

**DYNAMIC RELATIONSHIP BETWEEN UNEMPLOYMENT AND STOCK
MARKET DEVELOPMENT IN NIGERIA: A VECTOR ERROR
CORRECTION MODELING APPROACH**

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ABSTRACT

The unemployment rate in Nigeria has reached a level that requires urgent attention of both government and private sector to avoid possible reaction of the job seekers that could not find job opportunities despite their talent and qualification. Efforts of previous policies to promote stock market development and restore investors' confidence in financial markets did not yield a positive outcome and Nigerian stock market is yet to fully recover from the aftershock of global financial crisis. This paper empirically examines the dynamic relationship between unemployment and stock market development in Nigeria, using Johansen co-integration test and vector error correction model (VECM) for the sample period of 1987 to 2016. The Augmented Dikker Fuller (ADF) unit root test was employed to check for data stationarity and all the variables become stationary after first differencing. Similarly, the Johansen co-integration test suggests that unemployment and stock market development have a long-run co-integration relationship while the VECM reveals existence of a causal relationship both in the long-run and short-run. To boost the performance of Nigerian stock market, policies that can provide job opportunities should be formulated. When the unemployed are absorbed, there can be an increase in demand for goods produced by the domestic firms with a potential increase in sales volume and their value of shares.

Keywords: Financial Crisis, Stock Market, Unemployment, VECM, ADF

1. INTRODUCTION

The importance of stock market to nation building cannot be overstressed. It is a segment of the financial market that provides long-term investment opportunities to make sustainable returns. Therefore, every nation needs a well-functioning stock market for efficient investment and development. According to Ita and Duke (2013) stock markets provides channels for mobilization and allocation of funds in economies by firms to exploit their material and human resources for optimal output. In addition, stock markets, especially in small open economies play a vital role in mobilizing economic resources within and from outside to achieve greater economic potential (Aliyu, 2012). Despite stock markets assist in the development of economic activities, they are affected by conditions of other economic variables.

However, the confidence of investors is crucial for the development of the financial market. When the investors' confidence decline, it will further have a negative effect on their investment decision and risk taking. Sum (2013), notes that business and consumer confidence are critical factors that affect stock market returns. Nevertheless, Massa (2009) affirms that the investor's confidence in the African stock market is continuously degrading and it may not be unconnected to the traditional barriers of stock market development like the small size, low liquidity, lack of transparency and inadequate infrastructure.

Needless to say, however, most of the African stock markets are highly concentrated by few companies thus retarding their development. For example, according to the report of African Securities Exchange Association (2014), the Nigerian Stock Exchange (NSE) has more than 200 listed companies but a third of its value is represented by one company. This uncovers the level of underdevelopment of the market as stock markets are represented by several listed companies in terms of market capitalization, the stock traded and turnover ratio. There is a need for concerted effort to improve the performance of Nigerian stock market to be able to compete favorably with global stock exchanges and bring more investors to the country.

Despite its greater potential in supporting investment and economic development, the market is not developed in most African countries including Nigeria to be able to achieve its target. Although there is a clear intent to promote sustainability among the world's stock exchanges, most African Stock markets are illiquid concentrated and small in size. Similarly, Asiedu and Afful (2014) observe that Africa is classified as one of the most undeveloped continents because most of the countries are not likely to meet the United Nation Millennium development goals. Ahuru and Olaposi (2016) assert that in spite of financial sector reforms to open market to foreigners,

the performance of stock markets in African countries is below expectation. That is, most African Stock markets are not developed to be able to offer long-term financing (Dahou, Omar, & Pfister, 2009). Thus the structural transformations in Africa are seemed not productivity enhancing as they did not yield a positive outcome.

