THE RELATIONSHIP BETWEEN INFLATION AND STOCK PRICE IN NIGERIA

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ABSTRACT
This study examined the relationship between inflation and stock prices in Nigeria. There is a widely held argument that efficient functioning of the Nigerian Stock Exchange market is a sine-qua-nong as well as a prerequisite for every economy because it helps in mobilizing funds needed for investment in various sectors in an economy. Whether this assertion holds, especially within the context of the relationship that existed between stock prices (proxied by the All Share Index) and inflation rate in Nigeria was the major objective of this study. From the results obtained, it was found that, there exists a unidirectional causality between stock prices, proxied by All Share Index and Inflation rate in Nigeria. This implies that stock prices causes inflation rate to rise but not vice versa. Similarly, there was an evidence of a unique long run equilibrium relationship between the variables specified in models. On the basis and strength of this evidence, the work recommends the followings for policy implementation: the government through its monetary operators should devise ways and measures aimed at stabilizing the economy to bring inflationary pressures to the required threshold; that interest rate should be further lowered so as to increase the level of investment towards accelerated industrial development. An increase in investment will lead to an
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increase in economic growth in Nigeria. Finally, it must also address the reported cases of abuses and sharp practices by some companies in the market.

Keyword: Inflation and Stock Price

INTRODUCTION

The Nigerian economy has remained underdeveloped for a long period despite being endowed with huge human and natural resources. This is as a result of various factors such as corruption, unemployment, inflation etc. Researchers around the world have come to a consensus that inflation has an influence on the stock market. In the long-run analysis of the stock market variables, it has been observed that inflation is a major problem that cannot be ignored. In periods of inflation, an increase in the consumer price index due to increased interest rates leads to dwindling share price.

High inflation creates a high level of stock market volatility which could potentially destabilize the economy and make it inefficient. The performance of the stock market is of utmost importance to investors, policy makers and the likes. The measures of stock market performance include market capitalization; which measures stock market size, stock market liquidity which refers to the ability of investors to buy and sell securities easily. Others are All Share Index; which reflects the performance and condition of the stock market, and the turnover ratio; which is an index of comparison for market liquidity rating and level of transaction costs.

In Nigeria, inflation rates have persistently been two digits; this has been an issue confronting policy makers, investors, analysts and economists. Inflation is one of the major factors that could derail the economy of any nation. In Nigeria, inflation discourages investment in financial assets and leads to low growth of cash value, (Obafemi and Epetimehin, 2011). On their part, Boyd, Levine and Smith (1996 cited in Owolabi and Adegbite, 2013) in their study concluded that inflation is negatively correlated with stock market performance. Others that share this opinion include Caban (2008); Gottlieb (2010). The stock market, which also contributes to economic growth, will invariably be affected by inflation. Accordingly, this study aims to investigate the effects of inflation on the stock price in Nigeria.

Stock market contributes to economic growth through specific services it performs either directly or indirectly. Among the functions of the stock market are mobilization of savings, creation of liquidity, risk diversification, improved dissemination and acquisition of information, and enhanced incentive for corporate control.

At any stage of a nation’s development, both the government and the private sectors would require long-term capital. Companies would need to build new factories, expand existing ones, or buy new machinery. On the other hand, government would require funds for the provision of infrastructures. All these activities require long-term capital; which is provided by a well-functioning stock market. For instance inflation rate from 2008-2012 was 15.06%, 13.93%, 11.80%, 10.30% and 12.00% according CBN 2012 report respectively (CBN, 2012), compared to aggregate stock price of ₦3,187.8, ₦2,179.7, ₦3,517.0 and ₦3,643.4 within the same period.

