EFFECT OF INVESTORS' SENTIMENT ON STOCK MARKET RETURNS IN NIGERIA

BY

Mohammed ZUBAIRU
PhD/ADMIN/08269/2009-2010

DEPARTMENT OF BUSINESS ADMINISTRATION,
FACULTY OF ADMINISTRATION,
AHMADU BELLO UNIVERSITY

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BEING A THESIS PRESENTED TO THE POSTGRADUATE SCHOOL OF AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY (PH.D) IN BUSINESS ADMINISTRATION

DEPARTMENT OF BUSINESS ADMINISTRATION,
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January, 2016

Declaration

I declare that the work in this thesis entitled "Effect of Investors' Sentiment on Stock Market Returns in Nigeria" has been carried out by me in the Department of Business Administration. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other Institution.

Mohammed ZUBAIRU	_____	_____
Name of Student	Signature	Date

Certification

This thesis titled "Effect of Investors' Sentiment on Stock Market Returns in Nigeria" By Mohammed ZUBAIRU meets the Regulations Governing the Award of the Degree of Doctor of Philosophy (PhD) of the Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

Prof. S. A. Abdullah	_____	_____
Chairman, Supervisory Committee	Signature	Date
Prof. B. Sabo	_____	_____
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Prof. A.G Garba	_____	_____
Member, Supervisory Committee	Signature	Date
Prof. B. Sabo	_____	_____
Head of Department	Signature	Date
Prof. K. Bala	_____	_____
Dean, Postgraduate School	Signature	Date

Dedication

This thesis is dedicated to the Almighty ALLAH for His Mercies and Grace during the course of this programme and thesis work.

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Abstract

The study examined the effect of investors' sentiment on stock market return in Nigeria with consideration to bull and bear market cycles which most past studies neglected. The dependent variable was proxy by Stock Market Returns (SPR) while the explanatory variables were investors sentiment (SentPCA), Interest Rate(INTR), Inflation Rate (INFL) and Exchange Rate (EXRT), while bull events (positive market returns) and bear market event (negative market returns) were used as moderating variables to investors sentiment. In this study, quarterly data from 1985Q1 to 2014Q4 were collected from secondary sources such as CBN, NSE and SEC while in the estimation of the models formulated, statistical techniques which include descriptive statistics, correlation analysis, unit root test, Engel-Granger co-integration test, overparameterized and Parsimonious error correction model (ECM) were adopted. The results from the study show that investors' sentiment had a statistically significantly relationship with stock market returns dynamics in Nigeria but when moderated for bear market cycle, the impact of investors sentiment on stock returns in Nigeria became statistically insignificant. In the case of Bull market cycle, it was observed that there was a statistically significant relationship between investors' sentiment and stock market returns. We also found that exchange rate variation was more potent in distorting stock market returns dynamics in Nigeria than interest rate and inflation rate. Notably, inflation rate was found to have less value relevant to equity investors in Nigeria. This study therefore makes the following conclusions that investors in Nigeria's equity market are likely to take market sentiment news and exchange rate announcement more serious than interest rate and inflation rate when investing in shares. During the bear market cycle, most equity investors would completely try to stay off the market waiting for another bull market run. The study recommends that investors and capital market participants should develop strategies for managing sentiment while policy market should develop policies that would prevent extreme market sentiment and also maintain stable exchange rate and interest rate environment that promote less volatile stock market.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Stock market prices both in developed and emerging countries are generally believed to be responsive to economic and market fundamentals or new information. The event of 2008/2009 market crashwhich led to a wide deviation of stock prices from their fundamental value is generating questions and drawing attention to finding out if non-market and non-economic fundamentals are responsible for such deviations. The determination of equity price movement in most emerging stock markets has been discussed by scholars and researchers from the perspective of market, economic and firm-specific fundamentals.However, there has been some kind of shift in the discussion of equity price movement to favouringinvestors' sentiment/emotions. Investors' sentiment in general term refers to the attitude, emotions and biases that exhibit in the course of investment decision. Baek, Bandopadhaya and Du (2005) studies revealed that most short-term movements in asset prices such as equity are best explained by investors' sentiment. Similarly, Fisher and Stantunan (2000)are also of the view that investors' sentiment matter to asset pricing process.

Thus, in the pricing of equities and other financial assets, investors' attitude is of major concern for financial analyst and it is seen as a key determinant of the value of most financial assets (Huiwen, 2012). Baker and Wurgler (2006) recognized investors' psychology as a vital component in market pricing process of financial assets. This is because the sentiment of investors' may also reflect their risk profile and investors' emotion are displayed in different forms. In behavioural finance, emphasis is placed on investors' sentiment/bias such as

escalation, cognitive dissonance and overconfidence bias. Escalation bias tend to exist when an investor continue to purchase a poor performing stock with the notion that the stock poor performance is temporary, this single act of investors' can influence the price of the stock in question positively since the investors' are not selling even when bad news enter into the market. In the case of cognitive dissonance the investors' act only when market information conforms to his belief. This therefore means that equity price moves only when the investors' interpretation of an event negates the market news. Shefrin and Statman (1996) stressed that prices of equities and other financial assets are determined by the level of confidence investors' have on the growth of a company. The investor commits overconfidence bias when he/she overestimates the growth rate of a company and concentrates on good news and this has great influence to the determination of financial assets prices.

In some studies, findings of sentiment and stock returns relationship are not in accordance with the Efficient Market Hypothesis. Fama (1970)stressed that the stock prices reflect the discounted value of expected cash-flows and the effect of irrational market participants in stock prices are removed by the rational participants. However, behavioural finance experts such as Chang, Ma, Chiu, Lin and Lee (2009a), suggest that irrational sentiment (overly optimistic/pessimistic expectations about investment risk and future cash flow) can persist and affect stock prices for significant periods of time. On the contrary, Baker and Wurgler (2006) state that stock mispricing is based on uninformed demand shocks induced by irrational investors' and limits to arbitrage. Brown and Cliff (2005) claim that sentiment could be a very persistent effect so, the demand shocks of irrational traders could be correlated over time leading to a strong and persistent mispricing. The limits of arbitrage

prevent rational traders from eliminating this influence on stock prices since it is unclear how long the buying or selling pressure from overly optimistic or pessimistic irrational traders will persist (Shleifer & Vishny, 1997). However, every mispricing must eventually be corrected so that one should observe that high levels of investor optimism (pessimism) are on average followed by more volatile returns (Schmeling, 2009). In earlier evidence, Brown and Cliff (2005) indeed showed that there is a negative sentiment return relationship in the case of U.S. stock market.

The concern about the unbelievable crash in equity prices in Nigerian stock market seems to be directed mainly towards firm specific, market and economic fundamentals. That is, most market participants link stock market price decline to changes in output growth, exchange rate, business earnings, inflations rate, market rate of returns, government spending and money supply. The need to find out what is actually responsible for equity market price movement under bull and bear market cycle has generated more interest and has necessitated the need to integrate investors' sentiment as a potential explanation for equity price movement in both emerging and developed markets. Edo (2005), pointed out that the 2002 stock market upward price adjustment in Nigeria were characterised by perceived irrationality. He attributed the high equity prices movement to the irrational behaviour of market participants especially in cases when market fundamentals were not strong.

The integration of investors' sentiment as a major factor that affect equity prices has been viewed from different perspectives due to the problem of measuring investors' sentiment. The need to measure investors' emotion and how it determine the equity pricing process is gaining

more ground in behavioural finance. In most works on investors' sentiment, the concept is strongly related to noise trading. Guohua (2008) revealed that investors' sentiment which affects financial asset prices comes from noise traders. He further stated that narrow-framing, conservatism, representativeness, overconfidence and self-attribution are some potential sentiments of investors' that can directly affect their investment decisions and indirectly affect prices. This is similar to the contributions of Reilly and Brown (1999).

Modern research on equity pricing or on the determinants of equity price movement is now favouring the use of fusion investing approach. Lee (2003), pointed out that fusion approach centered on the importance of integrating economic fundamentals and investors' sentiment in pricing financial assets. Stock market price variations are often explained by non-fundamental and fundamental factors. The non-fundamental factor is largely dominated by investors' sentiment while the fundamentals are proxied by unique indices such as long term market rate of returns, market risk, market demand/supply imbalance, inflation rate, exchange rate, industrial production, etc. These factors are important in predicting equity prices in most emerging capital market like that of Nigeria. This research, therefore seeks to provide a better explanation of equity prices movement in Nigeria using economic and non-fundamental factors such as investors' sentiment.

1.2 Statement of the Problem

Nigerian stock market started in 1960 when the Lagos Stock Exchange was opened. The market has since gained depth and breadth. The stock exchange is the pivot of the Nigerian capital market. The main participants of the Nigerian capital market are retailers,

wholesalers (market makers) and institutional investors'. The major institutional investors' include insurance companies and pension funds (Mapsofwold, 2009). These major players over the years have played major roles in shaping the market forces to drive market sentiment.

The performance of the Nigerian stock market shows that there have been quite a number of different bull and bear market cycle, in some cases crashes and bubbles. Using greater than 20% rule to identify market bull cycle and less than 20% to represent bear market as adopted in (Dukes, Bowlin & MacDonald, 1987), it was observed that in Nigeria from 1985 to 2008, there were about 17 bull market cycles and 8 bear market cycles. From 2008 to 2014, a consistent bear market cycle which also manifested into market crash was noted. For ten years (1999-2008), the stock market grew, soared and gained extreme strength (Amedu, 2010). The Nigerian Stock Exchange (NSE) All Share Index grew from 5,672.76 in January, 1999 to 58, 579.77 in January, 2008, showing a 933% increase. The market hit a new high in March, 2008 when the NSE all-share index hit a record 66,371.20 points, an increase of 1070%. However, the index droppedby 45.8% or 26,537.44 points to close at 31,450.78 on December 31, 2008. From March, 2009 to December 31; it dropped again by 69% or 20,827.17 points to close at 10,623.61. The question of what could have caused the bear market cycle to have manifested into market crash became a moot point. Olisaemeka (2009) and Amedu (2010), gave a detailed account of essential factors that fuelled the occurrence of meltdown in the Nigerian stock market. These factors according to the authors include; deluge of public offers and private placement, pull-out of foreign investors' and over-valued stock. Bear market occurs when sophisticated investors' begin to exit market, companies begin to post disappointing earnings, panic selling dominates and investors' sentiment

becomes very negative (Oyetan, 2013). The crash of the Nigeria stock market has been attributed to sentiment that arise from fear of global financial crises, exit of foreign investors', margin calls, bad loans, low investors' appetite and persistent fall in prices of stock (Oyetan, 2013). Thus, the market scenario indicated bearish market cycle.This there shows that investors' in Nigeria stock market are expected to be risk adverse during bear market cycles.

Bearish market cycle of the Nigerian capital market led to a crash of the market capitalisation from a record high of N13.5 trillion in early 2008 to less than N4.5 trillion in early 2009,translating into certain costs and consequences that include; erosion of investors' confidence, vaporization of investors' real wealth, psychological pains and loss of jobs. The crash in the market also impacted negatively on other economic activities like consumption and investment. Many investors' shifted their resources to money market, real estates and other alternative investment destinations (Amedu, 2010). Market bear cycle or crash affects market sentiment negatively and if not well handled can manifest into depression of an economy, with loss of confidence, permanent capital losses, capital flight, pension funds value erosion and equity investment substitution. Extreme bear market or crash can be attributed to herd mentally, asset-liability mismatch, leverage, regulatory failure, global contagions of 2007/2009 global financial crisis, fraud and failure (Osaze, 2011). The consequence of these market crises also led to certain social-economic problems such as loss of jobs, depression, death and social violence. The 2008/2009 stock market crisis in Nigeria also brought adverse macroeconomic consequences, with the prevailing behaviour of the performance indices in Nigerian capital; it is significant to assess key macroeconomic risk

factors such as interest rate, inflation and exchange rates which are necessary in the study of stock market behaviours.

Studies of bull and bear market cycles have attracted much attention in the literature, e.g., Pagan and Sossounov (2003), Rutledge, Zhang and Karim (2008), de Bondt, Peltonen and Santabarbara (2011), because cycles of bull and bear markets not only reflects the economic development and investors' confidence but has a significant impact on the whole economy and social welfare. This is important for all countries around the world in particular for developing countries which have emerging financial markets and are more vulnerable to global economic fluctuations and in understanding the puzzle of mixed results on stock market price determination. Edward and Magee (1992) pointed out that trading activity tends to expand as price move to the direction of the positive trend and behave in the reverse for bear market. This means that in bull or bear market trade volume, price move in a manner that generate pattern that can create questioning of the stock market efficiency and the relationship between investors' sentiment and stock returns.

There have been controversies among scholars, researchers and finance professionals with regards to what triggers movement in equity prices in emerging equity markets. This disagreement among financial researchers has taken a new dimension since the computation of indices for measuring investors' sentiment. The introduction of investors' sentiment as an explanatory variable in predicting equity price movement is now being considered in emerging economies and could be useful if applied toNigeria.

In explaining stock market price dynamics in Nigeria, some studies tend to use fundamental factors that are based on Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) models without giving consideration to investors' sentiments and market cycles such as bull and bear trends (see Osaze, 2000; Alile & Anao,1986; Udegbunam & Oaikhenan,1999; Omole & Falokun,1999; Emenuga 1989; Yohannes 1999; Inanga & Emenuga,1997; Edo,1996).

Based on the above observation, this study intend to incorporate investors' sentiment and stock market returns dynamics using CAPM, APT and PCA as an improved analysis of investors' sentiment. Some studies discussed investors' sentiment using survey or questionnaires which are often subjected to responses bias and question errors (Baker & Wurgler 2006), while others used quantitative approach which support the use of Principal Component Analysis (PCA) as a better measure ofinvestors' sentiment (Baker & Wurgler 2006), Zhu (2012), Chen, Tai Leung Chong and She (2013). Neal and Wheatley (1998) were the first to use three popular market ratios (composite measure, number of IPOs and fitted value of trend volume of equity traded) as indicators of investor sentiment. Baker and Wurgler (2007) and Finter, Ruenzi and Ruenzi (2010) use the Principal Component Analysis (PCA) to construct a sentiment indicator based on proxies. Earlier efforts do not include PCA along with CAPM and APT in anointing proxies. There is therefore the need to extend CAPM and APT to include PCA. This inclusion of PCA would improve analysis of investors' sentiment.

In addition, most studies that seek to test the relationship between investors' sentiment and stock returns in emerging market including Nigeria ignore the estimation error that do occur due to non-integration of bull and bear market cycle in the estimation process. While there

are some works on bull and bear market cycle in developed and emerging economies, in Nigeria, the similar study that attempted to empirically examine market cycle was that of Adenola, Abdulrasshed, Babata, Atanda and Salaka (2011). The study evaluates market bubble and crashes rather than bull and bear cycle. It identified the period October 2005 to March 2008 as bubble regime and April 2008 to September 2010 as market crash regime. Sentiments are behavioural attributes that do explain reactions to values of sentiments. In stock market crashes, current prices bubbles are often driven by market sentiments. Behavioural studies are therefore necessary to enhance understanding of what determines stock returns either in a bull run or a bear runs. This study attempts to bridge empirical literature gap in emerging economies and Nigeria by including the bull and bear market cycle in the estimation error.

1.3 Research Questions

The basic questionis; do stock returns and investors' sentiment relationship differ under bull and bear market cycle in Nigeria? Other specific questions are to:

i. to what extent doesinvestors' sentiment under bear and bull stock market cycles in Nigeria differs?

ii. what extent does investors' sentiment significantly influence stock returns under bear market cycle in Nigeria?

iii. what extent does investors' sentiment impact on stock returns under bull market cycle in Nigeria?

iv. what extent does investors' sentiment significantly influence stock returns under bear and

bull market cycle in Nigeria?

v. what extent investors' sentiment and macroeconomic factors jointly explain stock returns in Nigeria?

1.4 Objectives of the Study

The broad objective of the study is to analyse the effect of investors' sentiment on stock market returns in Nigeria, while the specific objectives of the study are to;

i. test if there exist a significant difference in investors' sentiment under bear and bull stockmarket cycles in Nigeria

ii. evaluate the influence of investors' sentiment on stock returns under bear market cycle in Nigeria

iii. assess the extent to which investors' sentiment influence stock returns under bull market cycle in Nigeria

iv. investigate the relationship between investors' sentiment and stock returns under both bear and bull market cycle in Nigeria

v. determine the extent to which investors' sentiment andmacro-economic factors jointly explains the systematic variations on stock returns in Nigeria

1.5 Research Hypotheses

In order to achieve the objectives of the study, the following null hypotheses are formulated for this study;

H_{01}: There is no significant difference in investors' sentiment under bear and bull stock market cycle

H_{02}: There is no significant influence between investors' sentiment and stock returns under bear market cycle

H_{03}: There is a no significant impact between investors' sentiment and stock returns under bull market cycle

H_{04}: There is no significant influence between investors' sentiment and stock returns under both bear and bull market cycle

H_{05}: Investors' sentiment and macro-economic factors (interest rate, inflation rate and exchange rate) do not significantly explains stock returns

1.6 Significance of the Study

Are the movements in equity prices listed on the Nigeria stock exchange caused by investors' sentiment to stock market cycle matter? The answer to this question is not only of top most interest to investors' but also to financial security analysts and policy makers. The Investors' can reap huge and abnormal returns from the stock market if only they can predict the direction or behaviour of equity prices. The mistake investors' commit when investing can also be avoided if they can distinguish between movement in equity prices that is caused by fundamentals or those caused by mere emotions of investors'.

The policy makers will also find this work useful in understanding the potential causes of stock market booms or crashes and how non-market fundamentals such as investors' sentiment can drive equity market prices. Stock Market regulators as policy makers will find

the results helpful in formulating and implementing stock market intervention policies that could prevent bull and bear market from destroying shareholders wealth.

This study would also be relevant to investment and professional money/asset managers, as it would provide a better explanation for short and long-run factors that are responsible for the movement in equity prices in an emerging capital market such as the Nigerian stock market.It will also assist them in identifying investment approaches, pursuing available investment opportunities and reducing the probability of high value losses in the market.

This research would also be relevant to readers and researchers who would want to understand how economic, market fundamentals and investors' emotions jointly influence the behaviour of equity prices in Nigeria. This study will also open new research issues for future researchers. Lastly, business owners and managers will also benefit from this study as it would provide insights into stock price movement under bull and bear market cycle. This will enable them determine the best stock market and economic condition that will favour listing their shares on the exchange.

1.7 Scope of the Study

This study focuses on investors' sentiment and stock market returns in Nigeria. Literature on investors' sentiment has become extremely extensive in recent times. The literature indicates a large volume that may require inordinate amount of time. The study therefore, does not cover the entire spectrum of the literature.

The study used quarterly time series data for the period 1985 to 2014, even though it hasset aside weekly and monthly effects. The study hastried to minimize this bias through the use of

longer time-period in relation to Bull and Bear market cycle as suggested by Lo and MacKinlay (1988).The study used time series analysis with two market regimes, namely: Bull (average upward rise in prices) and Bear (average fall in prices).

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Introduction

This chapter reviewed literature on the concept and development of investors' sentiment, measurement of investors' sentiment, empirical studies on investors' sentiment with reference to bull and bear market cycle, economic factors and stock returns.

2.2 Concept of Investors' Sentiment

There is a lack of clarity about how sentiment is defined in the literature on investor sentiment(Bormann, 2013). Most studies on sentiment indicators such as Klein and Zwergel (2006) or Schmeling (2007), did not provide a definition of investor sentiment, but rather seem to assume some common understanding about the term "sentiment" that is enough to work on market sentiments. Hence investors' sentiment is defined in terms of short term and long term sentiment. Short term sentiment usually relates to forecasting the stock market development over a period of one week up till one month, whereas long term sentiment usually relates to forecasting periods ranging from three to six months. Nothing is said by this terminology about the expected (statistical) properties of the observed time series nor what sentiments are besides some observable time series.We therefore describe investors' sentiment from the perspective of market sentiment to be some kind of latent process. This latent process might be the overall emotional state of the market or of the investors'. The definition of emotions resorts to the realm of psychology.

The above definitions provide no explanation whether emotions contain information or specifically, whether (investor) sentiment data generally contains information about the stock market. Emotions are triggered by the availability of information, general knowledge, our imagination and the conceivability of a certain event. One can distinguish between the

implications of an action or the assessment of the expected output and the search for causes of action or attribution as a trigger for feelings.

Consequently, feelings always represent expectations, although not necessarily rational expectations like in the hypothesis of rational expectations, if the sentiment data actually reflect the sentiments of market participants regarding future market developments and then those feelings express interpretations of their available information. In consequence, the sentiment data could be used as a proxy or indicator of unobservable expectations or ideas, if sentiment data inadequately foresee the development of stock markets, feelings or sentiments might still have an influence and explanatory power for the development of the stock market.

In continuation, the concept of investors' sentiment has generated arguments among financial economists and finance experts. According to Chang and al. (2009a) investor sentiment can be defined as a situation often influenced by emotions, future returns and investment risk. Baker and Wurgler (2006) also explained it as the propensity to speculate optimism or pessimism of a given asset. He defines the feeling to identify an investor who is optimistic (pessimistic) without good (bad) economic reasons to be.

Barker and Stein (2004) described investors' sentiment as the misevaluation that is created by a group of investors'. While Lee, Shleifer and Thaler (1991) viewed investors' sentiment as investors' beliefs that are not justified by market and economic fundamentals. Zweig

(1973), as well as Brown and Cliff (2005) opined that investors' sentiment is the discrepancy that exists between rational and irrational investors'. This therefore means that investors' heterogeneity can also be called investors' sentiment. Prior empirical studies on investors' sentiment and how the concept can be measured have generated the issue of whether investors' sentiment is directly observable or not. This is why investors' sentiment is viewed by some researchers from a normative perspective. The definition of Baker and Wurgler (2007) confirms the subjective nature of investors' sentiment. They described investors' sentiment as what asset prices should be and not what it is.

2.2.1 Development of Investors' Sentiment

There are quite a numbers of ways investors' sentiment can be developed and these investors' sentiment formation process are rooted in behavioural finance. Traditional finance theory centered on market and economic fundamentals in explaining equity price movement but recent market situations all over the world have shown that behavioural factors have a strong influence on the valuation process of financial assets. The major forms of investors' sentiment are drawn from heuristic-driven bias, noise trading, limits to arbitrage, frame dependence, emotions, social influence and others. The heuristic-driven bias centred on overconfidence, anchoring, representatives, innumeracy and aversion to ambiguity. Overconfidence manifests itself in excessive trading in equity markets. Solt and Statman(1989) and Shefrin and Statman(1996) relate investors' bias in pricing assets to overconfidence and this tends to occur when the investors' overestimate the accuracy of asset prices forecasts. Overconfidence to investors' is like a stimulant that is based on the use of special information or knowledge. This means that investors' trade excessively when

they are overconfident. Anchoring bias results when after forming an investment opinion, investors' are unwilling to change their opinions even when market and economic fundamentals are changing. The anchoring bias is a major attack on the Efficient Market Hypothesis (EMH).

Representativeness, as another form of heuristic-driven bias is the tendency of investors' to form investment judgements based on stereotypes. Equity investors' may believe that a stable growth of corporate earnings in the past may be representative of high growth rate in future. This is why investors' would continue to buy stock even when economic and market fundamentals are weak. Innumeracy is a form of investors'' sentiment that affects investors'' asset pricing process and it simply describes the investors' experience in calculating and estimating data for stock market price determination. The innumeracy bias is a potential explanation of why investors' ignore market and economic mathematics in pricing equity. Aversion to ambiguity bias as a type of investors' sentiment that is heuristic-driven, refers to the investors' fear for ambiguous information and uncertainty. This aspect of investors' biases creates a situation where investors' trade irrationally when there is rumour or unclear information.

Frame dependence is an aspect of Investors' sentiment formation that is derived from emotional and cognitive factors. The emotional aspects of frame dependence focuses on how investors' feel when they receive and digest stock market information while the cognitive aspect refers to how investors' organise information mentally, in particular how investors' react to gains and loss outcomes. Kahneman and Tversky (1982) in their prospect theory

followed the frame dependence approach in explaining investors' decision making under uncertainty. They stated that investors' frame and values plays a vital role in their actions under uncertainty, and that investors' feel more strongly about the pains from loss than the pleasure from an equal gain. Thaler (1985) used the concept of mental accounting to explain frame dependence. In mental accounting, investors' tend to mentally operate two accounts, one of the accounts is managed rationally and the other is managed irrationally. This means that investors' are conservative about losing capital invested while the dividend income stream can be spent irrationally. Narrow framing as a form of frame dependence often leads to myopic risk aversions which captures how investors' evaluate their asset returns separately rather than as a whole portfolio. Market inefficiency and investment mistakes are often common because investors' focus on changes in wealth that are narrow in scope both across investment class and over time. Shefrin and Statman (1996) in explaining frame dependence used behavioural portfolio which follows a pyramid pattern and harped on diversification that results from investors' diversification goals, not from their purposeful asset diversification. This means that most investors' do not have efficient portfolio. They often ignore economic and market fundamentals in planning their asset portfolio and take too much risk for the returns expected from their asset portfolio. In explaining frame dependence, the snake bite effect or house-money effect or shadow of the past biases refers to a situation where investors' are less inclined to take risk after incurring a huge financial loss.