However, the persistent rise in unemployment usually diminishes investors' confidence and creates panic for expected changes in interest rates which traditionally, can have a negative effect on stock returns. Birz and Dutta (2016) assert that employment/unemployment news announcement is among the most crucial announcements affecting stock markets. However, Farmer (2015) found a significant link between unemployment and stock market crash in the United States. The author further attributes the market crash to a self-fulfilling crisis of confidence that shift economies from low to high unemployment equilibrium. In spite of the effort by government and private sectors, the unemployment in Africa is on the escalating trend and is becoming a socio-economic threat as the growing number of the unemployed citizens cannot be absorbed by the available job opportunities. Baah-boateng (2016) observes that without sufficient job opportunities, the increasing number of the educated unemployed youth could be detrimental and a source of conflict to Africa while Ilo (2015) asserts that unemployment has been prohibitively high in Nigeria since the adoption of the structural adjustment program and has contributed to low economic growth. Similarly, Asaju, Arome, and Anyio (2014) disclose that corruption and industrial decay are responsible for the escalating level of unemployment in the country.

There are several intervention programs launched to mitigate the rising trend of unemployment in Nigeria and its attendant consequences but the rate kept increasing to an unacceptable level. Available figures from National Bureau of Statistics (MBS) reveal that the rate rose from 14.2% to 18.8% as at December 2017 while in the same period, the Nigerian labor population rose from 83.9 million to 85.1 million representing 1.2 million additional workforces (Vanguard News, 2017). This escalating trend needs urgent attention of government and private sector before degenerating to crisis and conflicts due to joblessness.

In spite of the evidence on the poor performance of Nigerian stock exchange as well as the rising trend of unemployment, most of the prior literature focused on the relationship between unemployment and economic growth (Akeju & Olanipekun, 2014; Inekwe, 2014; Olusoji, 2016; Stephen, 2012). Although Ilo (2015) investigates the impact of the capital market on unemployment, this paper extends this line of research by investigating reverse causation as to how unemployment affects the stock market. This work is interested to know whether unemployment has both short-run and long-run relationship to the stock market development. In contrast to the focus

of prior literature, this study attempts to provide evidence in answering a policy question of whether unemployment has a short and long-run relationship to the stock market in Nigeria using vector error correction model (VECM) technique for the period starting 1987 to 2016. The remaining part of the paper is organized in the following order: section two reviews theoretical and empirical literature, section three describes data and empirical methodology, section four discusses empirical finding while section five is for conclusion and policy implications.

2. LITERATURE REVIEW

This section reviews empirical literature and theories underpinning the relationship between unemployment and stock market development.

Theoretical Framework

The theoretical link between stock market development and economic variables as well as between human capital development and economic growth were considered in this paper. The theories are Arbitrage Pricing Theory and Extended IS-LM model.

Arbitrage Pricing Theory

Arbitrage Pricing Theory (APT) was developed by Ross (1976) to predict the relationship between stock returns and other several investment risk factors. It is a theory that explains security values are the function of investment sensitivity to various common factors. In other words, multiple risk factors can be used to explain stock market returns. However, it is stated that asset prices are believed in reacting sensitively to economic news. Therefore, the individual assets are affected by a variety of unpredictable events where some have a more common outcome on assets than others. APT is however viewed as a substitute for capital asset pricing model (CAPM) which is a single factor model in explaining market expected returns.

Blanchard extended IS-LM Model

This model of Blanchard (1981) was developed with an emphasis on how asset prices are predicted by macroeconomic news or how the stock market reacts to the announcement of unemployment rates. The Blanchard model further predicts that the release of macroeconomic (unemployment) news can be good or bad to stock markets depending on the prevailing state of the economy.

Empirical Literature

Generally, there is a real dearth of empirical evidence on the relationship between unemployment and stock market development in Nigeria despite extensive research on their link in advanced countries. In view of the scant literature in Nigeria, this paper reviews the relationship between unemployment and economic growth. For example, (Olusoji, 2016) investigates causality between employment and GDP in Nigeria using Toda-Yamamoto causality test and the findings reveal unidirectional causality running from employment to GDP. Similarly, Inekwe (2014) examine how foreign direct investment, employment and GDP relate and found a positive long-run nexus between the series. Furthermore, Akeju and Olanipekun (2014) assess the relationship between unemployment and GDP using error correction model where it is found the series have both short and long-run relationship. Stephen (2012) examine how unemployment and GDP are related applying ordinary least square (OLS) regression and finding uncovers that urban unemployment has a negative impact on the economic growth.