Finance scholars have attempted to explained factors that influenced stock price at different times. For instances Efficiency Market Hypotheses (EMH) asserts that in an efficient market, prices of stocks at all-time fully reflect all available information that is relevant to their valuation (Kalu, 2008).
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The Nigeria Stock Exchange was established in September 15, 1960 but commenced business on June 5, 1961 with 19 securities listed and traded on the Lagos Stock Exchange. Based on the recommendation of the Government Financial System Review Committee in 1976, the Lagos Stock Exchange was renamed and made part of the Nigerian Stock Exchange in December 5, 1977. The Nigerian Stock Exchange has 9 branches established in major commercial cities in Nigeria. The main exchange of stocks of large enterprises are traded in the Nigerian Stock Exchange while small and medium scale enterprises are listed and traded in the Second tier Securities Market (SSM). From 1963 to 1990, the Nigerian stock exchange witnessed an overwhelming increase in government stock which exceeded the equities of industrial companies; however, this trend changed from 1991. The value of equities of industrial companies increased to billions of Naira, while government stock traded on the Nigerian Stock Exchange was worth millions of Naira this decrease continues till date, a development to the deregulation of the economy (Ibrahim and Abaje 2013).

Fisher’s Concept of Inflation

The connection between inflation and stock market performance has been explained theoretically and empirically in studies by several authors. Theoretically, the Fisher theory explains that equity stocks, which represent claims against the real assets of a business, may serve as a hedge against inflation thus investors would sell financial assets in exchange for real assets when expected inflation is pronounced. On the hand, the efficient market hypothesis explains that a market is efficient when it adjusts instantaneously to take account of all available information thus information on changes in inflation may be reflected in stock prices, which may affect the stock market performance.

In addition, various empirical studies explain that stock market is responsive to changes in exchange rate, inflation rate, money supply, and real output and that there is a causal relationship between stock market returns and inflation. Thus, the independent variable for this study was inflation measured using the consumer price index while the dependent variable was stock market returns measured using share index. Interest rates, money supply and exchange rates formed the control variables. Figure 1 shows the conceptual framework for the study.

Empirical Review

The linkage between stock market returns and inflation if any has drawn the attention of researcher’s and practitioners alike particularly since the twentieth century. The foundation...
of the discourse is the Fisher (1930) equity stocks proclamation. According to the generalized Fisher (1930) hypothesis, equity stocks represent claims against real assets of a business; and as such, may serve as a hedge against inflation. If this holds, then investors could sell their financial assets in exchange for real assets when expected inflation is pronounced. In such a situation, stock prices in nominal terms should fully reflect expected inflation and the relationship between these two variables should be positively correlated \( \text{ex ante} \) (Ioannidis JPA, 2005:910). This argument of stock market serving as a hedge against inflation may also imply that investors are fully compensated for the rise in the general price level through corresponding increases in nominal stock market returns and thus, the real returns remain unaltered. Further extension of the hedge hypothesis posits that since equities are claims as current and future earnings, then it is expected that in the long run as well, the stock market should equally serves as a hedge against inflation. Fama (1981) however, put up a proxy hypothesis when he argued the relationship between high rates of inflation and future real economic growth rates as negative. Views that rationalize the negative co-movements between inflation rates and real stocks returns however differ. The inflation illusion hypothesis of Modigliani and Cohn (1970) points out, that the real effect of inflation is caused by money illusion.

