
Effect of Interest Rate Instability on Investor's Sentiment in Nigerian Stock Market

Mohammed ZUBAIRU

Department of Business Administration, Ahmadu Bello University, Zaria, Kaduna State

Abstract: *The stock market is a part of the modern economy, geared towards promoting inclusive growth and development, and whose prices have been responsive to economic and market fundamentals. But with the crash of the market, which resulted to macroeconomic consequences that impacted economic activities, there has been a wide deviation of stock prices from their fundamental value. Thus, calling for attention as to finding out if non-market and non-economic fundamentals like such as investor's sentiments; are responsible for movement in equity prices. This paper therefore investigates the effect of economic fundamentals such as interest rate on Investors sentiments in the Nigerian Stock market over a period of 30 years (1985Q1-2014Q4), while using the unit root test, single equation co-integration test and the error correction model (ECM). The results of our study, showed that our variables were stationary at first levels, and that macroeconomic fundamentals such as Interest rate does not have an impact on Investors sentiments in Nigerian Stock Market. The study further made recommendations, one of which was that the disturbances in equity prices that are caused by investors' sentiment especially from stock in young, fast growing, technology etc can be managed through diversification of portfolio.*

Keywords: *Economic Activities, Interest Rate, Investors Sentiment, Stock Market*

1. Introduction

The stock market is a part of the modern economy, saddled with a responsibility to contribute and promote inclusive growth and development of the economy through its functions. Stock market prices in both developed and emerging markets have been responsive to economic and market fundamentals or new information, which are proxies by unique indices such as long term market rate of returns, market risk, market demand/supply imbalance, inflation rate, exchange rate, interest rate etc. These factors are important in predicting equity prices in most emerging capital market like that of Nigeria.

More recently, there exists a wide deviation of stock prices from their fundamental value. Questions and attention have been drawn to finding out if non-market and non-economic fundamentals are responsible for such deviations. Precisely, there has been some shift in the discussion of equity price movement to favoring investor's sentiment/emotions. Investors' sentiment in general term refers to the attitude, emotions and biases that investors' exhibit in the course of their 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.

Interest rates on the cost of borrowing are applied at a discounted rate to discount future cash flows of the financial assets which 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 rates rise, 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. Increase in interest rate causes decrease in stock prices because required rate of return on stocks rises which causes decrease in stock prices. Actions of monetary authorities have a significant impact on stock prices and the fluctuation of interest rates signals good or bad information to investors (Lobo, 2000).

Modern research on equity pricing or on the determinants of equity price movement is now favoring the use of fusion investing approach. Lee (2003) pointed out that fusion approach centered on the importance of integrating economic fundamentals and investor's 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 investor's sentiment while the fundamentals are proxies 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. 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 include; deluge of public offers and private placement, pull-out of foreign investors and over-valued stock.

Furthermore, the crash of the Nigeria stock market can be attributed to sentiments 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). The 2008 stock market crisis in Nigeria also brought adverse macroeconomic and microeconomic consequences, which 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).

Thus, key macroeconomic risk factors such as interest rate, inflation and exchange rates are necessary in the study of stock market behaviors. 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 coming of indices for measuring investors' sentiment. The introduction of investor's sentiment as an explanatory variable in predicting equity price movement is now being considered in emerging economies but with little attention in Nigeria. This study seeks to answer these research questions as to what extent does interest rate instability affect investors' sentiment in the Nigerian Stock Market. The objective of this study is to analyze the effect of interest rate instability on investors' sentiment in the Nigerian Stock Market. In order to realize the objectives of this research, the following hypothesis have been formulated and tested:

H₀₁: There is no significant relationship between Interest Rate Instability and Investors' Sentiment in the Nigerian Stock Market.

2.1 Review of Literature

2.2 Concept of Interest Rate

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 behavior 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. The instability of interest rates affects decision about how to save and invest. Investors differ in their willingness to hold risky assets such as stocks and bond. When the returns to holding stocks and bonds are highly volatile, investors who rely on these assets to provide for their consumption face a relatively large chance of having low consumption at any given time.