Moreover, there are studies found non-existence of relationship between unemployment and economic growth. For example, Sadiku, Ibraimi and Sadiku (2015) investigate the relationship between unemployment and economic growth using vector autoregressive and Engle-Granger causality test. The findings show that there is no causal relationship between the variables. Amassoma and Nwosa (2013) applied error correction model to examine the impact of unemployment on productivity growth in Nigeria and found that unemployment does not have a significant impact on productivity growth. Baah-Boateng (2016) investigates the drivers of youth unemployment in Africa and the study suggests demographic youth protuberance and poor economic growth of African countries as main factors responsible for the proliferation of unemployment in the region.

However, further review uncovers the existence of unemployment-stock market nexus in some emerging and advanced countries. For example, Tapa, Tom, Lekoma, Ebersohn, and Phiri (2016) investigates and found a positive non-significant relationship between the stock market and unemployment in South Africa. Farmer (2015) found that unemployment has a significant link to stock market crash in the United States while Ganzalo and Taamouti (2014) examine the reaction of anticipated unemployment on stock market returns in United States applying quintile regression analysis and disclose that an increase in anticipated unemployment leads to an increase in stock market returns. Belo, Lin, and Bazdresch (2014) examine the impact of labor hiring on stock market returns in the United States and found a decrease in stock returns was due to a rise in labor hiring cost. Also, Boyd, Hu, and Jagannathan (2005) investigate the stock market reaction to unemployment in the

United States where the findings reveal that announcement of unemployment is a good news for stocks during economic expansion and bad news during economic contraction. On the contrary, Gatti, Rault, and Vaubourg (2012) found that a rise in market capitalization can cause fall in unemployment if there is a low labor market regulation on wage negotiating.

However, from the reviewed literature it can be deduced that empirical findings on how unemployment relates to stock markets are scarce and are mostly done in advanced economies that accomplish all aspects of economic development (See Farmer 2015; Ganzolo & Taamouti 2014; Gatti & Voubourg 2012). Therefore it is still unclear as to how stock market responds to unemployment news in developing countries including Nigeria and this serve as motivation for this paper. The present study attempts to bridge the existing literature gap by investigating whether the high level of unemployment in the African countries contributes to the inefficiency and low development of African stock markets.

3. DATA AND EMPIRICAL METHOD

This paper adopts a causal research design to examine how unemployment and stock market are related in Nigeria. The annual data from 1987 to 2016 was retrieved from the World Bank World Development Indicators databank (WDI 2016) and the Financial Development and Structure database developed by Beck, Demirguc-kunt, and Levine (2010). To strengthen the relationship, the paper includes exchange rates, investment, and remittance as control variables. The paper hypothesizes a negative relationship between unemployment and stock market development. The control variables of exchange rate is expected to have a negative relationship with the dependent variables while both remittance and investment are assumed to be having a positive link to the dependent variable

For the method of analysis, after checking the autoregressive behavior of the series through unit root test, Johansen co-integration test and vector error correction model (VECM) will be applied to know whether the series have long run as well as a causal relationship. Therefore, to avoid confronting the problem of spurious regression, the first and necessary condition is to ensure data is free from a unit root or random walk. This paper employs Augmented Dikker Fuller test (ADF) to check for the stationarity of series. After establishing the time series property of the data, there is a need for the testing existence of long-run relationship and this paper applies Johansen Co-integration test to examine whether series are co-integrated. In addition, the paper specifies the first equation as the initial model for this paper which incorporates the dependent variable, independent variables and a set of control variables as follows:

$$SMD_t = \alpha_0 + \alpha_1 UN + \alpha_2 XR + \alpha_3 INV + \alpha_4 REM + \varepsilon_t \dots \dots \dots (1)$$

Where SMD stands for stock market development (stock traded value), UN is for unemployment, XR stands for exchange rates; INV represents investment while REM is a symbol for remittance rate. The epsilon ε means error term, whereas t denotes a period of time or the number of years to be covered.