Herd instincts, overreaction and emotional time line are some of the emotional and social influence that can also affect investors' rationality. Among these emotional and social

influence, herd instinct and overreaction have taken the center stage. There is a natural propensity for investors' to follow market sentiment or follow group investors' investment strategy rather than using market and economic fundamentals. The existence of herd behaviour in most financial markets has been greatly discussed by scholars. Scharfstern and Stern (1990) provide evidence that herd instincts, characterised the behaviour of fund managers. The fact that a significant change in equity prices in most stock market in the world are not necessarily related to the use of market information or to the fundamental change in economic and corporate performance indexes that may lead to the conclusion that certain investors' crowd effect exist (Count & Bouchaud, 2000). Overreaction as a form of investor bias tend to occur when investors' ignore new economic and market information and follow imitated behaviour of a certain large group of investors' which often overreact to both good and bad news. The overreaction of investors' to news is today suspected to be the major cause of stock market bubbles and crashes. This therefore means herd behaviour and overreaction are non-market fundamental factors that cause upward or downward trend in stock price. This in other words means that investors' sentiment is a potential factor to consider when predicting stock market price crashes or bubbles.

Noise trading and limits of arbitrage are also accepted causes of market inefficiency. Noise traders are group of investors' that are not rational. They trade equity based on their beliefs or sentiment and not by stock fundamentals. De Long and Shleifer (1989) found out that prices can actually diverge significantly from fundamental values even in the absence of fundamental risk and that noise traders strategy is becoming more attractive due to high chance of the noise trader earning higher than the rational investors'. The continued practice

of noise trading has generated the arbitrage profit opportunities. Arbitragers operations are also a cause of price variations as they try to take advantage of mood swings of noise traders. Shleifer and Summers (1990) identify arbitrage practices as a stimulant which interest other rational investors' to contribute to further deviation between asset prices and their fundamental values. This means that arbitrageurs in the short-run create market prices jumps and at the same time help to return asset prices to their fundamentals. Brown (1999) explained the effect of noise traders. He described noise traders as non-professional traders with no special information. He found out that when there are shifts in investors' market sentiment, noise traders move together and take similar actions thereby increasing the prices of their targeted securities.

2.2.2 Measurement of Investors' Sentiment

Following the above, recognizing that investors' sentiment exist is no longer an issue in finance, what matters now is how the concept can be quantified and how it triggers movement in equity prices in the stock market. In literature (see Baker and Wurgler, 2006),the measurement of investors' can also be viewed from two perspectives and these are direct (survey) and indirect approach (use of secondary proxy data).

(a)Direct Measures: are produced using surveys of investors' and economic studies. The studies in this area include the work of Solt and Statman (1988). They tested the influence of the sentiment index from the Investors' Intelligence survey of the Dow Jones over the periods 1963-1985 and they found that the feeling is not a reliable signal to effect transactions in scholarship. Indeed, there is no significant relationship between investor sentiments. Clarke

and Statman (1998) did the same test on the S & P500 over the periods 1963-1995 and confirmed the result found by Solt and Statman (1988). Shiller (2000) tested a weak relationship between confidence indices of Yale University and several other proxies of investor sentiment.

De Bondt (1993) study revealed a significant negative relationship between sentiment index published by the American Association of Individual Investors' (AAII) and future returns.His results contradict the results of previous studies. Brown and Cliff (2005) confirmed in there article that there is a long-term correlation between the index of Investors' Intelligence sentiment and profitability and the importance of investor sentiment in the valuation of financial assets. Otoo (1999) examined the study on consumer confidence indices and the relationship with the investor sentiment, and found a significant relationship between simultaneous changes in the consumer confidence index from the University of Michigan and returns to Wilshire 5000 index over the period 1980-1999, the causality tests indicate that market movements affect investor sentiment.

Fisher and Statman (2003) used the ratio of investors' optimism (pessimism) from a survey to proxy investors' sentiment and concluded in their study that there is the possibility to credibly predict stock returns from the indices of consumer confidence. Fisher and Statman (2003) stressed that there is a strong negative relationship between confidence indicators and returns of small cap stocks in the short term. This result was inconsistent with Otoo (1999), but confirms the behavioural approach, which provides that the sentiment of the individual investor claims primarily securities held by individuals, in this case small caps. Another

approach that was also direct in nature was the use of consumer confidence index adopted by Charoenrock (2003) and Fisher and Statman (2003) while Lashgair (2003) used a specific confidence index called Barron's confidence index to measure investors' sentiment/confidence in the market. In most of these studies, such as Qiu and Welch (2005), Lemmon and Portniaguina (2006) and Charoenrook (2006), their findings confirmed the results found by Fisher and Statman (2003). It should be noted that in each study, the measurement techniques used have both advantages and disadvantages. For instance direct indicators are specific measures that do not require sense to use theories to justify. But it does not take account of the strength and performance of the market. For this we will remake indirect indicators that provide a better reflection of the strength and performance of the market and relate to economic and financial variables. Although there several studies based on surveys to measure investor sentiment, Brown and Cliff (2004), Brown and Cliff (2005), the use of surveys can also be problematic because of inaccurate responses, misunderstood questions, Bertrand and Mullainathan (2001), and non-response bias, Groves (2006). Therefore, documents such as Lee, Thaler and Shleifer (1991) and Dorn (2009) suggest using indirect indicators.

(b) Indirect Measures: The indirect method assumes that certain financial and economic variables contain expectations that are relevant for measuring investors' sentiment, such as the put to call ratio, trading volume, number of IPOs, option volatility index, the discount on closed-end funds, the premium dividends, volatility premium, premium dividend, etc. To measure investor sentiment, several empirical studies refer to indirect proxies.

Put-call ratio is also a prominent proxy for investor sentiment (see, e.g., Dennis and Mayhew (2002), Brown and Cliff (2004)). The put-call ratio measures how bullish or bearish the market is. In times when most stocks perform strongly, the number of calls bought typically far outweighs the number of puts bought, resulting in a relatively low put-call ratio. The opposite holds in times when most stocks perform poorly. The use of Dennis and Mayhow (2002) ratio of put to call is highly limited in emerging stock markets like Nigeria due to the non-existence of a recognised options market.

Discount of closed end funds; Shleifer and Thaler tested (1991), show that the share of U.S. closed-end funds are traded at a discount relative to the value of their underlying portfolio and the discount affects the profitability of securities held primarily by individuals and they find that the discount decreases when the price of the securities of small caps and screws to increase it. Cons, Chen, Kan Miller (1993) and Elton, Gruber and Busse (1998) find that the discount on closed-end funds is not involved in the reproductive process of returns. The existence of the large premiums and discounts fluctuations over time find no justification in the traditional approach. Several previous studies have shown that the discount is negatively related to investor sentiment (Zweig (1973) and Lee, Shleifer and Thaler (1991)). Similarly, Branch (1976), Randhall, Suk and Tully (2003), Neal and Wheatley (1998) measured investors' sentiment using mutual fund cash reserve. They stressed that low cash holding of mutual fund managers is an indicator of aggressive buying (investors' optimism) while large cash balance is as a result of investors' pessimism or uncertainty in the market.

Whaley (2000) use volatility index (VIX) investors' fear Gauge which is popularly known as implied option volatility. This index is also limited due to the absence of unorganised options market in emerging economies. Kein and Madhavan (2000) use bid-ask spread of quoted traded stock in New York Stock Exchange (NYSE) to explaining investors' sentiment. To them, a wide deviation between the bid and ask seat prices indicates high level of investors' sentiment.

With respect to Volume of IPOs, studies by Lee, Shleifer and Thaler (1991), Helwege and Liang (1996), Rajan and Servaes (1997) and Lowry (1999), Baker and Wurgler (2006), Cornelli, Goldreich and Ljungqvist (2006) showed that the volume of IPOs is positively associated with investor sentiment and IPOs are very sensitive to the mood of investors'. Indeed, when investors' are optimistic, they are more prepared to overpay titles newly introduced to the market and therefore, more companies will be encouraged to enter. The volume of transactions can also be considered as an indicator of investors' sentiment. Baker and Stein (2004), notes that if the short sale is more expensive than opening and closing long positions (as in practice), the irrational investors' are more inclined to negotiate, thus, increasing liquidity when they are optimistic and invest in rising stocks rather than when they are pessimistic and threats decline in stocks. A similar indicator to this is the turnover ratio, which is calculated as the ratio of the volume of transactions on the number of shares outstanding, it measures market liquidity and may serve as a measure of sentiment Baker and Stein, (2004). In a market of short sales, the irrational investors' participate and increase liquidity in a market where investor sentiment is positive (Bris, Goetzmann, & Zhu (2007)). Other possible proxies indicators are Volatility Premium, Cash flow net flow and Firm debt

equity ratio. The Volatility Premium used by Baker and others (2009) to replace the dividend premium is inappropriate in countries where dividends are rare, which is an indicator of investors' demand is compared between periods of high and low volatility, in the case of Cash flow net proposed as a sentiment indicator in Frazzini and Lamont (2008) and Indro (2004). In times of high investor confidence, individual investors' bought mutual funds (see, eg, Brown & Cliff (2004), while Firm debt equity ratio, proposed by Baker and Wurgler (2000) to measure investor sentiment showed that managers try to time the market prefer to issue equity rather than debt when the sentiment is high, and vice versa

(c) Composite Measures

The problem of finding a best proxy for investors' sentiment was also tackled by some researchers through the use of composite/group index or a principal component analysis (PCA) score. The most respected and popular composite index for investors' sentiment is found in the work of Baker and Stein (2004) and Baker and Wurgler (2004). Baker and Wurgler (2006), use the principal component analysis to construct an index that aggregates a collection of variables sentiment indicator. In their composite sentiment index, they used measures like investors' survey, retail investors' trades, investors' mood proxies (weather, seasonal and periodical factors which affects investors' attitude to invest), mutual fund flows, dividend premium, closed end fund discounts, option implied volatility, first day returns on initial public offerings, volume of Initial Public Offering (IPO), new equity issues and trading volume. Guohua (2008), used four sentiment measures and these are short sell volume, turnover ratio (average turnover for 10 days divided by averaged turnover for 250 days), Relative strength index, money flow index, insider trading and the level of

institutional ownership. The relative strength index which is popularly known as RSI index is used to determine the level of oversold and overbought attitude of investors' while the insider trading and institutional ownership was seen as a good proxy for investors' sentiment because owners and executives of companies have material information. This therefore means that insider trading patterns may indicate sentiment. Seyhun (1998) gives evidence that users of insider trading information can predict stock returns. While there are quite a number of studies that have used the PCA approach in measuring investors' sentiment, they are limited in emerging economies and completely missing in Nigeria.

In the Nigerian stock market, there are available time series data on the volume of trading, new issues and IPO volume. The above discussion shows that these three indicators are part of the composite for measuring investors' sentiment and as such can be used to proxy investors' sentiment in Nigeria. There is some consensus among researchers in the use of new issues and the volume of Initial Public Offers (IPO) as proxies for investors' animalistic behaviour (bull and bear sentiment). The use of traded volume of stock as an indicator for investors' sentiment is subjected to debate and modification. Osaze (2000) ascertained that the volume of trading in stock to some extent actually measures the degree of investors'emotions. Baker and Stein (2004) in their composite index mentioned trading volume as a measure of investors' sentiment. Trading volume which is generally referred to as market liquidity can also be used to represent investors' emotions. Irrational investors' are more likely to trade, and thus add to market liquidity. Karpoff (1986) and Harris and Raviv (1993) revealed that investors' sentiment/emotions become high when trading volume increases. This shows that investors' sentiment becomes high when there is increase in

investors' heterogeneity which serves as oxygen for continuous increase in stock trading. Johnson, Lei, Lin and Sanger (2006) argued that the use of trading volume at levels is not a good measure of investors' sentiment. They see trading volume trend as a better measure. They also stress that there is the need to empirically differentiate levels of trading volume from trend of trading volume. Trading volume at levels according to them is a snapshot of the investors' sentiment at a point in time while trend volume summarizes the dynamic process of investors' sentiment/emotions. Another powerful time series index for measuring investors' sentiment can be derived from the all share price index such as from the Nigerian all share price index, Dow Jones industrial average price index, Standard and Poor (S&P) 500 index amongst others as used in other countries. Bandopadhyaya (2006) utilized the S&P 500 stock price index to generate a barometer for measuring investors' sentiment. The conclusion from the data estimation and analysis revealed that the obtained residual or error term from regressing current S&P 500 price index against previous S&P 500 price index is a sound indicator of non-market factor or investors' sentiment. This method of measuring investor sentiment is highly efficient in countries where option and Investors' survey or mutual fund data are not readily available. The Bandopadhyaya investors' sentiment index was time series in nature and makes it possible to summarize investors' emotions over time.

Drawing from the lessons above, it was observed that based on the availability of time series data, three measurements of Investors' sentiment proxy are suitable to use in Nigeria. These three proxies are the Bandopadhyaya investors' sentiment index, number of IPOs and fitted value of trend volume of equity traded. This study therefore hopes to construct a PCA score to measureinvestors' sentiment using these three measures.

As Presented in **APPENDIX II.** Are the summary of some studies using Principal Component Analysis (PCA) score for measuring investors' sentiment.

2.3 Alternative Approaches to Market Sentiments

In analysing stock market returns dynamics, we observed that a macro and micro approach have also been adopted. The Macro approach focuses on how macroeconomic factors impact on stock returns and sentiment while the micro approach centered on how firm specific factors influence firm stock returns. We also observed the APT model is a macro approach while the CAPM is a micro approach. We also observed that attempt was also made to expand the APT model using market sentiment or Investors' sentiment as a macro market risk variable. Some discussions on these issues are provided below;

2.3. 1 Macro Approach

Economic factors are mostly measured by sensitivities of particular stocks for changes in macroeconomic variables. Starting from 70s, when Stephan Ross published his Arbitrage Pricing Theory (APT), macroeconomic factors became one of the most popular "candidates" in stock models. The use of macroeconomic factors in explaining stock price returns has generated a lot of attention both in Nigeria and other countries. In this sub-chapter, we review empirical studies on macroeconomic determinants of stock returns in Nigeria and other countries.

Maku and Atanda (2009) in their study, selected exchange rate, inflation rate, interest rate, money supply and gross domestic product as key macroeconomic variables for explaining stock returns in Nigeria. Osisanwo and Atanda (2012) also selected exchange rate, consumer price index, broad money and gross domestic product while Izedonmi and Abdullahi (2011) adopted just inflation and exchange rate as macroeconomic variables for explaining stock returns in Nigeria. They stressed that there is a growing literature on how macro-economic variables can have effects on equity return in both developed and emerging stock markets. They empirically tested the performance of the Arbitrage Pricing Theory (APT) in the Nigerian Stock Exchange (NSE) for the period of 2000 up to 2004 on monthly basis. In this paper, 3 macro-economic variables (inflation, exchange rate and market capitalization) are investigated against 20 sectors of the Nigerian Stock Exchange. Using Ordinary Least Square (OLS), they observed that there are no significant effects of those variables on the stocks' return in Nigeria. They also stressed that their results are broadly consistent with similar studies carried out for most developed and emerging economies.

Akinnifesi (1987) used a disaggregated analysis to investigate the relationship between exchange rate and stock prices fluctuation. He found that a depreciating Naira exchange rate increases stock prices. Soyode (1993) made an attempt to test the association between stock prices and macroeconomic variables as exchange rate, inflation and interest rate. He found that the macro economic variables that co-integrated with stock prices are consequently related to stock returns.

Osisanwo and Atanda (2012), stated that it is a known fact that the market liquidity is an important attribute of stock market development. Liquid markets essentially improve the mobilization and allocation of capital and thereby enhance the prospects of facility long-term growth. This argument stems from the objective of this study in analyzing the determinants of stock market returns in Nigeria using the OLS method based on the sourced time series variables from the Central Bank of Nigeria (CBN) between 1984 and 2010. The findings indicated that interest rate, previous stock return levels, money supply and exchange rate are the main determinants of stock returns in Nigeria. Therefore, this study proffer the need to adopt a mixed policy approach between capital and monetary market instruments in order to enhance the returns in the Nigerian Stock Exchange.

Asaolu and Ogunmuyiwa (2011) investigated the impact of macroeconomic variables on Average Share Price (ASP) in addition to determining whether changes in macroeconomic variables explain movements in stock prices in Nigeria. Using econometric analysis such as Augmented Dickey Fuller (ADF) test, Granger Causality test, Co-integration and Error Correction Method (ECM) on time series data from 1986-2007, the results revealed that a weak relationship exists between ASP and macroeconomic variables in Nigeria. The findings in addition pointed out that ASP is not a leading indicator of macroeconomic performance in Nigeria, albeit, a long run relationship was found between ASP and macroeconomic variables for the period under review.

Amadi, Oneyema and Odubo (2002) employed multiple regressions to estimate the functional relationship between money supply, inflation, interest rate, exchange rate and stock prices. The study revealed that the relationship between stock prices and the macroeconomic

variables are consistent with theoretical postulation and empirical findings in some countries. Though, they found that the relationship between stock prices and inflation does not agree with some other works done outside Nigeria.

Nwokoma (2002), attempts to establish a long-run relationship between the stock market and some of macroeconomic indicators. His result showed that only industrial production and level of interest rates, as represented by the 3-month commercial bank deposit rate have a long-run relationship with the stock market. Nwokoma (2002) also found that the Nigeria market responds more to its past prices than changes in the macroeconomic variables in the short run.

Abdulrahim (2011) empirically investigates the relationship between the macroeconomic variables that affect the stock returns during the years between 2005M1- 2010M1 for the Nigerian Stock Exchange (NSE). The Arbitrage Pricing (APT) modeling framework is conducted by assuming the risk factors in the model as observable macroeconomic variables to explain the stock return variations. A multifactor regression model in this framework is employed to show the relevant macroeconomic variables namely: industrial production, interest rate, inflation, exchange rate and money supply. The Ordinary Least Square (OLS) technique is applied to test the validity of the model and the relative importance of different variables which may have an impact on the Nigerian Stock returns within the Nigerian economy. Based on the empirical results estimated, explanatory power supports the view that macroeconomic variables explain a significant part of the observed variations in Nigerian

Stock Market returns for the sample period. Namely Consumer price index, short-term interest rate, and money supply have a big influence on Nigerian Stock Market returns.

Adaramola (2011) in his study set out to investigate the impact of macroeconomic indicators on stock prices in Nigeria. Since none of the previous writers in this area looked at the study at the individual firm's level. The research work is therefore unique as it uses a different methodology to consider it at the micro level. Secondary data on stock prices of selected firms and six macroeconomic variables between 1985:1 and 2009:4 were used for the analysis. The macroeconomic indicators used in the research work are: money supply interest rate, exchange rate, inflation rate, oil price and gross domestic product (GDP).The pooled or panel model was used to examine the impact of macroeconomic variables on stock prices of the selected firms in Nigeria. This model was considered appropriate for its ability to combine both time series and cross-sectional data. The empirical findings of the study revealed that macro-economic variables have varying significant impact on stock prices of individual firms in Nigeria. Apart from inflation rate and money supply, all the other macroeconomic variables have significant impacts on stock prices in Nigeria.

Osamwonyi and Evbayiro-Osagie (2012) in a study attempted to determine the relationship between macroeconomic variables and the Nigerian capital market index. It considers the yearly data of several macroeconomic variables of interest rates, inflation rates, exchange rates, fiscal deficit, GDP and money supply from 1975 to 2005; and it tries to reveal the relative influence of these variables on the ‘All Share Index' of the Nigerian capital market. In pursuance of this, the Vector Error Correction Model (VECM) was used

to study the short-run dynamics as well as long-run relationship between the stock market index and the six selected macroeconomic variables from the Nigerian economy. The major finding is that macroeconomic variables influence stock market index in Nigeria. They recommended that the adoption of appropriate economic policies will be beneficial to the stock market index and this in turn will result in the needed growth in the capital market.

In the empirical studies so far done in Nigeria on stock price returns and economic variables, almost all the authors used inflation rate, interest rate and exchange rate. These macroeconomic variables are considered significant factors that affect stock market performance (see Zubairu, 2014).

(a) Inflation Rate

The views that Inflation rate is a key economic data that can be used as an input to Investors' analysis is stressed in the work of Fama and Gibbons(1984). However, on how it affects stock prices, there is no theoretical consensus on the existence of relationship between stock returns and inflation rate nor on the direction of the relationship. However, the existing literature can be viewed from three perspectives. These include those that support negative and positive relationship.

In supporting the existence of a negative relationship, Udegbunam and Eriki (2001) conducted a study on the Nigerian Stock Market by examining the relationship between stock prices and inflation and their results provided a strong support for the proposition that inflation exerts a significant negative influence on the behaviour of the stock prices. This implies that an

increase in inflation rate lead to a decrease in stock market returns. Zhao (1999), studies show the relationship between inflation and stock prices in the Chinese economy. The study employs monthly data covering the period from January 1993 to March 1998. The results also indicate a significant negative relation between stock prices and inflation. Al-Qenae, Carmen and Bob (2002), made an important contribution by investigating the effect of inflation on the stock prices of Kuwait Stock Exchange during the period 1981-1997. The study found that inflation has negative and statistically significant coefficients in almost all cases on stock prices. Saunders and Tress (1981), indicate that Australian nominal stock returns and inflation are related in a significantly negative fashion, implying that stocks are extremely poor inflationary hedges for the investor. In addition, the study indicates a mainly unidirectional relationship between inflation and stock returns, with price level charges leading the equity index in time. Erbaykal, Okuyan and Kadioglu (2008) investigating the relationship under "proxy hypothesis" developed by Fama (1981) reveal a negative long term relationship between the stock prices and inflation. The study concludes that under the light of this evidence, proxy hypothesis developed by Fama (1981) is valid for Turkey and that the variables which are the indicators of real economic activity such as industrial production index, employment level and fixed investments are effective on stock prices through inflation.

A number of studies have supported the existence of a positive relationship between stock returns and inflation rate. Boudoukh and Richardson (1993), find strong support for a positive relationship between nominal stock returns and inflation at long horizons while Choudhry (2001), finds that current stock market returns are positively correlated with current inflation in high inflation countries. Firth (1979) and Gultekin (1983) conclude that the relationship

between nominal stock returns and inflation in the United Kingdom is relatively positive, a finding consistent with the generalized fisher hypothesis. Choudhry (1998) investigates the relationship between stock returns and inflation in four high inflation countries (Argentina, Chile, Mexico and Venezuela) and finds a positive relationship between stock market returns and inflation rate.

Real world experience has shown that investors' are more concerned about expected inflation and not necessarily on current inflation. Fama and Gibbond (1984), Brandt and Wang (2003), Fama and Schwert (1977), Jaffe and Mandelker (1976) and Nelson (1976) form a wide literature that stresses the point, that expected inflation is what matters to equity prices movement and not the rate of inflation. Expected inflation if quantified would be a major determinant of companies expected real income, expenses and cash flow which are fundamental to equity price valuation. Niemira and Klein (1994) revealed that an inverse relationship exists between inflation expectation and the stock market prices. It was found out from their work, that leading inflation indicators were derived from inflation expectations.

We therefore conclude that mixed relationships exist between inflation and stock returns but an inverse relationship exists between inflation expectation and the stock market returns.

(b) Interest Rate

In evaluating the relationship between interest rate and stock returns, there have been a number of issues. The interest rate represents an opportunity cost for investing in stocks. It is also a component of the equity capitalization rate. Therefore, it is considered as one of the most important factors affecting the behaviour of investors' in the market. As interest rises, bonds become more attractive investment, given their risk- return characteristics; this

motivates investors' to adjust their investment portfolios by buying bonds and selling stocks, thus depressing stock prices. Furthermore, the rise in interest rates raises equity capitalization rates, which also leads to lowering stock prices. Accordingly, interest rate is expected to have an inverse effect on stock prices. There is neither theoretical consensus on the existence of relationship between stock returns and interest rate nor on the direction of the relationship. However, existing literature can be viewed from two perspectives. These include those that support negative and mixed relationship. In literature, a negative relationship between interest rates and stock prices is hypothesized due to several reasons. In an equity valuation process, at first a discount rate is determined. A chosen discount rate reflects both the time value of money and the riskiness of the stock. The risk free rate represents the time value of money. A risk premium represents compensation for risk, measured relative to the risk free rate. A decided discount rate is perceived by an investor as a required rate of return (Stowe et al. 2007). The CAPM is one of the methods used to determine the required rate of return.

