Economics and Finance*. **37**(C), 393–405.

Dumas, B. and Solnik, B., (1995). The world price of foreign exchange risk. *Journal of Finance*. **50**(2), 445–479.

Durland, J.M. and McCurdy, T.H., (1993). *Duration dependence and transitions in a Markov model of US GNP data using restricted semi-Markov process*. Kingston, Ontario: mimeo, Queens University.

Du Toit, E. Hall J.H. and Pradhan, R.P., (2018). The day-of-the-week-effect: South African stock market indices, *African Journal of Economic and Management Studies*, 1–25.

Durnev, A., Enikolopov, R., Petrova, M. and Santarosa, V., (2015). Politics, instability, and composition of international investment flows. *Journal of Corporate Finance*. **30**(1), 299–324.

Durusu-Ciftcia, D.M. Ispir, S. Yetkiner H., (2017). Financial development and economic growth: Some theory and more evidence. *Journal of Policy Modeling*, **39**(2), 290–306.

Economic Commission for Africa, (2017). *Development financing in Africa*, Addis Ababa, Ethiopia, UNECA.

Egert, B., Kierzenkowski, R., (2014). Exports and property prices in France: are they connected? *World Economy.* **37**(3), 387–409.

Elliot, J., and Echols, M., (1976). Market segmentation. Speculative behaviour, and the term structure of interest rates. *The Review of Economics and Statistics*. **58**(1), 40–49.

Elton, E.J. and Gruber, M.J., (1981). A Multi-index Risk Model of the Japanese Stock Market. *Japan and the World Economy*. **1**(1), 21–44.

Engle, R.F., (1990). Discussion: Stock Market Volatility and the Crash of 87. *Review of Financial Studies*. 3(1), 103–106.

Engle, R.F and Kroner, K.F., (1995). Multivariate simultaneous generalized ARCH, *Econometric Theory*. **11**(1), 122–50.

Engle, R.F. and Ng, V.K., (1993). Measuring and testing the impact of news on volatility. *Journal of Finance*. **48**(5), 1749–1801.

Engsted T., Tanggaard, C., (2002). The Relation between asset returns and inflation at short and long horizons. *Journal of International Financial Markets, Institutions and Money*. **12**(2), 101–118.

Erb, C.B., Harvey, C.R. and Viskanta, T.E., (1995). Country risk and global equity selection. *Journal of Portfolio Management*. **21**(2), 74–83.

Erb, C.B., Harvey, C.R. and Viskanta, T.E., (1996). Political risk, economic risk, and financial risk. *Financial Analysts Journal*. **52**(6), 29–46.

Essaddam, N. and Karagianis, J.M., (2014). Terrorism, country attributes, and the volatility of stock returns, *Research in International Business and Finance*. **31**(1), 87–100.

Faccio, M., and Parsley, D.C., (2009). Sudden deaths: Taking stock of geographic ties. *Journal of Financial and Quantitative Analysis*, 44(3), 683–718.

Fama, E.F., (1965). The behaviour of stock market prices. *Journal of Business*. **38**(1), 34–105.

Fama, E.F., (1970). Efficient Capital Markets: A review of theory and empirical work. *Journal of Finance*. **25**(2), 383–417.

Fama, E.F., (1981). Stock returns, real activity, inflation, and money, *American Economic Review*. **71**(4), 545–565.

Fama, E.F., (1990). Stock returns, expected returns, and real activity. *The Journal of Finance*. **45**(4), 1089–1108.

Fama, E.F., Fisher, L. Jensen, M.C. and Roll R., (1969). The Adjustment of Stock Prices to New Information. *International Economic Review*. **10**(1), 1-21.

Fama, E.F., and French, K., (1989). Business conditions and expected returns on stock and bonds. *Journal of Financial Economics*. **25**(1), 23–49.

Fama, E.F., and French, K., (1996). Multifactor explanations of asset pricing anomalies. *Journal of Finance*. **51**(1), 55–84.

Fama, E.F., and MacBeth, J.D., (1973). Risk, return, and equilibrium: empirical tests. *The Journal of Political Economy*. **81**(3), 607–636.

Fama, E.F. and Schwert, W.G., (1977). Asset returns and inflation, *Journal of Financial Economics*. **5**(2), 115–146.

Fan, S., Opsal, S. and Yu, L., (2015). Equity anomalies and idiosyncratic risk around the world. *Multinational Finance Journal*. **19**(1), 33–75.

Ferri, M.G. and Min, C., (1996). Evidence that the stock market overreacts and adjusts. *The Journal of Portfolio Management*, **22**(3) 71–76.

Filardo, A., (1992). *US-Canadian business cycles: expansions, contractions, and their transitions*. Kansas City: Federal Reserve Bank of Kansas City. [Unpublished manuscript].

Fisher, I., (1930). *The Rate of Interest*. New York: Macmillan.

Floros, C., (2008). The influence of the political elections on the course of the Athens Stock Exchange 1996-2002. Managerial Finance. **34**(7), 479–488.

French, J.J. and Li W-X., (2017) Sentiment, foreign equity flows, and returns: Evidence from Thailand's stock markets, *Research in International Business and Finance*. **42**(C), 816–831.

Frenkel, J.A., (1981). Flexible exchange rates, prices and the role of news: Lessons from the 1970s. *Journal of Political Economy*. **89**(4), 665–705.

Frimpong, J.M., (2009). Economic forces and the stock market in a developing economy: cointegration evidence from Ghana. *European Journal of Economics, Finance and Administrative Sciences*. **16**(1), 128–140.

Fung, M.K., (2009). Financial development and economic growth: Convergence or divergence? *Journal of International Money and Finance*, **28**(1), 56–67.

Furió, D. and Pardo A. (2012). Partisan Politics Theory and stock market performance: Evidence for Spain. *Spanish Journal of Finance and Accounting*. **41**(155), 371–392.

Gadzala, A., (2018). *Fintech: Powering Inclusive Growth in Africa*, Washington, DC: Atlantic Council's Africa Center and the OCP Policy Center.

Gärtner, M. and Wellershoff, K.W., (1995). Is there an election cycle in American stock returns? *International Review of Economics and Finance*. **4**(4), 387–410.

Gay D.R. and Nova, J., (2008). Effect of Macroeconomic Variables on Stock Market Returns for Four Emerging Economies. *Journal of International Business Economic Research*. **7**(3), 1–8.

Geczy, C. and Samonov, M., (2016). Two centuries of price-return momentum. *Financial Analysts Journal*. **72**(5), 32–56.

Genest, C., and MacKay, R.J., (1986). The joy of copulas: Bivariate distributions with uniform marginals. *The American Statistician*. **40**(4), 280–283.

Geske, R., and Roll, R., (1983). The fiscal and monetary linkage between stock returns and inflation. *The Journal of Finance*. **38**(1), 1–33.

Ghysels, E., (1994). On the periodic structure of the business cycle. *Journal of Business & Economic Statistics*. **12**(3), 289–298.

Gjerde, O. and F. Saettem, (1999). Causal relations among stock returns and macroeconomic variables in a small open economy. *Journal of International Financial Markets, Institutions and Money*, **9**(1), 61–74.

Goodell, J.W., Vähämaa, S., (2013). US presidential elections and implied volatility: the role of political uncertainty. *Journal of Banking and Finance*. 37(3), 1108–1117.

Gordon, M.J., (1962). *The investment, financing, and valuation of the corporation*. Homewood: RD Irwin.

Goswami, G., and Jung, S., (1997). Stock market and economic forces: Evidence from Korea, *Working paper*, Graduate School of Business, Fordham University.

Gourieroux, C., (1997). *ARCH Models and Financial Applications*. Springer-Verlag: New York.

Gray, S.F., (1996) Modelling the conditional distribution of interest rates as a regime switching process. *Journal of Financial Economics*. **42**(1), 27–62.

Graham, M.A., Ramiah, V.B., (2012). Global terrorism and adaptive expectations in financial markets. Evidence from Japanese equity market. *Research in International Business and Finance*. **26**(1), 97–119.

Greenwood, J. and Jovanovic, B., (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy*. **98**(5), 1076–1107.

Greenwood, J. and Smith, B.D., (1997). Financial markets in development and the development of financial markets, *Journal of Economic Dynamics and Control*. **21**(1), 145–182.

Gulen, H. and Mayhew S., (2000). Stock index futures trading and volatility in international equity markets. *Journal of Futures Markets*. **20**(7), 661–685.

Gulen, H., Ion, M., 2016. Policy uncertainty and corporate investment. *Review of Financial Studies.* **29**(3), 523–564.

Vardar, G. and Okan, B., (2008). Short Term Overreaction Effect: Evidence on the Turkish Stock Market. In Papers of the Annual IUE–SUNY Cortland Conference in Economics. *Proceedings of the Conference on Emerging Economic Issues in a Globalizing World*, Izmir University of Economics. pp. 155–165.

Hamann, K., Johnston, A. and Kelly, J., (2013). Unions against governments: explaining general strikes in Western Europe, 1980–2006. *Comparative Political Studies*. **46**(9), 1030–57.

Hamao, Y., (1988). An empirical investigation of the Arbitrage Pricing Theory. *Japan and the World Economy*. **1**(1), 45–61.

Hamburger, M.J., and Kochin, L.A., (1972). Money and stock prices: The channels of influence. *Journal of Finance*. **27**(2), 231–249.

Hamilton, J.D., (1988). Rational-expectations econometric analysis of changes in regime: an investigation of the term structure of interest rates. *Journal of Economic Dynamics and Control*. **12**(2/3), 385–423.

Hamilton, J.D., (1989). A new approach to the economic analysis of nonstationary time series and the business cycle. *Econometrica*. **57**(2), 357–384.

Hamilton J.D., (2008). Regime switching models. In S.N. Durlauf and L.E. Blume 2nd ed. *The new Palgrave dictionary of economics*. London: Macmillan. pp. 119–155.

Hamilton, J.D., (2013). Historical oil shocks. In: R.E. Parker and R. Whaples, ed. *Routledge Handbook of Major Events in Economic History*. New York: Routledge Taylor and Francis Group. pp. 239–265.

Hamilton, J.D. and Susmel, R., (1994). Autoregressive conditional heteroscedasticity and changes in regime. *Journal of Econometrics*. **64**(1/2), 307–333.

Hansen, B. E., (1999). Threshold effects in non-dynamic panels: estimation, testing, and inference. *Journal of Econometrics*. **93**(2), 345–368.

Hasan, T., and Samarakoon, L.P., (2009). Short-term Interest Rates and Expected Stock Returns: Evidence from Sri Lanka. *Advances in Pacific Basin Financial Markets*. **6**(1), 337-348.

Hassan, M.K., Maroney, N.C., El-Sady, H.M. and Telfah, A., (2003). Country risk and stock market volatility, predictability, and diversification in the Middle East and Africa. *Economic Systems.* **27**(1), 63–82.

Hausman, J.A., (1978). Specification tests in econometrics. *Econometrica*. **46**(6) 1251–71.

He, Y., Lin, H., Wu, C., Dufrene, U.B., 2009. The 2000 presidential election and them information cost of sensitive versus non-sensitive S&P 500 stocks. *Journal of Financial Markets*. **12**(1), 54–86.

Hensel, C.R. and Ziemba, W.T., (1995). United States investment returns during Democratic and Republican administrations, 1928–1993. *Financial Analysts Journal*. **51**(2), 61–69.

Herbst, A.F., and Slinkman, C.W., (1984). Political-economic cycles in the US stock market. *Financial Analysts Journal*. **40**(2), 38–44.

Hibbs, D.A. Jr, (1977). Political parties and macroeconomic policies. *The American Political Science Review*. **71**(4), 1467–1487.

Hibbs, D.A., (1992). Partisan Theory after fifteen years. *European Journal of Political Economy*. **8**(3), 361–373.

Hibbs, D.A., (1994). The partisan model of macroeconomic cycles: more theory and evidence for the United States. *Economics and Politics*. **6**(1), 1–23

Hilary, G. and Hui, K.W., (2009). Does religion matter in corporate decision making in America? *Journal of Financial Economics*. **93**(3), 455–473.

Hirshleifer, D., and Shumway, T., (2003). Good day sunshine: Stock returns and the weather. *Journal of Finance*. **58**(3), 1009–1032.

Homa, K. and Jafee, D., (1971). The supply of money and common stock prices. *The Journal of Finance*. **26**(5), 1045–1066.

Hon, M., Strauss, J. and Yong, S.K. (2004). Contagion in financial markets after September 11: myth or reality? *Journal of Financial Research*. **27**(1), 95–114.

Honohan, P. and Beck, T., (2007). *Making Finance Work for Africa*. Washington, D.C.: World Bank.

Hosseini, S.M., Ahmad, Z., and Lai, Y.W., (2011). The Role of Macroeconomic Variables on Stock market Index in China and India. *International Journal of economics and Finance*. **3**(6), 233–243.

Howe, J.S., (1986). Evidence on Stock Market Overreaction. *Financial Analysts Journal*. **42**(4), 74–77.