According to Bekaert and Engstrom (2007:1), inflation illusion suggest that when expected inflation rises, bond yields duly increase, but because equity investors incorrectly discount real cash flows using nominal rates, the increase in nominal yields leads to equity under-pricing and vice versa. Feldstein’s (1980) variant of the inflation and stock market returns theoretical nexus, suggests that inflation erodes real stock returns due to imbalance tax treatment of inventory and depreciation resulting to a fall in real after-tax profit. Feldstein further observed that the failure of share prices to rise during substantial inflation was because of the nominal capital gains from tax laws particularly, historic depreciation cost (Friend and Hasbrouck, 1981). In Fama’s (1981) hypothesis, which is based on money demand theory; correlation between inflation and stock market returns is not a causal one; rather, it is a spurious relationship of dual effect. Yeh and Chi (2009:168) in explaining the Fama’s hypothesis observed that the reason for the revised correlation is because when inflation is negatively related to real economic activity, and there is a positive association between real activity and stock returns, the negative relationship and stock returns holds. This flow of relationship according to them is not direct. Spyrou (2004) study of ten emerging economies further provide evidences that may suggest equity providing an effective hedge against inflation and that the inflation could be explained by a significant relationship between money and consumer prices in the emerging markets. Rapach (2002) employed data of 16 OECD countries to determine the direction of the correlates. He observed that long-run inflation neutrality exists in the stock markets of the countries. Following the methodology of King and Watson (1997) in the establishment of time series properties, Rapach explained that the long-run Fisher effects exists if the long-run real stock returns do not respond to a permanent inflation shock (Yeh and Chi, 2009: 169). Studies on the inflation-stock return maxim for the Nigerian economy as the scan on the literature revealed are however relatively sparse. The available few from our search equally have their limitations. Sub air and Salihu (n.d.) using an error correction model to investigate the effects of exchange rate volatility on the Nigerian stock market though found exchange rate volatility to exert strong negative impact on the Nigerian stock market, the rate
of inflation did not have any long run relationship with stock market capitalization. The reason for no long run relationship as adduced by the authors is the overbearing participation of the government in the market. First, the integration result which authors claimed to underscore this reason was not reported. Second, which market (stock exchange or foreign exchange) government participation is overbearing is not explicitly defined. However, in either of the two markets, government participation over the years has been eroded. Consequently, Subair and Salihu findings may be misleading. Daferighe and Aje (2009) using annual data analyzed the impact of real gross domestic product, inflation and interest rates on stock prices of quoted companies in Nigeria from 1997-2006. The results among others showed that low inflation rate resulted in increased stock prices of quoted firms in Nigeria. Daferighe and Aje study suffers from misspecification drawbacks and spurious relationship. A high R-squared with suspected highly correlated residuals signifies that the conventional significant tests are biased. The integrated process of the variables was not analyzed; neither are the individual tests of the series for random walks checked. The short data span of only ten points using a multiple regression technique is inappropriate.

The relationship between inflation and stock price or stock return is basically linked to the arbitrage pricing theory in finance. Sangmi & Hassan (2013) examine the impact of macroeconomic variables on the stock price in the Indian Stock Market. They find that there is a significant relationship between macroeconomic variables (such as inflation, exchange rate, interest rate, money supply, gold price, and industrial production) and stock price in India.

Various researches seem to show convergence opinions on the impact of inflation on the stock market. Engle and Rangel (2005) studied emerging markets as well as developed markets by accounting for volatility clustering and find that countries with high rates of inflation tend to have high stock market volatility.

Inflation affects the performance of stock markets as it causes differences between real and nominal interests rates; thus changing the spending and saving behaviour of individuals, companies and government. Unexpected changes in the rate of inflation make it difficult for companies to plan; which inhibits growth and innovations. Beyond the impact of the domestic economy, differential inflation and interest rates influence the traded balance between countries and exchange rate of currencies (Reilly and Brown, 1997).

Corradi, Distaso and Mele (2013), investigate the macroeconomics determinants of stock volatility and volatility premiums using the Vix index data maintained by the Chicago Board Options Exchange (CBOE) from 2007 to 2009. They developed and estimated a no arbitrate modern where stock market volatility is explicitly related to a number of macroeconomic and unobservable factors. The authors find that the level and fluctuations of stock volatility are largely explained by business cycle factors and that some unobserved factors contributes to nearly 20% of the overall variations in volatility, although not its ups and downs. The authors also argue that there is strong evidence that capital market volatility has a very conspicuous business cycle trending, being higher during economic slowdown than during economic boom. This position substantiates the empirical findings of Schwert (1989 a, b), Hamilton & Lin (1996), as well as Brandt & Kang (2004).

