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EFFECT OF INFLATIONARY EXPECTATIONS ON STOCK MARKET RETURNS IN NIGERIA

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Abstract
This study examined the effect of inflationary expectations on stock market returns during the financial crisis era and the post-financial crisis era in Nigeria. The study built its argument using Fisher's effect to examine the objective. The study employed quarterly data spanning through the periods of first quarter 2007 till the fourth quarter of 2018. Using Autoregressive Distributed Lag estimation technique after the stationarity of the variables have been confirmed by ADF and its long-run stability confirmed by Bounds co-integration test, the study found that inflationary expectations are key determinants of stock market returns in Nigeria. The study concludes that stocks do not hedge over inflation as expectations built up by agents in the economy affects stock returns. The study, therefore, rejects the Fisher hypothesis for the case of Nigeria in the post-global financial crisis era.

Keywords: *Inflationary Expectations, Stock Market Returns, Autoregressive Distributed Lag Model (ARDL)*
JEL Classification: *E31, E44*

1. Introduction

The stock market of an economy significantly contributes to the financial development of the economy as well as capital accumulation cum growth process (Tayyab &Anees, 2019). It market plays an important role in mobilizing capital for development processes in emerging economies which Nigeria is a part of. Further to this, the stock market manages the capital for companies from shareholders in exchange for shares in ownership to the potential investors that are interested in acquiring the shares.

The stock market is principally affected by many macroeconomic as well as a social and political phenomenon which interacts with each other. Thus, it can be a bit difficult to identify the factor(s) that specifically affects the stock market. In most cases, there are selected macroeconomic variables that act as a strong determinant of stock market performance (Rakhal, 2015). Vast literature since the financial crisis of the 1980s (Balduzzi, 1995; Barnes, Biyd& Smith, 1999; Graham, 1996) have identified that inflations, inflationary expectations, as well as volatilities are strong determinant of stock market returns; two of such are prominent.One of such opines that inflationary expectations do not play a significant effect, this is the Fisher effect while others identifies that there is a strong relationship between inflationary expectations and stock market returns. In an economy, inflationary expectations of agents may be significant determinants of macroeconomic decisions affecting the stock market or not.

There are two main schools on how expectation is formed in an economy, Lucas and Sargent-Rational Expectation Hypothesis and the Cagan and Friedman-Adaptive Expectation Hypothesis. The schools of thought agree that it is not the actual inflation that really affects outcomes, but expectations formed play a major role; however, the major difference is on how expectations are formed. The adaptive expectation hypothesis opines that expectations are formed in the light of past experiences and thereafter, economic agents, learn from them. Say for instance, the inflation rate for a particular month (January) as officially known in February does not affect outcomes, but people's expectation of what they feel prices in January will be in December that actually affects macroeconomic outcomes in January and not the actual inflation rate known in February.

Inflationary expectations are unobservable; however, market agents, investors as well as the firms take into cognizance the expected rate of inflation when making economic decisions, this is because inflation changes favour certain set of market agents (holders of assets, securities) within the economy while this does not favour at certain quarters (creditors, holders of liquidity). It, therefore, means that holding assets, securities, as well as equities, can help to hedge inflation. Fama (1981) however argued that in an efficient as well as the forward-looking market, the real returns on stocks should mirror expectations only about real variables and not expected inflations. Thus, inflationary expectations do not play a significant role in determining the returns on stock but only expected growth in output plays a significant role. This, therefore, supports the argument of the Fisher effect that the returns on equities are invariant with respect to nominal variables such as the inflation rates or the expected inflations formed.

The proponents that suggest that inflation has a strong negative impact on the stock market (The Volatility Hypothesis as developed by Kevin and Perry) argues that when price changes, expectations are built up, this creates market conditionings as well as information asymmetries thereby leading to an adverse effect on in the stock market (Zhongqiang, 2014). They seldom opine that increases in inflation led to lower real returns not only on the value of money but even on all assets which securities and equities traded in the stock exchange are inclusive. The frictions created from expectations lead to a contraction in the provision of credit which invariably limits human as well as physical investment.

Another strand of literature (Geetha, Mohidin, Chandran & Chong, 2011) has opined that there exist mixed results and inconsistencies in the effect of inflationary expectation on stock market returns due to errors in the technique used in the estimation of inflationary expectation coefficients and as such, there will always exist variations in the coefficient. This study, therefore, asks the following important question: do inflationary expectations affect stock market returns? The question can be asked in another form; are shares hedged against expected inflation going by the Fisher hypothesis? The highlighted questions motivate this study to critically examine the effect of inflationary expectation on stock returns in the Nigerian stock exchange. The Fisher null hypothesis is tested in this study which states that inflations do not in anyway affect the stock returns of any stock market.