As the government adjusts key interest rates, the risk-free rate changes, if interest rate increases, the risk-free rate also rises. This would result in the higher market rate. If nothing else changes, the stock's target price should drop due to the higher required rate of return. The reverse is also true. If interest rates fall and everything else is held constant, the stock's target price should rise because the required rate of return has dropped. Furthermore, the required rate of return will rise if the risk premium increases. There is also strong argument that Interest rate has an impact on a company's operations and any increase in the interest rates, ceteris paribus, will raise the cost of capital. Therefore, a company has to work harder to generate higher returns in a high interest environment. Otherwise, the inflated interest

expense will eat away its profits. The lower the profits, the lower cash inflows and the higher required rate of return for investors' that all translate into depressed fair value of the company's stock. Moreover, if interest rate costs shoot up to such a level that the company has problems paying off its debt, then, its survival may be threatened. In that case, investors' will demand an even higher risk premium. As a result, the fair value will fall even further. Interest rates are expected to be negatively related to market returns either through inflationary or discount factor effect. Choi and Jen (1991), report that the expected returns on common stocks are systematically related to the market risk and the interest rate risk. The findings of the study indicate that the interest rate risk for small firms is a significant source of investors' portfolio risk and the interest-rate risk for large firms is "negative". The study also shows that the interest-rate risk premium explains a significant portion of the difference in expected returns between the top quintile and the bottom quintile of the NYSE and the MEX firms. Shiller and Beltratti (1992), found an inverse relationship between stock returns and interest rates. Such a relationship is supported by Campbell and Ammer (1993) and Nissim and Penman (2003).

According to Humpe and Macmillan (2007), US and Japan stock prices are negatively correlated to a long term interest rate. Al-Sharkas (2004) for Jordan and Adam and Twenebboah (2008) for Ghana indicate that the relationship between stock prices and interest rates is negative and statistically significant. Maysami, Howe and Hamzah (2004) reveal that short-term and long-term interest rates respectively have significant positive and negative relations with the Singapore's Stock Market. According to the results of Abugri (2008), the responses of stock returns to interest rate is negative and significant in

Brazil, Argentina, and Chile, but the response of returns in Mexico to interest rates appears to be insignificant in explaining the movement of returns. The empirical results of Muradoglu and Metin (1996) for Turkey Case, indicate that growth rates of interest rates negatively affect stock returns with a significant lag in short run dynamic model. Wongbampo and Sharma (2002), in exploring the relationship between stock returns in five (5) Asian countries; Malaysia, Indonesia, Philippines, Singapore and Thailand, found a negative relationship between stock prices and interest rate for the Philippines, Singapore and Thailand, but positive for Indonesia and Malaysia. Their study also shows that stock markets usually respond negatively to interest rate increases and positively to interest rate decreases.

Following the above, we learn that interest rate and stock market returns are likely to be negatively related among the emerging economy like that of Nigeria.

(c) Exchange Rate

Most studies that try to explain the fluctuations of stock prices and exchange rates are interested in finding a high-frequency, statistical relationship between the two variables. Ajayi and Mougoue (1996) examine the short run relationship between stock and currency markets in the U.S. and U.K. Their results showed a significant relationship between stock market returns and currency market returns. Granger, Huang and Yang's (2000) work further illustrates that the two markets can jointly affect each other. Hsing (2004) and Zietz and Pemberton (1990) develop models with monthly data and simultaneously determined macroeconomic variables.

Ajayi and Mougoue (1996) investigate the short-and long- run relationship between stock prices and exchange rates in eight advanced economies. Of interest to me are the results on short-run effects in the U.S. and U.K. markets. They find that an increase in stock prices causes the currency to depreciate for both the U.S. and the U.K. Ajayi and Mougoue explain this as follows: a rising stock market is an indicator of an expanding economy, which goes together with higher inflation expectations. Foreign investors' perceive higher inflation negatively. Their demand for the currency drops and it depreciates.

As to the currency effect on the stock market, they found that currency depreciation leads to a decline in stock prices in the short run.. The authors explain this negative relationship as follows: exchange rate depreciation suggests higher inflation in the future, which makes investors' skeptical about the future performance of companies. As a result, the stock prices drop. This hypothesis is supported by data from the U.K. markets.

Granger, Huang and Yang (2000),carried out a research whether currency depreciation led to lower stock prices or whether declining stock prices led to depreciating currencies during the Asian Crisis of 1997. The data on some of the Asian countries support the case of bivariate causality.

Stock prices are expected to react ambiguously to exchange rates. The authors explain this with the effect of currency changes on the balance sheets of multinational companies. Depreciation could either raise or lower the value of a company, depending on whether the company mainly imports or mainly exports. When the stock market index is considered, the net effect cannot be predicted. The other hypothesis is that the currency will depreciate if the stock market prices drop. This is explained as follows: in markets with high capital mobility, it

is the capital flows, and not the trade flows that determine the daily demand for currency. A decline in stock prices makes foreign investors' sell the financial assets they hold in the respective currency. This leads to currency depreciation.

Seven of the countries examined by Granger, Huang and Yang (2000) showed a strong relationship between the two markets—causality was unidirectional in some cases and bi-directional in others. Whenever the relationship was unidirectional, it was found to be negative, regardless of which the lead variable was. For four of the countries, the authors found evidence of joint causality. The direction (positive or negative) of the dual causality could not be determined, nor could it be specified which the trigger variable was.

The reason for the disparity of results between the different countries might be the different degree of the capital mobility, trade volume and economic links among them. Another reason could be an omitted variable bias—for example interest rates may have an influence on stock and currency markets.

Following the above, we learnt that exchange rate and stock market returns are likely to be negatively related.

2.3.2 Micro Approach

From a micro perspective, the Capital Asset Pricing Model (CAPM) model is viewed as an appropriate approach for examining how the general stock market impact on individual company stock returns. A major problem with the CAPM model is its restriction to company beta as the only determinant of stock returns. The APT model which is a macro approach unlike the CAPM which is micro, uses macroeconomic variables and non-market factors as risk factors. Brealey, Myers and Allen (2006), related equity price returns to pervasive

macroeconomic factors and partly on noise. This means that the APT model if extended can accommodate macro market risk such as market investors' sentiment which is the cause of noise trading. There is a recent approach to explaining asset price determination called the fusion approach. This approach has further become important due to the huge criticism most behavioural finance expert has mounted on the popular CAPM and APT pricing models. They argued that the assumption of investors' homogeneity and the complete neglect of investors' psychological bias in pricing asset are unacceptable (Lee, Chan and Faff, 2003). This approach supports the use of market and economic fundamentals (such as rate of return, demand and supply for securities, market risk and macroeconomic factors) and investors' sentiment in explaining asset pricing. Pindyck (1988) revealed that equity prices react more readily and faster to macroeconomic news than they do to stock market news and exogenous factors. This implies that he recognises exogenous factors such as investors' sentiment as a potential determinant of equity prices.

A popular theoretical model that link macroeconomic variables to stock market returns but neglect investors' sentiment is the Arbitrage Pricing Theory (APT). The APT is an index model, a variant of the factor model. It assumes that there is basically more concern on uncertainty in asset returns from common macro-economic factors.

2.4 Bull and Bear Market Cycle

A stock market cycle or trend is a tendency of the market to move in a particular direction over time. These cycles are classified as (a) Secular for long time frames (b) Primary trend, which is a medium time frame and (c) Secondary for short time frames. The secular market cycle has duration of 5 to 25 years and consists of a series of primary trends. While the primary market cycle last for 1 to 2 years. In measuring bull and bear market cycle, we observed that Market

returns and P/E ratios have been used, but more emphasis has been placed on stock market returns. The below are some approaches for measuring bull and bear market cycles as reviewed in literature;

Stock markets have been classified to be in the period of 'up' and 'down' market phases which implies 'bull' and 'bear' periods (Maheu and McCurdy, 2000). Wiggins (1992) defines 'up' as when the (excess) market return is greater than 0, while 'down' as when the market return is less than 0. Granger and Silvapulle (2001) describe market into bullish and bearish periods by using quantiles of return distributions. Dukes, Bowlin and MacDonald (1987) used the S&P500 index to define bull markets as periods in which the index increased by at least 20% from a trough to a peak and bear markets as periods in which the index decreased by at least 20% from a peak to a trough.

A bull and Bear market could be secular or primary. According to Faber (2009), Wiggns (1993) and Cooper, Gutierrez Jr., Hameed (2004), a bull market is one with a monthly average returns that is greater than zero while a bear market is one with negative returns. Fabozzi and Francis (1979) describe a substantial up (Bull) as one with a market returns that is 1.5 times higher than its standard deviation. Gwilym, Clare, Seaton and Thomas (2009) describe a bull market (positive returns market) and Bear market (negative returns) as one where the annual average daily returns is greater than one year Moving Average (MA) and returns less than one year Moving Average (MA). The Bull market cycle is associated with increasing investors' confidence and increasing investing in anticipation of future price increase and this may impact on stock market efficiency. In the case of Bear Market cycle, there is a general decline in the stock market over a period of time. It is a transition from high investors' optimism to

widespread investors' fear and pessimism. While it is easy to describe Bull and Bear market, it may be a little difficult in quantitative in defining bull and bear Market cycle. In a simple manner, the Vanguard group (2000) describes a bull market as one with a 20% price up over a two-month period and a bear market as the opposite. Maheu, McCurdy and Song (2012) in their paper on the component of bull and bear market, classified a bull and bear market as one with average daily cumulative returns of above 10% and less than 10% respectively.

While the above simple method of using a single return benchmark to group a market into bull and Bear market cycle is well accepted, there are other advanced econometric techniques which are based on the use of Markov-Switching model. To investigate bull and bear markets. Hamilton (1989) first introduces the Markov-switching model to replicate the recessions and expansions of the U.S. economy as measured by the NBER. Subsequently, based on Hamilton (1989), there are a number of articles that have investigated bull and bear markets, such as Durland and McCurdy (1994) and Maheu and McCurdy (2000).

In this study we will adopt the approach of Dukes et al. (1987) in measuring bull and bear market cycle since we are using the all share price index while they used the S&P500 index to define bull markets as periods in which the index increased by at least 20% and bear markets as periods in which the index decreased by at least 20%.

2.5Review of Empirical Literature

In this chapter we hope to review some empirical literature on investors' sentiment and stock returns in Nigeria, emerging economies and also in some developed countries. We also provide a summary table of most valuable empirical studies in this chapter.

Investors' sentiment is a non-market factor that is also subjected to debate as regards its impact on equity price movement. Johnson, Lee, Lim and Sanger (2006) argued that investors' sentiment has no influence on equity pricing especially in a frictionless market and that even if it does generate abnormality in prices, arbitrager would estimate and eliminate the differences immediately. Delong, Shleifer, Summers and Waldman (1990), Miller (1977), Black (1986) and Shleifer and Vishny (1997) all posited that in real market situations, market frictions limit arbitrage activities and that investors' sentiment causes movement in equity prices. They further identified institutional friction such as noise trader risk as a factor that limits the activities of rational investors'. Baker and Wurgler (2004) argued that investors' sentiment affects asset prices and are commonly observed in investors' attitude to stock from young, small, unprofitable, extreme growing or distressed stocks. The relationship between investors'sentiment and equity prices is clearly deduced from the work of Miller (1977). He argued that stock prices reflect investors' optimistic opinions. That is, prices are driven upwards when investors' become more optimistic (investors' sentiment is high). This therefore suggests that investors' sentiment and equity prices are positively related. This in another way shows that pessimistic investors' will ginger fall in equity prices through panic selling which when unchecked, can lead to stock market price crash.

In Nigeria, there seems to be a very limited well known empirical study on investors' sentiment and stock returns in Nigeria. The two studies that attracted our attention were the works of Zubairu (2014) and Babajide and Adetiloye (2012). The work of Zubairu (2014) is similar to this work but ignored the effect of bull and bear market cycle on the relationship between investors' sentiment and stock returns in Nigeria. In the case of Babajide and Adetiloye (2012), they examined Investors' Behavioural Biases and the Security Market in

Nigeria. Although the paper was tagged an empirical study, a survey research design was adopted rather than time series approach. The authors focused on two major objectives: one, to examine the extent of behavioural biases among security market investors' in Nigeria and two, to examine the effects of behavioural biases on stock market performance in Nigeria. In data collection and analysis, questionnaire was employed in a survey as an instrument and the technique of correlation with Pearson Product Moment Coefficient (PPMC) was used to analyze 300 randomly selected investors' in Nigeria security market. The result revealed that there is strong evidence that behavioural biases exists but not so dominant in the Nigeria security market because a weak negative relationship exists between behavioural biases and stock market performance in Nigeria. The major drawback of this study was the sample biases that often results from survey and the neglect of market cycle.

With regards to the above, a large body of literature has provided empirical evidence about the relationship between investor sentiment and stock price outside Nigeria. Studies are focused on the time-series relationship between investor sentiment and stock price report that the current investor sentiment predicts lower future stock returns. Fisher and Statman (2000) find that the American Association of Individual Investors' Sentiment Index (proxy for individual/small investor sentiment) and Wall Street strategists' sentiment (proxy for institutional/large investor sentiment) are negatively correlated with the S&P 500 return in the following month. In a later study, Fisher and Statman (2003) examined whether the consumer confidence index is a good proxy for the individual investors' sentiment and if the consumer confidence index predicts stock returns. Their result shows that changes in consumer confidence index were accompanied by statistically significant changes in the

individual investor sentiment about the stock market. The contemporaneous relationship between changes in consumer confidence and S&P 500 returns is positive. Also, Fisher and Statman (2003), observed that high consumer confidence is generally followed by low future S&P 500, NASDAQ and small stock returns.

Brown and Cliff (2004), using different proxies for investor sentiment, note that the sentiment level and change are positively and strongly correlated with the contemporaneous stock market return. Also, Brown and Cliff (2004) test the causal relationship between sentiment level/change and stock return. It was suggested by them (Brown and Cliff (2004)) that the stock market return is a good predictor of individual and institutional investor sentiment in the short run. Charoenrook (2005) uses the University of Michigan Consumer Sentiment Index to investigate its explanatory power for stock market return and find that the changes in consumer sentiment are positively related to the contemporaneous excess market returns and negatively related to the future excess returns at one-month and one-year horizons. Using different sentiment proxies, Wang, Keswani and Taylor (2006), observed that their investor sentiment proxies are caused by stock returns and volatility rather than vice versa (in accordance with Brown and Cliff, 2004). Canbaş and Kandir (2009) obtained similar results for the Turkish stock market. The past stock returns clearly predict future level of investor sentiment. Similar, Schmeling (2009), in an international pooled analysis, suggests that there are two-way causality such that investor sentiment depends on previous returns and the returns depend on previous investor sentiment. Due to lack of specific indicators constructed to measure the sentiment of individual investors', in the international context, most empirical tests employ the consumer confidence index to proxy for investor sentiment (see, for instance, such an argument in Schmeling 2009). Schmeling (2009) remarks that the investor

sentiment is a contrarian indicator for the future stock market return across countries. High (low) investors' sentiment tends to be followed by lower (higher) stock returns. Also, Schmeling (2009) notes that the negative impact of investors' sentiment diminish as the forecast horizon of market return is increased. In economic terms, the decline of the investor sentiment impact suggests that the noise trading effects on stock prices vanish over long time periods. In the short period, there are limits to arbitrage, but in the medium and long run, the arbitrage becomes stronger. This evidence is in accordance with a theoretical point of view. As Schmeling (2009) claims, an opposite finding would mean that the noise trade demand shocks move from the stock prices permanently away from equilibrium.

From the existing literature, it can be seen that several studies have been done to examine the herd behaviour in stock markets. Christie and Huang (1995) gave a test to identify herding behaviour in the market. They used Cross Sectional Standard Deviation (CSSD) as a measure of average proximity of individual asset returns to the realized market average. They analyzed that market alternates between normal and extreme phases and that herding exists in periods of market extremes. They argued that when investors' follow aggregate market movement, disregarding their own judgment (herding) then individual asset returns will not diverge much from overall market return. Therefore, value of CSSD gets reduced. Olsen (1996) analyzed the implications of herding behaviour on earnings forecasts. Herding results in a reduction in dispersion and an increase in the mean of the distribution of expert forecasts creating a positive bias in earnings estimates.

In the work of Hwang and Salmon (2001), they developed a measure to test herding in US, UK, and South Korean stock markets. They evaluated the direction towards which the market

may be herding. Their measure took into account the fundamentals of the firms and influence of time series volatility. With this they could differentiate intentional herding from spurious herding. Contrary to Christie and Huang (1995), they found herding in normal market conditions rather than market stress.

Caparrelli and D`Arcangelis (2004) in a related study also investigated the presence of herding in Italian stock market. They found nonlinearity in herding pattern using methodology given by Chang et al (2004). They also determined the degree of herding (H statistics) to differentiate between spurious and intentional herding. Formula for H-statistics was given by Hwang and Salmon (2001). Intentional herding was indicated by a decreasing H-statistics and was found to be greater in Bull Phases and in small-cap companies of Italian stock market. Lao and Singh (2011) examined herding patterns in Indian and Chinese stock markets. They found that herding behaviour is greater during extreme market conditions in both markets but the pattern is different. In Chinese market, herding is greater when market is down (bear phase); however in India herding is greater when market is up (bull phase).

Another study was also conducted by Lakshman, Basu and Vaidyanathan (2011) on herding and they observed that the presence of market wide herding in Indian stock markets is not very severe. They found that FII's do not significantly impact on herding.However, Mutual Funds increase herding. They also found that Nifty returns have no impact on herding. They documented that herding was on a rising trend from 2003-2005, however, post 2006 herding started to decline. They suggested that periods of market crisis can help return markets to equilibrium, and that herding can be more apparent before market.

Baker and Wurgler (2006), in an empirical study in US, show how investor sentiment affects the cross-section of stock returns. They used a cross-sectional regression analysis and they stressed that a wave of investor sentiment disproportionately affects securities whose valuations are highly subjective and are difficult to arbitrage. They also found out that when the beginning-of-period proxies for investor sentiment are low, subsequent returns are relatively high on small stocks, young stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme-growth stocks, and distressed stocks, suggesting that such stocks are relatively under priced in low-sentiment states. When sentiment is high, on the other hand, the patterns largely reverse, suggesting that these categories of stocks are relatively overpriced in high-sentiment states. This therefore means that investors' sentiment whenmodelled on a micro-based? should conclude the effect of small stocks, young stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme-growth stocks, and distressed stocks. The study neglected the impact of market cycle in explaining investors' sentiment.

Prosad, Kapoor and Sengupta (2012), in their study of herding effect in Indian equity market using a linear regression and quadratic functional model to test the presence of herding, and using data from National Stock Exchange (NSE) and a methodology as described in Christie and Huang (1995) and Chang, Cheng and Khorana (2000), they found out that Security return dispersion as a function of aggregate market return has been taken as a proxy for herd behaviour. They also claim that previous studies have reported the presence of herding in emerging Asian economies. However, when the presence of herding was tested for periods of market stress, it prevailed in bull phase. This study clearly shows that when market cycle is considered,investors' sentiment and stock returns relationship might reflect a different thing.

Schmeling and Maik (2008), in their study of Investor sentiment and stock market returns using 18 industrialized countries, stress that consumer confidence can be used as a proxy for individual investor sentiment and they found out that investors' sentiment affects expected stock returns internationally in the 18 industrialized countries. In line with recent evidence for the U.S., they also find that sentiment negatively forecasts aggregate stock market returns on average across countries. When sentiment is high, future stock returns tend to be lower and vice versa. This relation also holds for returns of value stocks, growth stocks, small stocks, and for different forecasting horizons. They also employ a cross-sectional regression analysis and provide evidence that the impact of sentiment on stock returns is higher for countries which have less market integrity and which are culturally more prone to herd-like. This study apart from introducing consumer confidence as a proxy for measuring investors' sentiment which is not really a direct measurement of stock market investors' sentiment also did not consider bull and bear market cycle impact on its results.

A similar study is found in the work of Oprea and Brad (2010). The study examined Investor Sentiment and Stock Returns in Romania. They collected data from the Bucharest Stock Exchange (BSE) for a 10 year time period, starting from 2002 to 2011. They found out that the attitude of individual investors' is strongly correlated with their sentiment, so their behaviour on the stock market can generate important changes in price fluctuations. They proxy investor sentiment by consumer confidence index and their results proved that there is a positive correlation between changes in consumer confidence and stock market returns, demonstrating that individual investor sentiment affects stock prices. However, the influence of individual investor sentiment seems to be quickly removed by the force of arbitrage.

Moreover, the influence of individual investor sentiment on the prices of the most 10 liquid companies from BSE is not statistically significant. This study like the previous also did not consider investors' sentiment and stock returns under bull and bear market cycle but rather experimented the relationship between both variables for top liquid listed companies in Romanian and found a different result. This therefore means that investors' sentiment and stock returns relationship would depend on companies' types and market conditions.

Prosad, Kapoor and Sengupta (2011) in their study of Herd Behaviour in India Equity Market used data from National Stock Exchange (NSE) and methodology as described in Christie and Huang (1995) and Chang, Cheng and Khorana (2000). They express Security return dispersion as a function of aggregate market return has been taken as a proxy for herd behaviour. To test the presence of herding, linear regression model and linear regression using quadratic functional form have been applied. Previous studies have reported the presence of herding in emerging Asian economies. However no evidence has been found in developed economies. The result of the study endorses the fact that Indian markets are efficient as no severe herding has been reported. However, when the presence of herding was tested for periods of market stress, it prevailed in bull phase.

Zouaoui, Nouyrigat and Beer (2010), in their study focused on how investor sentiment affects stock market crises using panel data. They tested the impact of investor sentiment on a panel of international stock markets. Specifically, they examined the influence of investor sentiment on the probability of stock market crises. They found that investor sentiment increases the probability of occurrence of stock market crises within a one-year horizon. The impact of investor sentiment on stock markets is more pronounced in countries that are

culturally more prone to herd-like behaviour and overreaction or in countries with low institutional involvement. Their results also suggest that investors' sentiment is not a reliable predictor of stock market reversal points.

In the study of Ahmed and Ullah (2012), they focused on investors' sentiment and stock market dynamics in Pakistan and their major purpose was to confirm whether investors' sentiments had any impact on the return of Karachi Stock Exchange (KSE). If the results are found to have an impact on returns of KSE, this will mark a new research area in the field to explain variation in returns based on behavioural factors. Time series analysis of auto regressive distributive lag (ARDL) is used in this study. Their results on investor sentiments were proven to have positive and significant coefficient that indicates its impact on KSE returns. Further, the macroeconomic variable of inflation was also statistically significant. The study proves that investor sentiments have a positive significant coefficient when it comes to explaining market returns. They also believe that psychological factors that are rarely studied do have an important bearing on investors' decision making and consequently market returns of Pakistan in particular and to world at large.

Finter, Ruenzi and Ruenzi (2010)also did a similar study but they focused onthe impact of investor sentiment on theGerman stock market. They investigated whether investor sentiment can explain stock returns on the German stock market. Using a principal component analysis, they constructed a sentiment indicator that condenses information of several well-known sentiment proxies and their results show that this indicator explains the return spread between sentiment stocks and stocks that are not sensitive to sentiment fluctuations. Specifically, stocks that are difficult to arbitrage and hard to value are sensitive to the indicator. However,

the model did not have much predictive power of sentiment for future stock returns. Their findings were consistent with sentiment being of minor importance on the German stock market that is characterized by a low fraction of retail investors'.

Boubaker and Talbi (2014) in a case of Tunisian, examinedthe impact of investor sentiment on the Tunisian stock market. They argued that investor sentiment is a key concept in behavioural finance and it has attracted the interest of many researchers during the last decade. They adopted a new measure of the investor sentiment which includes indirect indicators and tested the impact of investor sentiment on returns using a VAR model. They found that there exist a strong negative relationship between investor sentiment and future returns. In addition, they also found that past returns for tangible stocks, young, mature, not very but highly profitable, and with policy of distribution of dividend are not factors that explain the sentiment indicator.