Huang, R.D., R.W. Masulis and H.R. Stoll, (1996). Energy shocks and financial markets. *Journal of Futures Markets*. **16**(1), 1–27.

Humpe, A., and Macmillian, P., (2009). Can macroeconomic variables explain long term stock market movements? A comparison of the US and Japan. *Applied Financial Economics*. **19**(2), 111–119.

Hussain, A., Rafique, M., Khalil, A., and Nawaz, M., (2013). Macroeconomic determinants of stock price variations: An economic analysis of KSE–100 index. *Pakistan Journal of Humanities and Social Sciences*. **1**(1), 28–46.

Ibrahima, M. and Alagidede, P., (2018a). Effect of financial development on economic growth in sub-Saharan Africa. *Journal of Policy Modeling*. **40**(6), 1104–1125.

Ibrahim, M. and Alagidede, P., (2018b). Nonlinearities in Financial Development and Economic Growth: Evidence from Sub-Saharan Africa. *Research in International Business and Finance*. **46**(C), 95–104.

Ikoku, A.E., (2010). Is the stock market a leading indicator of economic activity in Nigeria? *CBN Journal of Applied Statistics*. **1**(1), 17‑38.

Im, K.S., Pesaran, M.H., and Shin, Y., (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometric.* **115**(1), 53–74.

Institute for Economics & Peace (2019). Global Terrorism Index 2019: Measuring the Impact of Terrorism, [accessed 23 June 2020]. Available from: http://visionofhumanity.org/reports.

Irving, J., (2000), Africa's Struggling Stock Exchanges: Boost to Economic Development or costly irrelevance? *African Recovery*. **14**(3), 1–5.

Jayachandran, S., (2006). The Jeffords effect. *Journal of Law and Economics*. **49**(2), 397–425.

Jensen, M. and Murphy, K., (1990). Performance pay and top management incentives. *Journal of Political Economy*. **98**(2), 225–264.

Jeribi, A., Fakhfekh, M. and Jarboui, A., (2015). Tunisian revolution and stock market volatility: Evidence from FIEGARCH model. *Managerial Finance*. **41**(10), 1112–1135.

Jegadeesh, N. and Titman, S., (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. *Journal of Finance*. **48**(1), 65–91.

Johnston, B. and Nedelescu, O., (2006). The impact of terrorism on financial markets. *Journal of Financial Crime*. **13**(1), 7–25.

Jorion, P., (1990). The exchange-rate exposure of us multinationals. *Journal of Business*. **63**(3), 331–345.

Jurado, K., Ludvigson, S.C. and Ng, S., (2015). Measuring Uncertainty. *American Economic Review*. **105**(3), 1177–1216.

Karolyi, G.A., (2006). The consequences of terrorism for financial markets: What do we know? *Working Paper 2006-6*. Ohio State University, Charles A. Dice Center for Research in Financial Economics.

Karolyi, G.A., Martell, R., 2010. Terrorism and the stock market. *International Review of Applied Financial Issues and Economics*. 2(1), 285–314.

Kawakatsu H., (2003). *Cholesky factor GARCH*. California: Quantitative Micro Software, Irvine, CA.

Kelly, J. and Hamann, K., (2010). General strikes in Western Europe, 1980–2008. *Paper for the European Regional Congress of the International Industry Relations Association*, Copenhagen, 28 June-1 July 2010.

Keran, M.W., (1971). Expectations, money and stock markets. *Review*. **53**(Jan), 16–31.

Kilian, L., (2008). The economic effects of energy price shocks. *Journal of Economic Literature*, **46**(4), 871–909.

Kilian, L., (2014). Oil price shocks: causes and consequences. *Annual Review of Resource Economics*. **6**(1), 133–154.

King, R.G. and Levine, R., (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*. **108**(3), 717–737.

Kollias, C., Papadaumou, S. and Stagiannis, A. (2011). Terrorism and capital markets: The effects of the Madrid and London bomb attacks. *International Review of Economics and Finance*. **20**(4), 532–541.

Kryzanowski, L. and Zhang, H., (1992). The contrarian strategy does not work in Canadian markets. *Journal of Financial and Quantitative Analysis*. **27**(3), 383–395.

Kyereboah-Coleman, A. and Agyire-Tettey K.F., (2008). Impact of Macroeconomic Indicators on Stock Market Performance: The Case of the Ghana Stock Exchange. *The Journal of Risk Finance*. **9**(4), 365–378.

Leblang, D. and Mukherjee, B., (2005). Government Partisanship, Elections, and the Stock Market: Examining American and British Stock Returns, 1930-2000. *American Journal of Political Science*. **49**(4), 780–802.

Levin, A., Lin, C-F., and Chu, C-S. J., (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*. **108**(1), 1–24.

Levine, R., (1991). Stock markets, growth, and the tax policy. *Journal of Finance*. 46(4), 1445–1465.

Levine R, (1997). Financial development and economic growth: views and agenda, *Journal of Economic Literature*. **35**(2), 688–726.

Levine, R., (2005). Finance and growth: Theory and evidence. In: P. Aghion and S. Durlauf, ed. *Handbook of Economic Growth*. Philadelphia: Elsevier.

Levine, R. and Zervos, S., (1996). Stock Market Development and Long-Run Growth. *World Bank Economic Review*. **10**(2), 323–340.

Levine, R. and Zervos, S., (1998). Stock markets, banks, and economic growth. *American Economic Review*. **88**(3), 537–558.

Levine, R., Loayza, N. and Beck, T., (2000). Financial intermediation and growth: causality and causes. *Journal of Monetary Economics*. **46**(1), 31–77.

Levy H., (2002). *Fundamentals of Investments*. United Kingdom: Financial Times/Prentice Hall Books.

Li, J. and Born, J.A., (2006). Presidential election uncertainty and common stock returns in the United States. *Journal of Financial Research.* **29**(1), 609–622.

Li, Y. Sun, Q. and Tian, S., (2018). The impact of IPO approval on the price of existing stocks: Evidence from China. *Journal of Corporate Finance*. **50**(C), 109–127.

Liew, V. K-S. and Rowland, R., (2016). The effect of Malaysia general election on stock market returns. *SpringerPlus*. 5:1975.

Lim, C., Lakhoua, K. and Mazzawi, Z., (2016). *Africa and the Global Fintech Revolution*, Africinvest.

Liu L. X., Shu H. and Wei K.C. J., (2017). The impacts of political uncertainty on asset prices: Evidence from the Bo scandal in China, *Journal of Financial Economics*. **125**(2), 286–310.

Luintel K., B., and Paudyal K., (2006). Are common stocks a hedge against inflation? Journal of Financial Res., **29**(1), 1–19.

Luo, D., Chen K.C. and Wu L., (2017). Political uncertainty and firm risk in China. *Review of Development Finance*. **7**(2), 85–94.

MacKinlay, C., (1997). Event studies in economics and finance. *Journal of Economic Literature*. **35**(1), 13–39.

Macrae, D., (1977). A political model of the business cycle. *Journal of Political Economy*. **85**(2), 239–264.

Maku, O.E. and Atanda A.A., (2010). Determinants of stock market performance in Nigeria: Long run analysis. *Journal of Management and Organisational Behaviour*. **1**(3), 1–16.

Maysami, R.C. and Koh, T.S., (2000). A vector error correction model of the Singapore stock market. *International Review of Economics & Finance*. **9**(1), 79–96.

Markowitz, H., (1952). Portfolio Selection. *Journal of Finance*. **7**(1), 77–91.

Mattozzi, A., (2008) Can we insure against political uncertainty? Evidence from the U.S. stock market, *Public Choice*. **137**(1), 43–55.

Maysami, R.C. Howe, L.C. and Hamzah, M.A., (2004). Relationship between Macroeconomic Variables and Stock Market Indices: Cointegration Evidence from Stock Exchange of Singapore's All-S sector Indices. *Jurnal Pengurusan*. **24**(1), 47–77.

Mazouz, K., Mohamed, A. and Saadouni, B., (2016). Stock return co-movement around the Dow Jones Islamic market world index revisions. *Journal of Economic Behavior & Organization*. **132**(S), 50–62.

McMillan D. and Thupayagale, P., (2011). Measuring volatility persistence and long memory in the presence of structural breaks: Evidence from African stock markets. *Managerial Finance*. **37**(3), 219–241.

Mehdian, S., Perry, M.J. and Nas, T., (2008). An examination of investor reaction to unexpected political and economic events in Turkey. *Global Finance Journal*. **18**(3), 337–350.

Mijiyawa, A. G., (2015). What drives foreign direct investment in Africa? An empirical investigation with panel data. *African Development Review*. **27**(4), 392–402.

Mishra, S. and Narayan P. K., (2015). A nonparametric model of financial system and economic growth. *International Review of Economics and Finance*. **39**(1). 175–191.

Mok, H. M., (1993). Causality of interest rate, exchange rate and stock prices at stock market open and close in Hong Kong. *Asia Pacific Journal of Management*. **10**(2), 123–143.

Mollaahmetoğlu, E. and Akçalı, B.Y., (2019). The Missing-Link between Financial Development and Economic Growth: Financial Innovation. *Procedia Computer Science*, **158**(1) 696–704.

Mukherjee, T.K. and Naka, A., (1995). Dynamic Relations between Macroeconomic Variables and the Japanese Stock Market: An Application of vector error correction model. *The Journal of Financial Research*. **18**(2), 223–237.

Mukhopadhyay, D. and Sakar, N., (2003). Stock returns and macroeconomic fundamentals in model specification framework: Evidence from Indian stock market. *Economic Research Unit, ERU 2003–2005 Discussion Paper*, Indian Statistical Institute, January, 1–28.

Muradoglu, G., Taskin, F. and Bigan, I., (2000). Causality between stock returns and macroeconomic variables in emerging markets. *Russian & East European Finance and Trade*. **36**(6), 33–53.

Muthike, S.W., and Sakwa, M.M., (2012). Can macroeconomic indicators be used as predictors of the stock exchange index trends? A look at the Nairobi stock exchange. In: *Scientific Conference Proceedings*. pp. 516–534.

Musa M. and Morshed M., (2003). An Empirical Test of Uncertain Information Hypothesis in Bangladesh Stock Exchange. *The Journal of Developing Areas*. **36**(2), 85–99.

Mynhardt, H.R. and Plastun, Alex, (2013). The Overreaction Hypothesis: The case of Ukrainian stock market. *Corporate Ownership & Control*. **11**(1), 406–422.

Narayan S. and Narayan P.K., (2012). Do US macroeconomic conditions affect Asian stock markets? *Journal of Asian Economics*. **23**(6), 669–679.

Narayan P.K. and Narayan S., (2013).The short-run relationship between the financial system and economic growth: New evidence from regional panels. *International Review of Financial Analysis*. 29(C), 70–78.

Nandha, M. and Faff, R., (2008). Does oil move equity prices? A global view. *Energy Economics*. **30**(3), 986–997.

Nazir, M.S., Younus, H., Kaleem, A. and Anwar, Z., (2014). Impact of political events on stock market returns: empirical evidence from Pakistan, *Journal of Economic and Administrative Sciences*. **30**(1), 60–78.

Ndako, U.B., (2013). The day of the week effect on stock market returns and volatility: Evidence from Nigeria and South Africa. *MPRA Paper 48076*. University Library of Munich, Germany.

Nelson, C.R., (1976). Inflation and rates of return on Common Stocks. *Journal of Finance*. **31**(2), 471–483.

Nelson, D.B., (1991). Conditional heteroscedasticity in asset returns: A new approach. *Econometrica*. **59**(2), 347–370.

Niederhoffer, V., Gibbs, S. and Bullock, J., (1970). Presidential elections and the stock market. *Financial Analysts Journal*. **26**(2), 111–113.

Nofsinger, J.R., (2005). Social mood and financial economics. *The Journal of Behavioural Finance*. **6**(3), 144–160.

Nordhaus, W.D., (1975). The political business cycle. *The Review of Economic Studies*. **42**(2), 169–190.

Ntim, C.G., (2012). Why African stock markets should formally harmonise and integrate their operations. *African Review of Economics and Finance*. **4**(1), 53–72.

Nyantakyi, E.B. and Sy, M., (2015). The Banking System in Africa: Main Facts and Challenges, *Africa Economic Brief*. **6**(5), 1–16.

Oehler, A., Walker, T.J. and Wendt, S., (2013). Effects of election results on stock price performance: evidence from 1980 to 2008. *Managerial Finance*. **39**(8), 714–736.

Oler, D., Harrison, J. and Allen, M., (2008). The danger of misinterpreting short-window event study findings in strategic management research: an empirical illustration using horizontal acquisitions. *Strategic Organization*. **6**(2), 151–184.

Onyeiwu S., (2015). Aid, debt, and foreign direct investment. In: *Emerging Issues in Contemporary African Economies*. New York: Palgrave Macmillan. pp. 173–198.

Owusu-Nantwi, V. and Kuwornu J.K.M., (2011). Analyzing the effect of macroeconomic variables on stock market returns: Evidence from Ghana, *Journal of Economics and International Finance*. **3**(11), 605–615.