There remains scanty of literature with respect to Nigeria in examining the effect of inflationary expectation on stock market returns; this provides a strong justification for examining this objective. Empirically, there is an increasing amount of literature in Nigeria context that have examined how inflation directly emits signals that affect

the stock market activities (Daferighe & Charlie, 2012; Ibrahim & Agbaje, 2013; Mogire, 2014; Owolabi & Adegbite, 2013). However, studies that examine how Nigeria stock market returns will hedge over inflationary expectation remains very scanty, this study intends to contribute to existing literature. Empirical investigations on the effect of inflationary expectation on stock market returns have to some extent been carried out in the developed part of the world (Barnes et. al., 1999; Balduzzi, 1995; Caporale & Jung, 1997; Madsen, 2004) in particular, the empirical investigations were carried out prior to the 2008 global financial crisis. However, very scanty literature exists on this phenomenon with respect to economies in the period of post-global financial crisis, whether developed or developing; this study becomes relevant in increasing the body of literature in that direction. In Nigeria, although there is an increasing amount of empirical literature that examined how inflation directly emits signals that affect the stock market activities, for instance - (Daferighe & Charlie, 2012; Ibrahim & Agbaje, 2013; Mogire, 2014; Owolabi & Adegbite, 2013) - studies that examine how Nigeria stock market returns will hedge over inflationary expectation remains very scanty. This provides a strong justification for examining this objective. Besides, the study contributes to the literature by systematically employing the Adaptive Expectation Hypothesis and deriving inflationary expectations using the Koyck transformation approach.

Relevant data are obtained from CBN 2018 Quarterly Statistical Bulletin comprising of quarterly time series between the period first quarter 2007 till the fourth quarter, 2018 in order to cover the global financial crisis and post effect era on the Nigerian Stock Exchange. The remaining section of this paper is divided into four sections for clarity of presentation and drawing of policy implication. Section two examines a review of the literature with respect to theoretical and empirical investigations. Section three explains the theoretical framework and methods employed in analysis while section four presents and analyzes the results. Section five concludes and provides policy recommendation from the results obtained in section four.

2. Review of Related Literature

Theoretical Literature

Theoretical literature exist on the effects of inflationary expectation on stock returns, the strategies of estimating inflationary expectations since it cannot be directly observed, the determinants of stock market returns as well as the implications of inflation changes on economic performance. This section starts by examining the theoretical linkage between inflationary expectation and stock returns. In light of this, Fisher was amongst the first to provide an explanation on the linkage between stock returns and inflationary expectation. The Fisher effect postulates that nominal interest rates rise together with inflation in the long run while real interest rates remain indifferent; thus, the direct relationship between nominal interest rates and inflation changes over time (Fisher, 1930). Consequent to this, the Fisher effect is a useful tool in inflation targeting because nominal interest can be set to control inflation to a certain extent.

Fisher opines that shares are hedged against expected inflation (Fisher, 1930). That is, according to Fisher, inflationary expectations do not in any form affect the stock returns. The Fisher equation states that the coefficient of the impact of expected inflation at period t+1 on nominal share returns will always be equals to 1. That is, assuming there is the equation:

$$Share\ Returns_t^{Nominal} = \psi_0 + \psi_1 expected\ ingflation_{t+1} \quad (2.1)$$

the Fisher effect will hold for H_0: $\psi_1 = 0$. Thus, when the coefficient between expected inflation and share returns is significant, the alternative hypothesis is accept; we thus expect that expectations are rational and as such, real interest rate is constant (Madsen, 2004). Fisher effect or rather Fisher hypothesis has been criticized as it is difficult to measure inflation expectations and as such, the choice of the sample period, the instrument to use, data availability with respect to the country may lead to the biasedness of the conclusions drawn.

There is also the inflation illusion hypothesis as developed by Modigliani and Cohn (1979) which strongly argues that the real effect of inflation is principally caused by money illusion. This scenario presupposes that when inflation rises, bond yields will increase; however, because equity investors incorrectly discount real cash flows using nominal rates, the increase in nominal yields leads to equity underpricing and vice versa (Owolabi & Adegbite, 2013). Modiglianiand Cohn (1979) suggests that disinflation will on its own lead to mispricing by sending wrong signals to the stock market investors who are under inflation illusion. As such, the stability of inflation will reduce the volatility of mispricing and thus, contributes to the efficiency of the stock market. It is also quite alarming when stock investors suffer from money illusion because of the high returns at stake. Under this scenario, during the periods of high inflation, rational equity premium expectation builds up, then the market subjective expectation thereby leading to the undervaluation of stocks.

The estimation of inflationary expectation is difficult to obtain, Lucas and Sargent developed the rational expectation hypothesis in providing an explanation on how expectations in an economy is formed. They contend that "individual economic agents use current available and relevant information in forming their expectations and do not rely purely upon past experience. In essence, the Rational Expectation hypothesis contends that "expectations are rational in the sense that they efficiently incorporate all information available at the time the expectation is formulated and not just the past information" (Gujarati & Porter, 2011, pp. 637). The Rational expectation hypothesis has been criticized because it is empirically difficult to employ the strategy in examining how expectations are formed. This is because most models such as the Dynamic Stochastic General Equilibrium Analysis (DSGE) does not make provision to factor in changes in policy (Goutsmedt, Pinzon-Fuchs, Renault & Sergi, 2016).