The summary of review of some empirical literature on investors' sentiment and stock returns in Nigeria, emerging economies and also in some developed countries is shown in **APPENDIX II.**

2.5.1 Investors' Sentiment under Bull and Bear Market Cycle

There are a number of articles discussing bull and bear markets for other emerging markets. For example, Assoe (1998) investigates regime-switching behaviour of nine emerging markets as these markets experienced significant changes in government policies and capital market reforms from December 1975 to December 1997. He finds, based on Markov switching models that these emerging market returns and volatilities change significantly over time in response to government policies and capital market reforms. This implies that booms and busts in emerging

stock markets could be influenced by events such as monetary shocks and productivity switches, as these events could have an impact on traders' confidence. Similarly, following Bry and Boschans (1971) nonparametric approach, Biscarri and Gracia (2004) identify the bull and bear phases of Spanish stock market and discuss its characteristics. They find that the process of financial development, such as capital market opening, financial liberalization or integration processes, affect the Spanish stock market. The nine emerging markets are Argentina, Brazil, Chile, Greece, India, Korea, Mexico, Thailand,and Zimbabwe.

In Nigeria the similar paper that attempted on empirical study market cycle was that of Adenola, Abdulrasshed,Babata, Atanda and Salaka (2011) who studied market bubble and crashes rather than bull and bear cycle. In their study they identify the period of October 2005 to march 2008 as bubble regime and April 2008 to September 2010 as market crash regime. While this study provides insight into Nigeria stock market trends, there were no attempt by the authors in discussing stock market efficiency under bull and bear market state. While there are no well known empirical works on bull and bear market cycle in Nigeria, there are a number of studies in this area that was conducted for China. As found in Chen, Chong and Li (2011), the Chinese stock market has experienced a long period of bear cycle from early 2000 until 2006 and then it fluctuated greatly until 2010. However, the cyclical behaviour of stock markets during this period is less well-established. We may ask why the Chinese stock market experienced a long duration of bear market, and what industries would contribute to this cyclical behaviour, and whether firm size can determine the relationship between the firm stock cycles on the market cycles. By comparing the intervals of bull and bear markets between

stocks and indices, this paper will provide more explanation to the cycles of Chinese stock markets, and will contribute to the literature regarding the development of emerging markets.

Yan, John, Shi and Xu (2007) identify bull and bear market regime-turning points using five-month average returns and show non-identical cycles for these two markets. In addition, they find that the return differences between bull and bear market regimes decrease recently reflecting a maturing of the Chinese market. Using monthly data from April 1999 to September 2009, de Bondt, Peltonen and Santabarbara (2011) examined Shanghai A-share price misalignments in bull and bear markets. They found that it can be reasonably well explained by some fundamentals, such as corporate earnings and the risk-free interest rate. In addition, they found that stock prices in booms and busts can be significantly influenced by some policy actions from the Chinese authorities, either in the form of low deposit rates, loose liquidity conditions or stock market liberalizations. This implies that bull or bear markets are not only closely related with economic fundamentals but also with a wide spectrum of policy instruments.

Empirically, it has been proved that financial market exhibits upward and downward trends which in common terminology is categorized as bull and bear market. However, there is no clear classification of stock market regimes i.e. bull or bear in the literature but few studies by Fabozzi and Francis (1977), Kim and Zumwalt (1979) and Chen (1982) have defined bull regime on the basis of returns exceeding certain threshold value. The occurrence of these regimes is often attributed to several factors that can be broadly grouped into systematic and non-systematic risks. A bull regime is generally characterized as periods of generalized upward trend (positive returns with low volatility) and bear market corresponds to periods of

generalized downward trend (negative returns with considerably high volatility). The identification of regime shifts has great significance in making portfolio allocation strategies and enable policy makers to undertake measures to curb speculative activities.

Besides these risks, changes in the regime in a stock market can be due to external shocks caused by shocks in another market. The obvious examples are Asian flu (1997), Russian cold (1998), Brazilian fever (1999), NASDAQ rash (2000), Argentinean crisis (2001/02), Sub-prime crisis (2008) and the most recent European Sovereign debt crisis (2010). These incidents had catastrophic impacts on stock market regimes around the world including India and the markets were revived through policy interventions and attempts to highlight the dynamics of Indian stock market, in particular, identifying bull and bear regimes in two leading indices viz., NSE-Nifty and BSE-Sensex. The study apply a probability based Markov-switching model for returns in which the distribution of returns changes over time, i.e., the time-series tend to be cyclical, for example, due to business cycles or stock market cycles (bull and bear). Markov-switching (MS) models are characterized by transitions between states which are governed by a Markov chain. The study uses a Markov regime switching model which jointly characterizes the unobservable bull and bears regimes for stock returns, allows intra-regime dynamics, dating and enables further to model the uncertainty about the market regime to be incorporated into out-of-sample forecasts. These apart, it is empirically proved that stock market reflects behaviour such as sudden jumps and crash and therefore, the study also highlights the significance of the use of non-linear MS-AR model compared to linear AR model in case of Indian stock market.

De Bondt (1993) defines bull and bear markets as two market trends with a positive and negative return respectively. Empirical research proves higher correlation between stocks in bear markets (see e.g., Ang & Chen, 2002; Connolly, Stivers & Sun, 2007; and Longin & Solnik, 2001) and argues that it results from an increased herding behaviour due to low investors' sentiment (see e.g., Barberis, Shleifer, Vishny, 2005; and Kumar & Lee, 2006). Gonzalez, Powell, Shi & Wilson (2005), on the other hand, proved that bull markets are associated with persistently rising share prices, strong investors' interest and rising financial well-being. Arora and Buza (2003) also conclude that bull markets are usually associated with a period of prosperity, when the future seems bright and retail investors' have easy access to money. Odean (1998a) find that retail investors' are more likely to experience success in bull markets as the attribution bias exhibits an asymmetric property and is more present in bull conditions.

Pagan and Sossounov (2003) observed that retail investors' generally have higher sentiment in bull market states and lower sentiment in bear market states. In general, bull and bear markets incorporate a lot of different factors, i.e., the volatility, the degree of the movement, the historical trend and the market price of risk (Traustason, 2009). All these have their respective roles as sentiment drivers.

Cunado, Gil-Alana and Perez de Gracia, 2008; and Grobys, (2012) investigate stock market volatility in bull and bear markets and find that the volatility is higher during bear than bull markets. Chordia, Roll and Subrahmanyam. (2001) also argue that declining markets attract less investors', which leaves the markets to be subject to falling liquidity and therefore more uncertainty and volatility. Huiwen and Sun (2012) while investigating how investors'

sentiment is affected by such volatility observed that under a bear market, such sentiment is typically low. Rehman (2013) also find that the volatility in stock returns does influence the investors' sentiment in shaping their emotional perception about that particular company/market.

Thus, when a high proportion of retail investors' express a bearish (negative) sentiment, some analysts consider it to be a strong signal that a market bottom may be near. The predictive capability of such a signal is thought to be highest when investors' sentiment reaches extreme values (Hulbert, 2008).

Rutledge, Zhang and Karim (2008) examined the relationship between firm size and excess stock returns in the Chinese stock exchange (Shanghai and Shenzhen) bull and bear market phases from 1998 to 2003. They found that small firms had greater positive excess returns during the bull market period but greater negative returns or no significant difference in returns (using float market value) during the bear market period. In contrast, large firms show greater or similar portfolio returns as compared to small firms during the bearish time period. This finding reflects that small stocks react stronger than large stocks to economic conditions and events.

Similarly we also observed that firstly, the positive relationship between changes in investors' sentiment and stock returns proves that the stock prices tend to be overvalued (undervalued) in a bullish (bearish) market, especially when the excessive optimism (pessimism) of investors' is unjustified by fundamentals and there are limits to arbitrage. Secondly, the negative relationship between current investor sentiment and future stock

returns suggests that the prices tend to revert to their fundamental values after gradual corrections. Finally, the relation between investor sentiment and return is not very clear in the sense that the noise trade approach state that the sentiment cause the stock returns, but some empirical tests (Brown & Cliff, 2004; Wang, Keswani, & Taylor, 2006; Canbaş & Kandir, 2009) show that stock returns cause investor sentiment. Another study that also gave attention to sentiment and market cycle was that of Lao and Singh (2011), they examined herding patterns in Indian and Chinese stock markets. They found that herding behaviour is greater during extreme market conditions in both markets but the pattern is different. In Chinese market, herding is greater when market is down (bear phase); however in India herding is greater when market is up (bull phase).

Following the above, we came to the conclusion that there is an empirical literature gap for bull and bear market cycle studies in Nigeria especially in the study of sentiment and stock returns relationship. This study will therefore form a major contribution to empirical literature. We also observed that there are two approaches for measuring bull and bear market cycle. These are the simple average returns method and the Markov-switching models. In this study, we hope to use the simple average method to classify the Nigeria stock market into bull and bear market cycle since our focus is to use data for this time periods or regime to test for the traditional risk factor asset pricing models rather than for prediction as used in the context of Markov-switching models

2.6 Theoretical and Conceptual Framework

In pricing financial assets,most stock price models linked price adjustment to changes in market and economic fundamentals. These models include the efficient markethypothesis (EMH), Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT) and the Efficient Market Hypothesis (EMH).The Efficient Market Hypothesis (EMH)is one of the fundamental equity price models used to explain the movement of prices around its fundamental values. Fama (1965) pointed out that the theory relates fundamental value to potential earnings of stocks and that the current prices of any equity traded are based on its fundamental value. The fundamental value of equity in the theory was related to all forms of new information and any discrepancies between the current prices and the fundamental values would be random and short-lived. The basic theme of the random walk hypothesis theory of equity prices determination is traced to the assumption that the fundamental value of equity is determined by new information and when this new information gets to the market, the current prices would adjust to them immediately. The issue of investors' sentiment is a serious concern to the theorist of Efficient Market Hypothesis (EMH) because sometimes, new information might come in the form of noise, rumours, hearsay, etc which are part of investors' sentiment. The presence of irrational investors' can create a golden opportunity for traders to embark on speculative activities and panic trading which widen the discrepancy between current equity prices and their fundamental values. Fama (1970), in extension of the pattern of equity price behaviour brought into literature the concept of Efficient Market Hypothesis (EMH). This hypothesis stressed that predicting equity prices using market fundamentals or trends and charts is a waste of time and resources.

According to Fama (1975), current stock market prices move in a random pattern and it has no memory of past prices pattern. In EMH, equity prices would always reflect their true values

and any deviation is immediately restored but this restoration process might be limited by information asymmetry and investors' irrationality. Stock market price correction process is attributed to the activities of arbitrager. The actions of equity market price arbitragers if disturbed can create abnormal market prices movement such as market boom or crash. Investors' sentiment, when related to the above issue becomes a major driving force of abnormal returns and arbitrage activities. APT model as formulated by Ross (1976) rests on the assumption that equity prices are determined by some selected number of multi-risk factors.

The APT model unlike the CAPM which uses beta as the single-market risk uses macroeconomic variables and non-market factors as risk factors. Brealey (2006), related equity price returns to pervasive macroeconomic factors and partly on noise. This means that the APT model if extended can accommodate investors' sentiment which is the cause of noise trading. There is a recent approach to explaining asset price determination called the "fusion approach". This approach has further become important due to the huge criticism most behavioural finance experts have mounted on the popular CAPM and APT pricing models. They argued that the assumption of investors' homogeneity and the complete neglect of investors' psychological bias in pricing asset are unacceptable (Lee, 2003). This approach supports the use of market and economic fundamentals (such as rate of return, demand and supply for securities, market risk and macroeconomic factors) and investors' sentiment in explaining asset pricing. Pindyck (1988) revealed that equity prices react more readily and faster to macroeconomic news than they do to stock market news and exogenous factors. This implies that he recognises exogenous factors such as investors' sentiment as a potential determinant of equity prices.

A popular theoretical model that link macroeconomic variables to stock market returns but neglect investors' sentiment is the Arbitrage Pricing Theory (APT). The APT is an index model, a variant of the factor model. It assumes that there is basically more concern on uncertainty in asset returns from common macro-economic factors such as exchange rate, interest rate and inflation rate.

Ross (1976, 1977) hypothesized that a linear relationship exists between security's rate of returns and the factor which influences it. This is shown below.

$$R_{it} = E\,(R_i) + \beta_i F_{it} + e_t \text{……………………..…………………………} (2.1)$$

The model posited that the period of returns of different assets are explained by common factors in a linear model. It further argues that asset returns in a CAPM framework are influenced by factors which are measured by the covariance of each factor with the portfolio, which is the beta attached to each factor. In the world of Arbitrage pricing model, these betas are referred to as factor loading.

Again, the asset's return is similarly influenced by specific return which is assumed to be independent of the other factors. A multiple factor model for any asset in the market specifies a simple linear relationship between asset returns and its associated k factors which drive them.

The illustration is shown in equation (2.2),

$$R_i = \alpha_i + \beta_{ij} F_i + \ldots + \beta_i k F_k + e_i \text{………………………………...}(2.2)$$

Where βi is the predictable (constant) unsystematic component of the return, and ei is the unpredictable non-systematic (which is assumed to be normally distributed with zero mean and constant variance) component of return. Coefficient βij is the asset's loading factor, otherwise known as beta, which measures the sensitivity of security, i to factor j.

From the foregoing specification, it is clear that index model workings are based on three fundamental assumptions: first that the specific returns do not correlate with each other. This implies therefore that the correlation between the returns on two different assets is jointly dependent on the common factors, F_1 …. F_n. Secondly, the assumption that the expected specific return is zero, and lastly, that the specific returns are independent of the factors.

Derivable from the assumptions above is the fact that the error terms of different assets do not correlate, so their covariance is zero, i.e. E (ei, ej) = 0 for all i, j. The implication of the assumption is that the unsystematic risk is diversified into a large number of assets and thus declines to zero while the undiversifiable (systematic) risk is the only part of the total risk to be priced. So, all unique assets and unpredictable factors do not correlate, however, the unique and predictable component (β_1) of two assets' return generating processes may be equal if they belong to the same market sector.

A common variation is the "excess return" form of the model which is defined as

$$E(R_i) = \alpha_i + \beta_{i1}F_1 + \beta_{i2}F_2 + \beta_{i3}F_3 + \ldots\ldots\ldots + \beta_{ik}F_k + e_i \ldots\ldots\ldots\ldots\ldots\ldots (2.3)$$

This can be simply restated as;

$$R_i = E(R_i) + \beta_{jk}F_k + e_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.4)$$

Where;

j=1…n and where R_i is the return on asset i during a specified time period.

$E(R_i)$ is the expected return for asset i, β_{ik} measures the sensitivity of asset return to movement in a common factor.

F_k is defined as a set of common factors that is related to returns on assets.

e_i is the error term (which has a unique effect on asset i's return, assumed not to correlate with the factor).

By assumption, it is completely diversifiable into large portfolio and has a mean of zero.

As defined in the notation, F_k terms are the multiple factors expected to have an impact on the returns of all assets and such factors include mostly macroeconomic variables (inflation, interest and exchange rates, money supply, growth in GDP etc). APT proponents opined that there exist many such factors (it is the same for the original version as well as the excess return variant). This therefore means that extending the APT model to include investors’ sentiment would make more sense than just using only macro-economic risk factors. The extension of the APT model to accommodate investors’ sentiment leaves us to obtain equation (2.5) as derived by Bandopadhayaya (2005).

$$E(R_i) = \alpha_i + \beta_{i1}F_1 + \beta_{i2}F_2 + \beta_{i3}F_3 + \ldots\ldots\ldots + \beta_{ik}F_k + \beta_{ij}Sent + e_i \ldots\ldots\ldots\ldots (2.5)$$

Where;

$E(R_i)$ is the expected return for asset i, β_{ik} measures the sensitivity of asset return to movement in a common factor.

F_k is defined as a set of common factors that is related to returns on assets.

β_{ij}Sent is defined as the investors' sentiment , measured by principal component analysis.

e_i is the error term (which has a unique effect on asset i's return, assumed not to correlate with the factor).

By assumption, it is completely diversifiable into large portfolio and has a mean of zero.

The inclusion of investors' sentiment variable into equation (2.5), means that people do not always act rationally nor do they fully utilize all the information available to them. It also extends the APT model to issues on utility and prospect theories in behavioural finance.

Kahneman and Tversky (1979) stress that expected utility theory is unable to explain why people are often simultaneously attracted to both insurance and gambling. They found empirically that people under-weigh outcomes that are merely probable in comparison with outcomes that are obtained with certainty; also that people generally discard components that are shared by all prospects under consideration. Under the prospect theory, they argued that individual is risk-averse in relation to a known gain but risk-seeking in an effort to avoid a certain loss. Actual behaviour in a given situation depends on the sequence of events prior to that situation. For example, if an individual wins immediately prior to the time of the decision he/she is less likely to take a further gamble. However, if a loss has been incurred recently, then the individual is more likely to take a gamble in the hope of recouping such loss. Following the

above, Figure 2.1 below provides the theoretical framework for this study which is adapted from the arbitrage pricing theory (APT) and augmented with investors' sentiment and market cycles.

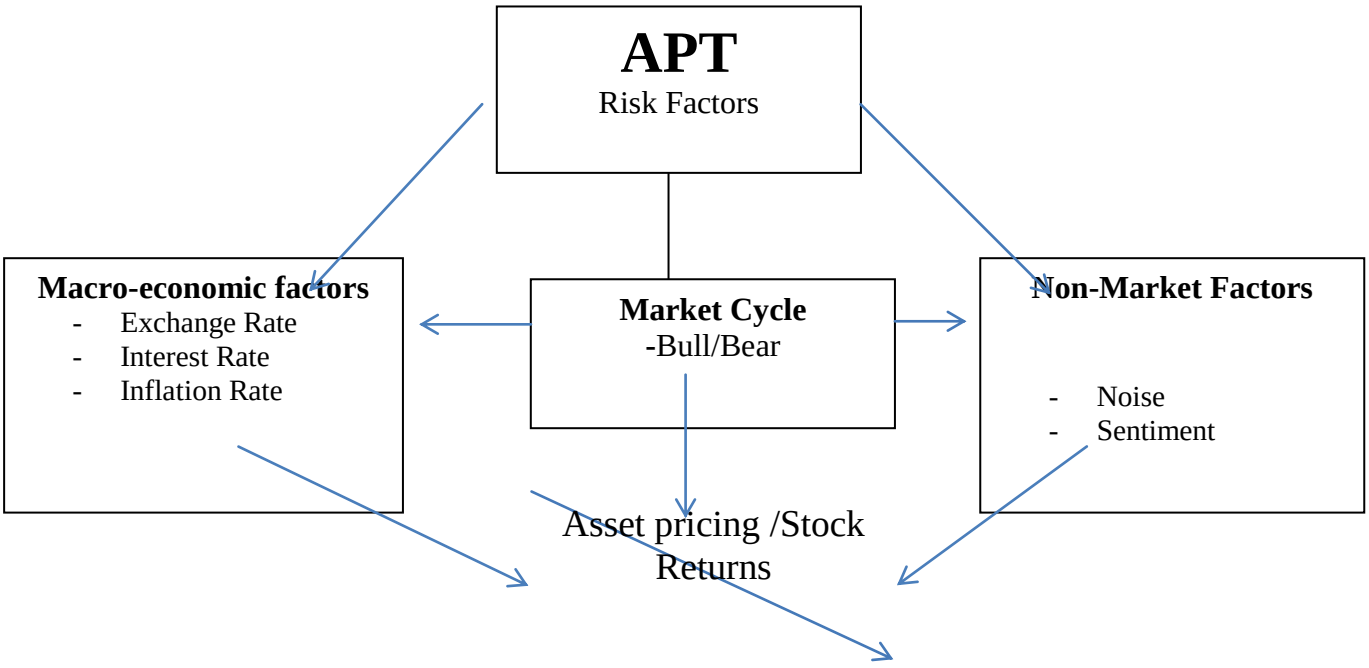


Figure 2.1; Diagram of theoretical framework

Source: Author (2015)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives an overview of the research methods and the sequential steps the researcher adopts in the research work. The steps and procedures are to ensure that the empirical results from our investigation are dependable, accurate and valid. It also presents a careful description of the model specification, data collection and method of data estimation for the model.

3.2 Research Method

In the study of investors' sentiment, two research approaches have been adopted. These include direct and indirect methods;

The direct method focuses on the use of survey while the indirect method uses secondary data sourced from stock market transactions. This therefore, indicates that our unit of analysis is transactions and not organization or group. This method entails the use of quantitative, statistical or regression techniques in evaluating the research issues or problems. This study is based on time series and the issue of questionnaire design is of less concern since we focus on the secondary data of variables that are relevant for indirectly measuring investors' sentiment. The choice of time series approach rather than surveys is also based on the suggestions from

Brown and Cliff (2004), Brown and Cliff (2005), stressed that the use of surveys can be problematic because of inaccurate responses, misunderstood questions.

Groves (2006), Bertrand and Mullainathan (2001) also stress that non-response bias are usually associated with investors' sentiment survey. Zubairu (2014) in a similar study on investors'sentiment used the Bandopadhyaya index for measuring investor sentiment and the justifications was based on (1) the index is best for measuring investors' sentiment over time (2) it is simple and require less mathematical computations and (3) it is best in a market like Nigeria where there are no option market and mutual fund or investors' opinion survey data. Studies like that of Baker and Wurgler (2006), Lee, Thaler and Shleifer (1991) and Dorn (2009) suggest using indirect approach in the study of investors' sentiment. In improving the reliability of using the indirect approach a number of recent studies suggest the use of Principal Component Analysis (PCA) in measuring investors' sentiment. This study adopts the indirect research design approach and a Principal Component Analysis, while our data analysis is based on advanced time series analysis.

3.2.1 Population and Sampling Techniques

The population of this study consists of all public quoted companies in Nigeria. These companies' form the bedrock of index used for measuring market relation in Nigeria and formed the all share price index (Asle). This excludes non-listed companies or public quoted companies trading on Over The Counter (OTC). The study used data of corporate bodies that are published by Nigerian Stock Exchange (NSE), Securities and Exchange Commission (SEC) and Central Bank of Nigeria (CBN). Such data form the basis of the population of the study.

Purposive Sampling Technique (PST) was used rather than randomly selecting companies that form the market index. The study adopts Baker and Wurgler (2006) method that uses market index rather than specific companies as sample. This therefore means that our sample would be viewed from a time period perspective rather than cross-sections of companies. The study used a period sample of 120 observations starting from 1985Q1 to 2014Q4. The choice of this sample period is based on the available of stock market index price data in Nigeria.

3.3 Model Specification

Based on the theoretical discussion and our formulated hypotheses, the appropriate mathematical model for this study is specified as follows;

$$SpR_t = f(SentPCA_t, DUM_{tBear}^{Bull}, Infl_t, Intr_t, \text{Exrt}) \quad \ldots\ldots\ldots\ldots (3.1)$$

Where:

SpR= is the All share price returns, measured by taking changes in all share price index. This represents the historical quarterly returns series between 1985Q1-2014Q4 in Nigeria

SentPCA= is the Investors' Sentiment, measured by Principal Component Analysis (PCA). The factor loads in the PCA are New Issues or IPOs, Trading Volume and the Bandopadhyaya sentiment. This represents the historical quarterly time series of these variables between 1985Q1-2014Q4 in Nigeria.

Infl = is the Inflation;which is computed from the historical quarterly inflation rate series between 1985Q1-2014Q4 in Nigeria.

Intr **=** is the Interest rates;which represents the historical quarterly interest rate series between 1985Q1-2014Q4 in Nigeria.

Exrt **=** is the Exchange rate;which represents the historical quarterly naira to US dollar exchange rate series between 1985Q1-2014Q4 in Nigeria.

DUM **=** is the Dummy variable which represents both bull and bear market cycle. The Bull market cycle dummy variable assign the value of "1" to represent bull market trend dominance (i.e where the quarterly average daily all share price returns is greater than 20%) and "0" for otherwise. In the case of bear market cycle, the dummy variable assign the value of "1" to represent bear market trend dominance (i.e where the quarterly average daily all share price returns is less than 20%) and "0" for otherwise. The use of 20% rule was adopted from the work of Kurov (2013) and Chen (2007) in their study of bull and bear markets regimes.

$\mathbf{E_t}$= is the stochastic disturbance term assumed to satisfy the usual properties of zero mean, unit variance and zero covariance, introduced to account for the non-deterministic nature of the specification.