The variability short-term and long-term interest rate is a prominent feature of the economy. Interest rates change in response to a variety of economic events, such as changes in federal policy, crises in domestic and international financial markets, and changes in the prospects for long-term economic growth and inflation. However, economic events such as these tend to be irregular. There is a more regular variability of interest rate associated with the business cycle, the expansions and contractions that the economy experience overtime. For example, short-term interest rate rises in expansions and falls in recessions. Interest rate instability also has implications for how the prices of certain types of assets are determined. Options are assets that give investors the right, but not the obligation, to buy (call options) or sell (put options) other assets (such as stocks or bonds) at a per-specified time in the future. For options purchased on interest bearing securities, modern finance theory demonstrates that the option price depends on the instability of returns on the underlying asset. The instability of interest rates is related to the instability of returns on these assets. Thus, interest rates and their stability have important implications for how both individuals and firms make investment decisions. These investment decisions are part of the process whereby resources are allocated in the economy (Udonsa, 2012).

According to Humpe and Macmillan (2007), U.S and Japan stock prices are negatively correlated to a long-term interest rate. Al-Sharkas (2004) for Jordan and Adam and Tweneboah (2008) for Ghana indicate 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.

2.3 Concept of Investors Sentiment

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). Barker and Stein (2004) described investors' sentiment as the misvaluation that is created by a group of investors. Lee, Shleifer and Thaler (1991) viewed investors' sentiment as investors' beliefs that are not justified by market and economic fundamentals. In Zweig (1973), as well as Brown and Cliff (2005), it was revealed 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.

We 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. 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.

2.3.1 Measurement of Investors Sentiment

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 find 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 period 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. Otoo (1999) figured their study on consumer confidence indices and their relationship with the investors' sentiment, and it is 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 investors' sentiment.

(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.

While the use of Dennis and Mayhew (2002) ratio of put to call is highly limited in emerging stock markets like Nigeria due to the non-existence of a recognized market options. 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.

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.

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.

(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 affect investors attitude to invest), mutual fund flows, dividend premium, closedend fund discounts, option implied volatility, first day returns on initial public offerings, volume of initial public offering (IPO), new equity issues and trading volume. 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 investor's sentiment they are limited in emerging economies and completely missing in Nigeria.

2.4 Review of Empirical Literature

Investor's 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, arbitrageur would estimate and eliminate the differences immediately. 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. Miller (1977) 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.

Babajide and Adetiloye (2012), examined Investors' Behavioural Biases and the Security Market in Nigeria. They employed questionnaire as instrument and the technique of correlation with Pearson Product Moment Coefficient to analyze a survey of 300 randomly selected investors in Nigeria security market. Finally, they found a strong evidence that behavioural biases exist 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.

3. Research Methodology

This research uses time series data and the population of the study consists of all public quoted companies in Nigeria. These companies form the bedrock of index used for measuring market relation in Nigeria to form the all-share price index. 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) and Securities and Exchange Commission (SEC). Such data formed 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 the 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. This study therefore used a period sample of 120 observations starting from 1985Q1 to 2014Q4. The choice of this sample period is based on availability of stock market index price data in Nigeria.

3.2 Model Specification

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

Model I:

$$\text{SentPCA} = f(\text{Intr}) \dots \dots \dots (3.1)$$

This therefore necessitates the need to re-specify equation (3.1) into an error correction model. This is shown in equation (3.2);

$$\text{SentPCA}_t = \alpha_0 + \alpha_1 \text{Intr}_t \dots \dots \dots (3.2)$$

$$\text{SentPCA}_t = \alpha_0 + \alpha_1 \text{Intr}_t + \alpha_2 \text{ecm}(-1) \dots \dots \dots (3.3)$$

The Apriori Sign:
 $\alpha_1 > 0$

Where;

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.

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

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.