However, when variables are I(1) and are co-integrated, there is need for estimating vector error correction model (VECM). The VECM allows us to examine how much the dependent variable (ST) changes, in reaction to change in explanatory variables (UN, XR, INV and REM) as well as the speed of adjustment or error correction term (ECT). Thus the general VECM specification can be estimated using the following equation:

$$\Delta Y_t = \alpha_1 + \gamma ECT_{t-1} + \beta \Delta X_t + \varepsilon_t \dots \dots \dots (2)$$

Where ΔY_t represents the change in the dependent variable, β is the impact multiplier (the short-run effect) which measures the immediate impact a current change in X_t will have on a change in Y_t , while γ is the adjustment effect that shows how much of the disequilibrium is being corrected annually. Thus γ should be less than 1 and significant to ensure stability. Furthermore, the paper will conduct post-estimation test to avoid reporting spurious results. This includes Breusch-Godfrey Serial Correlation LM Test, Heteroskedasticity test and Model Stability test.

4. EMPIRICAL FINDINGS

Table 1 below, reports the ADF unit root test results where all variables (SMD, REM, EXR and BSD) are having unit root at level. To confirm stationarity of variables, the t-statistic in each case should be greater than critical value at all known levels of significance (1%, 5% and 10)

Table1: ADF Stationary Test Results

Variables	I(0)		I(1)	
	Constant	Constant &Trend	Constant	Constant &Trend
SMD	-1.712	-1.603	-5.558**	-5.526**
UN	-2.200	-1.753	-4.933**	-5.117**
XR	-1.842	-1.854	-5.028**	-5.248**
INV	-0.081	-1.884	-4.673**	-4.646**
REM	-2.171	-2.293	-5.689**	-5.640**

Note: ** indicates 5% level of significance.

However, the variables with unit root problem become stationary after taking first difference fulfilling the VECM estimation condition, to determine how much of equilibrium is being corrected every year, as well as to examine the long-run and short-run causality among the series.

Moreover, the next estimate is Johansen co-integration test which is also required to know whether the variables are having a long-run relationship as shown in table 2 below:

Table 2 Johansen Co-integration test

Sample (adjusted): 1991 2016

Included observations: 26 after adjustments

Trend assumption: Linear deterministic trend

Series: ST UN XR INV REMR

Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	Statistic	Critical Value	Prob.**
None	0.05	266.1184	69.81889	0.0000
At most 1		131.1895	47.85613	0.0000
At most 2		57.36797	29.79707	0.0000
At most 3		16.75098	15.49471	0.0322
At most 4		0.050083	3.841466	0.8229

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	Statistic	Critical Value	Prob.**
No. of CE(s)	Eigenvalue			
None	* 0.994426	134.9289	33.87687	0.0000
At most 1	* 0.941533	73.82152	27.58434	0.0000
At most 2	* 0.790324	40.61699	21.13162	0.0000
At most 3	* 0.473941	16.70090	14.26460	0.0202
At most 4	0.001924	0.050083	3.841466	0.8229

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

As illustrated above, both the Trace and Maximum Eigenvalue Statistics suggest the presence of three co-integration vectors thus rejecting the null hypothesis of no co-

integration among the series. In other words, there is existence of a long-run relationship between stock market development and the explanatory variables of the model in Nigeria.