Equation3.1; when relates to bull and bear market cycle using dummy variable can be re-specified in its functional form as follows;

Model I: Bull Market Cycle Model

$$SpR_t = \partial_0 + \partial_1 SentPCA_t + \partial_2 DUM_{t\,Bear=0}^{Bull=1} + \partial_3 Infl_t + \partial_4 Intr_t + \partial_5 Exrt_t + \varepsilon_t \quad \ldots\ldots(3.2)$$

The Apriori Sign:

$\partial_1, \partial_2, \partial_5 > 0, \quad \partial_3 >< 0, \partial_4, \partial_6 < 0$

Model II: Bear Market Cycle Model

The Apriori Sign:

$$SpR_t = \partial_0 + \partial_1 SentPCA_t + \partial_2 DUM_{t\,Bear=1}^{Bull=0} + \partial_3 Infl_t + \partial_4 Intr_t + \partial_5 Exrt_t + \varepsilon_t \quad \text{.....(3.3)}$$

$\partial_1, \partial_2, \partial_5 > 0, \quad \partial_3 >< 0, \partial_4, \partial_6 < 0$

3.4 Definition of Variable

A brief definition of the dependent and independent variables are provided below;

3.4.1 Dependent Variable:

In formulating the model for this study, all share price index returns (dependent variable) was used. The two common approaches for measuring returns are;

(a) Stock returns percentage

$$SpR_t = \frac{P_t - P_{t-1}}{P_{t-1}} \quad \text{.....(3.4)}$$

(b) Log returns

$$SpR_t = \log\left(\frac{P_t}{P_{t-1}}\right) \quad \text{.....(3.5)}$$

Where: Pt=current stock price and Pt-1 = previous stock prices

Source: Bandopadhayaya (2005)

The study used the log returns, since it is based on transformation and reduce the problem of extreme returns outliers commonly associated with stock returns series.

3.4.2 Independent Variables;

In this study, the independent variables are investors' sentiment, inflation rate, interest rate and exchange rate. The below provide a brief descriptions of these variables;

(A) Investors' Sentiment (SentPCA); to proxy investors' sentiment over time, we adopted three PCA factors that are most suitable for computing investors' sentiment in Nigeria where there are no data on put to call ratios, mutual fund flow, new accounts and option VIX index. The study applies a principal component analysis (PCA) on the three sentiment indicators in order to isolate the common component. The Principal Component Analysis is a set of methods used to perform linear transformations of a large number of intercorrelated variables to obtain a relatively small number of uncorrelated components. This approach facilitates analysis by grouping the data into smaller sets so as to eliminate the problems of multi-collinearity between variables. Vogt (1993), stressed that the principal component analysis is similar to factor analysis, but it is an independent technique that is often used as a first step in a factor analysis while Stevens (1992), also puts into relief the interest offered by the principal component analysis as a technique for data reduction. The main objective of PCA is to summarize effectively as possible in single indicator information retained in the common set of indicators.

The use of PCA approach as a method of measuring investors' sentiment was recently supported by Tai-Leung Chong, Cao and Wong (2014) and Boubaker and Talbi (2014) while previous studies like that of Baker and Wurgler (2006) and Finter, Ruenzi and Ruenzi (2010) also strongly recommend the use of PCA in measuring investors' sentiment.

With regards to the above, the three measurement indicators are discussed below;

(i) New issues or IPO volume index (Factor 1)

IPO activity/issue is often associated with market tops and is considered as a measure of investors' sentiment because of information asymmetries between managers and investors' (See Ibbotson & Ritter, 1995). Polk and Sapienza (2004) find retail sentiment to have effects on the real economy by influencing managers' decisions to issue new shares when sentiment is high. The IPO market is also viewed as being sensitive to sentiment with high first day returns representing investors' enthusiasm (Loughran et al., 1994). Mahjoub (2010) pointed out that sentiment is a primary driver of under-pricing, and individual investors' are those driving the first day closing prices and are conducting the short-run IPO puzzle more than the institutional investors'. The new issues or Initial Public Offer (IPO) volume index of measuring the degree of investors' emotions in the capital market is clearly supported by Baker and Wurgler (2006) and Brown and Cliff (2004).They argued that the demand for initial public offer in the new issues market is extremely sensitive to investors' sentiment. This therefore means that investors' sentiment are high when the volume of shares bought through IPO in the new issues market is large while the reverse is the case when equity traded through IPO is low. The recent drastic fall in shares sold through IPO window in Nigeria is a clear indicator that investors' confidence in the market is low while the boom in the same IPO market (i.e animalist attitude of investors') during the Bank consolidation and economic reforms period was a clear indication that

investors' confidence in the capital market was high. The impact of financial and stock market reform on new issue market indicate that often times, the growth in new issues or IPO market might be attributed to deliberate actions taken by market stakeholders and not necessarily driven by investors' impulse. This may therefore form a major drawback in the use of new issues/IPO volume index as a single measure of investors' sentiment and also justify why we choose to use the variable as an investors' sentiment PCA factor in this study.

$$\frac{dNewIPO_t}{dSpR_t} > 0 \qquad \text{…….(3.6)}$$

On the basis of apriori expectation, we expect the number of IPOs or new issues as a proxy of investors' sentiment to be positively related to stock returns.

(ii) Volume of shares traded (liquidity) index (factor 2)

Wang (2001) used trading volume as a proxy for investors' sentiment since it is recognized by economists as important factor that indicates investors' interest. In some empirical tests trading volume is considered as an indication of the extent to which investors' disagree about the meaning of the information (Hiemstra & Jones, 1994; and Karpoff, 1987). Baker and Stein (2004) argued that market liquidity as measured by trading volume could be an indicator of investors' sentiment; however it is also used as a liquidity indicator. Increase in trading volume reflects the participation of overconfident investors' in the market and indicates an increase in investors' sentiment. They also suggest that higher trading volumes indicate overvaluation and abnormally low subsequent expected returns for both firm-level and aggregate market data.

In the case of the volume of equity traded index being investors' sentiment measure, Baker and Stein (2004) quantified the level of investors' sentiment with the use of the volume of equity

traded in the market. This approach of measuring investors' confidence is tagged Liquidity approach. They stressed that Investors' madness (investors' sentiment) translate to higher volume of securities traded. Johansen, Lei, Lin and Sanger (2006) argued that the level of trading volume of securities is not a better measure of investors' sentiment when compared to the trend in traded volume of securities. They use the following model to estimate the value of trend in the volume of securities traded as shown in equation (3.7);

$$Sent_{vol} = \beta_0 + \beta_1 t + \beta_2 t^2 + \psi \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.7)$$

Source: Johansen, Lei, Lin and Sanger (2006)

The value of $Sent_{vol}$ proxied the trend value of securities traded over time while the explanatory variables in equation (3.7) are time indexed t and t^2 and ψ_t represents the error term. This specification allows time variations in trading volume, which is a better proxy for investors' sentiment. B_1 and B_2 intuitively reflect how trading volume varies with time. This approach of measuring investors' sentiment centered on the fact that the trend in trading volume series of equity provide information which capture the changes in investors' propensity to trade or invest. This method when adopted in measuring investors' sentiment over time may be subjected to time bias and this justify why using trading volume transform data as a factor load in our PCA for investors' sentiment would provide better representation of investors' sentiment.

$$\frac{dSentVol_t}{dSpR_t} > 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.8)$$

On the basis of apriori expectation, we expect the transform volume of trading as a proxy of investors' sentiment to be positively related to stock returns.

(iii) Bandopadhayaya Investor Sentiment Index (factor 3)

A well-known regression time series approach for measuring investors' sentiment is found in the work of Bandopadhayaya (2005). In his method of estimating investors' sentiment, all share price index was used to capture market activity while those factors outside the price composite index were seen as non-market factors (investors' sentiment). In obtaining the level of investors' sentiment, the lagged S&P 500 price index was regressed on the current S&P price index and the error term from the estimated regression results was attributed to non-market factors of which investors' sentiment is a major part. The Bandopadhayaya equation is shown in equation (3.9);

$$SP_{500t} = \theta_0 + \theta_1 SP_{500t-1} + \ell_t \text{ …….. (3.9)}$$

Rewriting equation (3.9) to derive equation (3.10)

$$\ell_t = (SP_{500t}) - \theta_0 - \theta_1 (SP_{500t-1}) \text{ …. (3.10)}$$

Where SP_{500t} and SP_{500t-1} represent current and lagged composite securities price indexes respectively. The estimated error term ℓ_t is therefore the proxy for investors' sentiment i.e. $Sent = \ell_t$. While the Bandopadhayaya sentiment series is seen to be a robust measure of Investors' sentiment, a PCA approach would provide better results since it incorporate other vital time series variables such as trading volume and new issues or IPOs.

$$\frac{dresd_t}{dSpR_t} > 0 \qquad \text{……..(3.11)}$$

On the basis of apriori expectation, we expect the Bandopadhayaya sentiment series to be positively related to stock returns.

(B) Inflation Rate (Infl) is measured as the percentage change in consumer price index. In estimating or predicting equity price returns, financial economists have argued that financial asset prices are more sensitive to expected inflation rate and not actual inflation rate. In estimating expected inflation rate, Fama (1981) used yield to maturity on short-term treasury bill (Rf) which is related to monetary policy forces through expected inflation;

$$Rf = \hat{r} + \pi^e \quad \text{…….. (3.12)}$$

Where π^e is the expected rate of inflation, Rf is the yield to maturity of treasury bills and the constant expected real returns on treasury bills (Null hypothesis) is represented by $\hat{r}$.

Rewriting equation (3.12) to derive equation (3.13)

$$\pi^e = Rf - \hat{r} \quad \text{……. (3.13)}$$

Fama and Schwert (1977) and Fama and Gibbons (1984) used the estimated expected inflation rate π^e to estimate unexpected inflation rate.

A more popular and standard framework for estimating expected inflation is the fishers hypotheses (Mankiw 1997).

$$R = i - \pi^e \quad \text{..... (3.14)}$$

Where R is the real interest rate, i is the nominal interest rate and π^e is the expected inflation. The real interest rate(R) is computed by dividing nominal interest rate (i) by Consumer price index. Equation (3.14) can be re-written as; $\pi^e = i - R$. See Cozier and Rahman(1988). The study will use expected inflation rather than actual inflation rate as stock returns are more sensitive to expected inflation rate as represented in equation (3.15).

$$\frac{dInfl_t}{dSpR_t} > 0 \quad \text{.....(3.15)}$$

On the basis of apriori expectation, we expect the expected inflation rate to be positively related to stock returns.

(C) Interest Rate (INTR) is the bank prime lending rate. It is regarded as the minimum lending rate. The rate of returns on long term financial asset is a major determinant of stock price variations and it is often proxied by long term interest rate. There is also a clear evidence that interest rate depresses corporate profitability and leads to an increase in the discount rate applied by equity investors', both of which have an adverse impact on stock prices. The long term interest rate or returns on capital market instruments are usually not available but are proxied by interest rate on treasury certificates, treasury bonds or interest of over 12 months (Bursar, 2009). The justification is that investors' react more to changes in lending rate than other rates. This is so because it is more attractive to lend money with guaranteed interest than put the same money as investment into stock.

$$\frac{dIntr_t}{dSpR_t} < 0 \qquad \text{……..(3.16)}$$

On the basis of apriori expectation, we expect the interest rate to be negatively related to stock returns.

(D) Exchange Rate (Exrt) is measured by naira to US dollar rate. The justification for exchange rate in our model is based on the Mundell- Flemming theory. In Mundell-Flemining model, fiscal policy (IS-Curve) and monetary policy (LM-curve) were assumed to be the instrument to push output to influence stock market prices under floating and fixed exchange rate system. The below are summaries of IS and LM curve;

$$Y = C(\mathrm{Y}-\mathrm{T}) + I(r) + G + NX(e) \text{ …….. } (3.17)$$

$$M / P = L(r, Y) \text{ …….. } (3.18)$$

Source: Mankiw (1992)

Where Y=output, T= Tax, I=investment, G=government expenditure;

NX= next export, e=exchange rate, M/P=real money supply and r= interest rate.

As deduced from the Mundell-Fleming Model, in an open economy, fiscal policy will be ineffective in changing output in a floating exchange rate system while fiscal policy becomes very effective in pushing output in a fixed exchange rate regime. In the case of monetary policy, floating exchange rate will be very effective in pushing output while it would become ineffective under fixed exchange rate. In this study we expect exchange rate either under floating or fixed exchange regime to directly influence net export and output and indirectly

impact on stock returns. This means that a decrease in exchange rate will increase net export, output and also stock prices. We therefore express the sensitivity of stock returns to exchange rate as (3.19):

$$\frac{dExrt_t}{dSpR_t} \prec 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.19)$$

(E) DUM is the dummy variable introduced to account for the bull and bear market cycle effect on stock returns and the changing effect of investors' sentiment on stock returns. The Bull market cycle dummy variable assign the value of "1" to represent bull market trend dominance (i.e where the quarterly average daily all share price returns is greater than 20%) and "0" for otherwise. In the case of bear market cycle, the dummy variable assigned the value of "1" to represent bear market trend dominance (i.e where the quarterly average daily all share price returns is less than 20%) and "0" for otherwise. The use of 20% rule was adopted from the work of Kurov (2013) and Chen (2007) in their study of bull and bear markets regimes.

3.5 Data Collection

The nature of this study necessitated the use of secondary data. This research uses time series data and it covered a period of 30 years (1985Q1-2014Q4).This period is adopted because of the non-availability of data on all share price index before 1985. The All share price index was first published in the Nigerian stock market in 1985 since 1984 value was a base year (100). Specifically, all share price index, trading volume, new issues or IPOs and other variables that were used in computing investors' sentiment were sourced from Nigeria Securities and Exchange Commission (SEC) and Nigerian Stock exchange (NSE) Statistical reports and

bulletins. In the case of inflation rate, interest rate and Exchange rate data, both variables were sourced from Central bank of Nigeria (CBN) quarterly statistical bulletin.

3.6 Data Analysis Techniques

In testing all our formulated hypotheses in chapter one, the Error Correction Regression Analysis (ECM) was adopted. This was complemented with descriptive statistics and other diagnostic test such as correlation matrix, unit root test and single equation co-integration test. The stationarity properties of the time series data used was tested with the Dickey fuller (DF) and Augmented Dickey Fuller (ADF) unit root test. This is because the use of non-stationary time series data in OLS regression model especially at levels is often subjected to spurious regression. The Unit root equation is expressed as follows;

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t, \quad \ldots\ldots(3.20)$$

Source: Gujarati (2009)

Where α is a constant, β the coefficient on a time trend and p the lag order of the autoregressive process. Imposing the constraints $\alpha = 0$ and $\beta = 0$ corresponds to modeling a random walk and using the constraint $\beta = 0$ corresponds to modeling a random walk with a drift. By including lags of the order *p* the ADF formulation allows for higher-order autoregressive processes. This means that the lag length *p* has to be determined when applying the test. One possible approach is to test down from high orders and examine the *t*-values on coefficients. An alternative approach is to examine information criteria such as the Akaike

information criterion, Bayesian information criterion or the Hannan–Quinn information criterion.

The unit root test is then carried out under the null hypothesis $\gamma = 0$ against the alternative hypothesis of $\gamma < 0.$

$$DF_\tau = \frac{\hat{\gamma}}{SE(\hat{\gamma})} \quad \text{.....(3.21)}$$

Source: Gujarati (2009)

Once a value for the test statistic is computed it can be compared to the relevant critical value for the Dickey–Fuller Test. If the test statistic is less (this test is non-symmetrical so we do not consider an absolute value) than the (larger negative) critical value, then the null hypothesis of $\gamma = 0$ is rejected and no unit root is present.

In addition, after the unit root test, a second test known as the co-integration test will be conducted. The use of co-integration test will be to examine the stable long run relationship between the dependent and independent variables before running the Error Correction Model (ECM) regression analysis. The co-integration test is a required pre-requisite for conducting ECM regression analysis and the test is conducted using the Granger and Engle two stage techniques. The equation for the Engle-Granger two-step method is expressed as;

$$y_t - \beta x_t = u_t \quad \text{.....(3.22)}$$

Source: Gujarati (2009)

Where u_t is stationary. If two time series x_t and y_t are cointegrated, a linear combination of them must be stationary. In other words, if we knewu_t, we could just test it for stationarity with something like a Dickey–Fuller test or Phillips–Perron test. But because we don't knowu_t, we must estimate this first, generally by using ordinary least squares, and then run our stationarity test on the estimated u_t series.

In examining the dynamic short-run behaviour of the variables and how the disequilibrium between the short and long run is adjusted for, the Error Correction Model (ECM) was used while the relationship in these variables over a long term was also estimated. The Error Correction Model is often used to examine the short and long run relationship between the dependent variable and the independent variables. According to Granger(1988) and Miller and Russell (1990), there are two potential sources of causation in the dependent variable and these are the first difference of the independent variables (short run) in an Error Correction Model and the ecm(-1) coefficient which measures the long run causal relations.

3.6.1 Estimation Techniques Analysis

This study adopted the Error Correction Model as suggested by Gujarati (2009) in examining the long-run and short-run dynamic relationship in equation (3.20) and (3.21). This includes the error correction coefficient (β) and short run coefficient (δ) which measures the long-run and short-run relationship between the dependent variable and the independent variables. This therefore necessitates the need to re-specify both equation (3.20) and (3.21) in an error correction model form as;

Model I: Dynamic Bull Market Cycle Model

$$\Delta SpR_t = \partial_0 + \partial_1 \sum_{ti=0}^{n} \Delta SpR_{t-i} + \partial_2 \sum_{ti=0}^{n} \Delta SentPCA_{t-i} + \partial_3 \sum_{ti=0}^{n} \Delta Infl_{t-i} + \partial_4 \sum_{ti=0}^{n} \Delta Intr_{t-1} + \partial_5 \sum_{ti=0}^{n} \Delta Exrt_{t-1} + \partial_5 DUM_{Bear=0}^{Bull=1} + \beta_1 ecm(-1)_t + \varepsilon_t$$

…… (3.23)

The apriori expectations are;

$\partial_1 > 0,\ \partial_2 > 0,\ \partial_3 > 0,\ \partial_4 >$ or < 0 while $0 \leq \beta \geq 1$.

Model II: Dynamic Bear Market Cycle Model

$$\Delta SpR_t = \partial_0 + \partial_1 \sum_{ti=0}^{n} \Delta SpR_{t-i} + \partial_2 \sum_{ti=0}^{n} \Delta SentPCA_{t-i} + \partial_3 \sum_{ti=0}^{n} \Delta Infl_{t-i} + \partial_4 \sum_{ti=0}^{n} \Delta Intr_{t-1} + \partial_5 \sum_{ti=0}^{n} \Delta Exrt_{t-1} + \partial_5 DUM_{Bear=1}^{Bull=0} + \beta_1 ecm(-1)_t + \varepsilon_t$$

……..(3.24)

The apriori expectations are;

$\partial_1 > 0,\ \partial_2 > 0,\ \partial_3 > 0,\ \partial_4 >$ or < 0 while $0 \leq \beta \geq 1$.

Where;

Δ***SpR*** is the short run All share price returns, measured by taking the first difference of the changes in all share price index. This represents the historical quarterly returns series between 1985Q1-2014Q4 in Nigeria

Δ***SentPCA*** is the short run Investors' Sentiment, measured by taking the first difference of the Principal Component Analysis (PCA) scores of investors' sentiment time series. The factor loads in the PCA are New Issues or IPOs, Trading Volume and the Bandopadhyaya's sentiment. This represents the historical quarterly time series of these variables between 1985Q1-2014Q4 in Nigeria.

Δ***INFL*** is the short run Expected Inflation rate, measured by taking the first difference of expected inflation rate. This is computed from the historical quarterly inflation rate series between 1985Q1-2014Q4 in Nigeria.

Δ***INTR*** is the short run Interest rates, measured by taking the first difference of interest rate. This represents the historical quarterly interest rate series between 1985Q1-2014Q4 in Nigeria.

Δ***EXRT*** is the short run exchange rates, measured by taking the first difference of exchange rate. This represents the historical quarterly exchange rate series between 1985Q1-2014Q4 in Nigeria.

DUM is the dummy variable introduced to account for the bull and bear market cycle effect on stock returns and the changing effect of investors' sentiment on stock returns. The Bull market cycle dummy variable assigned the value of "1" to represent bull market trend dominance (i.e where the quarterly average daily all share price returns is greater than 20%) and "0" for otherwise. In the case of bear market cycle, the dummy variable assigns the value of "1" to represent bear market trend dominance (i.e. where the quarterly average daily all share price returns is less than 20%) and "0" for otherwise.

ECM is the error correction term from the long run regression model. While the short run effects are captured through the individual coefficients of the first difference terms. The coefficient of the *ECM* variable contains long run information lost due to existence of non-stationarity. The size and statistical significance of the coefficient on the error correction

term measures the tendency of each level variable to return to the equilibrium. A significant coefficient implies that past equilibrium errors play a role in determining the current outcomes. The coefficient of the *ECM* (-1) therefore captures the long-run impact.

3.7 Justification of Data Analysis Method

The methodology of this study was based on the use of an advanced econometric model known as Error Correction Model (ECM) regression analysis. The ECM time series method allow us to analyse how short and long run sentiments, interest and inflation rate variables would impact on stock returns in Nigeria capital market. The choice of this methodology is based on the following fundamental justifications (1) the data are time series and are likely to face unit root problems (2) our models are single equations rather than system equations, which requires the use of Vector Autoregressive (VAR) or Vector Error Correction Model (VECM) (2) to avoid spurious regression results that are often associated with the use of Ordinary Least Square (OLS) for non-stationary time series data. (3) The Error Correction Model allow us to connects the short run and the long-run behaviour of the dependent and independent variables over the period of study and (4) the ECM regression framework also allows us to find a parsimonious model for explaining the systematic variations in stock returns in Nigeria based on investors' sentiments.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESULTS

4.1 Introduction

In this study, we examined the effect of investors' sentiment on stock market return in Nigeria. The dependent variable was proxy by Stock Market Returns (SPR) while the explanatory variables were investors' sentiment (SentPCA), interest rate(INTR), inflation rate (INFL) and exchange rate (EXRT), while bull events (positive market returns) and bear market event (negative market returns) where used as moderating variables to investors' sentiment.

In an estimation of the model, econometric estimation techniques were adopted. The estimation starts with the computation of descriptive statistics, Pearson correlation coefficient of the variables. This was used to test for the presence of multicolinearity among the explanatory variables. The Unit root and co-integration test were also used. The unit root test provides information on the stationarity properties of the variables and this was conducted using the Augmented Dickey Fuller (ADF) test. In the case of co-integration test, the Engel and Granger two stage techniques was adopted. The co-integration test provides information on the existence of long-run stable relationship between the dependent and explanatory variables. These tests formed the basis for the short run dynamic error correction model. In carrying out this econometric estimation process, EViews 8 software was adopted. The next sub-section shows the presentation and interpretation of the estimated results obtained as shown in the following tables.

4.2 **Descriptive Statistics**

The descriptive statistics show the description of the mean, standard deviation and normality test. Below is the descriptive statistics of the variables under the period of 1985Q1 to 2014Q4.