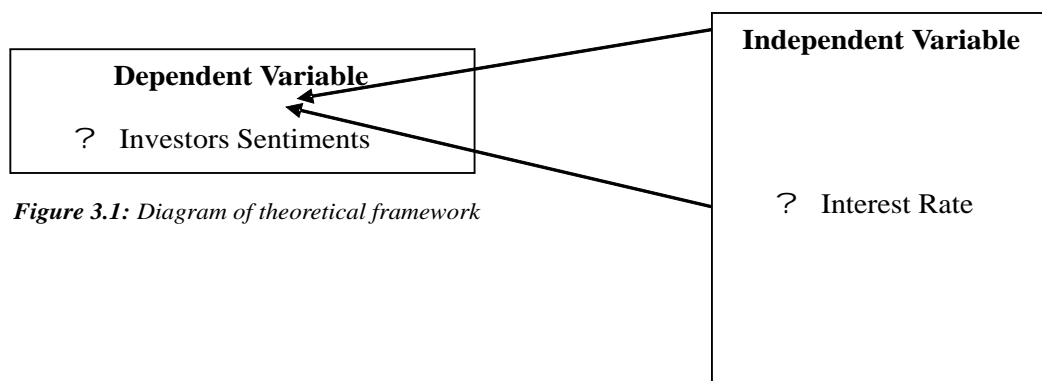


Figure 3.1: Diagram of theoretical framework

4.1 Presentation and Analysis of Results

In this study, we seek to examine the effect of Interest rate instability on Investors Sentiment in Nigerian Stock Market. The dependent variable was investors' sentiment (SentPCA), while the explanatory variable was Interest rate instability. The estimation started with the computation of descriptive statistics, Pearson correlation coefficient of the variables, this was to test for the presence of multi-co linearity among the explanatory variables. This is followed by Unit root and co-integration test. The unit root test will provide information on the stationarity properties of the variables and this will be 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 will form the basis for the short-run dynamic error correction model. In carrying out this econometric estimation process, E-Views (version 8) software was adopted. The next sub-section shows the presentation and interpretation of the estimated results obtained.

4.2 Descriptive Statistics

The descriptive statistics shows the description of the mean, standard deviation and normality test. Table 4.1 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
SENTPCA	-1.67E-06	0.125909	10.17326(0.0)	120
INTR	20.47167	4.657484	9.813526(0.0)	120

Source: Output from Analysis (2015)

From Table 4.1, the historically average level of investors' sentiment (SENTPCA) was -1.67E-06 and a standard deviation of 0.1259. 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 behavior sentiment in Nigeria. Interest rate had an average value of 20.47% over the periods. The standard deviation (4.65) 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 normally distributed at 1% since all the variables JB probability value where less than 0.05, this means that the normality assumption that is required for most regression analysis is met and any outlier that exists in the collected data may have no significant influence on the generalization that can be drawn from the study.

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 multicollinearity, which is the existence of high correlation in any two explanatory variables. Table 4.2 below; provide the obtained Pearson correlation coefficients results:

Table 4.2: Correlation Matrix

	SENTPCA	INTR
SENTPCA	1.00	
INTR	0.049381	1.00

Source: Output from Analysis (2015)

Table 4.2 also shows that Investors sentiments has weak positive correlation relationship with Interest rate (INTR = 0.04). Also, a close look at the value of the correlation coefficient result, the explanatory variable (INTR) showed it was not more than 70% correlated. This therefore provides evidence that the use of inflation rate, as explanatory variable in our model is not subjected to the problem of multicollinearity.

4.4 Unit Root Test

Unit root test in this study is used to investigate whether or not, Interest Rate and Investors sentiment (SentPCA) time series are stationary and to find out their order of integration. Table 4.3 below shows results for the unit root test for the variables first-difference using Augmented Dickey-fuller (ADF) test.

Table 4.3: Augmented Dickey-Fuller Unit Root Test at First Difference

	Variable	ADF Statistics	ADF (95%)	Order of Integration	Remark
First Difference	? SENTPCA	-13.1579	-2.886	I(1)	Stationarity
	? INTR	-10.1781	-2.886	I(1)	Stationarity

Source: Output from Analysis (2015)

The empirical findings from Table 4.3 reveal that Interest rate and investors sentiment (SentPCA), 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. This therefore means that the best regression results will be obtained when the first differences of the variables are used to estimate the model. The results also shows that the variables are all integrated of order one.

4.5 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 4.4, shows the co-integration test for the model adopted in this study.

Table 4.4: Co-integration Test

Variable	ADF Statistics	ADF (95%)	Order of Integration	Remark
Level ECM	-8.83204	-2.886	I(0)	Stationarity

Source: Output from Analysis (2015)

The results from Table 4.4, shows that the absolute value of the ADF statistic (-8.83204) 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. . That is between interest rate and investors' sentiment (SentPCA), such that any divergence in their behavior 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.