Engle & Rangel (2008) investigate the spline GARCH model for low frequency volatility and its macroeconomic causes. They find, that high frequency aggregate capital market
volatility has both a short-run and long-rung component and suggest that the long-run, dimension is related to the fluctuation of economic activities.

Attari and Safdar (2013) examine the relationship between macroeconomic volatility and stock market volatility in Pakistan. They employed the EGARCH technique to generate volatility from the Karachi Stock Exchange (KSE – 100 index). The macroeconomic variables include interest rate, inflation and gross domestic product. The results show that macroeconomic variables have significant impact on the security prices.


Yeh and Chi (2009) used the Autoregressive Distributed Lag (ARDL) to investigate inflation and stock markets in OECD countries to find a negatively significant short-run bi-directional causality between inflation and stock markets in selected 12 OECD countries. This finding extends to the long run in all selected countries but Ireland, France, Australia and Netherland.

Stock market indexing is one of the most widely used measures of stock performance. Investors hold portfolios of many assets but it is cumbersome to follow progress on each security in the portfolio. Thus, it is prudent to observe the entire market under the notion that their portfolio moved in the same direction as the aggregate market. According to Simiyu (1992) as cited in Kithinji and Ngugi (2009), the assumption that randomly, selecting a large number of stocks from the total market should enable the investor to generate a rate of return comparable to the market. Market capitalization is another measure of stock market performance. It measures market movements by measuring the total value of stock in a particular stock market by aggregating the market value of the quoted stocks. Changes in market capitalization occur due to fluctuations in share prices or issuance of new shares and bonus issues. The implication is that increased level of activity at the market may signal more investments in the market.

On the other hand, market turnover indicates inflows and outflows in the stock market and it is based on the actively traded shares. Otuke (2006) cited in Kithinji and Ngugi (2009) states that a change occurs due to the actively traded shares and owing to fluctuations in share prices or number of shares traded in a given day.

Adusei (2014) used monthly data from Ghana spanning 1992 to 2010; using the Granger Causality and Co-integration tests in the Error Correction Model to show that in the short-run inflation has a negative and significant relationship with stock returns, while in the long-run, the relationship is seen to be significantly positive. Hakim (2012) also investigated the phenomenon in the Nairobi Securities Exchange Market to reveal a positive and insignificant relationship between inflation and investment in the Stock exchange market.

Taofik and Omosola (2013) used OLS and ARDL to establish the link between inflation and stock markets which were proxied by Consumer Price Index and All Share Index in Nigeria from 1997 to 2010, to find a short run positive and significant relationship between the duo; further providing evidence of a long term link.
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Omotor (2011) utilized stratified monthly data from 1985 to 1996, and 1997 to 2008 to study inflation and stock prices in Nigeria. Findings from descriptive analysis reveal that the first stratum (1985-1996) had the least risk; while correlation results show a negative relationship between inflation and stock returns in the first stratum, while in the second stratum positive relations was established. Co-integration results show a long run relationship between the pair and a one directional causality which was substantiated by the Granger causality test to move from inflation to stock market returns.

Asaolu and Ognumuyiwa (2011) investigated the impact of macroeconomic variables on Average Share Price for Nigeria for the period of 1986 to 2007. The results from their causality test indicated that average share price does not Granger cause any of the nine macroeconomic variables in Nigeria in the sample period. Only exchange rate Granger causes average share price. However, the Johansen Co-integration test affirmed that a long run relationship exists between average share price and the macroeconomic variables.

Maku and Adelowokan (2013) observed that in Nigeria, there exists a strong correlation between the rates of inflation in the country. Looking at the inflation process over time they found out that inflation rate in Nigeria has dynamic pattern overtime. They stated that Nigerian government was hoping to reduce inflation rate in 2013 to less than 10% though there was a decline in the rate of inflation in 2010 and 2011 from 13.7% to 10.2% respectively and this was because of the tightening of the monetary insurance and the replacement of the food Leontyne Price. In 2012 and 2013, inflation reduced to 10.1% in 2012 and 8.4% in 2013. There was a decline in inflation from 13.7% in 2010 to 10.2% in 2011; this was as a result of monetary insurance tightening and easing of food toll.