Table 4.1: Descriptive statistics

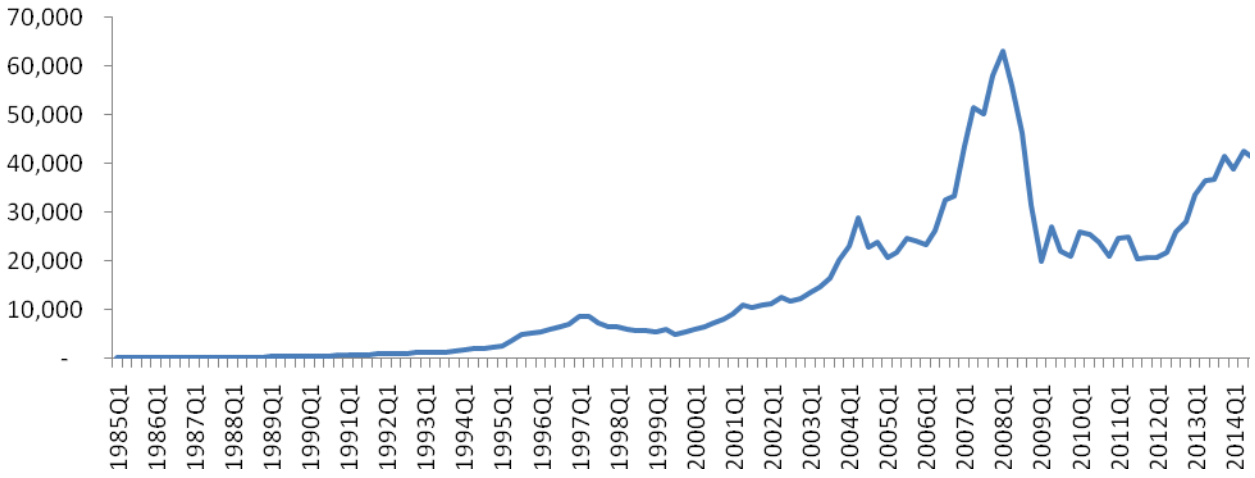
Variables	Mean	Standard Dev	Jarque-Bera	Observation
SPR	0.056	0.12	10.173(0.0)	120
SENTPCA	-0.00058	0.126	9.654(0.0)	120
INFL	8.128	7.141	9.414(0.0)	120
INTR	20.471	4.657	9.813(0.0)	120
EXRT	77.01	61.95	15.857(0.0)	120

Source: Generated by the Researcher from the CBN, SEC & NSE (2015)

The historically average Stock Market Returns (SPR) was 0.056 and a standard deviation of 0.12. The high standard deviation of stock market returns when compared to the mean shows that there has been stock market uncertainty in Nigeria over the period of study. The historically average level of investors' sentiment (SENTPCA) was -0.00058 and a standard deviation of 0.126. The high standard deviation of the level of investors' sentiment when compared to the mean shows that there has been presence of variation in investors' behaviour/sentiment in Nigeria (see Amedu, (2010) & Oyetan, 2013)). Exchange rate (EXRT) had an average value of N77.01 and the standard deviation was 61.95. This means that the period under study was also characterized by exchange rate variations. In the case of interest rate (INTR), it historical average was 20.4% for over the period of 1985Q1 to 2014Q4. This high interest rate has been a major concern for users of borrowed funds in Nigeria. The standard deviation of 4.657 shows that there is low variation in the high interest rate. Inflation rate (INFL) had an average value of 8.12% over the periods. The standard deviation (7.14) shows that there was dispersion in the variables over the period of study.

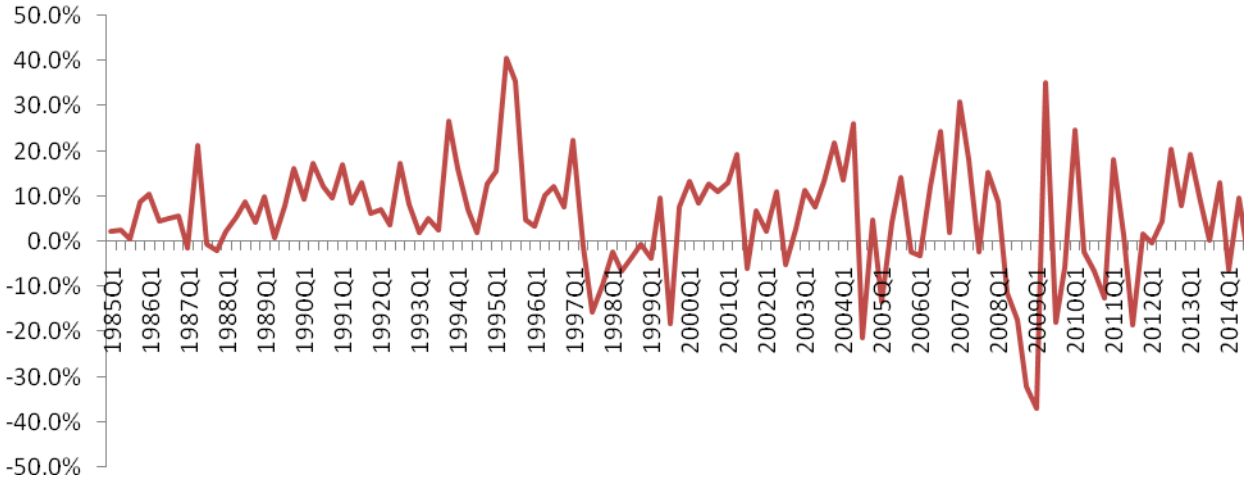
Added to the above, Jarque-Bera statistics shows that the variables were not normally distributed at 1% since all the variables JB probability value were less than 0.05. This non-normality problem is often common with volatile variables such as stock return data. This means that the normality assumption that is required for regression analysis that needs the intercept is not met but since this study does not require the interpretation of intercept we ignore the normality assumption as suggested by Gujirati (2009). The historical graphical representations of our variables are shown as follows;

Figure 4.1: Nigeria All Share price Index



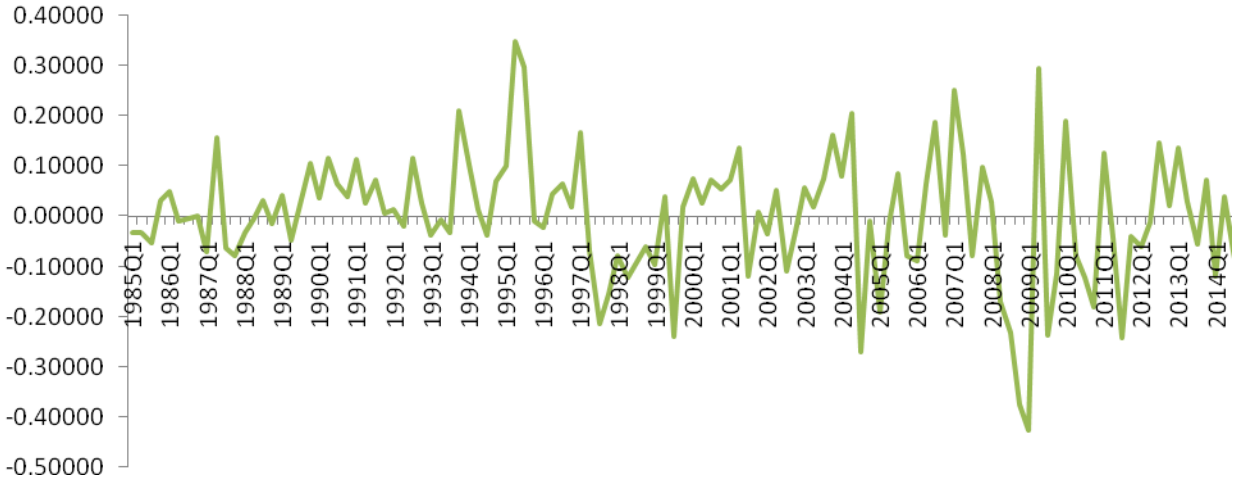
Source: Generated by the Researcher from the CBN, SEC & NSE (2015)

Figure 4.2: Nigeria All share price index returns



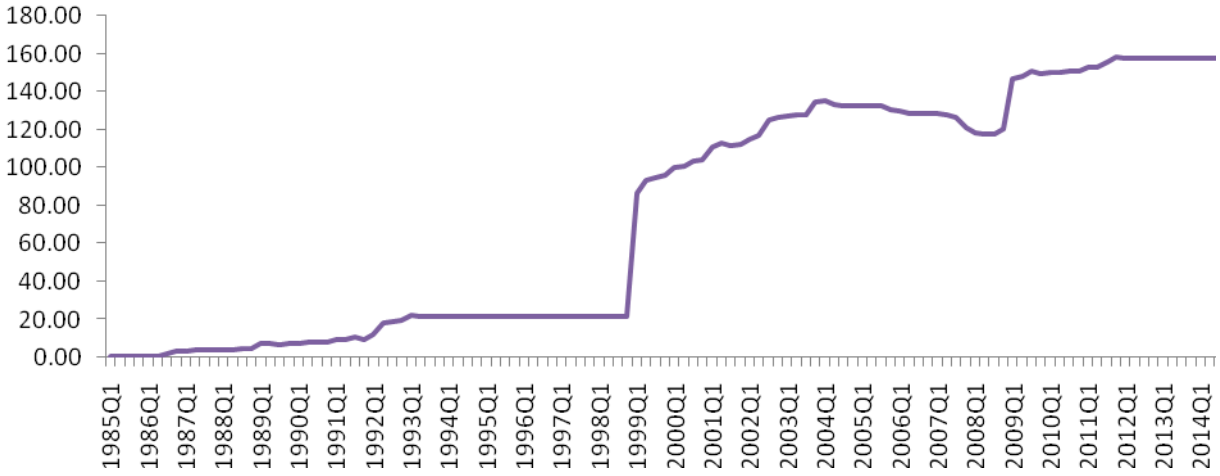
Source: Generated by the Researcher from the CBN, SEC & NSE (2015)

Figure 4.3: Investors Sentiment Index



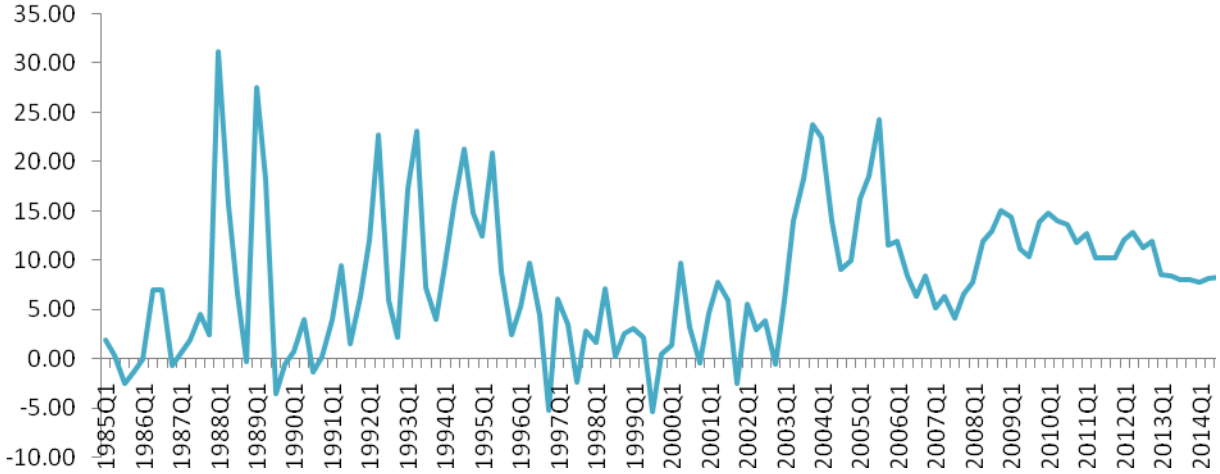
Source: Generated by the Researcher from the CBN, SEC & NSE (2015)

Figure 4.4: US Dollar to Naira Exchange Rate



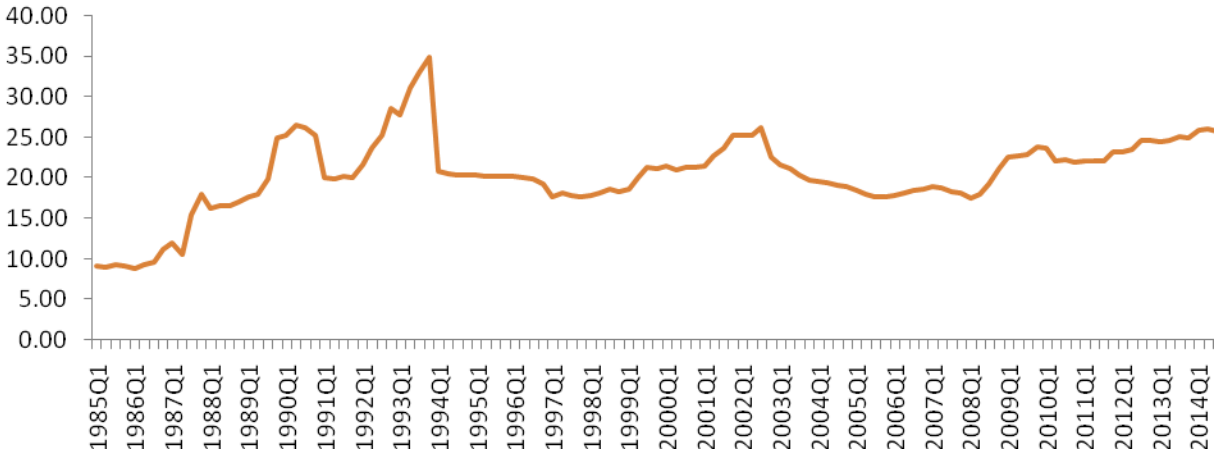
Source: Generated by the Researcher from the CBN, SEC & NSE (2015)

Figure 4.5: Inflation Rate



Source: Generated by the Researcher from the CBN, SEC & NSE (2015)

Figure 4.6: Interest Rate



Source: Generated by the Researcher from the CBN, SEC & NSE (2015)

A look at the graphs show that the variables are dynamic especially all share price index returns and investors' sentiment index. This therefore means a time series dynamic model will be more appropriate to study the relationship among our variables. The graphs also show that unit root and co-integration test will also be needed to test for stationarity and long run equilibrium relationship.

4.3 Correlation Matrix

Correlation measures the degree of linear association among the variables. In most regression analysis study, correlation matrix is often used to test for the existence of multicolinearity, which is the existence of high correlation in any two explanatory variables. Table 4.2 below; provides the obtained Pearson correlation coefficients results;

Table 4.2: Correlation Matrix

	SPR	SENTPCA	EXRT	INFL	INTR	BULL	BEAR
SPR	1.00						
SENTPCA	0.99	1.00					
EXRT	0.13	0.13	1.00				
INFL	0.02	0.03	0.26	1.00			

INTR	0.07	0.08	0.33	0.14	1.00		
BULL	0.73	0.72	-0.21	0.05	0.04	1.00	
BEAR	-0.73	-0.72	0.21	-0.05	-0.04	1.00	1.00

Source: Generated by the Researcher using e-views 8 version (2015)

The result in table 4.2 shows that bull market dummy variable was associated with positive returns (0.73) while the bear market dummy variable was associated with negative returns (-0.73). This result clearly shows that our data representing bull and bear cycle were properly assigned. Table 4.2 also shows that Stock Market Returns (SPR) has weak positive correlation relationship with Inflation rate (INFL = 0.02) and a weak positive association with interest rate (INTR =0.07). A close look at the value of the correlation coefficient results revealed that Stock Market Returns (SPR) had a relatively higher positive associated with exchange rate(EXRT= 0.13). This means that stock market investors' in Nigeria are more likely to respond to exchange rate variations than to interest rate and inflation rate. The table 4.2 also shows that Stock Market Returns (SPR) has high positive correlation with the level of investors' sentiment (SENTPCA =0.99). This means that market sentiment/psychology is highly associated with stock market returns.

In addition to the above, a close look at the value of the correlation coefficient results for all the explanatory variables revealed that none of the variable was more than 70% correlated. This therefore provides evidence that the use of exchange rate, inflation rate, interest rate and investors' sentiment as explanatory variables in our model is not subjected to the problem of multicolinearity.

4.4Test of Mean Difference

In testing our first hypotheses in this study, we used the Z-test. The test is used to find out the existence of significant difference in two samples which were bull and bear sample. Table 4.3 below; provides the obtained Z-test results;

Table4.3: Test of Significant Difference in Bull and Bear Cycles

	BEAR	*BULL*
Mean	-0.15	0.06
Known Variance	0.01	0.01
Observations	33.00	87.00
Hypothesized Mean Difference	0.00	
Z	-11.10	
z Critical one-tail	1.64	
P(Z<=z) two-tail	0.00	
z Critical two-tail	1.96	

Source: Generated by the Researcher using e-views 8 version (2015)

The results above show that the mean investor's sentiment index was -0.15 and 0.06 for bear and bull stock market cycle sample periods respectively. The Z-value was -11.10 while the Z-probability value was 0.00. This therefore means that at 5% level of significance, we found out that investors' sentiment differ significantly in bull and bear stock market cycle in Nigeria. ***This suggests that we should reject hypotheses one (H1) and also confirm the need for the study of investors' sentiment bebaviour under bull and bear market cycle in Nigeria.***

4.5 Unit Root Test

Unit root test in this study is used to investigate whether or not Stock Market Returns (SPR), investors' sentiment (SentPCA), interest rate(INTR), inflation rate (INFL) and exchange rate (EXRT) time series are stationary and to find out their order of integration. Table 4.4 and 4.5 below show results for the unit root test for the variables at levels and first-difference using Augmented Dickey-fuller (ADF) test.

Table 4.4: Augmented Dickey-Fuller Unit Root Test at Level

	Variable	ADF Statistics	ADF (95%)	Order of Integration	Remark
Level	SPR	-8.819	-2.885	I(0)	Stationarity
	SENTPCA	-8.819	-2.885	I(0)	Stationarity
	EXRT	-0.264	-2.885	I(0)	Non-Stationarity
	INFL	-3.493	-2.886	I(0)	Stationarity
	INTR	-2.724	-2.885	I(0)	Non-Stationarity

Source: Generated by the Researcher using e-views 8 version (2015)

The empirical findings from the table above reveal that stock market returns (SPR), investors' sentiment (SentPCA) and inflation rate (INFL) were stationary at level. While interest rate (INTR) and exchange rate (EXRT) were not stationary at level. This therefore means that using the OLS regression techniques at levels in estimating our formulated model would lead to spurious regression results since some of the variables were not stationary at level.

In order to resolve this problem, the first differences of the variables were taken and they were subjected to ADF Unit root test. Table 4.5, shows the results of the Unit root test at first difference using ADF test.

Table 4.5: Augmented Dickey-Fuller Unit Root Test at First Difference

	Variable	ADF Statistics	ADF (95%)	Order of Integration	Remark
First Difference	ΔSPR	-13.157	-2.886	I(1)	Stationarity
	ΔSENTPCA	-13.157	-2.886	I(1)	Stationarity
	ΔEXRT	-9.714	-2.886	I(1)	Stationarity
	ΔINFL	-11.972	-2.886	I(1)	Stationarity
	ΔINTR	-10.178	-2.886	I(1)	Stationarity

Source: Generated by the Researcher using e-views 8 version (2015)

The empirical findings from the table 4.5above reveal that Stock Market Returns (ΔSPR), investors' sentiment (ΔSentPCA), inflation rate (ΔINFL), interest rate (ΔINTR) and

exchange rate (ΔEXRT) were stationary at first difference. This therefore means that using the OLS regression techniques at levels in estimating our formulated model would lead to spurious regression results since some of the variables were not stationary at level. This in other words means that after taking the first-difference of the variables and testing for their stationarity property, they all became stationary. Thus, the best regression results were obtained when the first differences of the variables were used to estimate the model. The results also show that the variables are all integrated of order one.

4.6 Co-Integration Test

Co-integration among times series suggests that series may behave in a different way in the short run but that they will converge toward a common behaviour in the long run. According to Engle and Granger (1987), sets of series are co-integrated when their residual is stationary. The obtained residual which is often used to proxy the error correction representation (ECM) was therefore subjected to unit root test using the Dickey-fuller (DF) and Augmented Dickey Fuller (ADF) tests. The Engle-Granger two stages framework suggested that the stationarity of the residual from a regression result implies the existence of a long run stable relationship between the dependent and independent variables. Table 4.6, shows the co-integration test for the model adopted in this study.

Table 4.6 Co-integration Test

	Variable	ADF Statistics	ADF (95%)	Order of Integration	Remark
Level	ECM	-11.427	-2.886	I(0)	Stationarity

Source: Generated by the Researcher using e-views 8 version (2015)

The results from table 4.6, shows that the absolute value of the ADF statistic (-11.427) was greater than the absolute value of the ADF critical value at 5 % level of significance (-2.886). This implies that the dependent variable and independent variables are co-integrated. This in other words means that between 1985Q1-2014Q4 periods, there was a long run stable relationship among Stock Market Returns (SPR), investors' sentiment (SentPCA), interest rate(INTR), inflation rate (INFL) and exchange rate (EXRT) in Nigeria such that any divergence in their behaviour in the short run will converge in the long run. Engel et al (1987) postulated that any co-integrated series has an error correction representation. Therefore, the existence of co-integration in our model necessitates the formulation of the error correction model. The Error Correction Model when estimated represents the short run dynamics of the model. The existence of co-integration among the variables justified the use of Error Correction Model in this study.

4.7 Error Correction Model (ECM)

In order to explain the short-run deviations that might have occurred in the estimating the long-run co-integrated equation and to test our formulated hypotheses, three dynamic Error Correction Models were estimated. The first model was based on using time series data that cover both bull and bear market cycle, the second model examined how bull market dummy variable can be used as a moderating variable with investors' sentiment to explaining stock returns in Nigeria while the third model investigates how bear market dummy variable can be used as a moderating variable with investors' sentiment to explaining stock returns in Nigeria. The results from all the three models are presented and discussed as follows;

4.7.1 Model 1

Model 1 in this study investigates the influence of investors' sentiment (SentPCA) on stock market returns (SPR) in Nigeria without moderating for bull and bear market cycle. It also examines other controlled variables such interest rate (INTR), inflation rate (INFL) and exchange rate (EXRT). The result is presented in table 4.7 below;

Table 4.7: Error Correction Model 1

	ECM Overparametrized	ECM Parsimonious
C	-0.01	**-0.007**
	(-0.830)	**(-0.595)**
	[0.408]	**[0.553]**
ΔSPR (-1)	-1.428	**-2.17**
	(-0.856)	**(-1.628)**
	[0.394]	**[0.10]*** **
ΔSPR(-2)	1.506	-
	-0.777	-
	[0.438]	-
ΔSPR(-3)	0.44	-
	-0.254	-
	[0.799]	-
ΔSENTPCA(-1)	0.84	**1.555**
	-0.505	**-1.164**
	[0.614]	**[0.246]**
ΔSENTPCA(-2)	-1.899	**-0.381**
	(-0.986)	**(-3.633)**
	[0.326]	**[0.000]***
ΔSENTPCA(-3)	-0.487	**-0.048**
	(-0.282)	**(-0.523)**
	[0.778]	**[0.601]**
ΔINTR(-1)	0.001	**0.002**
	-0.143	**-0.397**
	[0.885]	**[0.691]**
ΔINTR(-2)	0.012	**0.012**
	-1.713	**-1.78**
	[0.089]* **	**[0.077]* **
ΔINTR(-3)	0	-
	-0.081	-
	[0.935]	-
ΔINFL(-1)	0.001	**0**
	-0.566	**-0.072**
	[0.572]	**[0.942]**
ΔINFL(-2)	0	-
	-0.466	-
	[0.641]	-
ΔINFL(-3)	0.001	-
	-0.759	-
	[0.449]	-
ΔEXRT(-1)	0.005	**0.005**
	-2.75	**-2.751**
	[0.007]**	**[0.007]** **
ΔEXRT(-2)	-0.003	**-0.002**
	(-1.675)	**(-1.453)**
	[0.097]* **	**[0.149]**
ΔEXRT(-3)	0.002	-
	-1.419	-
	[0.159]	-
ecm(-1)	0.485	**0.57**
	-0.244	**-0.293**
	[0.0807]* **	**[0.0469]** **
R-Squared	0.42	**0.4**
Adj R-Squared	0.32	**0.34**
F-Statistic	4.497(0.00)	**7.051(0.00)**
D-W statistic	2.07	**1.95**
N	116	**116**

Source: Generated by the Researcher using e-views 8 version (2015)

The results of the overparamerized and parsimonious ECM are presented in Table 4.7, we often interprete the parsimonious ECM results. The results obtained from model 1, revealed

that the adjusted R-squared value of 0.34 shows that 34% of the systematic variation in the dependent is jointly explained by the independent variables in the parsimonious ECM model. This clearly shows that about 68% of the systematic variation in stock returns was not explained by the independent variables in model 1. This indicates that more research that would investigate other variables that are outside the variables in this study needs to be conducted to improve the adjusted R-squared. The F-statistics value of 7.051 and its associated p-value 0.00 show that the model overall is statistically significant. This means that there exists a significant linear relationship between the dependent and independent variables in model 1.

Added to the aforementioned, the below provide a specific discussion on each variables;

Investors' sentiment (SENTPCA), which is the major explanatory variable in this study had three lags, which areSENTPCA (-1), SENTPCA (-2) and SENTPCA (-3)**.** Among the three lag variables on investors' sentiment dynamics, it was only the three periods lag investors' sentiment (SENTPCA (-1)) that had a significant effect on Stock Market Returns**.** The variable had a negative (-1.555) on stock market returns which is not significant at 1% level (P-value=0.246). This indicates that investors' sentiment or panic selling or trading that are not backed by fundamental often significantly and negatively impact on stock market returns in Nigeria,investors' sentiment (SENTPCA (-2)) had a significant effect on Stock Market Returns**.** The variable had a negative (-0.381) on stock market returns which is not significant at 1% level (P-value=0.000). This indicates that investors' sentiment or panic selling or trading that are not backed by fundamental often significantly and negatively impact on stock market returns in Nigeria,investors' sentiment (SENTPCA (-3)) that had a

significant effect on Stock Market Returns**.** The variable had a negative (-0.048) on stock market returns which is not significant at 1% level (P-value=0.601). This indicates that investors' sentiment or panic selling or trading that are not backed by fundamental often significantly and negatively impact on stock market returns in Nigeria. ***This suggests that we should reject the null hypotheses (H4) which state that there is no significant relationship between investors' sentiment and stock returns under both bear and bull market cycle.*** This finding confirms the contributions of Delong, Shleifer, Summers and Waldman (1990), Miller (1977), Black (1986), Baker and Wurgler (2004) and Shleifer and Vashny(1997) that investors' sentiment is a major factor that causes movement in stock prices.

