DO STOCK MARKET CYCLES CAUSE ECONOMIC CYCLES? THE CASE OF NIGERIA

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Abstract

Theoretically, stock market cycles precede an economic cycle, however the track record of stock market participants in predicting business cycles has been poor. This paper investigates the causal relationship existing between the All Share Index and real GDP. The study covers the period between 1985 and 2015. Data was obtained from CBN Statistical Bulletin 2015 and World Bank World Development Indicators 2015. The study employed the Hodrick-Prescott filter to obtain the cyclical series of the ASI and real GDP. Using the Granger causality test to investigate the causal relationship between the economic variables, the study found that the ASI does not Granger cause real GDP and real GDP does not Granger cause ASI at any lag length. The study recommends that investors should be more careful in estimating stock price valuations and rigorous in preparing their economic outlook as pessimism in the stock market is not always justified by a weakening economy.

Keywords: Stock market cycles, Speculative bubbles, Booms, Busts

INTRODUCTION

Allen & Gale (1999) and Bean (2004) assert that stock market meltdowns are typically accompanied by a financial crisis and an economic recession. However, stock market cycles do not cause economic cycles frequently enough to make it a norm. In fact, many economies have grown in years preceding and succeeding a stock market price bust, for example, Nigeria's economy grew around 7 percent in 2007 and again in 2008 while the All Share Index fell over 40 percent between December, 2007 and December, 2008 (CBN, 2015).

We opine that although investors typically claim to be pricing into stock prices the effect of future economic expectation on the balance sheet of firms, more often than not either those expectations fail to materialize or they were simply pricing something else. This means that stock prices may not be fair predictors of the timing of a future business cycle especially in Nigeria. We believe that rather than focusing on economic fundamentals, stock prices are more influenced by noise which drive stock prices to irrational or unsustainable levels before a reversal of the prevailing bias

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occurs. The short-lived investor irrational expectations thus causes cycles to occur more frequently in the stock market than in the broad economy.

This paper therefore seeks to examine the relationship between the cyclical components of All Share Index and Real Gross Domestic Product in Nigeria, determine the causality between the cyclical series of ASI and real GDP.

LITERATURE REVIEW

Osuala, Okereke, & Nwansi (2013) examined the causal relationship between the stock market and gross domestic product in Nigeria between 1981 and 2011. Using the General-to-specific Autoregressive Distributed Lag (ARDL)/Bound testing approach, they found that although there exist a long run co-integration relationship between the stock market performance and economic growth, there is no long run causal relationship between some stock market indicators (such as market capitalization ratio, turnover ratio and total number of deals ratio) and gross domestic product. The empirical model for data analysis excluded the All Share Index which is arguably the most important indicator in determining the performance of the stock market.

Adefeso, Egbetunde, & Alley (2013) investigated the long run and causal relationship between financial markets and economic growth in Nigeria between 1980 and 2010. Using Johansen Co-integration technique, they discovered there exist a long run relationship between gross domestic product, credit to private sector, value of shares traded and total investment. They then applied Granger Causality test to determine the causal relationship between the gross domestic product and financial markets. They found that there exist a unidirectional causality running from gross domestic product to stock market growth and bank credit. The result suggests that economic growth leads to growth in the financial sector not the other way round.

Owolabi & Ajayi (2013) evaluated the impact of the capital market on economic growth in Nigerian between 1971 & 2010. They adopted Ordinary Least Squares method for data analysis. They found that there exist a positive relationship between the capital market index and the gross domestic product. However the data reliability is questionable as the capital market index data suggests that the market capitalization of listed securities fell by almost 90 percent between 1995 and 1996. Also between 1997 and 2010, the market capitalization rose steadily year after year including during the Stock Market crash of '08 in Nigeria.

Alajekwu, Ezeabasili, & Nzotta (2013) examined the influence of trade openness and stock market development on economic growth in Nigeria on the long and short run. Using Johansen Multivariate approach, they found that there exist a long run relationship between trade openness, stock market development and economic growth in Nigeria. Also, they found no causal relationship between trade openness and stock market development. Using Ordinary Least Squares

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method, they found that the independent variables were jointly unable to explain variations in the gross domestic product. We believe the true cause of this problem is the misspecification of the economic growth model that was used in the empirical study.