Another approach that can be applied to explaining how expectations are formed is the adaptive expectation model. The Adaptive expectation model as developed by Cagan and Friedman proposes that expectations are formed from past experience of the economic behaviours. That is, the adaptive expectation argues that economic agents will adopt their expectations in the light of past experiences and learn from them. Thus, inflationary expectations are partly dependent on a fraction of past equilibrium expected long-run inflation rate and also on a fraction of the real or actual current inflation rate. The argument that individuals will always learn from their past experience can be said to be obviously a more sensible starting point than the implicit assumption that they totally make their decision without considering the past. However, caution should be placed in ensuring that more distant experiences exert a lesser effect than more recent experience would have on expectations (Gujarati& Porter, 2011, pp. 631). A setback to the Adaptive expectation model is that when there is a policy shift within the economy, we do not expect expectations to be formed based on the past experience, but the current happening

and policy in place will determine how expectation will be formed.

Other arguments theoretical arguments provide an explanation on the link between inflations and economic performance. The traditional classical theory suggests that there is a negative relationship between inflation and the level of economic performance; this is because the real variables are the determinant of economic activity. The Keynesian theory as developed by Keynes stipulates that there is no trade-off between inflation and the level of economic performance within the economy. They suggested that the aggregate supply curve is upward sloping and not vertical as stated by the Classicalists. As such, when there are changes in the aggregate demand, this will not affect the price level. They, however, concluded that in the short run, the formation of expectations, labour, prices and other reduction factors such as the monetary and fiscal policies are a strong determinant of inflation and also output. The theory suggests that the economy does not move in sine qua non with higher inflation rate but follows a transitional path where it first rises and then later falls.

2. Review of Empirical Literature

Gimeno and Marqués (2012) decomposed the nominal interest rates into real risk-free rates, risk premia and inflation expectations from January 1991 to December 1998 using an affine model that takes as factors the observed inflation rate and the parameters generated in the zero-yield curve estimation. In their study, they were able to measure inflations expectations for Spain during the 1990s and employed the Autoregressive Integrated Moving Averages (ARIMA). The study found out that with the evolution of inflationary expectations, its effect has yield minimal impact than expected.

Madsen (2004) empirically tested the Fisher hypothesis for Denmark amidst the controversies surrounding its validity between the periods 1890 to 1939 and the periods 1961 to 1995 and employed the Distributed Lag Model estimation technique. The paper showed theoretically and empirically that the validity of the Fisher effect is dependent on the way model is specified, the pattern of determining inflation, the measure or proxy of inflation expectations and the time frame of the data; and as such, the Fisher effect can hold temporary because it takes quite some time to share markets to adjust to news and innovations in inflation.

A related study conducted by Gao (2005) examined the effect of inflationary expectation on financial markets of United States for the 10-year period from January 1995 to December 2004. The study employed both quantitative methods in measuring inflation as well as a qualitative measure in determining inflationary expectation; the quantitative method is the Ordinary least Squares (OLS) The result found out that there is a direct impact of inflationary expectation on stock market performance. The implication of this study is that the Fisher effect does not hold in this economy.

Daferighe and Charlie (2012) examined the effect which inflation has on stock market performance in Nigeria within the period 1991 till 2010. The study employed the ordinary least squares estimation technique and various measures of stock market performance were used. The result amongst others discovered that inflation had a negative impact on market capitalization, the total value traded ratio and changes in all share index. However, inflation does not have a significant negative impact on the turnover ratio. The study recommended that the government should involve in enlightenment programmes which will improve the corporate governance measures in order to improve transactions in the market considering its present low level of activities.

Diaz and Jareño (2013) examined how inflation news affects the Spanish stock market returns. The study examined this objective in light of the market direction and flow-through ability. The data employed is 179 monthly IPC announcements that cover the period from February 1990 through December 2004 and they were analysed using the Autoregressive Moving Averages (ARMA). The result found from the study is that unanticipated inflation news spells abnormal returns on stock depending on the direction of the news, the present condition of the economy and flow-through ability of the sector.

Mogire (2014) examined the effect of inflation on stock market returns of the Nairobi Stock Exchange. Sixty-five listed firms in the Nairobi Securities Exchange was examined. The study employed the Granger Causality test as well as the ordinary least squares estimation technique to investigate the objective. From the Granger Causality test, the result shows that there is a bi-directional relationship running from stock returns and inflation and vice versa. The result, however, found that stock market returns are positively correlated with the inflation rate. However, from the study, there is a negative relationship between the interest rate and stock returns.

Ibrahim and Agbaje (2013) examined the long run relationships as well as the interaction between stock returns and inflation rate in Nigeria. The study employed data spanning through the period of 1997 till 2010 and the data wereanalyzed using the Autoregressive Distributed Lag Model the conclusion from the study is that there is a significant effect of inflation on stock returns in Nigeria.

Owolabi and Adegbite (2013) examined the effect of inflation on the capital market performance in Nigeria using data obtained from the CBN bulletin and the data was analyzed using ordinary least square regression analysis. The result reveals that there is an indirect impact of inflation on the various determinants of stock market performance as measured in the study, only that inflation did not have a negative impact on market volume for the period under study.

There remains to a large extent, scanty literature that has been conducted on this concept with respect to contemporary happenings and in a developing economy like Nigeria; this study intends to the existing literature.