In the case of the controlled variables, Interest Rate (INTR) which is part of the explanatory variable in this study had two lags in the parsimonious ECM model, which areINTR (-1) and INTR (-2). The second lag period interest rate (INTR(-1)) had a positive (0.002) and significant (p-value = 0.691) impact on stock market returns. This therefore means that increase in interest rate would significantly increase stock market returns. The second lag period interest rate (INTR(-2)) had a positive (0.012) and significant (p-value = 0.077) impact on stock market returns. This therefore means that increase in interest rate would significantly increase stock market returns.

Inflation rate (INFR) which is part of the explanatory variable in this study had one lag in the parsimonious ECM model, which areINFL (-1). The one lag period inflation rate (INFL(-1)) had a positive (0.000) and insignificant (p-value= 0.942) impact on stock market

returns. This therefore means that increase in inflation rate would not significantly affect stock market returns dynamics in Nigeria.

Exchange rate (INTR) which is part of the explanatory variable in this study had two lags in the parsimonious ECM model, which areEXRT (-1) and EXRT(-2). The one lag period Exchange rate (EXRT(-1)) had a positive (0.005) and significant (p-value = 0.007) impact on stock market returns in Nigeria. This therefore means that changes in exchange rate would significantly affect stock market returns dynamics in Nigeria. The second period exchange rate (EXRT(-2)) was found to have a negative (-0.002) and statistically significant (p-value = 0.073). This means that exchange rate disturbance has a short delay impact on Nigerian capital market.

The Error Correction Model (ECM (-1)) coefficient of 0.570 confirms that positive disequillium exists in Nigeria stock market but the (p-value = 0.0469) shows that this disequllium is statistically significant. The high value of ecm (-1) is based on the fact that the dependent variable (stock market returns changes) is highly volatile. This result also clearly shows that short-run deviation in stock market returns is quickly adjusted to equilibrium in the long-run. Also, we found that the Durbin-Watson value for model 1 was 1.95 which indicates that there is an absence of autocorrelation in the model.

4.7.2 Model 2

Model 2 in this study investigates the effect of investors' sentiment (SentPCA) on stock market returns (SPR) in Nigeria with moderating for bull market cycle. It also examines other controlled variables such interest rate (INTR), inflation rate (INFL) and exchange rate (EXRT). The result is presented in table 4.8 below;

Table 4.8: Error Correction Model 2- BULL Cycle

	ECM Overparametrized	**ECM Parsimonious**
C	-0.009	**-0.008**
	(-0.739)	**(-0.673)**
	[0.461]	**[0.501]**
ΔSPR (-1)	-0.507	**-0.404**
	(-3.111)	**(-3.546)**
	[0.002]	**[0.501]**
ΔSPR(-2)	-0.244	-
	-1.502	-
	[0.136]	-
ΔSPR(-3)	0.092	-
	-0.176	-
	[0.603]	-
ΔSENTPCA(-1)*BULL	-0.127	**-0.253**
	(-0.615)	**(-1.506)**
	[0.539]	**[0.135]**
ΔSENTPCA(-2)*BULL	-0.295	**-0.533**
	-0.219	**(-3.514)**
	[0.180]	**[0.000]**
ΔSENTPCA(-3)*BULL	-0.23	**-0.137**
	(-1.091)	**(-1.157)**
	[0.277]	**[0.249]**
ΔINTR(-1)	0	**0.002**
	-0.089	**-0.351**
	[0.928]	**[0.725]**
ΔINTR(-2)	0.012	**0.011**
	-1.786	**-1.71**
	[0.077]	**[0.090]**
ΔINTR(-3)	0	-
	-0.08	-
	[0.935]	-
ΔINFL(-1)	0.001	**0**
	-0.552	**-0.045**
	[0.582]	**[0.964]**
ΔINFL(-2)	0	-
	-0.346	-
	[0.729]	-
ΔINFL(-3)	0.001	-
	-0.777	-
	[0.439]	-
ΔEXRT(-1)	0.005	**0.005**
	-2.736	**-2.738**
	[0.007]	**[0.007]**
ΔEXRT(-2)	-0.003	**-0.003**
	(-1.703)	**(-1.808)**
	[0.091]	**[0.073]**
ΔEXRT(-3)	0.002	-
	-0.002	-
	[0.210]	-
ecm(-1)	0.344	**0.431**
	-0.172	**-0.217**
	[0.086]***	**[0.028]****
R-Squared	0.416	**0.379**
Adj R-Squared	0.322	**0.32**
F-Statistic	4.415(0.00)	**6.420(0.00)**
D-W statistic	2.04	**2**
N	116	**116**

Source: Generated by the Researcher using e-views 8 version (2015)

While the results of the overparamerized and parsimonious ECM are presented in Table 4.8, we often interprete the parsimonious ECM results. The results obtained from model 2, revealed that the adjusted R-squared value of 0.32 shows that 32% of the systematic variation in the dependent variable is jointly explained by the independent variables in the parsimonious ECM model. This clearly shows that about 68% of the systematic variation in stock returns was not explained by the independent variables in model 2. This indicates that more research that would investigate other variables that are outside the variables in this study needs to be conducted to improve the adjusted R-squared. The F-statistics value of 6.42 and its associated p-value 0.00 show that the model overall is statistically significant. This means that there exists a significant linear relationship between the dependent and independent variables in model 2. Added to the aforementioned, the below provide a specific discussion on each variables;

Investors' sentiment (SENTPCA), which is the major explanatory variable in this study had three lags, which areSENTPCA (-1), SENTPCA (-2) and SENTPCA (-3). **Unlike model 1, investor sentiment as used in model 2 is moderated for bull market cycle**. Among the three moderated lag variables on investors' sentiment dynamics, it was only the two periods lag investors' sentiment (SENTPCA (-2)) that had a significant effect on Nigerian Stock Market Returns**.** The variable had a negative (-0.533) on stock market returns which is significant at 1% level (P-value=0.00). This indicates that investors' sentiment or panic selling or trading that are not backed by fundamentals often significantly and negatively impact on stock market returns in Nigeria when moderated for bull market cycle. This finding indicate that most Nigerian equity investors' often react to market

emotions, hearsay and rummor during bull market cycle. They often quickly sell their shares and take profit before panic selling enters the market and bear market trends start.***This finding therefore suggests that we should reject the null hypotheses (H3) which states that there is no significant relationship between investors' sentiment and stock returns when moderated for bull market cycle.***

In the case of the controlled variables, **Interest Rate (INTR)** which is part of the explanatory variable in this study had two lags in the parsimonious ECM model, which areINTR (-1) and INTR (-2). The second lag period interest rate (INTR(-2)) had a positive (0.011) and significant (p-value = 0.09) impact on stock market returns. This therefore means that increase in interest rate would significantly increase stock market returns dynamics. **Inflation rate (INFR)** which is part of the explanatory variable in this study had one lag in the parsimonious ECM model, which areINFL (-1). The one lag period inflation rate (INFL(-1)) had a positive (0.000) and insignificant (p-value= 0.96) impact on stock market returns. This therefore means that increase in inflation rate would not significantly affect stock market returns dynamics in Nigeria. **Exchange rate (INTR)** which is part of the explanatory variable in this study that had two lags in the parsimonious ECM model, which areEXRT (-1) and EXRT(-2). The one lag period Exchange rate (EXRT(-1)) had a positive (0.005) and significant (p-value = 0.007) impact on stock market returns in Nigeria. This therefore means that changes in exchange rate would significantly affect stock market returns dynamics in Nigeria. The second period exchange rate (EXRT(-2)) was found to have a negative impact and statistically significant. This means that exchange rate disturbance in a short delay can negatively impact on Nigerian capital market returns.

The Error Correction Model (ECM (-1)) coefficient of 0.028 confirms that positive disequillium exist in Nigeria stock market but the p-value shows that this disequllium is statistically significant. This result also clearly shows that short-run deviation in stock market returns is adjusted to equilibrium in the long-run. This means that stock returns has a mean reversion property in Nigeria. Also, we found that the Durbin-Watson value for model 2 was 2.00 which indicate that there is absence of autocorrelation in the model.

4.7.3 Model 3

Model 3 in this study investigates the influence of investors' sentiment (SentPCA) on stock market returns (SPR) in Nigeria with moderating for bear market cycle. It also examines other controlled variables such interest rate (INTR), inflation rate (INFL) and exchange rate (EXRT). The result is presented in table 4.9 below;

Table 4.9: Error Correction Model 3- BEAR MARKET

	ECM Overparametrized	**ECM Parsimonious**
C	-0.009	**-0.007**
	(-0.729)	**(-0.575)**
	[0.467]	**[0.566]**
ΔSPR (-1)	-0.64	**-0.631**
	(-5.043)	**(-5.326)**
	[0.000]	**[0.000]**
ΔSPR(-2)	-0.524	**-0.414**
	(-3.408)	**(-3.472)**
	[0.000]	**[0.000]**
ΔSPR(-3)	0.132	-
	-1.107	-
	[0.270]	-
ΔSENTPCA(-1)*BEAR	0.139	**-0.124**
	-0.681	**-0.627**
	[0.497]	**[0.531]**
ΔSENTPCA(-2)*BEAR	-0.268	**0.196**
	-1.235	**-1.007**
	[0.219]	**[0.315]**
ΔSENTPCA(-3)*BEAR	0.227	**0.101**
	-1.078	**-0.577**
	[0.283]	**[0.565]**
ΔINTR(-1)	0	**0.003**
	-0.095	**-0.448**
	[0.924]	**[0.6548]**
ΔINTR(-2)	0.012	**0.013**
	-1.797	**-1.92**
	[0.053]	**[0.057]**
ΔINTR(-3)	0	-
	-0.082	-
	[0.934]	-
ΔINFL(-1)	0.001	**0**
	-0.56	**-0.271**
	[0.576]	**[0.786]**
ΔINFL(-2)	0	-
	-0.351	-
	[0.726]	-
ΔINFL(-3)	0.001	-
	-0.792	-
	[0.430]	-
ΔEXRT(-1)	0.005	**0.005**
	-2.732	**-2.709**
	[0.007]	**[0.007]**
ΔEXRT(-2)	-0.003	**-0.003**
	(-1.728)	**(-1.594)**
	[0.087]	**[0.113]**
ΔEXRT(-3)	0.002	-
	-1.269	-
	[0.207]	-
ecm(-1)	0.347	**0.459**
	-1.998	**-0.233**
	[0.086]***	**[0.048]****
R-Squared	0.414	**0.394**
Adj R-Squared	0.32	**0.33**
F-Statistic	4.384(0.00)	**6.157(0.00)**
D-W statistic	2.04	**1.98**
N	116	**116**

Source: Generated by the Researcher using e-views 8 version (2015)

The results of the overparamerized and parsimonious ECM are presented in Table 4.9, we often interprete the parsimonious ECM results. The results obtained from model 3, revealed

that the adjusted R-squared value of 0.39 shows that 39% of the systematic variation in the dependent is jointly explained by the independent variables in the parsimonious ECM model. This clearly shows that about 61% of the systematic variation in stock returns was not explained by the independent variables in model 3. This indicates that more research that would investigate other variables that are outside the variables in this study needs to be conducted to improve the adjusted R-squared. The F-statistics value of 6.157 and its associated p-value 0.00 shows that the model overall is statistically significant. This means that there exists a significant linear relationship between the dependent and independent variables in model 3. Added to the aforementioned, the below provides a specific discussion on each variables;

Investors' sentiment (SENTPCA), which is the major explanatory variable in this study had three lags, which areSENTPCA (-1), SENTPCA (-2) and SENTPCA (-3). **Unlike model 2, investor sentiment has used in model 3 is moderated for bear market cycle**. In the results of model 3, we discovered that all three moderated lag variables on investors' sentiment dynamics had no significant effect on Stock Market Returns. This indicates that investors' sentiment impact on stock market returns in Nigeria is distorted by bear market. This also mean that bear market generatesinvestors' behaviour that makes it difficult to predict the market in downward trend. This finding can be linked to the argument that during falling prices or bear market cycles investors' tend to ignore all market emotions, hearsay, rummor and future prospective earnings potentials which weaken the relationship between investors' sentiment and stock market returns in Nigeria. ***This finding suggests that we should reject the null hypotheses (H2) which states that there is no significant***

relationship between investors' sentiment and stock returns when moderated for bear market cycle.

In the case of the controlled variables, **Interest Rate (INTR)** which is part of the explanatory variable in this study had two lags in the parsimonious ECM model, which areINTR (-1) and INTR (-2). The First lag period interest rate (INTR(-1)) had a positive (0.003) and significant (p-value = 0.6548) impact on stock market returns. The second lag period interest rate (INTR(-2)) had a positive (0.013) and significant (p-value = 0.057) impact on stock market returns. This therefore means that increase in interest rate would significantly increase stock market returns. **Inflation rate (INFR)** which is part of the explanatory variable in this study had one lag in the parsimonious ECM model, which areINFL (-1). The one lag period inflation rate (INFL(-1)) had a positive (0.000) and insignificant (p-value= 0.786) impact on stock market returns. This therefore means that increase in inflation rate would not significantly affect stock market returns dynamics in Nigeria. **Exchange rate (INTR)** which is part of the explanatory variable in this study had two lags in the parsimonious ECM model, which areEXRT (-1) and EXRT(-2). The one lag period Exchange rate (EXRT(-1)) had a positive (0.005) and significant (p-value = 0.007) impact on stock market returns in Nigeria. This therefore means that changes in exchange rate would significantly affect stock market returns dynamics in Nigeria. The second period exchange rate (EXRT (-2)) was found to be negative (-0.003) and statistically insignificant (p-value = 0.113).The results from model 1, 2 and 3 revealed that exchange rate has an economic fundamental factor that was statistically significant in affecting stock returns in Nigerian stock market. ***This finding therefore suggests that we should reject the null***

hypotheses (H5) which states that there is no significant relationship between economic fundamental factors and stock returns in Nigeria.

The Error Correction Model (ECM (-1)) coefficient of 0.459 confirms that positive disequilibrium exists in Nigeria stock market but the p-value (p-value = 0.048) shows that this disequilibrium is statistically significant and most short-run deviation in Nigerian stock market returns often returnedto equilibrium in the long-run. This confirms that in the short-run, sentiment can drive stock returns and cause disequilibrium but in the long run stock prices often return to their fundamental values. Also, we found that the Durbin-Watson value for model 3 was 1.98 which indicates that there is absence of autocorrelation in the model.

In conclusion, the empirical results from this study reveal that investors' sentiment which is a non-market factor is more important than macroeconomic fundamentals in understanding stock market returns dynamics in Nigeria. This therefore suggests the need for more research into behavioural finance so as to predict stock market returns especially under bull and bear market cycle.

4.8 Summary of Findings

The below is itemized the major summary of findings from our empirical analysis;

1. Investors' sentiment (SENTPCA), which is the major explanatory variable in this study,had a non-significant negative relationship with ***investors' sentiment under both bear and bull market cycle.***This finding confirms the contributions of Delong, Shleifer, Summers and Waldman (1990), Miller (1977), Black (1986), Baker and Wurgler (2004) and Shleifer and Vashny(1997) that investors' sentiment have a negative relationship with stock returns.

This findings was based on both bull and bear market cycle which if studied under different each market cycle can distort the relationship.

Investor sentiment as used in model 2 is moderated for bull market cycle and our results shows that investors' sentiment had a negative and significant effect on Nigerian Stock Market Returns**.** This also indicates that investors' sentiment or panic selling or trading that are not backed by fundamentals often significantly and negatively impact on stock market returns in Nigeria when moderated for bull market cycle. This finding indicate that most Nigerian equity investors' often react to market emotions, hearsay and rummor during bull market cycle. They often quickly sell their shares and take profit before panic selling enters the market and bear market trends start.

Investors' sentiment in the case model 3 is moderated for bear market cycle and we discovered investors' sentiment dynamics had no significant effect on Stock Market Returns. This indicates that investors' sentiment impact on stock market returns in Nigeria is distorted by bear market. This also mean that bear market generates investors' behaviour that makes it difficult to predict the market in downward trend. This finding can be linked to the argument that during falling prices or bear market cycles investors' tend to ignore all market emotions, hearsay, rummor and future prospective earnings potentials which weaken the relationship between investors' sentiment and stock market returns in Nigeria.

2.Interest Rate (INTR) which is part of the explanatory variable in this study had a positive and significant impact on stock market returns. This therefore means that increase in interest rate would significantly increase stock market returns.

3. Inflation rate (INFR) which is part of the explanatory variable in this study had a positive and insignificant impact on stock market returns. This therefore means that increase in inflation rate would not significantly affect stock market returns dynamics in Nigeria.

4. Exchange rate (EXRT) which is part of the explanatory variable in this study had a positive and significant impact on stock market returns in Nigeria. This therefore means that changes in exchange rate would significantly affect stock market returns dynamics in Nigeria. The lag of exchange rate was found to have a negative and statistically significant on stock returns. This means that exchange rate disturbance has a short delay impact on Nigerian capital market. The results from model 1, 2 and 3 revealed that exchange rate has an economic fundamental factor that was statistically significant in affecting stock returns in Nigerian stock market.

In conclusion, the empirical results from this study reveal that investors' sentiment which is a non-market factor is more important than macroeconomic fundamentals in understanding stock market returns dynamics in Nigeria. This therefore suggests the need for more research into behavioural finance so as to predict stock market returns especially under bull and bear market cycle.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

In this study, we seek to examine the effect of investors' sentiment on stock market return in Nigeria. The dependent variable was proxy by stock market returns (SPR) while the explanatory variables were investors' sentiment (SentPCA), interest rate(INTR), inflation rate (INFL) and exchange rate (EXRT), while bull events (positive market returns) and bear market event (negative market returns) were used as moderating variables to investors' sentiment. In estimation of the models formulated, statistical techniques which include descriptive statistics, correlation analysis, unit root test, Engel-Granger co-integration test, overparameterized and Parsimonious Error Correction Model (ECM) were used.

The results from all our analyses, show that investors' sentiment had a statistically significantly relationship with stock market returns dynamics in Nigeria but when moderated for bear market cycle, the impact of investors' sentiment on stock returns in Nigeria became statistically insignificant. In the case of Bull market cycle, we observed that there was a statistically significant relationship between investors' sentiment and stock market returns. We also learn from our analysis of macroeconomic fundamentals that exchange rate variations were more potent in distorting stock market returns dynamics in Nigeria than interest rate and inflation rate. In fact, inflation rate was found to have less value relevant to equity investors' in Nigeria. This shows that investors' in Nigeria's equity market are likely to take market sentiment news and exchange rate announcement more serious than interest rate and inflation rate when investing in shares. This study therefore makes the following conclusions.

5.2 Conclusion

The preceding section reveals that investors' sentiment plays a significant role in determining stock returns dynamics in Nigeria. Moreover, investors' sentiment had a statistically significantly relationship with stock market returns dynamics in Nigeria but when moderated for bear market cycle, the impact of investors' sentiment on stock returns in Nigeria became statistically insignificant. In the case of Bull market cycle, we observed that there was a statistically significant relationship between investors' sentiment and stock market returns. Observation from the results of the analyses of macroeconomic fundamentals showthat exchange rate variations were more potent in distorting stock market returns dynamics in Nigeria.

The findings of this study, lead to the conclusion that investors' psychology and exchange rate disturbance matters more in predicting movement in equity prices in Nigeria.

5.3 Recommendations

Based on the findings of this study, we recommend as follows:

a) This study revealed that investors' sentiment which is a non-market factor is very important in understanding stock market returns dynamics in Nigeria. This finding can be linked to the argument that during falling prices or bear market cycles investors' tend to ignore all market emotions, hearsay, rummor and future prospective earnings potentials which weaken the relationship between investors' sentiment and stock market returns in Nigeria. We therefore recommended that;

- The Nigeria stock exchange (NSE) should develop a sound and test circult breakers in the exchange that would stop trade in periods of high market sentiment. This recommendation was recently used in china to prevent total stock market collapse due to extreme market

sentiment. The exchange and securities commission should also implement market regulations that would prevent noise trading and market frauds which often promote extreme investors' sentiment.

- Greater understanding of investors' emotion biases so as to avoid the potential psychology bias that is detrimental to their investment policy guidelines or objectives. This finding also suggest that policy makers such as Securities and Exchange Commission (SEC) should sensitises and enlighten investors' on the negative consequences of psychology bias on the performance of the market in general and the performance of the investments in particular.

- Investors', portfolio managers and other investing stakeholders should develop sentiment period market strategies and regularly review their investment sentiment biases in order to effectively manage investors' emotion biases.

- In addition, Federal and State Governments should support the stock exchange and securities commission with capital market policy guidelines and supports that would prevent extreme investor's sentiments that would lead to massive losses for retail and institutional investors'.This can include ban on directors and institutional stock sales during extreme market periods. This was also used in china recently.

- The significance of investor's sentiment in this study also suggested that we recommend the inclusion of the variable in the Forecasting of equity prices in Nigeria.

b) This study also found out some macroeconomic variables significantly influence stock returns in Nigeria. We therefore recommend a fusion investment evaluation system where the investors' should assess both macroeconomic and sentimental risk factors. We also recommended that;

- **Interest Rate** which is part of the explanatory variable in this study had a positive and significant impact on stock market returns. We therefore recommend that central bank of Nigeria and federal government should through their monetary and fiscal policy implement actions that would ensure interest rate stability and prevent frequent increase in rates which has potentials to distort stock market activities in Nigeria.

- **Exchange rate (EXRT)** which is part of the explanatory variable in this study had a significant impact on stock market returns in Nigeria. We therefore suggest that central bank of Nigeria should continue to purse policy that would promote stable exchange rates and also attract foreign capital inflow that would ensure regular supply of forex. We also recommended that government should give priority to exchange rate stability in its macro-economic policy directions since neglect in doing so would lead to serious stock market distortion and in the long-run panic stock selling.

- **Inflation rate (INFR)** which is part of the explanatory variable in this study had a positive and insignificant impact on stock market returns. We therefore suggest that capital market policy makers should focus on stable interest rate and exchange rate to ensure viable stock market in Nigeria since inflation does not significantly impact on investors' stock market decisions

5.4 Limitation of the study

i. A major limitation of this study is its focus on quantitative measure of investors' market sentiment which is a behavioural concept that requires investigations into investors' feelings.

ii. Another major limitation of this study is its focus on the aggregate investors' sentiment in Nigeria stock market which may not reflect the individual companies stock returns sentiments.

5.5 Suggestions for further studies

i. We therefore suggest that further study especially the use of survey based measures of investors' sentiment be conducted.

ii. We therefore suggest that a firm specific stock price approach to investors' sentiment be adopted. This would provide a micro/firm specific analysis perspective to investors' sentiment in Nigeria.

iii. Finally we suggest more studies on investors' sentiment and stock market returns dynamics in Nigeria be conducted especially with consideration for bull and bear market cycle. While this study provides the empirical background, a major limitation is the use of low frequency stock price data (quarterly data), we expect future studies to use high frequency market data like daily stock prices, weekly stock prices and monthly stock

prices when macroeconomic data can be made available on a weekly and monthly basis in Nigeria.

5.6 Contribution to Knowledge

This study provides empirical evidence by:

i. Creating the foundation for empirical literature on the relationship between investors' sentiment and stock market returns dynamics in Nigeria. While previous studies in developed and emerging countries often focus on the relationship between sentiment and stock returns without moderating for bull and bear market cycle. This study to a large extend is the first to investigate the relationship between sentiment and stock returns using an Error Correction Model (ECM) in Nigeria.

ii. This study also added to the theoretical literature on behavioural finance by providing explanation for the irrational behaviour of stock market investors' in Nigeria.

iii. Finally, this study also makes contribution in the measurement of investors' sentiment by using a Principal Component Analysis (PCA) statistical method.