Paddy, R., (1992). Institutional reform in emerging markets. *Policy Research Working Paper Series*. 907, The World Bank.

Pagano, M., (1993). Financial markets and growth: An overview. *European Economic Review*. **37**(2/3), 613–622.

Pástor, L. and Veronesi, P., (2012). Uncertainty about government policy and stock prices. *Journal of Finance*. **67**(4), 1219–1264.

Pástor, L. and Veronesi, P., (2013). Political uncertainty and risk premia. *Journal of Financial Economics*. **110**(3), 520–545.

Persson, T., Roland, G. and Tabellini, G., (2004). How do electoral rules shape party structures, Government Coalitions and Economic Policies? *CESifo Working Paper Series*. 1115, CESifo.

Peterson, P.P. (1989). Event studies: a review of issues and methodology. *Quarterly Journal of Business and Economics*. 28(3), 36–66.

Pettengill, G.N. and Jordan, B.D., (1990). The Overreaction Hypothesis, firm size, and stock market seasonality, *Journal of Portfolio Management*, **16**(3), 60–64.

Poon, S., and Granger, C.W.J., (2003). Forecasting volatility in financial markets: A review. *Journal of Economic Literature*. **41**(2), 478–539.

Postali, F.A.S. and Picchetti, P., (2006). Geometric Brownian Motion and structural breaks in oil prices: A quantitative analysis. *Energy Economics*. **28**(4), 506–522.

Poteshman, A., (2001). Underreaction, overreaction and increasing misreaction to information in the options market. *Journal of Finance*. **56**(3), 851–876.

Pukthuanthong, K., and Roll, R., (2009). Global market integration: An alternative measure and its applications. *Journal of Financial Economics*. **94**(2), 214–232.

Qiao, Yu, (1996). Stock prices and exchange rate: Experience in leading East Asian financial centres-Tokyo, Hong Kong and Singapore. *Singapore Economic Review*. **41**(1), 47–56.

Raghutla C. and Chittedi K.R., (2020). Financial development, real sector and economic growth: Evidence from emerging market economies. *International Journal of Finance & Economics*. 1–12.

Rahman, Z. Ali, A. and Jebran, K., (2018).The effects of mergers and acquisitions on stock price behavior in banking sector of Pakistan. *The Journal of Finance and Data Science*. **4**(1), 44–54.

Rapach, D.E., Wohar, M.E. and Rangvid, J. (2005). Macrovariables and international stock return predictability. *International Journal of Forecasting*. **21**(1), 137–166.

Rapach, D.E. and Zhou, G., (2013). Forecasting stock returns. In: G. Elliott, C. Granger and A. Timmermann ed. *Handbook of Economic Forecasting*. Amsterdam: Elsevier. **2**(1), pp. 328–383.

Ratanapakorn, O. and Sharma, S.C., (2007). Dynamic analysis between the US stock returns and the macroeconomic variables. *Applied Financial Economics*. **17**(5), 369–377.

Reboredo, J.C., Uddin, G.S., (2016). Do financial stress and policy uncertainty have an impact on the energy and metals markets? A quantile regression approach. *International Review of Economics & Finance*. **43**(C), 284–298.

Roberts, B.E., (1990). A dead senator tells no lies: Seniority and the distribution of federal benefits. *American Journal of Political Science*. **34**(1), 31–58.

Robinson, P.M., (1991). Testing for strong serial correlation and dynamic conditional heteroskedasticity in multiple regression. *Journal of Econometrics*. **47**(1), 67–84.

Rogalski, R.J. and Vinso, J.D., (1977). Stock returns, money supply and the directions of causality. *Journal of Finance*. **32**(4), 1017–1030.

Roll, R. and Ross, S., (1980). An empirical investigation of the arbitrage pricing theory. *Journal of Finance*. **35**(5), 1073–1104.

Roodman, D., (2009). How to do xtabond2: An introduction to difference and system GMM in STATA. *Stata Journal*. **9**(1), 86–136.

Ross, S., (1976). The Arbitrage Theory of Capital Asset Pricing. *Journal of Economic Theory*. **13**(3), 341–360.

Roubini, N. and Sachs, J., (1989). Political and economic determinants of budget deficit in the industrial democracies. *European Economic Review*. **33**(1), 903–938.

Rousseau, P.L. and Wachtel, P., (2000). Equity market and growth: cross-country evidence on timing and outcomes1980-1995. *Journal of Banking and Finance*. **24**(12), 1933–1957.

Rousseau, P.L. and Wachtel, P., (2011). What is happening to the impact of financial deepening on economic growth? *Economic Inquiry*. **49**(1), 276–288.

Rouwenhorst, K.G., (1998). International momentum strategies. *The Journal of Finance*. **53**(1), 267–284.

Rouwenhorst, K. G., (1999). Local return factors and turnover in emerging stock markets. *The Journal of Finance*. **54**(4), 1439–1464.

Rozeff, M.S., (1974). Money and stock prices: Market efficiency and the lag in effect of monetary policy. *Journal of Financial Economics*. **1**(3), 245–302.

Saeed, S., Ozra, B., and Meysam, G., (2012). The Relationship between Macroeconomic Variables and Stock Returns in the Tehran Stock Exchange. *International Journal of Academic Research in Business and Social Sciences*. **2**(6), 559–573.

Saint-Paul, G., (1992). Technological choice, financial markets and economic development. *European Economic Review*. **36**(4), 763–781.

Samuelson, P. A., (1965). A theory of induced innovation along Kennedy-Weisäcker lines. *The Review of Economics and Statistics*. **47**(4), 343–356.

Schiereck, D., Freytag, A., Grimm, M. and Bretschneider, W.H., (2018). Public corporations in Africa: A continental survey on stock exchanges and capital markets performance, *Jena Economic Research Papers*. 2018–013, Friedrich Schiller University Jena.

Schumpeter, J., Becker, M., and Knudsen, T., (2002). New Translations: Theorie der wirtschaftlichen Entwicklung. *The American Journal of Economics and Sociology*. **61**(2), 405–437.

Sargant, T.J., (1999). A primer on monetary and fiscal policy. *Journal of Banking & Finance*. **23**(10), 1463–1482.

Saunders, M., Lewis, P. and Thornhill, A., (2009). *Research Methods for Business Students*. 5th ed. Harlow: Pearson Education Limited.

Schipper, K. and Smith, K.G., (1983). Effects of recontracting on shareholder wealth: the case of voluntary spin-offs. *Journal of Financial Economics*. **12**(4), 437–67.

Schimmer, M., Levchenko, A. and Müller, S., (2014). Event Study Tools, [Research Apps]. St.Gallen [accessed 15 July 2020]. Available from: http://www.eventstudytools.com.

Schwert, G.W., (1989). Why does stock market volatility change over time? *Journal of Finance*, **44**(5), 1115–1153.

Sehrawat, M. and Giri, A.K., (2018). The impact of financial development, economic growth, income inequality on poverty: Evidence from India, *Empirical Economics*. **55**(4), 1585–1602.

Sellin, P., (2001). Monetary policy and the stock market: Theory and empirical evidence. *Journal of Economic Surveys*. **15**(4), 491–541.

Selmi R. and Bouoiyour, J., (2020). The financial costs of political uncertainty: Evidence from the 2016 US presidential elections. *Scottish Journal of Political Economy*. **67**(2), 166–185.

Seo, M.H., Kim, S. and Kim. Y-J., (2019). Estimation of dynamic panel threshold model using Stata. *Stata Journal*, **19**(3), 685–697.

Seo, M. H. and Shin, Y., (2016). Dynamic panels with threshold effect and endogeneity. *Journal of Econometrics.* **195**(2), 196–186.

Serletis, A. and Elder, J., (2011). Introduction to oil price shocks. *Macroeconomic Dynamics*. **15**(S3), 327–336.

Senbet, L. and Otchere, I, (2008). African Stock Markets. *Preliminary Seminar paper for the Section on Beyond Stock Markets*. IMF Seminar, Tunisia.

Senbet, L. and Otchere, I., (2010). In: Q. Marc and V. Genevieve, Palgrave, ed. *African Stock Markets: Ingredients for Development and Capacity Building, in African Finance in the 21th Century*. Macmillan Publishing.

Seyed, M.H., Zamri, A. and Yew, W.L., (2011). The Role of Macroeconomic Variables on Stock Market Index in China and India. *International Journal of Economics and Finance*. **3**(6), 233–243.

Shachmurove, Y., (2002). The Behavior of Secondary European Stock Markets to Positive and Negative Shocks. *International Journal of Business*. **7**(2), 1–16.

Shahzad, S.J.H., Raza, N., Balcilar, M., Ali, S. and Shahbaz, M., (2017). Can economic policy uncertainty and investors sentiment predict commodities returns and volatility? *Resources Policy*. **53**(C), 208–218.

Sharpe, W.F., (1964). Capital Asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*. **19**(3), 425–442.

Shaikh, I., (2017). The 2016 U.S. presidential election and the Stock, FX and VIX markets. *North American Journal of Economics and Finance*. **42**(C), 546–563.

Shon, J.J., (2010). Do stock returns vary with campaign contributions? Bush vs. Gore: The Florida recount. *Economics and Politics*. **22**(3), 257–281.

Sibindi, A.B., (2015). Insurance market development: an empirical study of African countries. *Risk governance & control: financial markets & institutions*. **5**(4), 319–330.

Singh, A., (1997). Financial liberalisation, stock markets, and economic development. *The Economic Journal*. **107**(442), 771–782.

Smales, L.A., (2015). Better the devil you know: The influence of political incumbency on Australian financial market uncertainty. *Research in International Business and Finance*. **33**(1) 59–74

Sohail, N. and Hussain, Z., (2009). Long-run and short-run relationship between macroeconomic variables and stock prices in Pakistan: The case of Lahore Stock Exchange. *Pakistan Economic and Social Review*. **47**(2), 183–198.

Solnik, B., (1987). Using Financial Prices to Test Exchange Rate Models: A Note. *Journal of Finance*. **42**(1), 141–149.

Solow, R.M., (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*. **70**(1), 65–94.

Stoian, A. and Tatu-Cornea, D., (2015). What do European stock markets prefer? Left or right governments? *Managerial Finance*. **41**(10), 1096–1111.

Stulz, R. and Williamson, R., (2003). Culture, openness, and finance. *Journal of Financial Economics*. **70**(3), 313–349.

Suhaibu, I., Harvey, S.K., and Amidu, M., (2017). The impact of monetary policy on stock market performance: Evidence from twelve, (12) African countries. *Research in International Business and Finance*. **42**(C), 1372–1382.

Suleman, M.T. and Randal, J., (2016). Dynamics of political risk rating and stock market volatility, Available at SSRN 2315645.

Sulemana T., Guptac R. and Balcila M., (2017). Does country risks predict stock returns and volatility? Evidence from a nonparametric approach. *Research in International Business and Finance*. **42**(C), 1173–1195.

Suwanna T., (2012). Impacts of dividend announcement on stock return. *Procedia - Social and Behavioral Sciences*. **40**(C), 721–725.

Tachiwou A.M., (2010). Day-of-the-week-effects in West African regional stock market. *International Journal of Economics and Finance*. **2**(4), 167–173.

Taylor, S.J., (1986). *Modelling Financial Time Series*. Chichester: John Wiley.

Thorbecke, W., (1997). On stock market returns and monetary policy. *The Journal of Finance*, **52**(2), 635–654.

Trabelsi Mnif A., (2017). Political uncertainty and behavior of Tunisian stock market cycles: Structural unobserved components time series models. *Research in International Business and Finance*. **39**(PA), 206–214.

Tursoy, T., Gunsel, N., and Rjoub, H., (2008). Macroeconomic factors, the APT and the Istanbul stock market. *International Research Journal of Finance and Economics*. **22**(1), 49–57.

United Nations, (2013). *Microfinance in Africa: Overview and Suggestions for Action by Stakeholders*, Office of Special Adviser on Africa.

United Nations Conference on Trade and Development (UNCTAD), (2013). *Capital Flows to Developing Countries: When Are They Good for Development?* Geneva, Switzerland: United Nations.

UNCTAD, (2019a). *Key statistics and trends in Regional Trade in Africa*. Geneva, Switzerland: United Nations.

UNCTAD, (2019b). *World investment report*. Geneva, Switzerland: United Nations.

UNCTAD, (2019c). *Economic Development in Africa Report 2019: Made in Africa - Rules of Origin for Enhanced Intra-African Trade,* Geneva: United Nations.

Veronesi, P., (1999). Stock market overreaction to bad news in good times: a rational expectations equilibrium model. *Review of Financial Studies*. **12**(5), 975–1007.

Volkerink, B. and De Haan, J., (2001). Fragmented government effects on fiscal policy: new evidence. *Public Choice*. **109**(3/4), 221–242.

Vychytilová, J., Pavelková, D., Pham, Ha and Urbánek, T., (2019). Macroeconomic factors explaining stock volatility: multi-country empirical evidence from the auto industry, *Economic Research-Ekonomska Istraživanja*. **32**(1), 3327–3341.