4.6 Error Correction Model (ECM)

In order to explain the short-run deviations that might have occurred in estimating the long-run co-integrated equation and to test our formulated hypotheses, the error correction model was taken and results are presented and discussed as follows:

Table 4.5: Error Correction Model

	ECM Over-parameterized	ECM Parsimonious
C	-0.00014 (-0.01135) [0.991]	-0.00126 (-0.10463) [0.9169]
D(SENTPCA(-1))	-0.17796 (-1.09509) [0.276]	-0.17312 (-1.06377) [0.2899]
D(SENTPCA(-2))	-0.08978 (-0.59265) [0.5547] 0.078798	-0.08685 (-0.57236) [0.5683] 0.082109
D(SENTPCA(-3))	(0.607029) [0.5452] -0.04034	(0.631537) [0.5291] -0.0363
D(SENTPCA(-4))	(-0.40724) [0.6847] -0.00091	(-0.36605) [0.7151] -0.00125
D(INTR(-1))	(-0.13676) [0.8915]	(-0.18637) [0.8525]
D(INTR(-2))	0.008638 (1.295515) [0.198]	0.008544 (1.279151) [0.2037]
D(INTR(-3))	-0.00244 (-0.36253) [0.7177]	-0.00208 (-0.30892) [0.758]
D(INTR(-4))	-0.00275 (-0.40822) [0.684]	-0.00303 (-0.44957) [0.6539]
Ecm(-1)	-0.66428 (-3.81464) [0.0002]	-0.65474 (-3.75716) [0.0003]
R-squared	0.444828	0.43746
Adjusted R-squared	0.391446	0.389242
F-statistic	8.332918(0.00)	9.072595(0.00)
Durbin-Watson statistic	1.986963	1.987081
N	115	115

Source: Output from Analysis (2015)

The results of the over-parameterized and parsimonious ECM are presented in Table 4.5; we often interpreted the parsimonious ECM results. The results revealed that the adjusted R-squared value of 0.38 shows that 38% of the systematic variation in the dependent is jointly explained by the independent variable in the parsimonious ECM model. This clearly shows that about 62% of the systematic variation in stock returns was not explained by the independent variable. This indicates that more research that would investigate other variables that are outside the variable in this study needs to be conducted to improve the adjusted R-squared. The F-statistics value of 9.072 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 variable.

Interest rate, which is the explanatory variable in this study had four lags in the parsimonious ECM model, which are $D(INTR(-1))$, $D(INTR(-2))$, $D(INTR(-3))$, $D(INTR(-4))$. The one lag period Inflation $D(INTR(-1))$, had a negative (-0.00125) and an insignificant (p-value = 0.8525) impact on investor's sentiments in Nigeria Stock Market. This therefore means that changes in Interest rate would not significantly affect investor's sentiments in Nigeria Stock Market. The second period Inflation $D(INFL(-2))$, had a positive (0.008544) and statistically insignificant (p-value = 0.2037). This also means that changes in Interest rate would not significantly affect investor's sentiments in the Nigerian Stock Market.

The third period Inflation $D(INFL(-3))$, had a negative (-0.00208) and statistically insignificant (p-value = 0.758). Again this means that changes in Interest rate would not significantly affect investor's sentiments in Nigeria Stock Market. The fourth period Inflation $D(INFL(-4))$, had a negative (-0.00303) and statistically insignificant (p-value = 0.6539). This therefore means that changes in interest rate would not significantly affect investor's sentiments in the Nigerian Stock Market. This finding therefore suggests that we should accept the null hypotheses which state that there is no significant relationship between interest rate instability and investors sentiments in Nigeria.

The Error Correction Model ECM (-1) coefficient of -0.65474 carries the correct sign, and it is statistically significant at the (p-value = 0.0003). This result also clearly shows that short-run deviation in Interest rate is quickly adjusted to equilibrium in the long-run. Also, we found that the Durbin-Watson value was 1.98 which indicates that there is absence of autocorrelation in the model.

In conclusion, the empirical results from this study, based on the ECM, reveal that Interest rate which is an Economic and market factor is important in understanding but as an explanatory variable in the study; it did not have a significant impact on investor's sentiments in Nigerian Stock Market. This also suggests the need for more research into Economic and market factors that have the capacity to influence Investors sentiments in the Nigerian Stock Market.