3. Methods and Procedure

This section begins by examining the theoretical foundations upon which inflationary expectations and stock market performance is investigated. The relationship between stock market performance measured by stock market returns, stock prices, and inflationary expectations are best explained using the theory propounded by Fisher (1930) known as the Fisher's effect. Fisher's effect is of important relevance to the relationship between stock market returns and inflationary expectations. The Fisher effect presupposes that the real interest rate which implies the real stock market returns is not affected by the changes that occur in expected inflation. That is, the hypothesis implies that inflationary expectation does not have a significant effect on stock market returns; this is because the changes in inflationary expectation result in equal changes in the nominal stock returns. Also, rather put, the Fisher effect implies that shares are hedged against expected inflation (Madsen, 2004).

The implication of this is that the nominal stock returns respond one-for-one to the expected inflation rate (Hatemi-J, 2009). As discussed in the empirical review, there are empirical works that found that real stock market returns have a negative relationship with the expected inflation, implying that Fisher's effect does not hold. Tobin (1969) argues that the reason for

this is simply because investors in the stock market shift their portfolios towards real assets if their expected inflation rate becomes very high. Also, the money illusion phenomenon is another reason for not finding the Fisher effect.

In examining the relationship between the stock returns and the expected inflation, we start by specifying the theoretical model as used by other researchers in evaluating the relationship. Following the model as specified by (Madsen, 2004; Barnes, Boyd & Smith, 1999), equation (3.1) shows that:

$$SR_t^N = \varsigma_0 + \varsigma_1 \pi_{t+1}^e + \varepsilon_t \qquad (3.1)$$

Where SR_t^N is the nominal share returns and π_{t+1}^e is the expected inflation. The Fisher effect hypothesis holds that the coefficient ς_1 is 1. Empirical studies (Fama, 1981; Kaul & Seyhun, 1990). have argued that the regression of share returns on expected inflation yields biased and inconsistent result simply because expected income growth has been omitted from the modeling and thus concluded that inflationary expectation will not have a significant effect on share returns when expected income growth is factored into the modeling. The expected growth is the growth in output from the current year to the future year. Thus, equation (3.1) becomes:

$$SR_t^N = \varsigma_0 + \varsigma_1 \pi_{t+1}^e + \varsigma_2 \Delta logGDP_{t+1} + \varepsilon_t \quad (3.2)$$

Converting the inflationary expectation to a more representative symbol, we have:

$$SR_t^N = \varsigma_0 + \varsigma_1 INF_{t+1}^e + \varsigma_2 \Delta logGDP_{t+1} + \varepsilon_t \quad (3.3)$$

Where: INF^e is the inflationary expectation. Equation (3.2) can thus be expanded to incorporate other control variables which are determinant of stock returns (Rakhal, 2018); these are money supply, foreign direct investments, remittances, and financial crisis. Therefore, incorporating these determinants into the model, we expand equation (3.3) to become:

$$SR_t^N = \varsigma_0 + \varsigma_1 INF_{t+1}^e + \varsigma_2 \Delta logGDP_{t+1} + \varsigma_3 MS_t + \varsigma_4 FDI_t + \varsigma_5 REM_t + \varsigma_6 crisis_t + \varepsilon_t \qquad (3.4)$$

It is difficult to measure inflationary expectation as this cannot be directly observed; hence, this renders tests of the Fisher hypothesis sensitive to the choice of the sample period, time aggregation of the data, instruments, and country (Madsen, 2004). However, the adaptive expectation model as developed by Cagan (1956) and Friedman (1957) is a plausible and empirically meaningful strategy of modeling expectations of future variables in an economy of uncertainty. The Adaptive Expectation model is arguably preferred as it provides a relatively simple way of modeling expectations in the economic theory whilst postulating a mode of behaviour upon the part of economic agents which seems eminently sensible. Cagan and Friedman opine that expectations are formed in the light of past experiences and thereafter, economic agents, learn from them. That is, under the inflation scenario, inflationary expectations are formed based on past experiences. For inflationary expectations, it is thus modeled that expected inflation is formed in the following way:

$$INF_{t+1}^e - INF_t^e = \gamma(INF_t - INF_t^e) \qquad (3.5)$$

Where INF_t^e = equilibrium expected long-run inflation rate

INF_t = Real or actual inflation rate

γ = coefficient of expectation.