Osamwonyi & Kasimu (2013) examined the causality between capital markets and economic in Nigerian, Ghana and Kenya. The study included only four stock market indicators to regress against the gross domestic product. These indicators are namely stock market capitalization, stock turnover ratio, stock traded value, number of listed securities, and stock market index. Using the Granger Causality test to analyze the variables, they found that there was no causality running between the stock market indicators and gross domestic product in Nigeria and Ghana, however, there was a bidirectional causality between the stock market indicators and gross domestic product in Kenya. This result could mean that capital financing Nigeria and Ghana are provided from bank loans whereas in Kenya, there is a stronger capital market support for production financing in the country.

Okodua & Ewetan (2013) evaluated the long run relationship between capital market performance and economic growth in Nigeria. Using the autoregressive distributed lag (ARDL) testing and estimation procedure, they found that over the long run, gross domestic product was not susceptible to variations in the stock market capitalization and average dividend yield, rather the economy was more sensitive to variations in the lending interest rate. This shows that majority of external financing in the economy is through bank credit which are relatively short term loans rather than through equity financing which is a long term financing instruments. Also, the use of market capitalization in model may not have been the best indicator to capture the performance of the capital market overtime. Rather, the All Share Index should have been included in the model since it measures the performance of the stock market overtime.

Bayar, Kaya & Yildirim (2014) examined the effect of capital market development on economic growth in Turkey between 1999 and 2013. Using Johansen-Juselius co-integration test, they found that there exist a long run relationship between stock market indicators and economic growth in Turkey. Using the Granger causality test, they found that there is a unidirectional causality from stock market capitalization, total value of stocks traded and turnover ratio of stocks traded to economic growth.

Nageri, Nageri, & Amin (2015) evaluated the influence of the stock market and corruption on economic development in Nigeria. Applying the Johansen Co-integration test, they found that there exist a long run relationship between the market capitalization of the Nigerian Stock Exchange and the corruption perception index on gross domestic product in the country. However, although the findings are in line with conventional wisdom, it should be taken with a spoon of salt as the model specification is not in line with existing theoretically supported economic growth models that are commonly used in literature.

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Levine, Lin & Xie (2015) examined the role of stock markets in substituting banks in providing finance for the economy during periods of banking crises in 36 countries around the world. Using ordinary least squares (OLS), with heteroscedasticity robust standard errors clustered at the country level to account for the potential correlations among firms within a country, they found that stock markets with strong shareholder protection laws are vital to ensuring businesses get the external financing they need to increase production during credit crunch, thus ensuring that productivity and profitability are inelastic to systemic banking crisis.

Narayan, Sharma, & Phan (2016) investigated the influence of asset price bubbles on economic welfare. The study adopted a time series model for the study. Eight welfare variables in six different countries were analyzed during the course of the study. The countries were Canada, USA, France, Germany, Japan and United Kingdom. They found that asset price bubbles had both positive and negative effects on the economic welfare of the countries. However, the study found that asset price bubbles were far more welfare enhancing than they were welfare degrading. This means that there were net economic benefits to the presence of bubbles in these countries during the period under review.

METHODOLOGY
This study collates annual data of the All Share Index (ASI) and Real Gross Domestic Product sourced from the Statistical Bulletin by Central Bank of Nigeria and World Development Indicators by World Bank respectively over the period of 1985 to 2015. The study employs a Univariate detrending technique called the Hodrick-Prescott (HP) filter for analyzing economic time series. After extracting the cyclical series of the ASI and real GDP using the HP filter, we then test for the correlation between the cyclical series and the Granger causality between the variables. The result produced will provide answers to our initial research questions.

RESULTS AND DISCUSSION OF FINDINGS
Unit Root Test
We take the unit root test of the variables using the ADF test to ensure that the data is stationary and suitable for economic analysis. This test is necessary as most financial and economic variables are not stationary. Table 1 below shows that the logged values of ASI are stationary at levels while the logged values of real GDP are only stationary after first difference.

Table 1: Augmented Dickey-Fuller Unit Root Test for Stationarity of Series

Variables	ADF Test Statistic	ID	Remarks
LASI	-3.047	I(0)	Stationary
LRGDP	-4.344	I(1)	Stationary