Evaluation of Literature

To investigate the relationship between inflation and stock price in Nigeria, the study will explore the Fisher’s theory, the Inflation Illusion Hypothesis and the Efficient Market Hypothesis.

Fisher Effect Theory

The Fisher effect theory was formulated by Fisher (1930), and the theory presupposes that nominal interest rates fully reflect available information concerning the expectations of inflation. The theory is the basis for the idea that monetary policy should mainly focus on managing expectations of inflation in an attempt to keep real interest rate stable. This aims at promoting savings and investment (Laichena & Obwogi, 2015). The Fisher effect theory also states that the expected rate of return on common stocks comprises a real return and the expected rate of inflation. The real return on common stocks is assumed to be constant over time. It is assumed the negative returns will exactly outweigh the positive real return, the rate of the common stock are therefore expected to move one-on-one with the rate of inflation (Mahonye & Mandishara, 2014).

The Fisher effect presupposes that nominal rates of interest on financial assets should move one-to-one with expected inflation. Moreover, changes in both short-term and long-term rates are expected to affect the discount rate in the same direction through their effect on the nominal risk-free rate (Kuwornu, 2012). The Fisher hypothesis assumes that there is no relationship between real rates and monetary sector (Floros, 2004). However, the Fisher hypothesis, when studied using more real rather than nominal stock returns, suggests that real
stock returns should be independent of inflation (Shanmugam and Misra, 2008). Generally, the Fisher theory presumes the nominal returns on financial assets should increase with the rate of inflation, whereas real rates of return are independent of the inflation rate. Thus, the Fisher effect theory as applied to stock returns presupposes an inverse relationship between stock returns to expected and unexpected inflation.

**Inflation Illusion Hypothesis**

The inflation illusion hypothesis of Modigliani and Cohn (1970) point’s out, that the real effect of inflation is caused by money illusion (Omotor, 2011). The inflation illusion suggests that when expected inflation rises, bond yields duly increase, but because equity investors incorrectly discount real cash flows using nominal rates, the increase in nominal yields leads to equity underpricing and vice versa (Owolabi and Adegbite, 2013). Accordingly, the Modigliani-Cohn (1970) hypothesis suggests that disinflation may itself generate mispricing by confusing stock market investors who are subject to inflation illusion. It also implies that a successful stabilization of inflation will reduce the volatility of mispricing and thereby contribute to the efficiency of the stock market (Campbell and Vuolteenaho, 2004).

The inflation illusion hypothesis also claims that stock market investors suffer from money illusion is a particularly intriguing and controversial proposition, as the stakes in the stock market are obviously very high. Thus, when inflation is high (low), the rational equity-premium expectation is higher (lower) than the market’s subjective expectation, and the stock market is undervalued (overvalued) (Cohen, Polk and Vuolteenaho, 2005). Under the inflation hypothesis, an overly strong (weak) nominal discounting of future real cash flows in times of higher (lower) inflation expectations depresses (raises) current stock prices and thus leads to an undervaluation (overvaluation) of equity markets (Schmeling and Schrimpf, 2008). The Inflation illusion theory generally makes identical predictions about the forecasting power of inflation for asset returns in the stock market.

**Efficient Market Hypothesis**

The Efficient Market Hypothesis (EMH) was formulated by Fama (1970). The Efficient Market Hypothesis (EMH) is a financial theory that explains that information is quickly reflected in share prices such that investors are not able to earn excess risk adjusted returns (Njuguna, 2015). The core idea behind the EMH is that stock prices should fully reflect all new and available information in an unbiased manner to the market participants. Such markets deliver accurate signals for resource apportionment as market prices represent each security’s basic worth, although deviations can occur (Rono, 2013). The efficient market hypothesis and rational expectations hypothesis are based on the idea of a perfect capital market.