In order to estimate the coefficient of expectation, we apply the Koyck (1954) transformation method of transforming equation (3.5), expanding equation (3.5), we have:

$$INF_{t+1}^e = \gamma INF_t + (1-\gamma) INF_t^e \qquad (3.6)$$

Substitute equation (3.6) into equation (3.4), we have:

$$SR_t^N = \varsigma_0 + \varsigma_1\left[\gamma INF_t + (1-\gamma)INF_t^e\right] + \varsigma_2 \Delta logGDP_{t+1} + \varsigma_3 MS_t + \varsigma_4 FDI_t + \varsigma_5 REM_t + \varsigma_6 crisis_t + \varepsilon_t \quad (3.7)$$

Thus,

$$SR_t^N = \varsigma_0 + \varsigma_1\gamma INF_t + \varsigma_1(1-\gamma)INF_t^e + \varsigma_2 \Delta logGDP_{t+1} + \varsigma_3 MS_t + \varsigma_4 FDI_t + \varsigma_5 REM_t + \varsigma_6 crisis_t + \varepsilon_t \quad (3.8)$$

Following the Koyck transformation, we lag equation (3.4) with one period and multiply it by $(1-\gamma)$ thus, we have:

$$(1-\gamma)SR_{t-1}^N = (1-\gamma)\varsigma_0 + \varsigma_1(1-\gamma)INF_t^e + \varsigma_2(1-\gamma)\Delta logGDP_t + \varsigma_3(1-\gamma)MS_{t-1} + \varsigma_4(1-\gamma)FDI_{t-1} + \varsigma_5(1-\gamma)REM_{t-1} + \varsigma_6(1-\gamma)crisis_{t-1} + (1-\gamma)\varepsilon_{t-1} \quad (3.9)$$

Subtract equation (3.9) from equation (3.8), we have:

$$SR_t^N - (1-\gamma)SR_{t-1}^N = \varsigma_0 - (1-\gamma)\varsigma_0 + \varsigma_1\gamma INF_t + \varsigma_1(1-\gamma)INF_t^e - \varsigma_1(1-\gamma)INF_t^e + \varsigma_2\Delta logGDP_{t+1} - \varsigma_2(1-\gamma)\Delta logGDP_t + \varsigma_3 MS_t - \varsigma_3(1-\gamma)MS_{t-1} + \varsigma_4 FDI_t - \varsigma_4(1-\gamma)FDI_{t-1} + \varsigma_5 REM_t - \varsigma_5(1-\gamma)REM_{t-1} + \varsigma_6 crisis_t - \varsigma_6(1-\gamma)crisis_{t-1} + \varepsilon_t - (1-\gamma)\varepsilon_{t-1} \quad (3.10)$$

From equation (3.10), we have:

$$SR_t^N = \gamma\varsigma_0 + \varsigma_1\gamma INF_t + \varsigma_2\Delta logGDP_{t+1} - \varsigma_2(1-\gamma)\Delta logGDP_t + \varsigma_3 MS_t - \varsigma_3(1-\gamma)MS_{t-1} + \varsigma_4 FDI_t - \varsigma_4(1-\gamma)FDI_{t-1} + \varsigma_5 REM_t - \varsigma_5(1-\gamma)REM_{t-1} + \varsigma_6 crisis_t - \varsigma_6(1-\gamma)crisis_{t-1} + (1-\gamma)SR_{t-1}^N + \varepsilon_t - (1-\gamma)\varepsilon_{t-1} \quad (3.11)$$

Estimating equation (3.11) using the Ordinary least squares estimation technique will break down because it can be verified that SR_{t-1}^N is correlated with $\varepsilon_t - (1-\gamma)\varepsilon_{t-1}$, that is, $Cov\left(SR_{t-1}^N, (\varepsilon_t - (1-\gamma)\varepsilon_{t-1})\right) \neq 0$ However, using the instrument SR_{t-2}^N can also be verified that it is not correlated with $\varepsilon_t - (1-\gamma)\varepsilon_{t-1}$ and thus, the variable SR_{t-2}^N is set as an instrument. The final model to be estimated is defined in equation (3.12).

$$SR_t^N = \gamma\varsigma_0 + \varsigma_1\gamma INF_t + \varsigma_2\Delta logGDP_{t+1} - \varsigma_2(1-\gamma)\Delta logGDP_t + \varsigma_3 MS_t - \varsigma_3(1-\gamma)MS_{t-1} + \varsigma_4 FDI_t - \varsigma_4(1-\gamma)FDI_{t-1} + \varsigma_5 REM_t - \varsigma_5(1-\gamma)REM_{t-1} + \varsigma_6 crisis_t - \varsigma_6(1-\gamma)crisis_{t-1} + (1-\gamma)SR_{t-2}^N + V_t \quad (3.12)$$

Definition and a priori expectations of variables from equation (3.12) are presented in table i.

Table i: Definition, Measures and A priori Expectation of Variables

Variable	Definition	Measures	A priori Expectation
SR_t^N	Nominal Stock Returns at time t	All share Index showing the behaviours of the common shares quoted using 1985 as the base year	Dependent Variable
INF_t	Actual Inflation rate at time t	Rate of change in the consumer price index	< 0
$\Delta logGDP_{t+1}$	Expected Growth in Output at time t	Growth in output from the current year to the future year	> 0
$\Delta logGDP_t$	Current Growth in Output	The growth rate in output from the current year to the past year	> 0
MS_t	Money Supply at time t	Broad money supply (M2)	> 0
FDI_t	Foreign Direct Investment at time t	Foreign direct investment, net inflows (% of GDP)	> 0
REM_t	Remittances Inflow at time t	Personal remittances received (% of GDP)	> 0
$crisis_t$	Financial crisis at time t	Dummy variable of 1 assigned to quarters in which at least one commercial bank merged or was acquired and 0 otherwise.	< 0

All data are sourced from the Fourth Quarter, CBN 2018 Bulletin

In order to estimate equation (3.12), the study employs the Autoregressive Distributed Lag model (ARDL) technique with fixed lag length selection criteria as specified by equation (3.12) in order to effectively estimate the inflationary expectations, the expected output growth rate and their effect on stock returns. The ARDL model is also preferred as it accommodates for variables that can be integrated at varying order of stationarity (both at I(1) and I(0)). Also, the issue of cointegration is tested using the Pesaran, Shin and Smith (2001) method of examining the long run relationship between variables. The test for unit root is conducted using the Augmented Dickey-Fuller (ADF) test statistics.