Source: Autho Compilation Using Eviews 9
Note: LASI, and LRGDP represents the logged values of All Share Index and Real Gross Domestic Product respectively. We took the log of the variables to smoothen the data for ease of processing
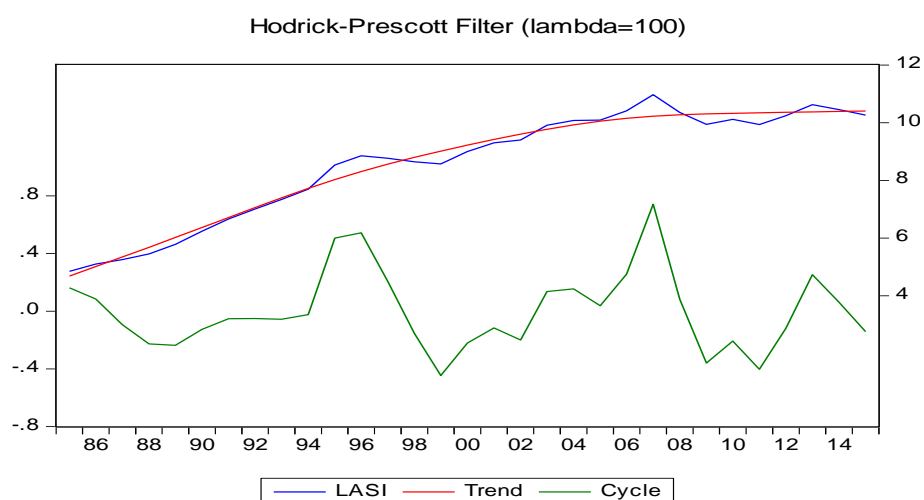
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in HP filter and Granger Causality tests. ID represents the order of integration: I(0) stationary at levels, I(1) stationary after first difference and I(2) stationary after second difference.

Hodrick Prescott Filter

The HP filter is a univariate detrending technique used to determine the cyclical characteristics of a macroeconomic indicator. We use the HP filter to derive the cyclical series of the ASI and real GDP from their time series values. The cyclical series will then show us the magnitudes of the cycles which have occurred in the both economy and stock market and how frequently they occur. From Figure 1-5 below, we observed that the magnitude of the cycles occurring in the stock market were overweight compared to cycles in the economy. Observing the cyclical series of ASI, we find that booms and busts occur at a rapid pace compared to the speed of cycles in real GDP. However, economic booms in Nigeria are usually short lived and the economic busts are much longer. For example there were only two obvious boom periods in the Nigerian economy during the period under review, the first was between 1987 and 1990 while the second was between 2002 and 2004. The economic busts stretched over longer periods of time, the first was between 1985 and 1986, followed by 1990 to 2002 and finally from 2004 till 2015.

From figure 5, we observed a few stock market cycles that were not accompanied by cycles in the economy. This is typically referred to as a market bubble. A market bubble occurs when stock prices grew at a rapid pace such that they become misaligned from economic reality. These bubbles appear to emerge between 1994 and 1996, 2005 and 2007 and 2011 and 2013 and are immediately followed by a sharp price bust.
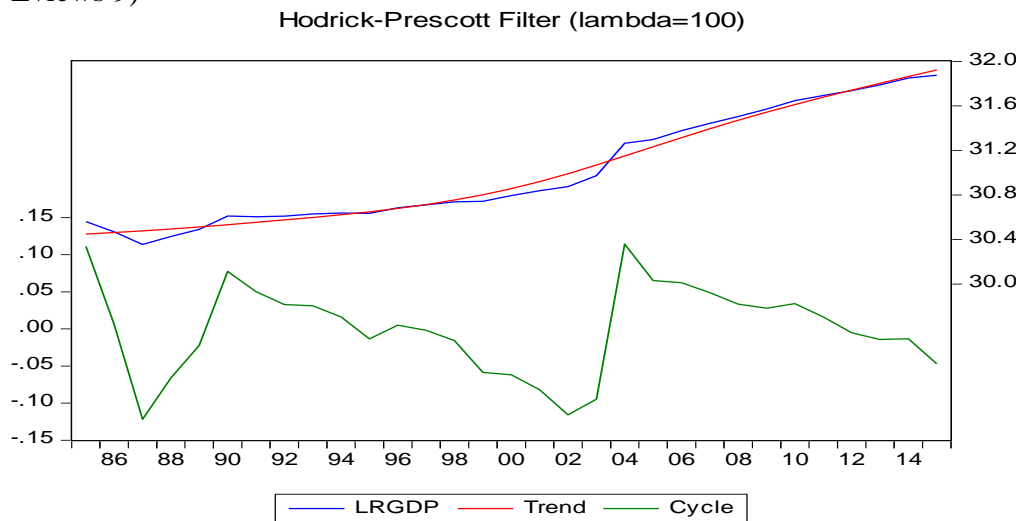