5. Summary, Conclusion and Recommendations

5.1 Summary

In this study, we seek to examine the effect of interest rate on Investors' sentiments in Nigeria Stock Market. The dependent variable was investors' sentiment (SentPCA) while the explanatory variable was interest rate. In estimation of the models formulated, statistical techniques which include descriptive statistics, correlation analysis, unit root test, Engel-Granger co-integration test, over-parameterized and Parsimonious error correction model (ECM) was used in the analysis. The results from all our analysis show that macroeconomic fundamentals such as Interest rate have an impact on Investors sentiments in Nigerian Stock Market. This study therefore makes the following conclusions.

5.2 Conclusion

The preceding section reveals that Interest rate has an impact on Investors sentiments in Nigerian Stock Market. Moreover, we clearly observed that macroeconomic and market fundamentals such as Interest rate did not have a statistically significant relationship with Investors sentiment in Nigerian Stock Market. By way of the recommendation extracted from this study, it is important to consider further studies on the powerful effect of Macroeconomic fundamentals in determining Investors sentiment and pricing equities in Nigeria.

5.3 Recommendations

Based on the findings of this study, we suggest the following measures:

1. Understand investors' emotion biases: this study suggested that investors would be better off when they know and avoid the potential psychology bias that is detrimental to their investment policy guideline or objectives.
2. Earn market returns: this study also reveals that the presence of many forms of investors' sentiment makes predicting the stock market prices almost impossible. Therefore investors must not strive to out-perform the market since trying to make more than what the market can offer necessitates psychological biases.
3. Fusion investment evaluation: the relevant role of investors emotions in explaining equity prices, also led to the suggestion in the use of investors sentiment and market fundamentals in predicting equity prices.
4. Diversification: the disturbances in equity prices that are caused by investors' sentiment especially from stock in young, fast-growing technology etc can be managed through diversification of portfolio.
5. Regular review of biases: to manage investors' emotion biases, this study also suggests that timely review of investment mistakes caused by sentiments, rumours, hearsay, emotions etc can be detected and prevented in subsequent trading if they are reviewed regularly.
6. Forecasting equity prices: in predicting the prices of equity in emerging stock market where there are investor's sentiment and market manipulations, this study recommends the use of empirical models that consider both market and non-market factors.
7. Market Regulation; this study also recommends the need for professional ethics and standards that prevent market participants from generating market sentiments that benefit them and cause abnormality in equity prices movement.

References

- Abugri, B.A. 2008. Empirical relationship between macroeconomic volatility and stock returns: Evidence from Latin American Markets. *International Review of Financial Analysis*, 17(2), 396-410.
- Al-Sharkas, A. 2004. The dynamic relationship between macroeconomic factors and the Jordanian Stock Market. *International Journal of Applied Econometrics and Quantitative Studies*, 1(1), 97-114.
- Amedu, S. 2010, Global Financial market meltdown and the Nigerian stock market crash of 2008: Any lesson for market players and regulators? , *Nigerian Journal of Securities and Finance*. 15 (1), 99-124.
- Babajide, A. A and Adetiloye, K. A 2012, Investors' Behavioural Biases and the Security Market: An Empirical Study of the Nigerian Security Market, *Accounting and Finance Research*, vol 1 No.1. URL: <http://dx.doi.org/10.5430/afr.v1n1p219>
- Baek, In-Mee, A. Bandopadhyaya and Chan Du, 2005, "Determinants of Market Assessed Sovereign Risk: Economic Fundamentals or market Risk Appetite?", *Journal of International Money and Finance*, volume 24, Issue 4, pp 533-548.
- Baker, M and Stein, J. 2004, Market liquidity as a sentiment indicator, *Journal of Financial Markets*, Elsevier, vol. 7(3), pages 271-299, June.
- Baker, M. and Wurgler, J. 2006, "Investor Sentiment and the Cross-section of Stock Returns", *Journal of Finance*, 61(4), 1645-1680.
- Baker, M. and Wurgler, J. 2007, "Investor Sentiment in the Stock Market", *Journal of Economic Perspectives*, 21(2), 129-151.
- Branch ,B 1976, "The Predictive Power of Stock Market indicators", *Journal of Financial and Quantitative Analysis*, Vol. 11, Issue 2, pp.269-286.
- Brown, G.W. and Cliff, M.T. 2004, "Investor Sentiment and the Near-term Stock Market", *Journal of*