Wang, Y-H. and Lin, C-T., (2008). Empirical analysis of political uncertainty on TAIEX stock market. *Applied Economics Letters*. **15**(7), 545–550.

Wisniewski, T.P., (2016). Is there a link between politics and stock returns? A literature survey. *International Review of Financial Analysis*. **47**(C), 15–23.

Wisniewski, T.P., Lambe, B.J. and Dias, A., (2020). The influence of general strikes against government on stock market behavior. *Scottish Journal of Political Economy*. **67**(1), 72–99.

World Bank, (2019). *Remittance Prices Worldwide, An analysis of trends in cost of remittances services*. Issue 9, March 2019, Washington, DC.

Wongbampo, P. and Sharma, S.C., (2002). Stock market and macroeconomic fundamental dynamic interactions: ASEAN-5 countries. *Journal of Asian Economics*. **13**(1), 27–51.

Wright, W.F., and Bower, G.H., (1992). Mood effects on subjective probability assessment. *Organizational Behaviour and Human Decision Processes*. **52**(2), 276–291.

Wu, J., Hou, H., and Cheng, S., (2010). The dynamic impacts of financial institutions on economic growth: Evidence from the European Union. *Journal of Macroeconomics*. 32(3), 879–891.

Xiao, L. and Aydemir, A., (2007). Volatility modelling and forecasting in finance. In: J. Knight, and S. Satchell, eds. *Quantitative Finance, Forecasting volatility in the financial markets*. 3rd ed. Butterworth-Heinemann, pp. 1–45.

Yartey, C.A., and Adjasi, C.K., (2007). Stock market development in Sub-Saharan Africa: Critical issues and challenges. *IMF Working Papers*. No. WP/07/209. Washington, DC: International Monetary Fund.

Yeung, W.H. and Aman, A., (2016) Sensitivity of stock indices to global events: The perspective for Pakistani Canadians. *Journal of Economic and Administrative Sciences*. **32**(2), 102–119.

Zaremba, A., (2019). Performance persistence in anomaly returns: Evidence from frontier markets. *Emerging Markets Finance and Trade*. **56**(12), 2852–2873.

Zaremba, A. and Shemer, J.K., (2018). Is there momentum in factor premia? Evidence from international equity markets. *Research in International Business and Finance*. **46**(C), 120–130.

Zarowin, P., (1989). Does the Stock Market Overreact to Corporate Earning Information? *Journal of Finance*. **44**(5), 1385–1399.

Zimbabwe Independent, (2015). ZSE market capitalization sheds nearly US$2 billion. [online]. *Zimbabwe Independent* [Viewed 05 September 2019] Available from: https://www.theindependent.co.zw/2015/10/02/zse–market–capitalisation–sheds–nearly–us2–billion/.

APPENDICES

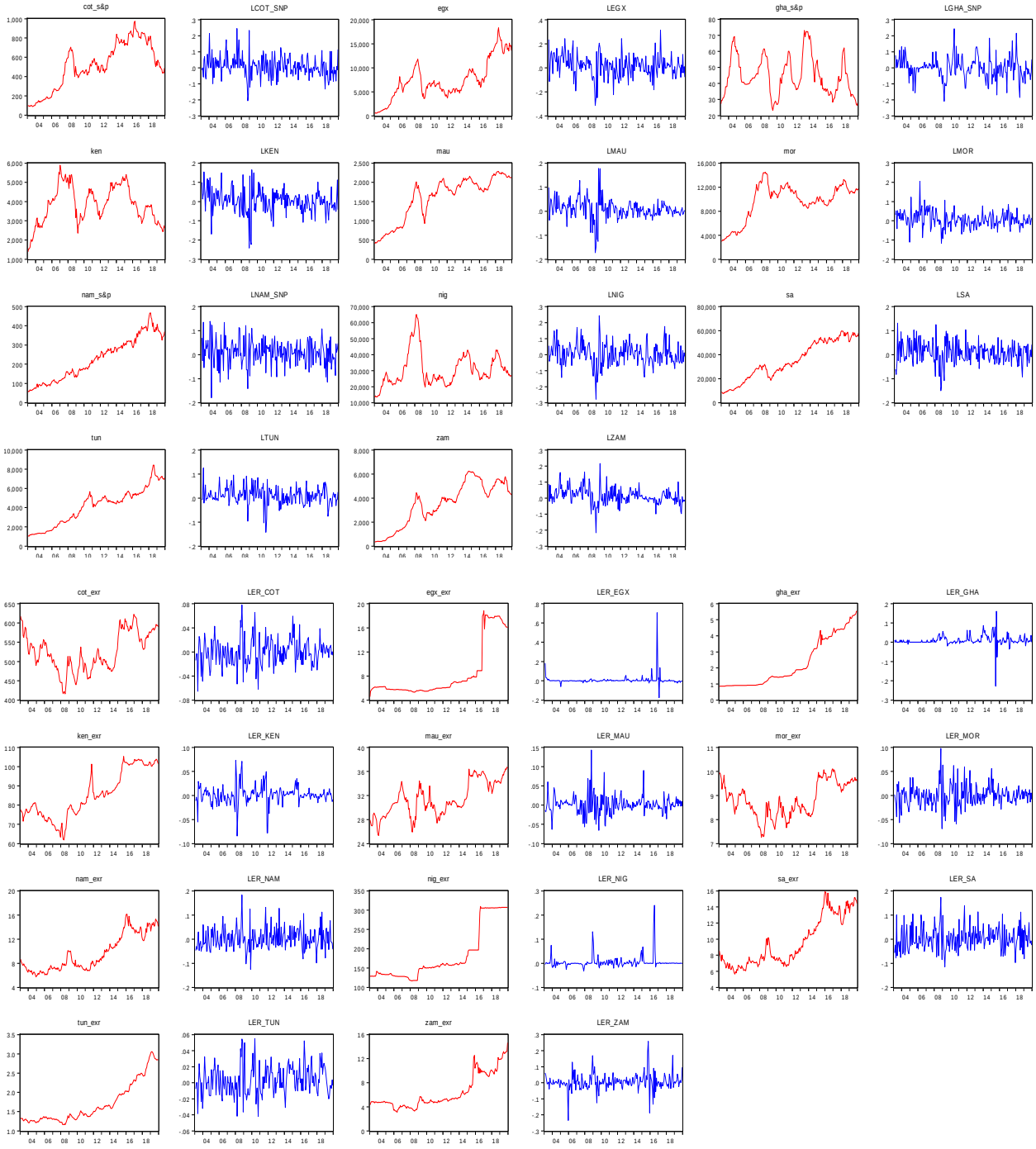
Appendix 1: Classification of African Countries into Sub-groups

North Africa	West Africa	Central Africa	East Africa	Southern Africa
Algeria	Benin	Burundi	Comoros	Angola
Egypt, Arab Rep.	Burkina Faso	Cameroon	Djibouti	Botswana
Libya	Cabo Verde	Central African Republic	Eritrea	Eswatini
Morocco	Cote d'Ivoire	Chad	Ethiopia	Lesotho
South Sudan	Gambia, The	Congo, Rep.	Kenya	Malawi
Sudan	Ghana	Congo, Dem. Rep.	Madagascar	Mozambique
Tunisia	Guinea	Equatorial Guinea	Mauritius	Namibia
	Guinea-Bissau	Gabon	Seychelles	South Africa
	Liberia	Rwanda	Somalia	Zambia
	Mali	Sao Tome and Principe	Uganda	Zimbabwe
	Mauritania		Tanzania	
	Niger			
	Nigeria			
	Senegal			
	Sierra Leone			
	Togo			

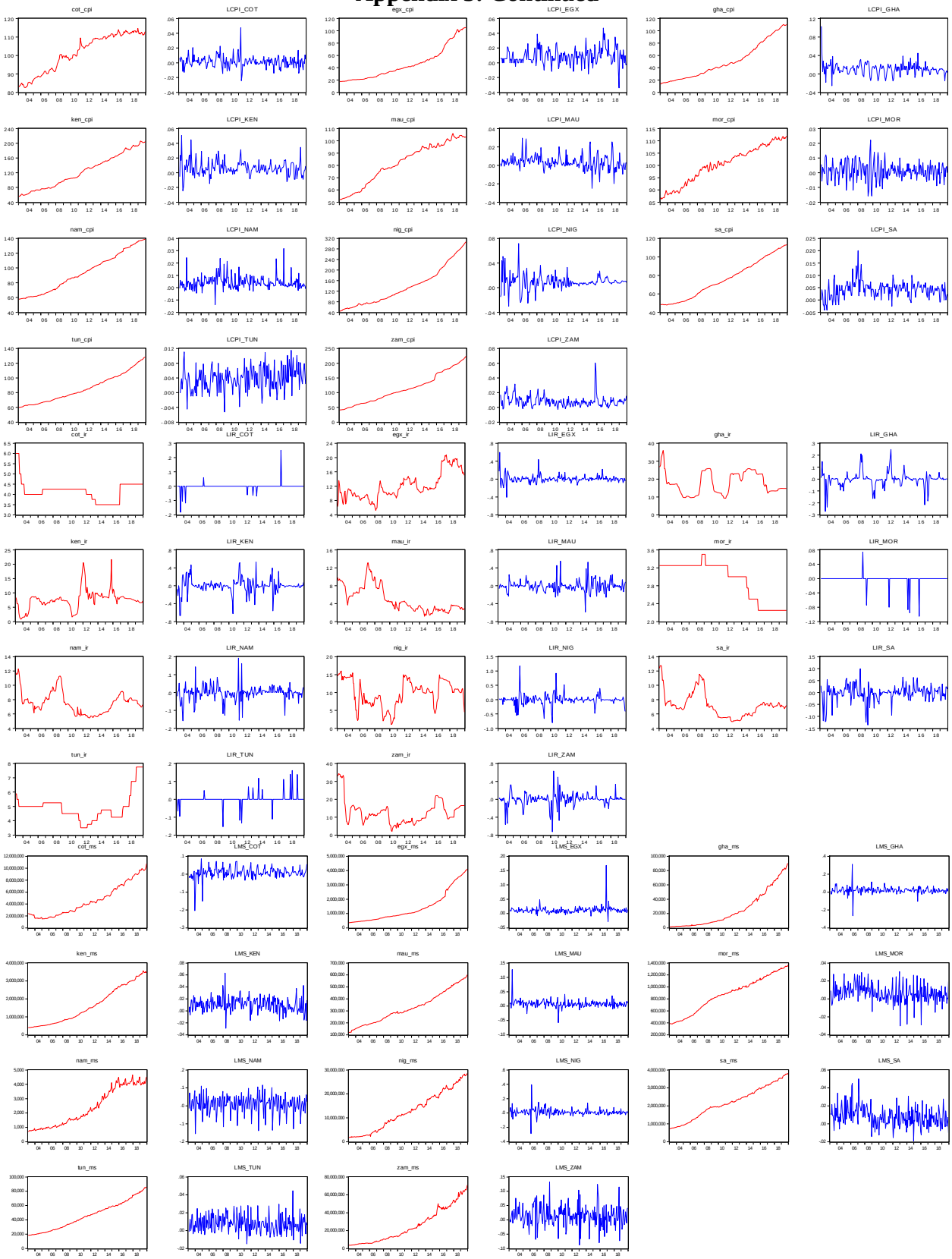
Appendix 2: Overview of National Exchanges in Africa

Country Name	Name of Exchange	Code	Location	Established
	North Africa			
Algeria	Algiers Stock Exchange	SGBV	Algiers	1997
Egypt, Arab Rep.	Egyptian Exchange	EGX	Cairo	1883
Libya	Libyan Stock Market	LSM	Tripoli	2007
Morocco	Casablanca Stock Exchange	Casa SE	Casablanca	1929
Sudan	Khartoum Stock Exchange	KSE	Khartoum	1994
Tunisia	Bourse de Tunis	BVMT	Tunis	1969
	West Africa			
Cabo Verde	Bolsa de Valores de Cabo Verde	BVC	Mindelo	2005
Ghana	Ghana Stock Exchange	GSE	Accra	1990
Nigeria	Nigerian Stock Exchange	NSE	Lagos	1960
Sierra Leone	Sierra Leone Stock Exchange	SLS	Freetown	2009
Benin, Burkina Faso, Ginuea Bissau, Cote d'ivoire, Mali, Niger, Senegal and Togo	Bourse Régionale des Valeurs Mobilières	BRVM	Abidjan	1998
	Central Africa			
Cameroon	Douala Stock Exchange	DSX	Douala	2001
Rwanda	Rwanda Stock Exchange	RSE	Kigali	2005
Central Africa Republic, Chad, Congo DR, Equatorial Guinea and Gabon	Bourse des Valeurs Mobilières de l'Afrique Centrale	BVMAC	Libreville	2003
	East Africa			
Kenya	Nairobi Securities Exchange	NSE	Nairobi	1954
Mauritius	Stock Exchange of Mauritius	SEM	Port Louis	1988
Seychelles	MERJ Exchange Limited	MERJ	Victoria	2012
Somalia	Somali Stock Exchange	SSE	Mogadishu	2015
Uganda	Uganda Securities Exchange	USE	Kampala	1997
Tanzania	Dar es Salaam Stock Exchange	DSE	Dar es Salaam	1998
	Southern Africa			
Angola	Bolsa de Dívida e Valores de Angola	Bodiva	Luanda	2012
Botswana	Botswana Stock Exchange	BSE	Gaborone	1989
Eswatini	Eswatini Stock Exchange	ESE	Mbabane	1990
Lesotho	Maseru Securities Exchange	MSM	Maseru	2016
Malawi	Malawi Stock Exchange	MSE	Blantyre	1995
Mozambique	Bolsa de Valores de Mozambique	BVM	Maputo	1999
Namibia	Namibia Stock Exchange	NSX	Windhoek	1992
South Africa	JSE Limited	JSE	Johannesburg	1887
Zambia	Lusaka Stock Exchange	LuSE	Lusaka	1994
Zimbabwe	Zimbabwe Stock Exchange	ZSE	Harare	1948