4. Results and Discussion of Findings

This section presents the analysis of our results estimated using various estimation techniques as specified in the previous section. The purpose of the section is to ascertain the objectives that were stated in section one of this paper and this, help to draw conclusions and policy implications of the findings to stock market behavior. We begin by discussing the descriptive statistics of the variable.

Table ii: Descriptive Statistics

	Mean	Maximum	Minimum	Std. Dev.	J-B	Prob	Obs
Crisis	0.333333	1.000000	0.000000	0.476393	8.500000	0.014264	48
FDI	1362.346	3084.896	314.4352	677.7378	3.675319	0.159190	48
GDP	4.801439	9.941480	-2.34083	3.261413	2.686111	0.261047	48
GDP_{t+1}	4.852874	9.941480	-2.34083	3.276934	2.869785	0.238141	47
INF	11.35672	18.45093	4.385962	3.391949	0.747559	0.688129	48
MS	44756361	78577904	12820594	17989063	2.161360	0.339365	48
REM	5.206322	7.163690	3.613717	0.950871	2.515540	0.284287	48
SR	33031.88	60952.95	20550.60	10235.98	7.587347	0.022513	48

Source: Authors' Construct using Data Obtained from CBN 2018 4th Quarter Bulletin

From table ii, it can be seen that inflation over the period of study averaged 11.36% and reached the maximum of 18.45%, however, inflation within the period declined to 4.39% in one of the quarters. The implication of the result is that the inflation rateis stable within the period. The GDP growth rate averaged 4.80% within the period of 2007 and 2018 even for the period of recession. Also, the ratio of remittances to output averaged 5.21% for the period of study while its peak was 7.16% and the minimum was 3.6%. Also, table ii reveals that the average foreign direct investment inflow within the periods 2007 and 2018 are 1.3 billion dollars and the highest FDI inflows were 3.08 billion dollars in a single year. Share returns averaged 33,031.88 indexes while its peak was 60,952.95 index. The implication of this is that the share returns has maintained more growth compared to its decline. The Jarque-Berra statistics examine the normality of the distribution. It assumes that the null hypothesis is normally distributed while the alternative is that the distribution is not normally distributed. From table ii, it can be seen that the null hypothesis of the normal distribution is rejected for crisis dummy, as well as the share returns. However, the result fails t reject the null hypothesis for foreign direct investment, output growth, inflation rate, money supply, and remittances.

Table iii: Correlation Test Result

	CRISIS	FDI	GDP	$GDPT_{t+1}$	INF	MS	REM	SR
CRISIS	1.00	0.05	-0.07	-0.01	-0.14	0.21	-0.23	-0.14
FDI		1.00	0.44	0.47	0.05	-0.55	-0.02	-0.16
GDP			1.00	0.95	-0.39	-0.82	0.11	0.14
$GDPT_{t+1}$				1.00	-0.45	-0.82	0.04	0.11
INF					1.00	0.41	0.29	-0.50
MS						1.00	-0.15	-0.21
REM							1.00	0.14
SR								1.00

Source: Authors' Construct using Data Obtained from CBN 2018 4th Quarter Bulletin

Table iii shows the correlation coefficient between the variables examined; this is to help investigate the extent of multicollinearity that is associated with the regression result. There is a need to examine the level of correlation that is associated with the independent variables; this will help to checkmate for the presence of multicollinearity. It is important there should not be a high level of correlation between independent variables for there not to be multicollinearity. From the table, it can be seen that there is no high level of correlation amongst the independent variables meaning that there is no high level of multicollinearity associated in the regression result.

Having established that there is no multicollinearity associated with the regression result, it is thus important to test for the stationarity of the variables and ensure that there is no unit root associated with the regression result. Thus, the next section examines the stationarity of the variables and this is reported in table iv.