- Empirical Finance*, 11(1), 1–27.
- Brown, G.W. and Cliff, M.T. 2005, “Investor Sentiment and Asset Valuation”, *Journal of Business*, 78(2), 405–440.
- Brown, G.W. and Cliff, M.T. 2004, “Investor Sentiment and Near-Term Stock Market”, *Journal of Empirical Finance*, 11, 1-27.
- Chang, W.J., Ma, J.C., Chiu, H.T., Lin, K.C. and Lee, P. 2009 a Job satisfaction and perceptions of quality of patient care, collaboration and teamwork in acute care hospitals. *Journal of Advanced Nursing* 65(9), 1946–1955.
- Chen, Kan Miller 1993. Are the Discounts on Closed-End Funds a Sentiment Index? *Journal of Finance* 48:795–800.
- Clarke, R. G. and Statman, M, 1998. "Bullish or Bearish?" *Financial Analysts Journal*, (May/June): 63-72
- Cornelli, F., Goldreich, D. and Ljungqvist, A. 2006, “Investor Sentiment and Pre-IPO Markets”, *Journal of Finance* 61, 1187-1216.
- Colander, D.C. 1995. Macro-economic. Second Edition. United States of America: Richard D. Irwin, Inc.
- Dennis, P and S. Mayhew 2002 Risk- Neutral skewness: evidence from stock options, *Journal of financial and quantitative analysis*, vol 37, issue 1, 35-58.
- Elton, E. J., Gruber, M. and Busse J.A 1998 Do investors' care about Sentiment? *Journal of business* Vol 71 no. 4.
- Granger .C. WJ 1988 Some Recent Developments in the concept of causality, *Journal of Econometrics*, Vol. 39.
- Groves, R. M. 2006, “Non response Rates and Non response Error in Household Surveys.” *Public Opinion Quarterly* 70:646–75.
- Gujarati D N., Poter D C. 2009, “*Basic Econometrics*.” Fifth Edition, McGraw/Irwin Inc Publishers, New York. NY 10020.
- Helwege J. and Liang N., (1996), Is there a Pecking Order? Evidence From a panel of IPO firms, *Journal of Financial Economics* 40, 429-458.
- Hamilton, A. 2001. “Exploding Inflation”. Zeal Intelgence.
- Humpe, A. and Macmillan, P. 2007. Can macroeconomic variables explain long term stock market movements? *A comparison of the US and Japan. CDMA Working Paper Series* ,No. 07/20 Available at SSRN : <http://ssrn.com/abstract>.
- Johnson, S. A., Lei, A., Ji-Chai, L. and Sanger, C.G. (2006) *Trading volume trend, investor sentiment, and stock returns*, Louisiana state university, Baton, USA.
- Lee, C.M.C., Shleifer, A. and Thaler, R.H. 1991 “Investor sentiment and the closed-end fund puzzle”, *Journal of Finance*, Vol. 46, pp. 75–109.
- Lee, D., Chan, H., Faff, F.W and Kalov, P.S 2003 “Short-term contrarian investing- is it profitable?, Yes and no.”, *Journal of Multinational Financial management*, 13 (4-5), pg 385-404.
- Hamilton, A. (2001). “Exploding Inflation”. Zeal Intelgence.
- Lobo, B. J. 2000. Asymmetric Effects of Interest Rate Changes on Stock Prices. *The Financial Review* , 35, 125-144.
- Lowry, M 1999, “Determinants of IPO Volume” University of Rochester working paper series.
- McDonald G. and Fisher A.K. 1972, “New Issue Stock Price Behaviour” *The Journal of Finance* 17, 97-102.
- Maysami, R.C., Howe, L.C. and Hamzah, L.C. 2004. Relationship between macroeconomic variables and stock market indices: Co-integration evidence from Stock Exchange of Singapore's All-Sector Indices. *Journal of Pengurusan*, 24, 47-77.
- Melberg, H.O. 1992. “Inflation: an overview of Theories and Solutions” (www.geocities.com/hmelberg/papers/921201.htm).
- Miller. E. M. 1977 Risk, uncertainty, and divergence of option, *Journal of Finance* 32.1151-1168
- Muradoglu, G. and Metin, K. 1996. Efficiency of Turkish Stock Exchange with respect to monetary variables: A Co-integration analysis. *European Journal of Operational Research*, 90(3), 566-576.
- Neal, R. and Simon, W. 1998 “Do measures of Investment Sentiment predict Stock Return” .*Journal of Finance and Quantitative Analysis* 34, 551-584.
- Nwude, E. C and Herbert, W. E. 2013. Are Brewery Stocks Inflation Hedges: Evidence from Nigeria,