Appendix 3: Graphical Representation of Monthly Data Series in Levels and their Returns



Appendix 3: Continued



Appendix 4: Results of GARCH Models for ASM Returns and Macroeconomic Variables

		Cote D'Ivoire					
		INDEX	ER	IR	MS	CPI	OIL
	ω	0.0019	1.40E-05	0.0003***	-9.49E-06***	4.22E-05***	0.0015*
	α	0.1319*	0.0523**	-0.0109***	-0.0082***	0.3520***	0.2870***
	β	0.4232	0.9113***	0.5919***	1.0222***	-0.1032	0.5675***
GARCH	$\alpha + \beta$	0.5551	0.9636	0.581	1.014	0.2488	0.8545
	AIC	-2.6026	-4.8698	-4.4643	-4.3182	-7.0394	-1.8740
	LL	267.86	499.28	456.89	443.30	719.50	194.27
	ARCH Test	9.4060***	0.9057	0.0436	0.2417	27.3204***	3.5204*
	ω	-2.0763	-1.7741*	-6.6364***	-4.7215***	-8.3145***	-1.2334**
	α	0.1750	0.0298	-2.1234***	0.7067***	0.4471***	0.3608*
	β	0.6448	0.7745***	0.0803	0.4101***	0.1987	0.8046***
EGARCH	$\alpha + \beta$	0.8198	0.8043	-2.0431	1.1168	0.6458	1.1654
	γ	-0.0807	0.1350**	1.0707***	0.5370***	0.2615***	-0.1306
	AIC	-2.5883	-4.8562	-4.8105	-4.2239	-7.0667	-1.8830
	LL	267.42	498.90	492.86	434.73	723.27	196.19
		Egypt					
		INDEX	ER	IR	MS	CPI	OIL
	ω	0.0019	-9.37E-07	0.0005***	3.35E-07***	1.24E-06***	
	α	0.1600	-0.018266	0.1791***	-0.0268***	-0.0481***	
	β	0.5996	1.033958	0.7052***	1.0367***	1.0437***	
GARCH	$\alpha + \beta$	0.7596	1.015692	0.8843	1.0099	0.9956	
	AIC	-1.9684	-4.5345	-2.5752	-6.4454	-6.5396	
	LL	204.79	463.98	266.38	655.9871	665.50	
	ARCH Test	7.4252***	8.72E-05	5.7238**	0.0057***	0.3488***	
	ω	-0.9844*	-5.9791**	-0.6811***	-4.9326***	-0.9607***	
	α	0.2008***	-0.7424**	0.2600***	1.2332***	-0.3874***	
	β	0.8304***	-0.0234	0.9097***	0.5652***	0.8646***	
EGARCH	$\alpha + \beta$	1.0312	-0.7658	1.1697	1.7984	0.4772	
	γ	-0.1079**	-1.0410***	-0.0026	-1.3248***	0.2509***	
	AIC	-1.9782	-3.1078	-2.5760	-6.1481	-6.5435	
	LL	206.78	320.89	267.46	626.96	666.89	

Appendix 4: Continuation 2 of 6

		Ghana					
		INDEX	ER	IR	MS	CPI	OIL
	ω	0.0007**	0.0001	0.0002***	0.0013***	1.40E-05***	
	α	0.2196***	1.1176***	0.6965***	0.1408**	0.1976***	
	β	0.6364***	0.0265***	0.3430***	-0.1464	0.6546***	
GARCH	$\alpha + \beta$	0.856	1.1441	1.0395	-0.0056	0.8522	
	AIC	-2.6678	-5.3139	-3.8486	-3.8574	-6.3668	
	LL	275.44	542.71	393.71	395.60	648.04	
	ARCH Test	2.9069*	16.3542***	25.7620***	23.4679***	4.5633**	
	ω	-1.1632***	-3.0316***	-2.6683***	-4.5213***	-3.5362***	
	α	0.4289***	0.8753***	0.8788***	-0.2841**	0.6162***	
	β	0.8474***	0.7114***	0.6868***	0.3052	0.6687***	
EGARCH	$\alpha + \beta$	1.2763	1.5867	1.5656	0.0211	1.2849	
	γ	-0.0380	0.3341***	-0.0796	0.5599***	0.0337	
	AIC	-2.7001	-5.3754	-3.8291	-3.9061	-6.3579	
	LL	279.71	549.92	392.74	401.52	648.16	
		Kenya					
		INDEX	ER	IR	MS	CPI	OIL
	ω	0.0005**	3.98E-05***	0.0014***	2.55E-05	1.85E-06***	
	α	0.2454**	0.6658***	2.0858***	0.1103	0.0191	
	β	0.6180***	0.3186***	0.1018**	0.7047***	0.9374***	
GARCH	$\alpha + \beta$	0.8634	0.9844	2.1876	0.815	0.9565	
	AIC	-2.8667	-5.7281	-1.6511	-6.0573	-6.8026	
	LL	294.53	586.40	172.5911	616.79	695.46	
	ARCH Test	23.1886***	5.0992***	11.3637***	12.8277***	0.5955	
	ω	-1.1413**	-2.3881***	-1.8284	-11.464***	-1.6720***	
	α	0.4177**	0.8032***	1.0854***	0.2545	0.1384	
	β	0.8577***	0.7905***	0.7492***	-0.2597	0.8411***	
EGARCH	$\alpha + \beta$	1.2754	1.5937	1.8346	-0.0052	0.9795	
	γ	-0.0403	0.0921	-0.0679***	0.1035	0.4581***	
	AIC	-2.8702	-5.7185	-1.6591	-6.0440	-6.8631	
	LL	295.89	586.42	174.40	616.44	702.66	

Appendix 4: Continuation 3 of 6

		Mauritius					
		INDEX	ER	IR	MS	CPI	OIL
	ω	5.69E-06	1.25E-05**	0.0027***	6.41E-05***	3.13E-06*	
	α	0.1592***	0.4312***	0.7921***	-0.0138*	0.0721**	
	β	0.8391***	0.6674***	0.2659***	0.5953***	0.8664***	
GARCH	$\alpha + \beta$	0.9983	1.0986	1.058	0.5815	0.9385	
	AIC	-4.1162	-4.9310	-1.6569	-5.8717	-7.1486	
	LL	421.74	503.04	173.35	600.97	727.01	
	ARCH Test	6.0110**	0.0557	11.9446***	0.0071***	0.4309	
	ω	-0.3358**	-0.9385***	-1.1358***	-14.607***	-0.9509*	
	α	0.3141***	0.6424***	0.4277***	-0.4717***	0.1914**	
	β	0.9883***	0.9393***	0.8185***	-0.6696***	0.9179***	
EGARCH	$\alpha + \beta$	1.3024	1.5817	1.2462	-1.1413	1.1093	
	γ	-0.0485	0.0596	-0.3256***	0.6886	0.0247	
	AIC	-4.1142	-4.9140	-1.7298	-6.0463	-7.1548	
	LL	422.53	502.32	181.71	619.70	728.64	
		Morocco					
		INDEX	ER	IR	MS	CPI	OIL
	ω	-2.30E-05**	8.44E-06	2.21E-06***	0.0002***	1.46E-06	
	α	-0.0117***	0.1531***	-0.0183***	0.1516***	0.1104*	
	β	1.0252***	0.8363***	1.0169***	-0.6548***	0.8423***	
GARCH	$\alpha + \beta$	1.0135	0.9894	0.9986	-0.5032	0.9527	
	AIC	-3.6441	-4.9078	-6.3930	-6.3786	-7.5617	
	LL	374.06	500.69	653.89	646.05	772.51	
	ARCH Test	0.3923	0.4291	0.1682	2.9183*	16.8559***	
	ω	-7.4037	-0.6755**	-8.4519***	-11.028***	-0.3039***	
	α	-0.1717	0.3492***	-3.3464***	0.2732	-0.1253***	
	β	-0.1694	0.9487***	-0.0224***	-0.1547	0.9586***	
EGARCH	$\alpha + \beta$	-0.3411	1.2979	-3.3688	0.1185	0.8333	
	γ	-0.0373	0.0805*	0.1739	0.4422***	0.2996	
	AIC	-3.5323	-4.9030	-6.1270	-6.4652	-7.6275	
	LL	363.77	501.21	627.89	655.75	780.19	

Appendix 4: Continuation 4 of 6

		Namibia					
		INDEX	ER	IR	MS	CPI	OIL
	ω	0.0005	0.0020***	0.0011***	0.0015***	1.27E-05	
	α	0.1077*	0.2241*	0.4837***	0.3687**	-0.0403	
	β	0.7019***	-0.2074	-0.0793***	-0.0460	0.5816**	
GARCH	$\alpha + \beta$	0.8096	0.0167	0.4044	0.3227	0.5413	
	AIC	-3.0734	-3.3763	-3.7077	-3.3183	-7.6456	
	LL	316.95	346.01	379.48	339.49	773.38	
	ARCH Test	7.1662***	1.6780	26.2115***	13.3327***	0.1796***	
	ω	-0.0398	-8.5319***	-6.1385***	-1.9349***	-7.7376**	
	α	-0.0987***	0.3794**	0.6053***	0.1194	0.2588*	
	β	0.9811***	-0.3131	0.1181	0.7091***	0.2795	
EGARCH	$\alpha + \beta$	0.8824	0.0663	0.7234	0.8285	0.5383	
	γ	0.0459**	-0.0515	-0.0948	0.4858***	-0.2190**	
	AIC	-3.1119	-3.3711	-3.6408	-3.4263	-7.5983	
	LL	321.86	346.48	373.72	351.35	769.63	
		Nigeria					
		INDEX	ER	IR	MS	CPI	OIL
	ω	0.0008*	0.0004***	0.0009***	0.0002***	-4.80E-08	
	α	0.1976**	0.2384	1.4016***	0.5979***	-0.0282***	
	β	0.6364***	-0.1033*	0.3431***	0.4831***	0.9979***	
GARCH	$\alpha + \beta$	0.834	0.1351	1.7447	1.081	0.9697	
	AIC	-2.6139	-5.1040	-1.3989	-3.6085	-7.1936	
	LL	267.00	523.06	146.29	371.26	731.55	
	ARCH Test	0.9520	26.5955***	1.4888	60.2311***	2.0504	
	ω	-1.3196*	-2.1229***	-1.0311***	-1.8741***	0.0230	
	α	0.3301**	-0.5342***	0.7909***	0.6898***	-0.0587*	
	β	0.8071***	0.7203***	0.8723***	0.7881***	1.0011***	
EGARCH	$\alpha + \beta$	1.1372	0.1861	1.6632	1.4779	0.9424	
	γ	-0.0395	0.7397***	-0.3949***	0.0256	-0.0354**	
	AIC	-2.5894	-5.2481	-1.4353	-3.6082	-7.1423	
	LL	267.53	538.68	150.97	372.23	727.37	