Figure 1: Trend Component and Cyclical Component of the All Share Index (ASI)
(Authors' Compilation Using Eviews 9)
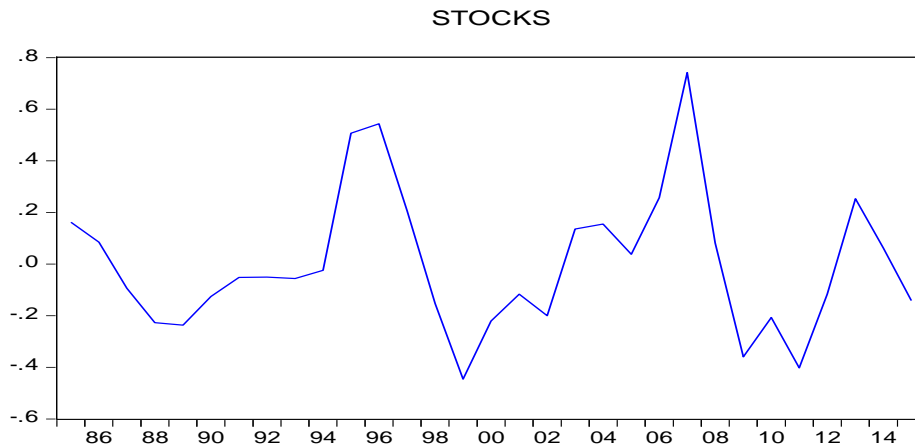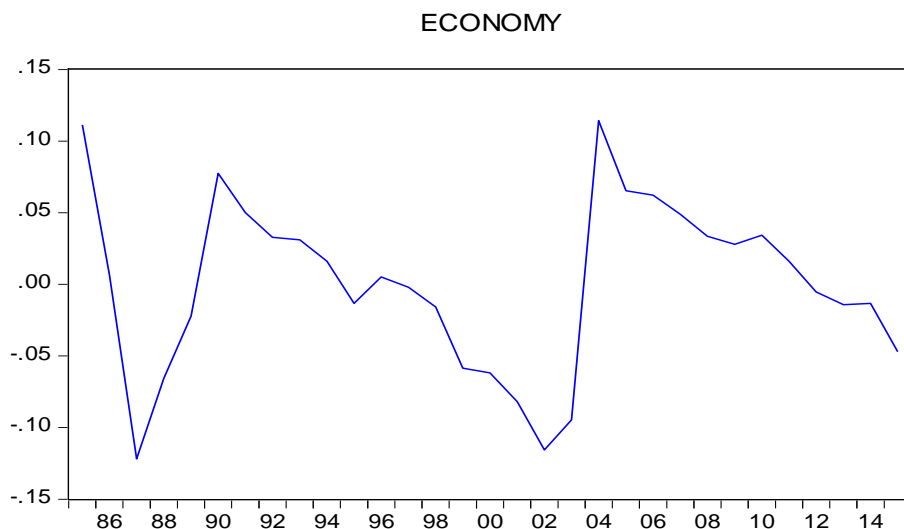
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Figure 2: Cyclical Component of the All Share Index (Stocks) (Authors' Compilation Using Eviews 9)
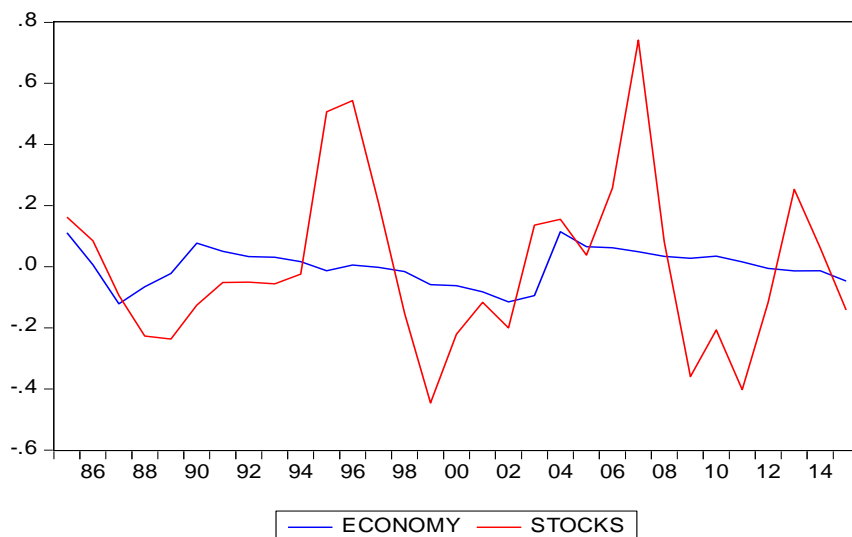