- Research Journal of Finance and Accounting*, Vol. 4, No.7, pp. 78-89.
- Oyetan, O. 2013 "Market Cycles: Transition from Bear to Bull", *NSES retail Investor Clinic, Stanbic IBTC Asset Management Ltd.*
- Otoo M.W 1999. "Consumer sentiment and the stock market". *Finance and Economics Discussion Paper 1999-60, Federal Reserve Board, Washington, D.C.*
- Ojo, M.O. 2000. "The role of the Autonomy of the Central Bank of Nigeria (CBN) In Promoting Macroeconomic Stability". *Central Bank of Nigeria Economic and Financial Review*, Vol.38, Number 1, March.
- Owolabi A. Usman and Adegbite Tajudeen Adejare 2013 Inflation and Capital Market Performance: The Nigerian Outlook. *Journal for Emerging Trends in Economics and Management Sciences (JETEMS) 5(1):93-99* © Scholarlink Research Institute Journals, 2013 (OISSN: 2141-7024) jetems.scholarlinkresearch.org
- Piana, V. (2001). *Inflation Economic*. Web Institute.
- Randall, M.R, Suk, D.Y. and Tully, W. S. 2003 Mutual fund cash flows and stock market performance, *Journal of investing*, 12(1), 78-81.
- Rajan, R. and Servaes, H. 1997, Analyst following of initial public offerings, *Journal of Finance* 52, 507-529
- Seyhun, H. N. 1998, "Investment Intelligence from Insider Trading" *Cambridge, MA: MIT Press. Baker.*
- Shiller R.J. 2000, "*Irrational Exuberance*", Princeton University Press
- Solt, M.E. and Statman.M. 1988. "How Useful is the Sentiment Index?" *Financial Analysts Journal*, vol. 44, no. 5 (September/October):45-55.
- Thomas, P. (2006). "Does the US have a Handle on Inflation?" *Street Insight*.
- Udonsah Idorenyin L. 2012 The Impact Of Interest Rate On Investment Decision In Nigeria. An Econometric Analysis 1981-2010. A project understudied, for the Department Of Economics, Faculty of Management and Social Sciences, Caritas University Enugu State Nigeria
- Wongbambo, P. and Sharma, S.C. 2002. Stock market and macroeconomic fundamental d y n a m i c interactions: ASEAN - 5 Countries. *Journal of Asian Economics*, 13, 27-51.
- Zweig, A and Martin E. 1973. "An Investor Expectations Stock Price Predictive Model Using Closed End Fund Premiums." *Journal of Finance*, 28(1): 67-87.
- Zubairu A.A, and Umaru A. 2012. Effect of Inflation on the Growth and Development of the Nigerian Economy (An Empirical Analysis). A paper written for the *International Journal of Business and Social Science*. Vol. 3 No. 10 [Special Issue – May 2012]
- Zubairu, M 2014 Macroeconomic Variables and Nigeria Stock Market Returns: A Stepwise Regression Analysis, *Being First PhD Seminar Paper Presented to Department of Business Administration, Ahmadu Bello University, Zaria in Partial Fulfillment of the Requirements for the Award of the Doctor of Philosophy in Business Administration (PhD)*
- Zubairu, M 2014 The Influence of Investors Sentiment on Stock Market Returns in Nigeria, *Being Second PhD Seminar Paper Presented to Department of Business Administration, Ahmadu Bello University, Zaria in Partial Fulfillment of the Requirements for the Award of the Doctor of Philosophy in Business Administration (PhD)*