Appendix 4: Continuation 5 of 6

		South Africa					
		INDEX	ER	IR	MS	CPI	OIL
	ω	0.0002	0.0004	9.22E-05***	0.0002***	1.22E-06*	
	α	0.2147**	0.0950	0.0872***	0.1123*	0.2069**	
	β	0.6616***	0.7043***	0.8058***	-0.6631*	0.6554***	
GARCH	$\alpha+\beta$	0.8763	0.7993	0.893	-0.5508	0.8623	
	AIC	-3.4856	-3.2394	-4.1135	-6.2387	-8.8569	
	LL	357.05	333.80	420.46	636.10	896.11	
	ARCH Test	12.5348***	0.9683	15.7649***	1.3354	12.6178***	
	ω	-1.4936**	-1.4860	-0.7193**	-16.392***	-12.639***	
	α	0.3414**	0.2252	0.1255***	0.3638***	0.6878***	
	β	0.8129***	0.7873***	0.9108***	-0.7534***	-0.0280	
EGARCH	$\alpha+\beta$	1.1543	1.0125	1.0363	-0.3896	0.6598	
	γ	-0.2413***	0.0131	-0.0323	-0.1045**	0.1749	
	AIC	-3.5166	-3.2384	-4.0968	-6.2525	-8.8720	
	LL	361.18	334.69	419.77	638.50	898.64	
		Tunisia					
		INDEX	ER	IR	MS	CPI	OIL
	ω	0.0002**	2.20E-05	0.0004***	3.78E-06**	3.55E-07	
	α	0.2154**	0.0779*	-0.0351***	-0.0719***	-0.0305***	
	β	0.5940***	0.8393***	0.5814***	1.0273***	1.0241***	
GARCH	$\alpha+\beta$	0.8094	0.9172	0.5463	0.9554	0.9936	
	AIC	-3.9041	-5.3309	-4.1745	-6.5790	-5.8401	
	LL	399.31	543.42	427.63	672.77	597.77	
	ARCH Test	2.6267	1.7627	0.4933	0.0991	0.9007	
	ω	-1.4283***	-1.8844	-6.3366***	-1.0045***	-12.666***	
	α	0.3608***	0.1694	-2.1955***	-0.4039***	0.8369**	
	β	0.8326***	0.7875***	0.0953***	0.8593***	-0.3711**	
EGARCH	$\alpha+\beta$	1.1934	0.9569	-2.1002	0.4554	0.4658	
	γ	0.1268**	0.0792	2.2126***	-0.0078	0.2194*	
	AIC	-3.9195	-5.3091	-4.6551	-6.5769	-5.8669	
	LL	401.87	542.22	477.16	673.55	601.49	

Appendix 4: Continuation 6 of 6

		Zambia					
		INDEX	ER	IR	MS	CPI	OIL
	ω	7.26E-05*	0.0003***	0.0023***	0.0007	3.90E-05	
	α	0.0905**	0.7737***	1.4390***	0.1843	0.0257	
	β	0.8784***	0.4152***	0.2082***	0.2367	-0.0059	
GARCH	$\alpha + \beta$	0.9689	1.1889	1.6472	0.421	0.0198	
	AIC	-3.3292	-3.3808	-1.4507	-3.8121	-7.2485	
	LL	342.25	346.4656	152.52	390.02	737.10	
	ARCH Test	0.0504	8.1985***	0.7479	15.1879***	0.1973	
	ω	-0.3643*	-8.3308***	-0.5507***	-2.0939*	-1.4444***	
	α	0.1806***	1.2349***	-0.0627	0.0486	-0.3753***	
	β	0.9625***	-0.1958***	0.8658***	0.6930***	0.8277***	
EGARCH	$\alpha + \beta$	1.1431	1.0391	0.8031	0.7416	0.4524	
	γ	-0.0422	-0.1907**	-0.5403***	0.2523**	0.2365***	
	AIC	-3.3273	-3.4028	-1.6156	-3.8310	-7.4652	
	LL	343.05	349.68	170.18	392.93	759.99	

Notes: *,**,*** denote statistical significance at the 10%, 5%, and 1% levels respectively. ARCH test represents the test for heteroscedasticity, AIC is the Akaike Information Criteria and LL is the Log-Likelihood ratio.

Appendix 5: Results of Panel Linear Models

Appendix 5a: Dynamic OLS Growth Model

VARIABLES	(1)	(2)	(3)	(4)	(5)
GDP_{it-1}	0.996***	0.994***	0.994***	0.996***	0.993***
CONS	-0.0004	-0.0004	-0.0004	-0.0009**	-0.0006*
OPEN	0.0002**	0.0000	0.0000	0.0002**	0.0000
INF	-0.0000***	-3.56e-06***	0.0002	-0.0009***	-0.0002***
INV	-5.91e-05	-1.03e-06	-8.87e-05	0.0004	-2.22e-06
HC	-0.0000	-0.0000	0.0004**	0.0001	-0.0001
DC	0.0001*				
MS		0.0003***			
BR			0.0016***		
MC				-0.0000	
DEP					0.0003***
Constant	0.0304	0.0629**	0.0474	0.0485	0.0506
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
R-squared	0.999	0.999	0.999	0.999	0.999
Observations	789	842	448	332	838

Appendix 5b: Fixed Effect Growth Model

VARIABLES	(1)	(2)	(3)	(4)	(5)
GDP_{it-1}	0.995***	0.994***	0.994***	0.996***	0.993***
CONS	-0.0005	0.0000	-0.0004	-0.0009**	-0.0006*
OPEN	0.0001*	0.0001	0.0001	0.0002**	0.0001
INF	-0.0000***	-0.0000***	0.0002	-0.0009***	-0.0002***
INV	-0.0000	0.0001	-0.0001	0.0004	-0.0000
HC	0.0001	-0.0001	0.0004**	0.0001	-0.0001
DC	0.0001*				
MS		0.0003***			
BRANCH			0.0016***		
MC2				-0.0000	
DEPOSITS					0.0003***
Constant	0.0441	0.0541*	0.0474	0.0485	0.0506
Country FE	NO	NO	NO	NO	NO
Year FE	YES	YES	YES	YES	YES
R-squared	0.999	0.999	0.999	0.999	0.999
Observations	844	896	448	332	838

Appendix 5c: Dynamic Fixed Effect Growth Model

VARIABLES	(1)	(2)	(3)	(4)	(5)
GDP_{it-1}	0.963***	0.959***	0.868***	0.979***	0.951***
CONS	-0.0023***	-0.0024***	-0.0012	-0.0016*	-0.0025***
OPEN	0.0003	0.0003	0.0003	0.0001	0.0003*
INF	-0.0000***	-0.0000***	-0.0008*	-0.0010***	-0.0002***
INV	0.0001	0.0000	0.0003	-0.0000	-0.0001
HC	-0.0023***	-0.0022***	-0.0011	-0.0020	-0.0020***
DC	0.0003				
MS		0.0004**			
BR			0.0033**		
MC				0.0002**	
DEP					0.0006***
Constant	0.440***	0.463***	1.045***	0.318***	0.510***
Country FE	NO	NO	NO	NO	NO
Year FE	YES	YES	YES	YES	YES
R-squared	0.956	0.959	0.922	0.981	0.955
Observations	844	896	448	332	838
Number of id	35	35	35	16	35

Appendix 6: Average Abnormal Returns of ASMs over a 10-Day Election Event Window

		Botswana		
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	0.34%	1.015	0.695	1.006
-9	-0.14%	0.194	-0.318	-0.573
-8	-0.03%	-0.148	-1.33	-0.696
-7	0.01%	0.201	-0.318	0.045
-6	0.10%	0.367	-1.33	0.524
-5	0.04%	-0.009	-0.318	0.425
-4	0.21%	0.831	-0.318	1.273
-3	0.17%	0.796	1.708*	1.928*
-2	0.24%	0.936	0.695	1.771*
-1	0.09%	0.446	0.695	0.816
0	–	-0.072	-0.318	–
1	0.06%	0.341	1.708*	2.028**
2	0.11%	0.153	0.695	0.758
3	0.06%	0.375	-0.318	0.294
4	0.15%	0.419	0.695	1.281
5	-0.04%	-0.114	-1.33	-0.796
6	–	-0.052	-0.318	–
7	-0.52%	-2.193**	-1.33	-2.253**
8	-0.05%	-0.318	-1.33	-1.173
9	0.02%	0.044	0.695	0.943
10	-0.09%	-0.294	-1.33	-1.674*
		Egypt		
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	0.79%	1.631	1.38	1.754*
-9	0.26%	0.734	1.38	0.908
-8	0.70%	0.714	0.485	1.428
-7	0.38%	0.673	0.485	1.2
-6	0.28%	0.984	0.485	0.405
-5	-0.78%	-1.236	-1.304	-3.425***
-4	-0.27%	-0.529	-1.304	-0.64
-3	-0.25%	-0.387	0.485	-0.515
-2	-0.06%	-0.335	-0.409	-0.115
-1	-0.50%	-0.813	-1.304	-1.449
0	0.57%	0.986	1.38	1.033
1	0.37%	0.72	0.485	1.189
2	-0.59%	-0.753	0.485	-0.811
3	-0.22%	-0.075	-0.409	-0.415
4	0.01%	0.27	-0.409	0.028
5	-0.06%	-0.013	0.485	-0.274
6	-0.33%	-0.917	0.485	-0.724

7	-0.15%	-0.158	-0.409	-0.306
8	-0.17%	-0.384	-0.409	-0.556
9	-0.40%	-0.512	-0.409	-0.85
10	0.46%	0.747	0.485	1.15

Ghana

Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	-0.59%	-1.977**	-1.820*	-2.858***
-9	-1.40%	-3.911***	-1.820*	-2.581***
-8	0.64%	2.475**	1.194	1.205
-7	-1.01%	-3.469***	-1.820*	-1.801*
-6	-0.22%	-0.116	-0.815	-0.875
-5	-1.44%	-2.937***	-1.820*	-1.577
-4	0.01%	-0.322	0.189	0.023
-3	-0.54%	-0.968	-0.815	-1.499
-2	-0.58%	-1.552	-1.820*	-2.047**
-1	-0.12%	-0.192	-0.815	-1.43
0	-0.54%	-1.543	-0.815	-2.345**
1	0.17%	1.052	0.189	0.517
2	-0.18%	0.904	-0.815	-0.239
3	-0.06%	0.115	0.189	-0.322
4	0.22%	0.988	1.194	0.418
5	-0.01%	-0.052	0.189	-0.07
6	1.02%	5.795***	0.189	0.656
7	0.27%	1.213	0.189	0.575
8	0.88%	2.693***	1.194	1.541
9	-0.61%	-0.169	-0.815	-0.623
10	-1.18%	-4.712***	-0.815	-1.068

Kenya

Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	0.39%	0.889	0.5	0.757
-9	0.23%	0.534	-0.395	0.601
-8	-0.15%	-0.636	0.5	-0.323
-7	0.25%	0.695	1.394	0.924
-6	-0.43%	-1.592	-1.29	-1.957*
-5	-0.39%	-1.448	-1.29	-1.162
-4	0.56%	1.555	1.394	1.958*
-3	0.52%	1.485	-0.395	1.274
-2	0.34%	1.177	1.394	1.235
-1	-0.04%	-0.213	-0.395	-0.624
0	-0.09%	-0.306	-1.29	-0.971
1	0.67%	2.269**	2.289**	2.346**
2	0.93%	3.012***	2.289**	1.538
3	0.48%	1.781*	1.394	1.843*
4	-0.65%	-0.649	0.5	-0.551

5	0.97%	3.824***	2.289**	1.867*
6	1.07%	4.747***	0.5	0.82
7	1.25%	2.838***	0.5	1.227
8	1.06%	2.041**	0.5	0.999
9	-0.16%	-0.613	-0.395	-0.263
10	0.03%	-0.244	0.5	0.085

Mauritius

Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	0.02%	0.128	0.108	0.385
-9	0.38%	2.548**	2.111**	2.410**
-8	-0.01%	0.1	0.108	-0.057
-7	0.02%	-0.103	1.109	0.163
-6	-0.03%	-0.446	-0.894	-0.356
-5	0.13%	0.918	1.109	1.093
-4	-0.03%	0.048	-0.894	-0.341
-3	-0.16%	-0.644	-0.894	-1.734
-2	-0.02%	0.126	-0.894	-0.15
-1	-0.30%	-1.29	-0.894	-2.001**
0	-0.01%	0.08	0.108	-0.173
1	-0.19%	-1.216	1.109	-0.81
2	-0.44%	-1.911*	-0.894	-1.839*
3	-0.44%	-1.197	0.108	-1.071
4	0.26%	1.24	1.109	1.486
5	0.08%	0.969	0.108	0.376
6	-0.36%	-1.005	0.108	-0.978
7	-0.03%	0.079	-0.894	-0.119
8	-0.28%	-0.455	0.108	-0.789
9	0.36%	1.071	1.109	1.153
10	0.01%	-0.197	0.108	0.122

Morocco

Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	0.11%	0.207	-0.942	0.448
-9	0.03%	0.116	0.058	0.092
-8	-0.54%	-1.133	-1.943*	-3.824***
-7	-0.23%	-0.455	-0.942	-0.883
-6	-0.39%	-0.773	-1.943*	-3.146***
-5	-0.05%	-0.177	0.058	-0.124
-4	-0.48%	-0.926	-1.943*	-2.435**
-3	-0.60%	-1.216	-1.943*	-2.029**
-2	-0.21%	-0.127	-0.942	-0.493
-1	0.09%	0.226	0.058	0.399
0	0.04%	0.194	0.058	0.094
1	0.79%	1.631	2.059**	2.303**
2	0.16%	0.334	0.058	0.92

3	0.19%	0.306	-0.942	0.322
4	-0.21%	-0.52	-0.942	-0.82
5	-0.06%	-0.111	-0.942	-0.284
6	-0.12%	-0.161	-0.942	-0.934
7	0.16%	0.37	1.059	0.944
8	-0.32%	-0.709	-0.942	-1.763*
9	0.44%	0.93	1.059	1.404
10	-0.30%	-0.789	-0.942	-0.626