Having confirmed series are integrated of the same order and that there exists a long-run relationship, the next estimate is vector error correction model which examines both long-run and short-run causality among the series. Long-run causality is run using the first among the system equations through ordinary least square regression (OLS) and presented in the table below:

Table 3: VECM Long-run Equation

Dependent Variable: D(ST)

Method: Least Squares (Gauss-Newton / Marquardt steps)

Sample (adjusted): 1990 2016

Included observations: 27 after adjustments

$$\begin{aligned}
 D(ST) = & C(1)*(ST(-1) - 0.719151421303*UN(-1) + \\
 & 0.395602852965*XR(-1) + 0.0526281391994*INV(-1) - 0.225016741026*REMR(-1) + \\
 & 1.3235796894) + C(2)*D(ST(-1)) + C(3)*D(ST(-2)) + C(4)*D(UN(-1)) \\
 & + C(5)*D(UN(-2)) + C(6)*D(XR(-1)) + C(7)*D(XR(-2)) + \\
 & C(8)*D(INV(-1)) + C(9)*D(INV(-2)) + C(10)*D(REMR(-1)) + C(11)*D(REMR(-2)) + \\
 & C(12)
 \end{aligned}$$

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.563077	0.205388	-2.741528	0.0151
C(2)	0.778187	0.105162	7.399855	0.0000
C(3)	-0.198378	0.232967	-0.851530	0.4079
C(4)	-0.367802	0.205021	-1.793976	0.0930
C(5)	-0.199829	0.219183	-0.911702	0.3763
C(6)	1.145323	0.506538	2.261078	0.0390
C(7)	0.162147	0.495554	0.327204	0.7480
C(8)	2.140283	0.636164	3.364356	0.0043
C(9)	0.829175	0.831134	0.997643	0.3343
C(10)	0.025196	0.071844	0.350701	0.7307
C(11)	0.199226	0.064994	3.065286	0.0079
C(12)	-0.570115	0.249473	-2.285275	0.0373

R-squared	0.903929	Mean dependent var	0.025786
Adjusted R-squared	0.833477	S.D. dependent var	1.444322
S.E. of regression	0.589387	Akaike info criterion	2.081635
Sum squared resid	5.210658	Schwarz criterion	2.657563
Log likelihood	-16.10208	Hannan-Quinn criter.	2.252889
F-statistic	12.83046	Durbin-Watson stat	2.159479
Prob(F-statistic)	0.000010		

From the result above, C(1) represents the error correction term as the coefficient of the cointegration equation. The value of the coefficient is negative and statistically significant revealing presence of long-run causality among the variables. In other words, the value (-0.563) explains that about 56.3% of the disequilibrium is being corrected every year. In addition, the coefficient of C(4) and C(5) disclose that unemployment and stock market are negatively related. This is in line with the empirical findings of Gatti et al. (2012) that show unemployment news can cause panic among investors thereby selling off their securities at a lower market value. Therefore, the rising unemployment rate is not desirable for stock market investors due to its adverse consequence.

For the short-run causality, however, the Wald coefficient test is applied to find the joint impact of the explanatory variables to the stock market development as revealed below:

Table 4: VECM Short-run Causality

Wald Test:

Equation: Untitled

Test	Value	df	Probability
F-statistic	6.222492	(8, 15)	0.0012
Chi-square	49.77993	8	0.0000

Null Hypothesis: $C(4)=C(5)=0$, $C(6)=C(7)=0$, $C(8)=C(9)=0$,
 $C(10)=C(11)=0$

Null Hypothesis Summary:

Normalized Restriction (=0)	Value	Std. Err.
C(4)	-0.367802	0.205021
C(5)	-0.199829	0.219183
C(6)	1.145323	0.506538
C(7)	0.162147	0.495554
C(8)	2.140283	0.636164
C(9)	0.829175	0.831134
C(10)	0.025196	0.071844
C(11)	0.199226	0.064994

Restrictions are linear in coefficients.

The Chi-square value of 49.78 and probability of 0.0000, as shown above, rejects the null hypothesis of no short-run causality between the stock market and the explanatory variables. Therefore this confirms the existence of a short-run causal relation between the variables.