Figure 3: Trend Component and Cyclical Component of the Real GDP (RGDP) (Authors' Compilation Using Eviews 9)

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ECONOMY

Figure 4: Cyclical Component of the Real GDP (Economy) (Authors' Compilation Using Eviews 9)

Figure 5: Cyclical Components of the Real GDP (Economy) and All Share Index (Stocks) (Authors' Compilation Using Eviews 9)

Pairwise Correlation Coefficient

The Pairwise correlation analysis is a measure of the strength and direction of association that exists between two time series data. The correlation coefficient ranges from -1 to 1. Where 1 means perfect positive correlation, -1 means perfect negative correlation and 0 means zero correlation. The correlation results shows that the cyclical series of the ASI and real GDP exhibit a positive

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relationship with a correlation strength of about 30 percent. This means that when the All Share Index increases, there is a fair tendency that the economy will expand and vice versa.

Table 2: Correlation of the Cyclical Components of the All Share Index and Real GDP

	ECONOMY	STOCKS
ECONOMY	1.00	0.30
STOCKS	0.30	1.00

Source: Authors' Compilation Using Eviews 9

Granger Causality Tests
The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. We say that Xt is Granger causal for Yt if Xt helps predict Yt at some stage in the future. To run the test, first we state the null hypothesis that the lagged X-values do not explain the variation in Y. In other words, it assumes that X_t doesn't Granger-cause Y_t. If the probability value is significant at 5 percent level of significance, it means that values of X are useful in predicting future values of Y, therefore we reject the null hypothesis and conclude that X Granger causes Y. The Granger causality test in carried out in a Vector Autoregressive model, therefore the log of large variables like All Share Index and real GDP were taken to analyze the causality among variables in the model.
Table 3-5 indicates that there is no Granger causal relationship between the cyclical series of ASI and real GDP at any lag length. In other words, stock market cycles are not good predictors of economic cycles and economic cycles are also not a good indicator for stock market cycles.

Table 3: Granger Causality Tests after Two Lags

Pairwise Granger Causality Tests			
Date: 03/18/17 Time: 22:27			
Sample: 1985 2015			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
STOCKS does not Granger Cause ECONOMY	29	0.45	0.65
ECONOMY does not Granger Cause STOCKS		0.55	0.58

Source: Authors' Compilation Using Eviews 9

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Table 4: Granger Causality Tests after Four Lags

Pairwise Granger Causality Tests			
Date: 03/18/17 Time: 22:28			
Sample: 1985 2015			
Lags: 4			
Null Hypothesis:	Obs	F-Statistic	Prob.
STOCKS does not Granger Cause ECONOMY	27	0.95	0.46
ECONOMY does not Granger Cause STOCKS		1.17	0.36

Source: Authors' Compilation Using Eviews 9

Table 5: Granger Causality Tests after Eight Lags

Pairwise Granger Causality Tests			
Date: 03/18/17 Time: 22:29			
Sample: 1985 2015			
Lags: 8			
Null Hypothesis:	Obs	F-Statistic	Prob.
STOCKS does not Granger Cause ECONOMY	23	0.33	0.93
ECONOMY does not Granger Cause STOCKS		1.69	0.27

Source: Authors' Compilation Using Eviews 9

CONCLUSION AND RECOMMENDATION
Conclusion
The main objective of the study was to examine the relationship between the cyclical series of the All Share Index and real GDP in Nigeria between 1985 and 2015. The study employed the HP filter technique to estimate the cyclical series of the ASI and RGDP. The study found that cycles in the stock market were more rapid and short-lived whereas the cycles in the economy where much longer with the boom being quite brief and the bust extending over a long period of time. The study also traced periods of speculative bubbles in the capital market where large stock price swings were not succeeded or preceded by similar cycles in the broad economy. However, the study found that there exist a positive correlation between the cyclical series of the ASI and the cyclical series of real GDP with a correlation strength of 30 percent. After running the Granger causality tests, the study found that there is no Granger causal relationship between the cyclical series of ASI and RGDP at any lag length. Therefore, stock market cycles are inefficient predictors

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of economic cycles and economic cycles do not fairly predict future cyclical changes in the stock market.

Recommendation

From our empirical findings, we recommend the following policies:

1. The Central Bank should introduce innovative monetary policies that stimulate economic growth, thus extending the years of boom periods and reducing the bust periods.
2. Investors should be more careful in estimating stock price valuations and rigorous in preparing their economic outlook as pessimism in the stock market is not always justified by a weakening economy.

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