The Efficient Market Hypothesis outlines three main dimensions of capital market efficiency: weak form, semi-strong and strong market efficiency, with each depending on the information set available. The weak-form efficiency is based on the random walk hypothesis, where future price changes are independent of price changes in the past. Similarly, semi-strong form efficiency occurs when the information set is publicly available information while strong form efficiency occurs when the information set is all information, including insider information (Osei, 2015). According to Fama (1970), the theory of the EMH of financial markets holds that the security prices tend to fluctuate randomly around their intrinsic values, return quickly towards equilibrium, and fully reflect the latest information available.
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Specification of the Model

In examining the impact of inflation on economic growth in Nigeria, an OLS modeling system is adopted. The model can be written in its functional form as follows:

\[ \text{INFL} = f(\text{ASI, INTR, RGDP}) \quad \ldots \quad (1) \]

Where

\( \text{INFL} \) = Inflation Rate
\( \text{ASI} \) = All share index
\( \text{INTR} \) = Interest rate
\( \text{RGDP} \) = Real Gross domestic product

\( f \) = Functional relationship.

Expanding the model into linear mathematical relationships, we have

\[ \text{INFL} = a_0 + a_1 \text{ASI} + a_3 \text{INTR} + a_3 \text{RGDP} \quad \ldots \quad (2) \]

However, our econometric model is yet to be complete. We complete our econometric model by including the stochastic error term (et). Thus our model specification becomes

\[ \text{INFL} = a_0 + a_1 \text{ASI} + a_3 \text{INTR} + a_3 \text{RGDP} + et \quad \ldots \quad (3) \]

Where

\( a_0 \) is the intercept depicting unemployment when explanatory variables are equal to zero. \( a_1, a_2, a_3 \) are the coefficients or parameters attached to the explanatory variables. The inclusion of stochastic or error term (et) in the above model is to capture the impact of other variables that are not included in the models.

The model for causality test is mainly to determine the relationship between unemployment and economic growth in Nigeria. It is specified as follows:

\[ \text{INFR} = \sum_{i=1}^{n} \beta_i \text{ASI}_{t-i} + \sum_{j=1}^{i-1} \beta_j \text{INTR}_{t-j} + \sum_{j=1}^{i-1} \beta_j \text{RGDP}_{t-j} + e_{t} \quad \ldots \quad (4) \]

\[ \text{ASI} = \sum_{i=1}^{n} \beta_i \text{INFR}_{t-i} + \sum_{j=1}^{i-1} \beta_j \text{RGDP}_{t-j} + e_{t} \quad \ldots \quad (5) \]

\[ \text{INTR} = \sum_{i=1}^{n} \beta_i \text{RGDP}_{t-i} + \sum_{j=1}^{i-1} \beta_j \text{INFR}_{t-j} + \sum_{j=1}^{i-1} \beta_j \text{ASI}_{t-j} + e_{t} \quad \ldots \quad (6) \]

\[ \text{RGDP} = \sum_{i=1}^{n} \beta_i \text{INFR}_{t-i} + \sum_{j=1}^{i-1} \beta_j \text{ASI}_{t-j} + \sum_{j=1}^{i-1} \beta_j \text{INTR}_{t-j} + e_{t} \quad \ldots \quad (7) \]

**Table 1: ADF Unit Root Test with Intercept**

Null Hypothesis: INFL has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3.068172</td>
<td>0.0387</td>
</tr>
</tbody>
</table>

Test critical values:
- 1% level: -3.639407
- 5% level: -2.951125
- 10% level: -2.614300
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Null Hypothesis: \( D(ASI) \) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-4.011567</td>
</tr>
<tr>
<td>Test critical values:</td>
<td>1% level</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.954021</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.615817</td>
</tr>
</tbody>
</table>