Table iv: Unit Root Test Result

Variable	Unit Root at Level			Unit Root at First Difference			conclusion
	ADF Test Statistics	ADF 5% Critical Value	Prob.	ADF Test Statistics	ADF 5% Critical Value	Prob.	
Crisis	-2.307180	-2.925169	0.1740	-6.662279**	-2.926622	0.0000	I(1)
FDI	-2.454727	-2.925169	0.1329	-8.907428**	-2.926622	0.0000	I(1)
GDP	-1.123292	-2.925169	0.6990	-5.976358**	-2.926622	0.0000	I(1)
$\Delta\log(GDP)_{t+1}$	-1.031533	-2.926622	0.7342	-5.960495**	-2.928142	0.0000	I(1)
INF	-3.510339*	-2.926622	0.0120	-	-	-	I(0)
MS	-4.023593**	-2.925169	0.0029	-	-	-	I(0)
REM	-1.049668	-2.933158	0.7265	-2.229189*	-1.948886	0.0265	I(1)
SR^N	-0.310650	-1.947975	0.5684	-4.903770**	-1.948140	0.0000	I(1)

Note: *** implies Significant at 1% and * significant at 5%*

Source: Authors' Construct using Data Obtained from CBN 2018 4th Quarter Bulletin

Table iv examines the stationarity of the series using the Augmented-Dickey fuller test on all the variables employed. The unit root test was conducted at level as well as at first difference. The ADF test statistics are compared with the 5% critical value, the null hypothesis of unit root test is rejected for variables in which its ADF statistics is greater than the 5% critical value, else, we fail to reject the null hypothesis. From the table, it can be revealed that we only fail to reject the null hypothesis for inflation rate and money supply at level while in others, we fail to reject it. The implication of this is that the inflation rate and money supply growth rate are stationary at level. The study goes further to examine the stationarity of the other variables at first difference and the result reveals that the null hypothesis of unit root is rejected for crisis dummy variable, foreign direct investment, output growth, remittances and share returns as their test statistics is greater than 5% critical value. Thus, from table iv, it can be revealed that some of the variables are integrated into the order of 1 and others are at level.

Table v: ARDL Bound Co-integration Test

Test Statistic	Value	K	I0 Bound @ 5%	I1 Bound @ 5%
F-statistic	4.256451	6	2.45	3.61

Source: Authors' Construct using Data Obtained from CBN 2018 4th Quarter Bulletin

Having established that the variables are stationary at different order, at level and first difference, we next conduct a co-integration test in order to establish the existence of a long run relationship. This study employs the ARDL bound co-integration test as suggested by Pesaran, Shin and Smith (2001) which provides a Fisher's distribution for variables that are integrated at level and at first difference. The decision is that if the F-statistics is greater than the I(1) upper bound critical value, we reject the null hypothesis of no co-integration, meaning that there is long run stability associated with the regression result. However, if the F-statistics is lower than the I(0) 5% lower bound critical value, we fail to reject the null hypothesis that there is no co-integration and if the f-statistics is in-between the I(0) and I(1), the decision is inconclusive. Table v reveals that the f-statistics is above the I(1) upper bound critical value, implying that there is long run stability associated with the regression result.

Table vi: ARDL Estimated Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF_t	-0.073204**	0.021	-3.511	0.0014
INF_{t-1}	0.069376*	0.027	2.618	0.0137
GDP_t	0.017806	0.034	0.525	0.6034
$\Delta\log(GDP)_{t-1}$	-0.058856*	0.026	-2.257	0.0315
$\Delta\log(GDP)_{t+1}$	0.007778	0.024	0.318	0.7529
$\log(MS)_t$	1.705326*	0.724	2.355	0.0252
$\log(MS)_{t-1}$	-1.582906*	0.730	-2.168	0.0382
$\log(FDI)_t$	0.039328	0.079	0.501	0.6202
$\log(FDI)_{t-1}$	-0.036861	0.073	-0.507	0.6161
REM_t	-0.891224**	0.219	-4.062	0.0003
REM_{t-1}	0.837081**	0.208	4.031	0.0004
$CRISIS_t$	0.000929	0.083	0.011	0.9912
$CRISIS_{t-1}$	-0.166292	0.088	-1.897	0.0675
$logSR^N_{t-2}$	0.874954**	0.132	6.620	0.0000
C	-0.395406	3.644	-0.109	0.9143
R-squared	0.813014	Breusch-Pagan-Godfrey Stat.		1.712784
Adjusted R-squared	0.725754	Breusch-Pagan-Godfrey Prob.		0.1039
Durbin-Watson stat	1.970660	Breusch-Godfrey Serial Stat.		2.404135
F-statistic	9.317131	Breusch-Godfrey Serial Prob.		0.1081
Prob(F-statistic)	0.0000	J-B Stat.		0.750185
RAMSEY Reset stat.	3.253558	J-B Prob.		0.6872
RAMSEY Reset Prob.	0.0531			

Note: *** implies Significant at 1% and * significant at 5%***

Source: Authors' Construct using Data Obtained from CBN 2018 4th Quarter Bulletin

Hence, our estimated model of equation (3.12) is defined as:

From the model estimated in equation (3.12), we have that:

$$(1-\gamma) = 0.874954 \text{ hence, } \quad \gamma = 0.125046$$

$$\begin{aligned} \hat{SR}^N_t = &-0.395406 - 0.73204INF_t + 0.007778\Delta logGDP_{t+1} + 0.017806\Delta logGDP_t + 1.705326MS_t \\ &+ 1.582906MS_{t-1} + 0.039328FDI_t + 0.036861FDI_{t-1} - 0.891224REM_t \\ &- 0.837081REM_{t-1} + 0.000929crisis_t + 0.166292crisis_{t-1} + 0.874954SR^N_{t-2} \end{aligned}$$

$$Also,\ given\ that\ \gamma = 0.125046,\ \gamma\varsigma_0 = -0.395406;\ \varsigma_0 = \frac{-0.395406}{0.125046},\ \varsigma_0 = -3.162$$

$$Also,\ given\ that\ \gamma = 0.125046,\ \gamma\varsigma_1 = -0.73204;\ \varsigma_1 = \frac{-0.395406}{0.73204},\ \varsigma_1 = -0.54$$