Moreover, the paper conducts post-estimation diagnostic tests to avoid reporting and drawing inference on spurious results. The test of Multicollinearity test was conducted using Breusch-Godfrey Serial Correlation LM Test and the chi-square value of 0.146 denotes rejection of the null hypothesis. Therefore, the model is free of multicollinearity problem. Similarly, the test of Heteroscedasticity was carried out

using Breusch-Pagan-Godfrey test. Based on the probability value of the Chi-square (0.20), the model does not have heteroscedasticity problem while the stability of the model is checked using CUSUM test which reveals model is stable and can be reliable (See Appendix A).

5. CONCLUSIONS AND POLICY IMPLICATIONS

This paper empirically examines the dynamic relationship between unemployment and stock market development in Nigeria for a sample period of 1987 to 2016. The findings suggest the existence of long-run relationship between the stock market development and unemployment. Similarly, unemployment and stock market development are found to be causally related in both short-run and long-run estimates. The findings confirm the importance of utilizing information related to unemployment while making an investment decision in firms listed in Nigerian Stock Market. Therefore, for the stock market to develop and boost the Nigerian economy, policies that can revamp the real sectors of the economy through increased productivity and job creation should be given priority to absorb the rapid increase of teeming unemployed youths that are vulnerable to the society due to their joblessness.

REFERENCES

- Ahuru, R. R., & Olaposi, O. J. (2016). The impact of financial liberalization on stock price volatility in Nigeria. *International Journal of Advances in Management, Economics and Entrepreneurship*, 3(7), 1–6.
- Akeju, K. F., & Olanipekun, D. B. (2014). Unemployment and economic growth in Nigeria. *Journal of Economics and Sustainable Development*, 5(4), 138–144. Retrieved from www.iiste.org
- Aliyu, S. U. R. (2012). Does inflation have an impact on stock returns and volatility? Evidence from Nigeria and Ghana. *Applied Financial Economics*, 22(August 2013), 427–435.
<https://doi.org/10.1080/09603107.2011.617691>
- Amassoma, D., & Nwosa, P. I. (2013). The impact of unemployment rate on productivity growth in Nigeria: An error correction modeling approach. *International Journal of Economics and Management Sciences*, 2(8), 1–13.
- Asaju, K., Arome, S., & Anyio, S. F. (2014). The rising rate of unemployment in Nigeria: The socio-economic and political implications. *Global Business and Economic Research Journal*, 3(2), 12–32.
- ASEA (2014): Africa Securities Exchange Association Annual Reports and Statistics. mondovisione.com/media-and-resources/news/african-securities-exchanges-association-asea-2014-annual-report.
- Asiedu, K., & Afful, K. (2014). Stock markets development in Sub-Saharan Africa: Business regulations, governance and fiscal Policy. *International Journal of Economics and Finance*, 6(1), 15–31.
<https://doi.org/10.5539/ijef.v6n1p15>
- Baah-Boateng, W. (2016). The youth unemployment challenge in Africa: What are the drivers? *The Economic and Labour Relations Review : ELRR*, 27(4), 413–431. <https://doi.org/10.1177/1035304616645030>
- Beck, T., Demirguc-kunt, A., & Levine, R. (2010). Financial institutions and markets across countries and over time: The updated financial development and structure database. *The World Bank Research Observer*, 24(1), 77–92.
<https://doi.org/10.1093/wber/lhp016>