Null Hypothesis: \( D(INTR) \) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-5.839890</td>
</tr>
<tr>
<td>Test critical values:</td>
<td>1% level</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.954021</td>
</tr>
<tr>
<td>10% level</td>
<td>-2.615817</td>
</tr>
</tbody>
</table>


Null Hypothesis: \( D(RGDP) \) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-5.526102</td>
</tr>
<tr>
<td>Test critical values:</td>
<td>1% level</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.954021</td>
</tr>
</tbody>
</table>
Testing the stationarity of economic time series is important since standard econometric methodologies assume stationarity in the time series while in the real sense they may not be stationary. Hence the usual statistical tests are likely to be inappropriate and the inferences drawn are likely to be erroneous and misleading. The data series are expected to be stationary to ensure the absence of unit root problems. When the time series data which includes the All Share Index (ASI), inflation rate (INFR), interest rate (INTR) and Real Gross Domestic Product (RGDP) respectively were tested for stationarity they could not all attained stationarity at their level forms but became stationary at after first differencing i.e. I(1) at 5% significance level, hence we conclude that the series are first difference series.

Cointegration Analysis

Having found that all the variables are first difference stationary and integrated of order one, and the lag length determined, cointegration tests are conducted using Johansen (1988; 1995) full information maximum likelihood to see if there is a long-run equilibrium relationship between the variables. Based on the Akaike Information Criterion, Likelihood Ratio, Final Prediction Error, Schwartz Information Criterion, and Hannan-Quinn Information Criterion, the lag length one (1) was used and the Cointegration test results are presented in table 1 (a) and (b).

Table 2: Johansen Cointegration Test output

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.788148</td>
<td>70.67648</td>
<td>47.85613</td>
<td>0.0001</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.302902</td>
<td>19.46492</td>
<td>29.79707</td>
<td>0.4599</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.185722</td>
<td>7.557538</td>
<td>15.49471</td>
<td>0.5139</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.023288</td>
<td>0.777592</td>
<td>3.841466</td>
<td>0.3779</td>
</tr>
</tbody>
</table>

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
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* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>No. of CE(s)</th>
<th>Max-Eigenvalue</th>
<th>Max-Eigen Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.788148</td>
<td>51.21157</td>
<td>27.58434</td>
<td>0.0000</td>
<td></td>
</tr>
<tr>
<td>At most 1</td>
<td>0.302902</td>
<td>11.90738</td>
<td>21.13162</td>
<td>0.5568</td>
<td></td>
</tr>
<tr>
<td>At most 2</td>
<td>0.185722</td>
<td>6.779945</td>
<td>14.26460</td>
<td>0.5155</td>
<td></td>
</tr>
<tr>
<td>At most 3</td>
<td>0.023288</td>
<td>0.777592</td>
<td>3.841466</td>
<td>0.3779</td>
<td></td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Eviews version 9.0 2021

Based on the statistical results, the maximum eigenvalue statistics and the trace test rejects
the null hypothesis at 0.05% level of no cointegration, stating otherwise, that there exist
econeointegrating vectors or equations each. Both tests (trace and maximum eigenvalue)
reinforces and or supports each other thus suggesting that there indeed exists a long-run
relationship between the monetary variables ASI, INFR, INTR and RGDP respectively.

Table 3: Pairwise Granger Causality Test

The direction of causality can only be truly ascertained through granger causality test
hence it is applied. Pairwise granger causality test is used to examine the causal relationship
between unemployment and economic growth in Nigeria. The second panel was selected for
discussion. The findings from the causality testing are presented below.