So, our estimated model on the impact of inflationary expectation on stock market returns is given as:

$$\begin{aligned} \hat{SR}^N_t = &-3.162 - 0.54INF^e_{t+1} + 0.007778\Delta logGDP_{t+1} + 1.705326MS_t + 0.039328FDI_t \\ &- 0.891224REM_t + 0.000929crisis_t \end{aligned}$$

Following the Fisher's effect which states that stock market returns are not affected by the changes that occur in expected inflation, this assertion can thus be verified from table vi investigated as well as the inflationary expectation stock returns model estimated. The result shows that there is a significant and negative impact of expected inflation on stock market returns. The implication of this is that

expected inflation is a major determinant of stock market returns in the Nigeria scenario during the post-financial crisis era. The result suggests that increases in inflationary expectation on average reduces the nominal expected stock returns. In essence, we can thus reject Fisher's effect and conclude that the Fisher effect does not hold for Nigeria's stock market for the period investigated. This shows that expected inflation are strong determinants of stock market returns and as such, investors' risk assessment and decisions in the stock market are strongly influenced by the expected inflation. Rather put, we conclude that expected inflation isa strong determinant of stock returns.

From table vi, the result also reveals that expected output is not strong determinants of stock returns. The implication of this for bull and investors is that expected output growth is not a major determinant of stock market returns and as such, people's expectation of the future growth in output is not a major determinant of stock market returns. The result from the study also reveals that foreign direct investment into the domiciled country (Nigeria) stimulates and enhances stock returns. Thus, increases in foreign direct investment will always increase the stock returns. This conclusion is also applicable to the growth in money supply as the result reveals that higher money supply within the economy increases stock returns within the economy as there is a positive and significant effect of money supply on the stock returns examined. However, the remittances inflow as a percentage of GDP from the table does not stimulate stock returns as the result suggests that there is a negative effect of remittances on stock returns. The financial crisis as dummied using 1 as the presence of crisis to those periods in which at least one bank suffered distress and was acquired or merged and 0 for those years that did not suffer any acquisition, distress or merger shows that financial crisis does not affect the stock returns on stocks traded in the stock exchange. The implication of this is that the stock market is not receptive of the financial crisis suffered by the commercial banks during the period.

It is important that we examine the statistical properties of the models estimated. We begin by examining the r-squared of the model and it can be seen from table vi that about 81.3% of variations in the dependent variable (stock returns) is explained by the variables put together. The implication of this is that the explanatory variables to a very large extent, explains the changes in stock returns. Also, the Durbin-Watson d test examines the presence of autocorrelation associated with the regression result. The d-statistics of 2 shows that there is no autocorrelation associated with the regression result. The d-statistics from the table is 1.97 and this is approximately 2, thus we can conclude that there is no serial correlation of order one associated with the regression result.

The f-statistics examines the extent of a considerable harmony associated with the regression result. From the study, the result revealed that the f-statistics is statistically significant and we can thus conclude that there is a considerable harmony associated with the regression result. The RAMSEY Reset further test for the null hypothesis of a relatively stable model against the alternative hypothesis of an unstable long-run model. The result reveals that the null hypothesis of a stable model is not rejected against the stable model. We further investigate the presence of higher-order serial correlation defined by the Breusch-Godfrey statistics. The Breusch-Godfrey(BG) test for the null hypothesis of no serial autocorrelation against the alternative. The result shows that we fail to reject the null hypothesis of no serial higher correlation associated with the regression result. Also, the Breusch-Pagan-Godfrey (BPG) test for the presence of heteroscedasticity associated with the

regression result. The result shows that the null hypothesis of homoscedasticity is not rejected meaning that the model does not suffer from heteroscedasticity.

5. Conclusion, Recommendation and Policy Implication

This study examines the effect of inflationary expectation on stock market returns during the financial crisis era and the post-financial crisis era in Nigeria. The study built its argument using Fisher's effect to examine the objective as the Fisher effect states that there is no relationship between inflationary expectations and stock market returns. The Autoregressive Distributed Lag Model (ARDL) estimation technique is employed in examining the objective. The result found that inflationary expectations are key determinants of stock market returns in Nigeria. Further to this, we can conclude that inflation news leaks to the agents before its official publications. The result is in tandem with that of Diaz and Jareno (2013) Also, another conclusion drawn from the study is that the expected output growth is not strong determinants of stock returns.

The study thus recommends that monetary authorities must find effective ways of managing the increases, or changes in prices of goods and services so that expectations will not be formed on how the stock market will react to changes in price level and other macroeconomic fundamentals. Also, the study further recommends that investors in the stock market should be driven by the profitability and the returns of the listed firms and not be expectations on changes in prices of goods and services.

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