Nigeria

Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	0.42%	1.536	1.426	2.246**
-9	-0.02%	-0.07	0.531	-0.138
-8	0.03%	0.035	-1.259	0.088
-7	-0.41%	-1.394	-1.259	-2.049**
-6	0.32%	1.229	1.426	1.970**
-5	-0.04%	-0.069	0.531	-0.132
-4	–	-0.003	-0.364	–
-3	0.11%	0.302	-0.364	0.956
-2	0.49%	1.576	1.426	2.119**
-1	0.13%	0.481	0.531	0.391
0	0.68%	1.819*	-0.364	0.876
1	-0.09%	-0.494	-1.259	-0.214
2	0.09%	0.298	0.531	0.795
3	-0.06%	-0.193	-0.364	-0.406
4	0.21%	0.625	1.426	1.696*
5	-0.12%	-0.318	0.531	-0.768
6	-0.04%	-0.19	-0.364	-0.175
7	0.19%	0.62	1.426	1.202
8	-0.06%	-0.139	-1.259	-0.431
9	-0.17%	-0.541	-0.364	-0.979
10	0.12%	0.288	1.426	0.739

South Africa

Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	-0.06%	-0.083	-0.977	-0.205
-9	0.80%	0.84	1.023	1.171
-8	0.30%	0.556	1.023	1.166
-7	-0.15%	-0.308	-0.977	-1.386
-6	0.58%	0.481	0.023	0.954
-5	-0.36%	-0.595	-1.977**	-2.195**
-4	-0.35%	-0.222	0.023	-0.753
-3	0.15%	0.471	0.023	0.444
-2	-1.28%	-1.564	-1.977**	-1.637
-1	-0.32%	-0.259	0.023	-0.515
0	-0.05%	-0.083	-0.977	-1.779*

1	-0.37%	-1.411	0.023	-0.335
2	0.30%	0.122	0.023	0.545
3	-0.07%	-0.116	0.023	-0.242
4	-0.42%	-0.333	-0.977	-0.84
5	0.08%	-0.1	0.023	0.157
6	0.36%	0.448	1.023	1.061
7	-0.35%	-0.751	-0.977	-2.180**
8	0.81%	0.624	1.023	0.801
9	-0.14%	-0.19	-0.977	-1.486
10	0.26%	-0.049	-0.977	0.44

Tunisia

Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-10	-0.16%	-0.922	-0.882	-2.121**
-9	-0.04%	-0.211	-0.882	-0.613
-8	-0.44%	-2.639***	-1.884*	-2.105**
-7	-0.29%	-1.456	-0.882	-1.961**
-6	0.03%	0.215	1.121	1.035
-5	0.14%	1.075	1.121	0.696
-4	-0.30%	-0.781	-0.882	-0.992
-3	-0.08%	1.129	1.121	-0.144
-2	0.36%	1.778*	1.121	1.991*
-1	0.28%	1.235	1.121	1.674*
0	-0.19%	-0.326	-0.882	-0.829
1	0.03%	0.183	0.119	0.198
2	-0.04%	0.291	0.119	-0.248
3	-0.31%	-1.399	-0.882	-1.849
4	-0.43%	-1.720*	-1.884*	-2.528**
5	-0.10%	-0.304	-0.882	-0.855
6	0.32%	1.313	2.123**	3.095***
7	0.23%	1.014	2.123**	3.501***
8	0.06%	0.304	1.121	1.618
9	-0.21%	-0.981	-1.884*	-1.63
10	0.07%	-0.315	-0.882	0.243

Appendix 7: Macro Factors and Market Volatility during Elections in Africa

				Botswana				
Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. Rate	Int. rate	CPI	GDP
				2004				
15	-2.3873	-0.0337	-0.031	-0.5091	0.2225**	-0.101	0.0679	-0.0298
30	-2.4898	-0.0228	-0.0303	-0.5936	-0.1057**	0.073	-0.0056	-0.0368
60	-6.0135	-0.0663	-0.0828*	-0.717	0.1853	-0.0203	0.1377	-0.0463
90	-1.5398	-0.0217	-0.0312	-0.6438	0.1696	-0.1006	0.0529	-0.0243
				2009				
15	3.7817	-0.0255	0.1399	-2.0433	0.1108	-0.0979	-0.0569	-0.0071
30	1.9202	0.0802	0.1807	-2.019	0.2603	-0.0885	-0.0453	-0.0047
60	3.6472	0.0454	-0.0744	-2.1562	0.0519	-0.0984	-0.0483	-0.0086
90	-1.1926	0.2291***	0.1822*	-1.0246	0.1944	-0.0183	-0.0008	0.0007
				2014				
15	4.0182	0.0483	-0.0417*	1.2099	0.0785	-0.0729**	-0.0341	-0.0097
30	3.4587	0.0295	-0.0334	1.1768	-0.0805*	-0.0709*	-0.0276	-0.0088
60	4.5041	0.0216	-0.0173	1.1923	-0.048	-0.0632	-0.0431	-0.0092
90	-1.4833	-0.0709	-0.139*	1.2206	0.0302	0.1126	0.0112	-0.0035

				Egypt				
Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. rate	Int. rate	CPI	GDP
				2005				
15	-324.68***	0.0333	0.4287	0.3486**	42.01***	-0.4768	4.16**	-0.1304
30	-323.86**	0.0827	0.0796	0.343**	41.89**	-0.4766	4.1814**	-0.1422
60	-332.49**	0.0868	-0.1969	0.3395**	40.891**	-0.2923	4.8036	-0.1888
90	-305.71**	-0.0931	0.1728	0.3638**	41.529**	-0.5898	3.4508	-0.0992
				2010				
15	6.8574	0.3886	0.4184	0.0687	-5.2007	0.6816	0.4114**	0.2617
30	29.982	0.8694	1.2735**	0.0358	-10.887**	1.1569**	0.5529**	0.1485
60	-0.054	-0.081	0.2496	0.0618	-4.4345	0.6874**	0.4646**	0.378*
90	3.5128	-0.0926	0.3487	0.0655	-5.5072	0.7361**	0.5182*	0.4079*
				2012				
15	-80.262**	-0.0576	-0.8272**	-0.0041	18.605**	0.0354	-0.9298***	2.8535***
30	-119.57***	0.711**	0.0694	0.034	28.63***	-0.1646	-1.3737***	2.7457***
60	-93.125**	-0.278	-0.5525	0.0515	19.842**	0.2322	-0.8734**	3.0546***
90	-120.87**	0.7075**	0.4644	0.0176	28.187***	-0.1997	-1.2021***	1.3393
				2014				
15	30.055**	0.5447	0.2041	0.0254	-4.1155**	0.7989***	-0.1306	-1.046
30	19.368	0.3174	-0.1529	0.0181	-2.2144	0.6926	-0.1787	-0.751
60	19.549	-0.0722	-0.241	0.0306	-1.7219	0.7703	-0.2425	-1.1634
90	11.147	0.348	-0.0333	0.0209	-1.4188	0.7831	-0.1857	-0.1116
				2018				
15	-11.994	0.6699*	0.1389	-0.0887	1.1012	-0.2498	-0.0196	-0.2341
30	-12.956	0.5634**	0.1076	-0.0832	1.1209	-0.249	-0.0094	-0.3074

60	-0.4521	-0.0026	-0.208	-0.1034	0.4165	-0.2331	-0.0246	-0.063
90	0.9245	0.29331	-0.034	-0.1123	0.215	-0.2742	0.015	-0.2165
				Ghana				
Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. rate	Int. rate	CPI	GDP
				2004				
15	0.5695**	-0.0004	0.001	-0.0083	-0.3799**	-0.0152	0.002	-0.0009
30	0.587	0.0001	0.0011	-0.0093	-0.3742	-0.0169	0.0024	-0.0014
60	1.1291	0.0024	0.0017	-0.0067	-0.3695	-0.0551	0.0089	-0.0046
90	0.6464	0.0002	0.0008	-0.006	-0.372	-0.021	0.0032	-0.0025
				2008				
15	0.0922	0.0003	0.0017	0.012	-0.0354	0.0004	-0.0014	-0.002
30	0.0841**	-0.0017**	-0.0002	0.0053	-0.0286	0.0005*	-0.0016	-0.0015**
60	0.1039***	-0.0033***	-0.0018	0.0046	-0.0264	0.0008***	-0.0024	-0.0018***
90	0.0408	0.0042	0.0046	0.0133	-0.0443	-0.0001	0.0006	-0.001*
				2012				
15	0.1039*	-0.0032***	0.0008	-0.1921***	-0.044	-1.52E-06	0.0001	-0.0027
30	0.084	-0.0007	-0.0008	-0.1849***	-0.0545*	0.0006	0.0006	-0.0023
60	0.0968	-0.0017	-9.28E-06	-0.1998***	-0.0494	0.0009	2.26E-05	-0.0025
90	0.0588	-0.0009	0.0014	-0.1968***	-0.0266	0.0009	-0.0002	-0.0019
				2016				
15	0.0927	-0.0044	0.0056	0.0275	-0.0002	-0.0005	-0.001	0.0011
30	0.0551	-0.0043**	0.0024	0.0222	0.0014	-0.0005	-0.0006	0.0002
60	-0.071	-0.0044***	0.0044**	0.0371	0.0005	0.0005	0.0008	-0.0008
90	0.0871**	-0.0026**	0.0022	0.0414	-0.0033	-0.0005*	-0.0007	0.0002
				Kenya				
Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. rate	Int. rate	CPI	GDP
				2002				
15	-20.045	0.3047	0.4494	0.0304	0.0829	0.2476	0.2112	0.0434
30	-44.288**	-0.6272*	-0.164	0.0355	0.2162*	0.4572**	0.4336**	0.0323
60	-20.871	0.2273	-0.1936	0.04	0.0872	0.3182	0.2071	0.1905
90	-26.109**	0.3177	1.342***	0.0364	0.004	0.3537*	0.4221***	-0.6028*
				2007				
15	-10.183	-0.0036	-0.2321	0.0739	0.0322	-0.216	0.1078	0.1193
30	-6.4466	0.2262	-0.6741*	0.0796	0.0429	-0.1734	0.0564	0.0335
60	-11.766	0.0534	-0.2817	0.0739	0.0603	-0.2934	0.1127	0.1
90	-21.015*	-0.0896	0.5192*	0.0590	0.0595	-0.0852	0.1936*	0.2825**
				2013				
15	2.1785	-0.3795	0.1521	0.2363***	0.0503	0.0279	-0.0595	0.2706
30	3.5554	-0.4705**	0.2321	0.2401***	0.0845**	0.0148	-0.0962**	0.4245*
60	-1.4657	-0.0907	0.3167	0.237***	0.1072	-0.0118	-0.0616	0.1472
90	3.0401	-0.2118	-0.0621	0.2438***	0.0519	0.0386	-0.0665	0.2606
				2017				
15	-48.383***	0.0633	0.3038	0.3517***	0.4437***	0.4707**	-0.0113	0.1455
30	-62.87***	-0.1911	-0.0033	0.3482***	0.5706***	0.3843**	0.0012	0.1141

60	-52.306**	0.0016	0.0009	0.3528***	0.4719**	0.3984**	-0.0015	0.1106
90	-81.364	-0.4003*	-0.1847	0.3529	0.6548	0.3422	0.0627	-0.0835

Mauritius

Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. rate	Int. rate	CPI	GDP
				2005				
15	22.331*	0.0263	0.1769*	0.0302	0.2224	0.0869	-0.5058	–
30	28.403**	0.046	0.2769**	0.0272	0.296**	0.1003	-0.6491**	–
60	14.567	-0.0819	0.257***	0.0146	0.1854	-0.0273	-0.3406	–
90	16.938	-0.0899	0.1061	0.0198	0.0696	0.0894	-0.3358	–
				2010				
15	-11.537	-0.1053	0.0226	0.1019***	0.0299	0.0639	0.1372	–
30	-12.894	-0.008	-0.1927	0.1119***	0.0388	0.0663	0.1524	-0.1346
60	-11.424	-0.1237	-0.0601	0.1117***	0.0072	0.0915	0.14	-0.0399
90	-11.782	-0.0382	-0.1231	0.1095***	0.0124	0.0261	0.148	-0.0782
				2014				
15	-1.9381	-0.022	-0.0587	0.0632***	-0.0054	-0.0077	0.0022	0.5208
30	1.6986	-0.0833**	-0.148***	0.0597***	-0.0071	0.0282	-0.0184	0.0643
60	0.7056	-0.0294	-0.0839	0.0613***	-0.0199	0.0068	0.004	-0.1194
90	-4.4525	0.0074	-0.1488**	0.063***	0.0017	0.0655	0.0261	0.5008
				2019				
15	14.087	-0.0015	0.0127	0.0916**	-0.0289	0.3317**	-0.1355	–
30	12.379	0.1111	0.0885	0.0885**	-0.0816	0.3977***	-0.1027	–
60	13.913	-0.0521	–	0.0878**	-0.0145	0.2667**	-0.1368*	–
90	17.196	-0.0475	–	0.0862**	-0.0354	0.3535***	-0.1636*	–