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Appendix I: Bull & Bear Market Cycle in Nigeria 1985 - 2014

Trends: P/E Returns □ 0, □ 0; □ 10, □ 10 S&P 500 index ≥ 20% & ≤ 20%			
Phase 1	**1985**	**27.36**	**□ 20**
	1986	**28.78**	**□ 20**
	1887	**16.5**	**□ 20**
	1988	**22.4**	**□ 20**
	1989	**39.3**	**□ 20**
Phase 2	**1990**	**57.9**	**□ 20**
	1991	**52.5**	**□ 20**
	1892	**41.4**	**□ 20**
	1993	**39.4**	**□ 20**
	1994	**42.8**	**□ 20**
Phase 3	**1995**	**130.9**	**□ 20**
	1996	**37.3**	**□ 20**
	1897	**-8.1**	**□ 20**
	1998	**-11.8**	**□ 20**
	1999	**-7.2**	**□ 20**
Phase 4	**2000**	**54.0**	**□ 20**
	2001	**35.2**	**□ 20**
	2002	**10.7**	**□ 20**
	2003	**65.8**	**□ 20**
	2004	**18.5**	**□ 20**
Phase 5	**2005**	**1.0**	**□ 20**
	2006	**37.8**	**□ 20**
	2007	**0.8**	**□ 20**
	2008	**26.5**	**□ 20**
	2009	**-12.2**	**□ 20**
Phase 6	**2010**	**7.1**	**□ 20**
	2011	**-18.5**	**□ 20**
	2012	**8.2**	**□ 20**
	2013	**36.0**	**□ 20**
	2014	**9.3**	**□ 20**

Source: Author (2014), Wiggins J.B (1992) and Dukes, W.P, Bowlin, O.D and MacDonald, S.S et al (1987)

Appendix II: Summary of PCA Investors' Sentiment Studies

	Authors' Title Publication	Objectives	PCA Factors
	Finter, N. Ruenzi,*and* S. Ruenzi (2010) Measuring investors' sentiment using PCA framework	To investigate the factors that is relevant in constructing an index for investors' sentiment.	Used Consumer confidence, trading volume, net funds flows, IPO returns, number of IPOs, equity to debt ratio and put to call ratios for developing investors' sentiment data using a PCA framework.
	Boubaker and Talbi(2014) The Impact of Investor Sentiment on the Tunisian Stock Market	To develops a new investor sentiment index for the Tunisia stock market and its impact on stock market	Construct composite sentiment index using indirect indicators measuring sentiment (the performance index, the number of IPO, the average profitability of the first days of the firms newly introduced, the volatility premium, the Premium Dividend and finally the turnover rate) and based on the Analysis of the Principal Component. Using a VAR model,
	Tai-Leung Chong, Cao and Wong (2014) A New Principal-Component Approach to Measure the Investor Sentiment:	To develops a new market sentiment index for the Hong Kong stock market, one of the largest stock market in the world.	The components of the sentiment measure include the turnover ratio, short-selling volume, money flow, HIBOR and return of the U.S. and Japanese markets
	Chen and Tai Leung Chong and She (2013) A Principal Component Approach to Measuring Investor Sentiment in China	To develops a new investor sentiment index for the Chinese stock market.	PCA factors: The variables for investor sentiment used in this paper include the value of market turnover, number of newly opened investor accounts, change in industrial production, change in money supply, 30-day National Interbank Offered Rate, and

			exchange rate.
	Zhu (2012) Investor sentiment and volatility of stock index using a PCA	To use the generated PCA investors' sentiment to estimate the future trend of stock market.	Used factors such as; P/E, Trading volume, Turnover rate, Closed-end funds discount, New accounts amount and VIX index

Source: Author (2014)

Appendix III: SUMMARY OF EMPIRICAL STUDIES

	Authors' Title Publication	**Objectives & Related Variables**	**Methodology**	**Results & Gaps**
	Prosad J.M., Kapoor S. and Sengupta J. (2012) An Examination of Herb Behaviour: An empirical study of Indian equity market	Objectives: To investigate the effect of herd on Indian equity market Variables: DV Stock Returns dispersion IV Aggregate market returns	They use data from Indian national stock exchange. They use cross sectional standard deviation to measure herd behaviour of investors' and Linear and quadratic regression model was applied to test for the relationship	They find out that Indian market is efficient and there is no severe herding but when tested for market stress; it prevailed in bull market phase. This study focuses on Indian only and ignore other emerging market
	Chung S.L., Chi-Hsiou Hung and Chung-Ying Yehz (2012) When Does Investors' Sentiment Predict Stock Returns? China	Objectives: To investigate which economic cycle investors' sentiment predict stock returns Variables: DV Stock Returns under bull and bear market regime IV lagged Investors' sentiment of small stocks, non-	They use cross sectional data from china stock exchange. They use a Markov-Switching regression model in testing for the relationship stock returns and investors' sentiment under different market states.	They find out that lagged sentiment performs both in-sample and out-of-sample predictive in explaining stock returns only on expansion state. This study focuses on economic state and ignores bull and bear market state.

		earnings stocks, growth stocks and non-dividend paying stocks		
	Schabek. T (2013) Influence of behavioural and fundamental factors on stock returns. Case of Brazilian and Polish emerging market	Objectives: To investigate what factors generate movement in stock prices Variables: DV Stock Returns IV (a) Market Factors: market capitalization, Price to Book value, liquidity, beta, past returns momentum (b)Macroeconomic factors: local and global macroeconomic variables (c) Behavioural Factors: Variability in investors' sentiment index	In this study, he used cross sectional regression model that was adopted from Fama and French (1973) to test for the impact of market, macro and behavioural factors on stock price movement in Brazil and Poland stock market. In this study he also used principal component analysis (PCA) to reduce the variables from all three components of stock price determinants.	The Results from this study show that all three factors, that is, market, macro and sentiment or behavioural biases are statistically relevant in explaining stock price movement for both brazil and Poland emerging stock market. The study ignores bull and bear market states in testing these relationships.
	Rehman. M.U (2013) Investors' sentiments and stock market volatility: an empirical from emerging stock market-Pakistan	Objectives: To find out if sentiments of investors' affect the returns of stocks listed on the Karachi stock exchange. DV Stock returns volatility IV Sentiment index uses the six proxies: Number of IPOs, First day	In this study, he used time series regression model to test for the impact of investors' sentiment on stock returns volatility. GARCH model was used to generate the stock returns volatility while the principal component analysis (PCA)	The results from this study shows that sentiments influence stock returns in a weak form efficient market and also identify the presence of irrational noise traders in Karachi stock market. This study like other study also neglected the bull and bear market stress conditions.

		returns on IPOs, Closed end fund discount, dividend premium, equity to debt ratio and average daily turnover.	was used to generate the sentiment index from the six proxies.	
	Beer. F and Zouaoui, M (2011) Measuring Investors' sentiment in the stock market- US	Objectives: To find a better way to measure investors' sentiment and investigate the relative performance of different measures on returns of stocks DV Stock returns IV Direct Sentiment Indirect sentiment Composite sentiment index	In this study, they tested direct and indirect measures of investors' sentiment on stock returns using regression model	The results from this study show that composite investors' sentiments index are better measure when compared to direct or indirect measurement. They also did not test their results under different stock market states.
	Schmeling, M (2008) Investors' sentiment and stock returns: Some international evidence	Objectives: To find a better way to measure investors' sentiment and investigate the relative performance of different measures on returns of stocks DV Stock returns IV Direct Sentiment Indirect sentiment Composite sentiment index	In this study, they tested direct and indirect measures of investors' sentiment on stock returns using regression model	The results from this study show that composite investors' sentiments index are better measured when compared to direct or indirect measurement.
	Schmeling, M (2008) Investors' sentiment and stock returns:	Objectives: To test whether consumer confidence as a proxy for	In this study, Schmeling collected data from 18 industrialized	The results from this study show that sentiment negatively forecasts

	Some international evidence	individual investor sentiment affects stock returns of 18 international industrialized countries DV Stock returns IV Consumer confidence as proxy for investors' sentiment	countries and employed a cross-sectional regression model.	aggregate stock market returns on average across countries. He is also found out that the relationship holds for value stocks, growth stocks and small stocks. He also stressed that the impact of sentiment on stock returns is higher for countries which have less market integrity and which are culturally more prone to herd-like behaviour.
	Prosad, Kapoor and Sengupta (2011) An Examination of Herd Behaviour: An Empirical Study on Indian Equity Market:	The paper aims to study the herding effect in Indian equity market. DV Stock returns IV Consumer confidence as proxy for investors' sentiment	To test the presence of herding linear regression model and linear regression using quadratic functional form has been applied.	The result of the study endorses the fact that Indian markets are efficient as no severe herding has been reported. However, when the presence of herding was tested for periods of market stress, it prevailed in bull phase.
	Oprea and Brad (2010) Investor Sentiment and Stock Returns in Romania.	The objective was to study Investor Sentiment influence on Stock Returns in Romania. DV Stock returns	They collected data from the Bucharest Stock Exchange (BSE) for a 10 year time period, starting from 2002 to	They found out that the attitude of individual investors' is strongly correlated with their sentiment, so their

		IV investors' sentiment	2011. Regression analysis	behaviour on the stock market can generate important changes in price fluctuations.
	Zouaoui, Nouyrigat and Beer (2010), How does investor sentiment affect stock market crises? Evidence from panel data	We test the impact of investor sentiment on a panel of international stock markets. Specifically, we examines the influence of investor sentiment on the probability of stock market crises. DV Stock returns IV Investors' sentiment	Cross country Panel Regression analysis	We find that investors' sentiment increases the probability of occurrence of stock market crises within a one-year horizon. The impact of investor sentiment on stock markets is more pronounced in countries that are culturally more prone to herd-like behaviour and overreaction or in countries with low institutional involvement. Results also suggest that investors' sentiment is not a reliable predictor of stock market reversal points.
	Sara Ahmed and Naeem Ullah (2012), Investor Sentiment And Stock Market Dynamics: A Case of Pakistan	The main purpose of this article is to confirm that whether investors' sentiments had any impact on the return of Karachi Stock Exchange (KSE).	Time series analysis of Auto Regressive Distributive Lag (ARDL) is used in this study.	The results indicate that our variables are cointegrated in the long run. Investor sentiments were proven to have positive and

		DV Stock returns IV Investors' sentiment		significant coefficient that indicates its impact on KSE returns. Further, the macroeconomic variable of inflation was also statistically significant.
	Finter, N.Ruenzi and S. Ruenzi (2010) The Impact of Investors' Sentiment on theGerman Stock Market	This paper investigates whether investor sentiment can explain stock returns on the German stock market.	Based on a principal component analysis, we construct a sentiment indicator that condenses information of several well-known sentiment proxies. The hypotheses were tested based on regression analysis	We show that this indicator explains the return spread between sentiment stocks and stocks that are not sensitive to sentiment fluctuations. Specifically, stocks that are difficult to arbitrage and hard to value are sensitive to the indicator. However, we do not need much predictive power of sentiment for future stock returns. This is consistent with sentiment being of minor importance on the German stock market that is characterized by a low fraction of retail investors'.
	Adel Boubaker and Mariem Talbi (2014)	Our main objective is to test the impact	Using a VAR regression model	They found a strong negative

	The Impact of Investor Sentiment on the Tunisian Stock Market	of investors' sentiment on returns. DV Stock returns IV Investors' sentiment Profit Age Tangible Assets		relationship between investors' sentiment and future returns. In addition, we find that past returns for tangible stocks, young, mature, not very and highly profitable,

Source: Author (2014)

Appendix IV: DATA

YEARS	ASPI	SPR	EXRT	INFL	INTR	SENTPCA	BULL	BEAR
1985Q1	113	2.4%	0.85	1.96	9.08	-0.03291	1.00	0.00
Q2	116	2.6%	0.89	0.39	9.00	-0.03091	1.00	0.00
Q3	117	0.5%	0.90	-2.46	9.33	-0.05191	1.00	0.00
Q4	127	8.9%	0.94	-1.31	9.17	0.03209	1.00	0.00
1986Q1	141	10.6%	1.00	-0.10	8.83	0.04909	1.00	0.00
Q2	147	4.7%	1.06	7.05	9.33	-0.00991	1.00	0.00
Q3	155	5.2%	2.41	6.97	9.67	-0.00491	1.00	0.00
Q4	164	5.7%	3.61	-0.62	11.17	0.00009	1.00	0.00
1987Q1	162	-1.3%	3.76	0.63	11.97	-0.06991	0.00	1.00
Q2	196	21.3%	4.04	1.87	10.63	0.15609	1.00	0.00
Q3	195	-0.6%	4.03	4.47	15.43	-0.06291	0.00	1.00
Q4	191	-2.1%	4.24	2.43	17.93	-0.07791	0.00	1.00
1988Q1	196	2.4%	4.25	31.26	16.30	-0.03291	1.00	0.00
Q2	206	5.4%	4.17	15.59	16.50	-0.00291	1.00	0.00
Q3	224	8.8%	4.64	6.63	16.60	0.03109	1.00	0.00
Q4	234	4.2%	5.09	-0.35	17.07	-0.01491	1.00	0.00
1989Q1	257	10.0%	7.34	27.61	17.67	0.04309	1.00	0.00
Q2		0.9%	7.48	18.26	18.00	-0.04791	1.00	0.00

	259							
Q3	280	8.0%	7.25	-3.60	19.83	0.02309	1.00	0.00
Q4	325	16.2%	7.51	-0.56	24.93	0.10509	1.00	0.00
1990Q1	356	9.4%	7.90	0.74	25.17	0.03709	1.00	0.00
Q2	417	17.2%	7.94	3.97	26.47	0.11509	1.00	0.00
Q3	468	12.2%	7.96	-1.31	26.20	0.06509	1.00	0.00
Q4	514	9.7%	8.35	0.24	25.27	0.04009	1.00	0.00
1991Q1	601	17.0%	9.43	3.96	19.99	0.11309	1.00	0.00
Q2	652	8.5%	9.47	9.54	19.92	0.02809	1.00	0.00
Q3	737	13.1%	10.87	1.55	20.13	0.07409	1.00	0.00
Q4	783	6.2%	9.87	6.33	20.11	0.00509	1.00	0.00
1992Q1	839	7.2%	12.47	12.04	21.60	0.01509	1.00	0.00
Q2	871	3.8%	18.47	22.74	23.73	-0.01891	1.00	0.00
Q3	1,022	17.4%	18.76	5.93	25.20	0.11709	1.00	0.00
Q4	1,108	8.4%	19.50	2.16	28.50	0.02709	1.00	0.00
1993Q1	1,131	2.1%	22.33	17.34	27.73	-0.03591	1.00	0.00
Q2	1,188	5.0%	22.10	23.12	31.10	-0.00691	1.00	0.00
Q3	1,217	2.5%	21.89	7.29	32.90	-0.03191	1.00	0.00
Q4	1,544	26.8%	21.89	4.04	34.87	0.21109	1.00	0.00
1994Q1	1,793	16.1%	21.89	9.66	20.77	0.10409	1.00	0.00
Q2	1,919	7.0%	21.89	15.66	20.50	0.01309	1.00	0.00
Q3	1,956	1.9%	21.89	21.39	20.33	-0.03791	1.00	0.00
Q4	2,205	12.7%	21.89	14.80	20.33	0.07009	1.00	0.00
1995Q1	2,551	15.7%	21.89	12.48	20.40	0.10009	1.00	0.00
Q2	3,587	40.6%	21.89	20.93	20.13	0.34909	1.00	0.00
Q3	4,858	35.5%	21.89	8.78	20.20	0.29809	1.00	0.00
Q4	5,092	4.8%	21.89	2.44	20.20	-0.00891	1.00	0.00
1996Q1	5,266	3.4%	21.89	5.29	20.15	-0.02291	1.00	0.00
Q2		10.1%	21.89	9.80	20.09	0.04409	1.00	0.00

	5,799							
Q3	6,502	12.1%	21.89	4.40	19.90	0.06409	1.00	0.00
Q4	6,992	7.5%	21.89	-5.29	19.21	0.01809	1.00	0.00
1997Q1	8,561	22.4%	21.89	6.07	17.60	0.16709	1.00	0.00
Q2	8,459	-1.2%	21.89	3.47	18.07	-0.06891	0.00	1.00
Q3	7,131	-15.7%	21.89	-2.33	17.81	-0.21391	0.00	1.00
Q4	6,441	-9.7%	21.89	2.82	17.70	-0.15391	0.00	1.00
1998Q1	6,299	-2.2%	21.89	1.67	17.85	-0.07891	0.00	1.00
Q2	5,892	-6.5%	21.89	7.16	18.07	-0.12191	0.00	1.00
Q3	5,698	-3.3%	21.89	0.21	18.57	-0.08991	0.00	1.00
Q4	5,673	-0.4%	21.89	2.51	18.25	-0.06091	0.00	1.00
1999Q1	5,456	-3.8%	86.32	3.16	18.60	-0.09491	0.00	1.00
Q2	5,978	9.6%	93.25	2.19	20.03	0.03909	1.00	0.00
Q3	4,891	-18.2%	94.88	-5.38	21.37	-0.23891	0.00	1.00
Q4	5,266	7.7%	96.32	0.49	21.20	0.02009	1.00	0.00
2000Q1	5,966	13.3%	99.88	1.45	21.47	0.07609	1.00	0.00
Q2	6,467	8.4%	101.12	9.75	21.03	0.02709	1.00	0.00
Q3	7,299	12.9%	103.53	3.23	21.26	0.07209	1.00	0.00
Q4	8,111	11.1%	103.90	-0.37	21.33	0.05409	1.00	0.00
2001Q1	9,160	12.9%	110.62	4.71	21.47	0.07209	1.00	0.00
Q2	10,937	19.4%	113.25	7.76	22.77	0.13709	1.00	0.00
Q3	10,274	-6.1%	111.71	5.95	23.73	-0.11791	0.00	1.00
Q4	10,963	6.7%	112.19	-2.56	25.24	0.01009	1.00	0.00
2002Q1	11,214	2.3%	114.76	5.51	25.17	-0.03391	1.00	0.00
Q2	12,441	10.9%	117.06	3.03	25.32	0.05209	1.00	0.00
Q3	11,812	-5.1%	125.31	3.83	26.26	-0.10791	0.00	1.00
Q4	12,138	2.8%	126.76	-0.60	22.60	-0.02891	1.00	0.00
2003Q1	13,531	11.5%	127.18	5.90	21.55	0.05809	1.00	0.00

Q2	**14,566**	**7.6%**	**127.62**	**14.00**	**21.10**	**0.01909**	**1.00**	**0.00**
Q3	**16,501**	**13.3%**	**128.08**	**18.40**	**20.42**	**0.07609**	**1.00**	**0.00**
Q4	**20,129**	**22.0%**	**134.54**	**23.80**	**19.74**	**0.16309**	**1.00**	**0.00**
2004Q1	**22,896**	**13.7%**	**135.23**	**22.50**	**19.51**	**0.08009**	**1.00**	**0.00**
Q2	**28,887**	**26.2%**	**133.09**	**14.10**	**19.36**	**0.20509**	**1.00**	**0.00**
Q3	**22,740**	**-21.3%**	**132.82**	**9.10**	**19.05**	**-0.26991**	**0.00**	**1.00**
Q4	**23,845**	**4.9%**	**132.86**	**10.00**	**18.91**	**-0.00791**	**1.00**	**0.00**
2005Q1	**20,682**	**-13.3%**	**132.85**	**16.30**	**18.50**	**-0.18991**	**0.00**	**1.00**
Q2	**21,565**	**4.3%**	**132.85**	**18.60**	**18.03**	**-0.01391**	**1.00**	**0.00**
Q3	**24,636**	**14.2%**	**132.30**	**24.30**	**17.64**	**0.08509**	**1.00**	**0.00**
Q4	**24,086**	**-2.2%**	**130.59**	**11.60**	**17.63**	**-0.07891**	**0.00**	**1.00**
2006Q1	**23,337**	**-3.1%**	**129.53**	**12.00**	**17.89**	**-0.08791**	**0.00**	**1.00**
Q2	**26,161**	**12.1%**	**128.46**	**8.50**	**18.16**	**0.06409**	**1.00**	**0.00**
Q3	**32,555**	**24.4%**	**128.33**	**6.30**	**18.52**	**0.18709**	**1.00**	**0.00**
Q4	**33,189**	**1.9%**	**128.29**	**8.50**	**18.66**	**-0.03791**	**1.00**	**0.00**
2007Q1	**43,456**	**30.9%**	**128.23**	**5.20**	**18.92**	**0.25209**	**1.00**	**0.00**
Q2	**51,331**	**18.1%**	**127.65**	**6.40**	**18.74**	**0.12409**	**1.00**	**0.00**
Q3	**50,229**	**-2.1%**	**126.58**	**4.10**	**18.27**	**-0.07791**	**0.00**	**1.00**
Q4	**57,990**	**15.5%**	**120.87**	**6.60**	**18.21**	**0.09809**	**1.00**	**0.00**
2008Q1	**63,017**	**8.7%**	**118.04**	**7.80**	**17.58**	**0.03009**	**1.00**	**0.00**
Q2	**55,949**	**-11.2%**	**117.84**	**12.00**	**18.03**	**-0.16891**	**0.00**	**1.00**
Q3	**46,216**	**-17.4%**	**117.75**	**13.00**	**19.24**	**-0.23091**	**0.00**	**1.00**
Q4	**31,451**	**-31.9%**	**120.65**	**15.10**	**21.15**	**-0.37591**	**0.00**	**1.00**
2009Q1	**19,852**	**-36.9%**	**146.88**	**14.40**	**22.62**	**-0.42591**	**0.00**	**1.00**
Q2	**26,862**	**35.3%**	**147.76**	**11.20**	**22.67**	**0.29609**	**1.00**	**0.00**
Q3	**22,065**	**-17.9%**	**150.92**	**10.40**	**22.81**	**-0.23591**	**0.00**	**1.00**
Q4	**20,827**	**-5.6%**	**149.69**	**13.90**	**23.77**	**-0.11291**	**0.00**	**1.00**
2010Q1	**25,966**	**24.7%**	**149.83**	**14.80**	**23.62**	**0.19009**	**1.00**	**0.00**

Q2	**25,384**	**-2.2%**	**150.19**	**14.10**	**22.03**	**-0.07891**	**0.00**	**1.00**
Q3	**23,748**	**-6.4%**	**151.03**	**13.60**	**22.20**	**-0.12091**	**0.00**	**1.00**
Q4	**20,812**	**-12.4%**	**150.48**	**11.80**	**21.86**	**-0.18091**	**0.00**	**1.00**
2011Q1	**24,621**	**18.3%**	**152.54**	**12.80**	**22.02**	**0.12609**	**1.00**	**0.00**
Q2	**24,980**	**1.5%**	**152.54**	**10.20**	**22.02**	**-0.04191**	**1.00**	**0.00**
Q3	**20,373**	**-18.4%**	**155.26**	**10.30**	**22.09**	**-0.24091**	**0.00**	**1.00**
Q4	**20,731**	**1.8%**	**158.23**	**10.30**	**23.21**	**-0.03891**	**1.00**	**0.00**
2012Q1	**20,652**	**-0.4%**	**157.59**	**12.10**	**23.21**	**-0.06091**	**0.00**	**1.00**
Q2	**21,600**	**4.6%**	**157.59**	**12.90**	**23.44**	**-0.01091**	**1.00**	**0.00**
Q3	**26,012**	**20.4%**	**157.34**	**11.30**	**24.67**	**0.14709**	**1.00**	**0.00**
Q4	**28,079**	**7.9%**	**157.32**	**12.00**	**24.61**	**0.02209**	**1.00**	**0.00**
2013Q1	**33,536**	**19.4%**	**157.31**	**8.60**	**24.49**	**0.13709**	**1.00**	**0.00**
Q2	**36,464**	**8.7%**	**157.31**	**8.40**	**24.58**	**0.03009**	**1.00**	**0.00**
Q3	**36,585**	**0.3%**	**157.32**	**8.00**	**25.11**	**-0.05391**	**1.00**	**0.00**
Q4	**41,329**	**13.0%**	**157.27**	**8.00**	**24.90**	**0.07309**	**1.00**	**0.00**
2014Q1	**38,748**	**-6.2%**	**157.30**	**7.80**	**25.80**	**-0.11891**	**0.00**	**1.00**
Q2	**42,482**	**9.6%**	**157.30**	**8.20**	**26.07**	**0.03909**	**1.00**	**0.00**
Q3	**41,210**	**-3.0%**	**157.30**	**8.30**	**25.77**	**-0.08691**	**0.00**	**1.00**
Q4	**34,657**	**-15.9%**	**169.68**	**8.00**	**25.91**	**-0.21591**	**0.00**	**1.00**

SOURCE: CBN, NBS, SEC and NSE (2015)