Pairwise Granger Causality Tests
Date: 05/09/21 Time: 15:15
Sample: 1985 2019
Lags: 2

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASI does not Granger Cause INFR</td>
<td>33</td>
<td>4.04893</td>
<td>0.0285</td>
</tr>
<tr>
<td>INFR does not Granger Cause ASI</td>
<td></td>
<td>2.46289</td>
<td>0.1034</td>
</tr>
<tr>
<td>INTR does not Granger Cause INFR</td>
<td>33</td>
<td>0.82141</td>
<td>0.4501</td>
</tr>
<tr>
<td>INFR does not Granger Cause INTR</td>
<td></td>
<td>5.73162</td>
<td>0.0082</td>
</tr>
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</table>
Empirical evidence revealed the fact that there exist a unidirectional causality between stock prices, proxied by All Share Index and Inflation rate in Nigeria. This implies that stock prices causes inflation rate to rise but not vice versa. The study also revealed a unidirectional relationship between inflation rate and interest rate and All share index and real gross domestic product in Nigeria.

**Test of Hypotheses**

**Formulated Hypotheses:**

**H₀₁:** *There is no causal effect stock prices and inflation rate in Nigeria*

To answer the above hypothesis, the significant probability values 0.0285 from the Pairwise Granger Causality Test above indicated the rejection of the null hypothesis, thus it is concluded that there is a causal effect between inflation and stock prices in Nigeria.

**H₀₂:** *There is no longrun relationship between inflation and stock prices in Nigeria*

Similarly, judging from the output of the Johansen Cointegration test above, it is safely concluded that there is a unique longrun relationship between inflation and stock prices in Nigeria.

**Robustness Checks**

We performed certain diagnostic tests to ensure that our models yield robust estimates. These results are presented in the Appendix section. Based on the diagnostic tests, we can conclude that the modelling and results of our models is correct. The residual stability and normality are as presented hereunder.

(a) **CUSUM Test**

It can be seen that the result of both the CUSUM and CUSUMQ stability test indicates that the model is stable. This is because both the CUSUM and CUSUMQ lines fall in-between the acceptance region.
The Jarque-Bera test is used to detect normality of model. This test first finds the skewness and kurtosis of the residuals in the estimates. The test is conducted to check whether the error term follows the normal distribution. The normality test adopted is the Jarque-Bera (JB) statistics. Looking at the histogram, the study observes that the residual is normally distributed because of the insignificant probability value of 0.706606.

CONCLUSION

This study was carried out to empirically examine the relationship between inflation and stock prices in Nigeria. There is a widely held argument that efficient functioning of the Nigerian Stock Exchange market is a sine-qua-none as well as a prerequisite for every economy because it helps in mobilizing funds needed for investment in various industries in an economy. Whether this assertion holds, especially within the context of the relationship that existed between stock prices (proxied by the All Share Index) and inflation rate in Nigeria was the major objective of this study. From the results obtained, it was found that, there exist a unidirectional causality between stock prices, proxied by All Share Index and Inflation rate in Nigeria. This implies that stock prices causes inflation rate to rise but not vice versa. Similarly, there was an evidence of a unique longrun equilibrium relationship between the variables specified in models.
RECOMMENDATIONS

The Nigerian Stock Exchange has a positive and significant role to play in enhancing output growth and overall economic growth and development in Nigeria. However, there is limited contribution of the market to the development of economic growth as a result of the absence of lack of some sub-sector development stimulant. If these recommendations are efficiently implemented, the effectiveness of the Nigeria capital market will be enhanced. On the basis and strength of this evidence, the work recommends the followings for policy implementation:

(i) The government through its monetary operators should devise ways and measures aimed at stabilizing the economy to bring inflationary pressures to the required threshold.

(ii) That interest rate should be further lowered so as to increase the level of investment towards accelerated industrial development. An increase in investment will lead to an increase in economic growth in Nigeria.

(iii) Government should ensure an investment friendly environment by putting in place necessary infrastructures, services and policy reforms that will enable the Nigerian capital market effectively and efficiently mobilize long-term financial resources and channel same to the industrial sector of the economy.

(iv) Finally, it must also address the reported cases of abuses and sharp practices by some companies in the market.

REFERENCES


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