Morocco

Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. rate	Int. rate	CPI	GDP
				2002				
15	3.9182	-0.3809*	-0.0514	0.0289	-0.2438	-0.2654	–	-0.0963
30	4.473	-0.0563	0.0842	0.0325	-0.2661	-0.3625	–	-0.0993
60	1.5571	0.2719	0.3601	0.0385	0.0061	-0.526	–	0.0223
90	4.4699	0.2402	0.3247	0.0288	-0.3728	-0.1706	–	-0.047
				2007				
15	-8.0899	0.5202***	-0.082	0.0984	0.1375	–	0.0641	0.1258
30	-3.7281	0.4227**	0.0839	0.1052	0.0093	–	0.031	0.1358
60	-19.618	0.2198	-0.1911	0.107	0.226	–	0.1707	0.0873
90	-14.979	-0.1077	-0.3085	0.0974	0.0618	–	0.1424	0.0248
				2011				
15	-16.035*	-0.1503	0.3808	0.0915	-0.8165**	0.6208	0.1947	-0.1645
30	-17.258*	-0.0844	0.5009*	0.0927	-1.2063***	0.4122	0.2433**	-0.2233**
60	-8.3081	0.0965	0.6688**	0.0771	-1.4941***	-1.4945*	0.2326**	-0.0954
90	-14.631	-0.0441	0.419***	0.0902	-1.0615***	-0.381	0.2229	-0.0249
				2016				
15	-14.841	-0.1059	-0.0822	0.2268	0.3576	–	0.0978	-0.0558
30	-18.695	-0.1286	-0.1031	0.2265	0.332	–	0.133	-0.0579

60	-15.584	-0.0588	-0.1039	0.2264	0.5679	–	0.0872	-0.0845
90	9.5484	0.1478	0.2689	0.2255	0.0252	–	-0.0836	-0.0302

Nigeria

Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. rate	Int. rate	CPI	GDP
				2003				
15	0.0708	-0.0017	-0.0006	-0.0395	-0.0002	-0.0024***	3.11E-05	-0.0004
30	0.0721	-0.0021	0.0006	-0.0426	-0.0002	-0.0024***	-2.70E-05	-0.0005
60	0.1343*	-0.0013	0.0021	-0.0404	-0.0006	-0.0031***	-4.48E-05	-0.0006
90	0.0872	0.0007	0.0018	-0.0409	-0.0004	-0.0027***	7.39E-05	-0.0003
				2007				
15	-0.0471	0.0017	-0.0032**	0.0324	0.0003	0.0014	-0.0007	0.0078**
30	-0.0462	0.0012	0.0002	0.0349	0.0003	0.001	-0.0007	0.0067
60	-0.0736	0.001	-0.0005	0.0404	0.0005	0.0012	-0.0005	0.0066*
90	-0.2414	-0.0018	-0.0027	0.0434	0.0016	0.0006	-0.0004	0.01**
				2011				
15	0.0871	-0.0009	-0.0018	0.0266	-2.27E-05	0.0011**	-0.0008**	-0.0005
30	0.076	-0.0013	-0.0004	0.0296	7.34E-05	0.001**	-0.0008**	-0.0005
60	0.114*	-0.0064***	-0.0038***	0.0302	0.0004	0.0009*	-0.0015***	-0.0014***
90	0.0729	0.0004	0.0005	0.025	-8.41E-07	0.001*	-0.0007*	-0.0004
				2014				
15	-0.0584	-0.0009	0.0073	-0.1204	0.0006*	-0.0002	-0.0003	0.0025
30	-0.1082	0.0055	0.0055	-0.1306	0.0004	0.0004	0.0001	0.0027
60	0.0751	-0.0072	-0.0019	-0.1092	0.0007*	2.42E-05	-0.0012	0.0004
90	-0.017	-0.0068	-0.0032	-0.126	0.0008**	0.0017	-0.001	0.0026
				2019				
15	-0.3592	0.0054*	-0.0023	-0.16	0.0013	-0.0014	-8.29E-05	-0.0006
30	0.0364	0.0055*	-0.0026	-0.1965	3.36E-05	-0.0025	-6.41E-05	-0.002
60	0.4889	0.0037*	-0.0012	-0.1741	-0.0015	-0.0023	-0.0001	0.0061
90	0.3573	0.003	7.59E-05	-0.1795	-0.0011	-0.0013	-7.05E-05	0.0075

South Africa

Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. rate	Int. rate	CPI	GDP
				2004				
15	-5.1191	0.234	-0.2893	-0.064*	0.1442	-0.2942	0.1404	-0.0761
30	-5.5166	-0.1613	-0.3883*	-0.0588*	0.1856	-0.1558	0.1189	-0.033
60	-8.8649	-0.3318**	-0.5003***	-0.0628*	0.2345	0.1412	0.1321	0.0315
90	-14.652	0.1427	-0.0791	-0.0599*	0.03	-0.3072	0.3608	-0.1565
				2009				
15	78.335**	-0.2308	-0.0685	-0.0193	-0.8498**	-0.3623	-1.0129**	0.0521
30	74.701	0.3776	-2.32E-05	-0.0242	-0.9257**	-0.2751	-0.9603	0.0573
60	106.17**	0.3685	-0.3461	-0.0417	-1.2666**	-0.4629	-1.3619**	0.0894
90	106.57**	-0.2493	-0.5053	-0.0314	-1.0609**	-0.5466	-1.3812**	0.0194
				2014				
15	6.6272	0.1068	0.0473	-0.0427	-0.2458	0.4326	-0.0759	0.0683
30	6.2254	0.0692	0.0744	-0.0451	-0.2201	0.4174	-0.074	0.0926

60	4.225	0.1289	0.095	-0.0468	-0.1867	0.2998	-0.0494	0.1675
90	4.3418	0.0907	0.0175	-0.0438	-0.3003	0.3842	-0.0422	0.1707

Tunisia

Day	Constant	Before (β_1)	After (β_2)	Stock return	Ex. rate	Int. rate	CPI	GDP
				2004				
15	-64.674**	0.037	0.082	-0.0054	0.113	–	1.0132**	0.0268
30	-66.723**	-0.0341	-0.0975	-0.0026	-0.8277	–	1.0625**	0.0473*
60	-64.692**	-0.0101	-0.0434	-0.0019	-0.8083	–	1.0308**	0.0398*
90	-55.316*	-0.0974	-0.1984***	-0.0076	-2.5386*	–	0.9191**	0.0351
				2009				
15	13.131***	-0.2104	-0.2706	0.0314	-5.0461***	–	-0.1124*	0.7656*
30	11.772**	-0.1834	-0.3672***	0.0362	-5.8221***	–	-0.0746	0.6141
60	14.257**	0.116	0.12	0.0306	-3.4186**	–	-0.1643*	0.956*
90	14.528***	-0.1003	-0.1027	0.0274	-5.2959***	–	-0.1308*	0.8907**
				2014				
15	-14.411**	-0.3311**	-14.411**	-0.0603**	-0.7787	0.1604**	0.139	-0.1546
30	-7.3226	0.1917	0.0118	-0.0431	-1.2031	–	0.0992	-0.0367
60	-10.482*	-0.0049	-0.0329	-0.0521*	-1.038	–	0.1271*	0.0381
90	-7.906	-0.0918	-0.139*	-0.0569**	-0.1126	–	0.0834	0.0663
				2019				
15	0.1306	-0.1141	-0.1166**	-0.0008	0.0443	–	-0.0018	–
30	1.0226	-0.068	-0.0858*	0.0042	-0.1101	–	-0.0053	–
60	3.9852	-0.1011	-0.1076	0.0009	-0.6778	–	-0.0154	–
90	0.4634	-0.0445	0.4634	0.0101	0.0714	–	-0.0051	–

Appendix 8: Average Abnormal Returns of ASMs over a 5-Day Regime Change Event Window

Botswana				
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	0.18%	0.489	1.484	1.286
-4	0.28%	0.819	0.068	0.747
-3	-0.26%	-0.457	0.068	-0.722
-2	0.26%	0.528	1.484	1.486
-1	0.16%	0.514	0.068	0.582
0	–	0.040	0.068	–
1	–	0.026	0.068	–
2	0.25%	0.713	0.068	0.926
3	0.22%	0.690	0.068	0.543
4	0.08%	0.185	1.484	5.333***
5	-0.10%	-0.223	-1.348	-20.00***
Egypt				
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	-0.60%	-0.678	-0.148	-0.418
-4	-0.36%	-0.618	0.854	-0.464
-3	-0.90%	-1.350	-0.148	-0.786
-2	-0.34%	-0.775	0.854	-0.200
-1	3.35%	4.286***	1.857*	2.013**
0	0.52%	0.572	-0.148	0.636
1	2.20%	2.985**	1.857*	1.387
2	1.50%	2.175**	0.854	1.323
3	-0.89%	-1.192	-1.151	-1.017
4	2.16%	2.785***	0.854	2.036**
5	0.18%	0.199	0.854	0.698
Ghana				
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	1.04%	1.330	1.484	1.078
-4	-1.98%	-3.132***	-1.348	-1.825*
-3	-0.08%	-0.027	0.068	-0.444
-2	-0.68%	-1.585	-1.348	-2.159**
-1	0.34%	1.272	0.068	0.415
0	0.82%	2.374**	0.068	0.808
1	-0.20%	-0.191	0.068	-0.714
2	0.27%	0.893	0.068	0.535
3	-0.28%	-0.526	-1.348	-11.20***
4	2.34%	6.564***	0.068	0.888
5	-0.13%	-0.116	0.068	-0.684

Kenya				
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	0.10%	0.299	0.211	0.714
-4	0.31%	0.912	0.211	0.775
-3	0.68%	1.938*	0.211	0.889
-2	1.34%	3.800***	0.211	0.950
-1	2.42%	6.121***	1.641	2.272**
0	0.89%	1.041	0.211	0.369
1	-0.84%	-2.308**	-1.219	-1.128
2	-0.62%	-1.708*	-1.219	-1.148
3	0.21%	-0.087	0.211	0.159
4	2.02%	3.790***	0.211	0.888
5	1.86%	3.539***	0.211	0.949
Mauritius				
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	-0.02%	-0.099	-1.483	-0.237
-4	0.13%	0.761	-0.147	0.854
-3	0.06%	0.119	0.521	0.568
-2	-0.02%	-0.437	-0.147	-0.240
-1	0.03%	-0.012	-0.147	0.324
0	0.02%	0.083	1.189	0.399
1	0.11%	0.654	0.521	1.224
2	0.02%	0.240	0.521	0.210
3	0.15%	1.164	1.857*	2.811***
4	0.04%	0.496	1.857*	0.489
5	0.01%	0.203	0.521	0.074
Morocco				
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	0.06%	0.031	-0.912	0.129
-4	-0.34%	-0.849	-0.912	-0.581
-3	0.38%	0.547	-0.912	0.399
-2	-0.69%	-1.242	-0.912	-0.861
-1	-0.21%	-0.426	0.089	-0.677
0	0.92%	1.805*	2.091**	2.944***
1	-0.62%	-1.170	-1.913*	-1.429
2	0.03%	0.033	-0.912	0.046
3	-0.06%	-0.065	0.089	-0.214
4	0.36%	0.755	1.090	1.379
5	-0.16%	-0.271	-0.912	-1.230

		Nigeria		
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	-0.19%	-0.584	-0.564	-1.081
-4	0.22%	0.763	-0.564	0.674
-3	0.32%	0.937	0.591	1.368
-2	0.15%	0.297	0.591	1.029
-1	0.30%	0.679	-0.564	0.733
0	0.37%	0.830	0.591	1.082
1	1.34%	3.018***	1.746*	1.153
2	0.40%	0.798	0.591	0.759
3	0.20%	0.404	0.591	1.160
4	-0.05%	-0.052	0.591	-0.240
5	0.42%	0.934	0.591	1.892*
		South Africa		
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	-0.17%	0.072	0.582	-0.144
-4	-0.13%	-0.555	-0.573	-0.235
-3	1.38%	0.879	0.582	0.682
-2	2.05%	2.105**	1.737*	2.189***
-1	-0.72%	0.087	-0.573	-0.451
0	0.86%	0.839	1.737*	1.306
1	0.92%	3.160***	0.582	0.665
2	-0.33%	-1.001	-0.573	-0.361
3	-2.18%	-3.005***	-0.573	-1.172
4	0.77%	0.113	0.582	0.566
5	-1.28%	-0.486	-0.573	-1.052
		Tunisia		
Event day	Average AR	Patell Z	Generalized Sign Z	Csect T
-5	-0.10%	-0.530	-0.512	-0.519
-4	-0.74%	-2.658***	-1.407	-1.499
-3	-0.78%	-2.916***	-1.407	-1.038
-2	-0.83%	-3.241***	-1.407	-1.191
-1	-0.84%	-2.968***	-1.407	-0.987
0	0.32%	1.372	2.173***	2.751***
1	0.32%	1.268	1.278	1.841*
2	0.13%	0.446	-0.512	1.217
3	-0.09%	-0.260	-1.407	-0.780
4	0.03%	0.352	0.383	0.267
5	-0.05%	-0.395	-0.512	-0.420