- Belo, F., Lin, X., & Bazdresch, S. (2014). Labor hiring , investment , and stock return predictability in the cross section. *Journal of Political Economy*, 122(1), 129–177.
- Birz, G., & Dutta, S. (2016). U . S . macroeconomic news and international stock prices : Evidence from newspaper coverage. *Accounting and Finance Research*, 5(1), 247– 252. <https://doi.org/10.5430/afr.v5n1p247>
- Blanchard, O. (1981). Output , the stock Market , and interest rates. *The American Economic Review*, 71(1), 132–143.
- Boyd, J. H., Hu, J., & Jagannathan, R. (2005). The stock market’s reaction to unemployment news : Why bad news is usually good for stocks. *The Journal of Finance*, LX(2), 649– 672.
- Dahou, K., Omar, H. I., & Pfister, M. (2009). Deepening African financial markets for growth and investment. In *Ministerial and Expert Meeting of the NEPAD- OECD Africa Investment Initiative*.
- Farmer, R. (2015). The stock market crash really did cause the great recession *. *Oxford Bulletin of Economics and Statistics*. <https://doi.org/10.1111/obes.12100>
- Ganzalo, J., & Taamouti, A. (2014). The reaction of stock market returns to anticipated unemployment *. *Journal of Economic Literature*.
- Gatti, D., Rault, C., & Vaubourg, A. (2012). Unemployment and finance: How do financial and labour market factors interact? *Oxford Economic Papers*, 64(3), 464–489. <https://doi.org/10.1093/oep/gpr046>
- Ilo, B. M. (2015). Capital market and unemployment in Nigeria. *Acta Universitatis Danubius*, 11(5), 129–140.
- Inekwe, J. K. (2014). FDI, Employment and Economic Growth in Nigeria - FDI-Employment and Economic Growth in Nigeria.pdf. *African Development Review*, 25(4), 421–433.
- Ita, J. J., & Duke, J. (2013). Macroeconomic Factors That Influence Stock Market Development in Nigeria. *International Journal of Business Management and Review*, 1, 43-56.
- Massa, I. (2009). *Stock markets in Africa: Bidding for growth amid global turmoil*. London: Overseas Development Institute.

- Olusoji, M. O. (2016). A cross causal analysis of employment and economic growth in Nigeria. *The Indian Journal of Labour Economics*, 59(4), 553–562. <https://doi.org/10.1007/s41027-017-0072-5>
- Ross, S. A. (1976). The Arbitrage Theory of Capital Asset Pricing. *Journal of Economic Theory*, 13, 341–360.
- Sadiku, M., Ibraimi, A., & Sadiku, L. (2015). Econometric Estimation of the Relationship between Unemployment Rate and Economic Growth of FYR of Macedonia. *Procedia Economics and Finance*, 19(15), 69–81. [https://doi.org/10.1016/S2212-5671\(15\)00009-X](https://doi.org/10.1016/S2212-5671(15)00009-X)
- Stephen, B. A. (2012). Stabilization policy, unemployment crises and economic growth in Nigeria. *Universal Journal of Management and Social Sciences*, 2(4), 55–63.
- Sum, V. (2013). Effects of business and consumer confidence on stock market returns: Cross-sectional evidence. *Economics, Management, and Financial Markets*, ..., 9(1), 21–25. Retrieved from <http://works.bepress.com/vichetsum/35/>
- Tapa, N., Tom, Z., Lekoma, M., Ebersohn, J., & Phiri, A. (2016). The unemployment-stock market relationship in South Africa: Evidence from symmetric and asymmetric cointegration models. *MPRA*, (74101).
- Vanguard News (2017): Nigeria's Unemployment rates rises from 14.2% to 18.8% retrieved from <https://www.vanguardngr.com/2017/12/nigerias-unemployment-rate-rises-14-2-18-8/>
- WDIs. (2016). The World Bank world development indicators-World Bank. <http://data.worldbank.org/data-catalog/worldwide-governance-indicators>

Appendix A: Post Estimation Tests

A1: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.078834	Prob. F(2,13)	0.3686
Obs*R-squared	3.843405	Prob. Chi-Square(2)	0.1464

A2: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.801863	Prob. F(15,11)	0.1641
Obs*R-squared	19.18995	Prob. Chi-Square(15)	0.2053
Scaled explained SS	3.817621	Prob. Chi-Square(15)	0.9983

A3: Model Stability Test

