International Journal of
Advanced Research in Statistics, Management and Finance
p-ISSN: 2315-8409 | e-ISSN: 2354-1644

IJARSMF

January, 2021
Vol. 8, No. 1

Macroeconomic Variables and Stock Market Movement in Nigeria (1988 – 2019)

[1]**Olaolu, E. O. &**
[2]**Nwankpa, E. C.**
[1]*Department of Business Management, Baze University, Abuja, Nigeria*
[2] *Department of Banking & Finance, Nasarawa State University, Keffi, Nigeria*

Article DOI:
10.48028/iiprds/ijarsmf.v8.i1.07

Abstract

The goal of this study was to analyse empirically the effect on the stock market movement of five selected macro-economic variables, including the exchange rate, inflation rate, interest rate, crude oil price, and foreign portfolio investment. For the movement of the stock market, stock market capitalizations were used as a reference. Information from the annual time series covering the period between 1988 and 2019 was used. The analysis started with examining stochastic characteristics of each time series by testing their stationarity using Augmented Dickey Fuller (ADF) test. The findings show that only equity market capitalization and crude oil price was found stationary at level, while the other time series were found stationary at first difference. The bounds cointegration test procedure indicates that the variables have long-run equilibrium relationship amongst themselves. Analysis from the study showed that foreign exchange rate, interest rate, inflation rate, crude oil, and foreign portfolio investment are all significant in determining the performance of equity market capitalisation. They were all found to have significant effect on stock market movement in Nigeria. Based on these findings, the study recommended that there is need to formulate sustainable macro-economic policies to curtail depreciation of the Naira, high inflation and interest rate, while attracting long-term foreign portfolio investors into Nigeria. Aggressive diversification of the economy should be made from its mono-cultural dependence on oil whose price over which Nigeria has no control.

Keywords:
Crude Oil Price, Foreign Portfolio Investment, Equity Market Capitalization

Corresponding Author:
Olaolu, E. O.

Background to the Study

Nigeria's stock market has witnessed remarkable fluctuations in the recent years especially within the past decade. The stock market, being a sector within the larger economy, cannot be looked at as an independent component. Hence, movements in the market must have some factors that drive it and such factors can be used to explain such moves in the market. One major factor that determines the move in the stock market is 'investors sentiments' which represents the way investors feel about a particular market at any point in time. If investors believe the general price will rise in the near future which means a positive sentiment, then they will tend to buy more stocks which will most likely push the market indices to the positive side, and vice versa for a negative sentiment. In addition to sentiments, other factors such as macroeconomic variables, business cycles, market manipulations, unforeseen events, etc can also be used to explain movements in the stock market. In line with fundamental and economic principles, stock prices are generally determined through the mechanism of price discovery which operates on the economic law of demand and supply. Aside these, there are also fundamental company-related factors which determines a stock price. The ideas presented above is a popular area of research and has drawn the attention of many scholars in the finance research space.

Table 1: Movement in Nigerian Stock Market Capitalization (Past 10 Years)

S/N	Date	Market Cap (N'bn)	Change(N'bn)	% Change
1.	31-Dec-2010	7,913.75	-	-
2.	31-Dec-2011	6,532.58	(1,381.17)	(17.45)%
3.	31-Dec-2012	8,974.45	2,441.87	37.38%
4.	31-Dec-2013	13,226.00	4,251.55	47.37%
5.	31-Dec-2014	11,477.66	(1,748.34)	(13.22)%
6.	31-Dec-2015	9,850.60	(1,627.05)	(14.18)%
7.	31-Dec-2016	9,246.92	(603.69)	(6.13)%
8.	31-Dec-2017	13,609.47	4,362.55	47.18%
9.	31-Dec-2018	11,720.72	(1,888.76)	(13.88)%
10.	31-Dec-2019	12,968.59	1,247.87	10.65%
11.	31-Oct-2020	14,822.88	1,854.29	14.30%

Source: Author's Field Survey as extracted from CBN Statistical Bulletin 2019

The objective of this study is to investigate whether variations in macroeconomic variables affect listed Nigerian equities market, during the years 1988 to 2019.

Literature Review

The main conceptual review of this study covered market capitalization and macroeconomic determinants of stock movement. The market capitalization sums up all the computed values of all listed entities and this serves as a reliable tool of measuring an economy's stock market size. For instance, NSE (2020) reported that the total market capitalization on the floor of the Nigerian Stock Exchange was N14.822 trillion as at close of business on 13th October 2020 and this is the value the investors have placed on all the listed entities collectively on the reference date. Onyeisi, Odo and Anoke (2016) argued that Market capitalization measures growth of a stock market whereby increases points

to growth, decreases imply decline and a static position means there is no change. Chen et al (1986) conceptualized how movements in macroeconomic variables impact on the future dividends, discount rates and stock prices. Fama (1981), conducted similar test and established the existence of a long-term association between macroeconomic variables and stock market in United States of America. This study adopts the same concept that macroeconomic emanate from business activities and the variables affect the level of activities in the stock market. The variables selected for this study are exchange rate, Interest rate, inflation rate, crude oil price and foreign portfolio investment.

Theoretical Framework

The Arbitrage Price Theory (APT) have been adopted for this study. The justification of this theory is predicated on the fact that APT can conveniently be used to examine the conceptual framework. In this study, the several risk factors of the APT are indexed by the five macroeconomic variables (exchange rate, interest rate, inflation rate, crude oil price and foreign portfolio investment) which are theorized to impact the stock market movement in Nigeria. The Arbitrage Pricing Theory (APT) has been proved empirically as an effective way of linking macroeconomic variables and stock market behavior. Under the APT, multiple risk factors can be used to describe the features of stock values (Ross, 1976). The emergence of APT in finance literature was necessitated as result of the fact that the Capital Asset Pricing Model (CAPM) which preceded it assumes the existence of only one risk factor which is not realistic.

The APT model can be stated as follows:

$$E(Ri) = Rf + \beta i1*RP1 + \beta i2*RP2 + \beta i3*RP3 + \ldots\ldots + \beta in*RPn \quad \ldots\ldots\ldots\ldots\ldots(1)$$

Where: E(Ri) = risky assets expected returns, Rf = risk-free rate, βin = sensitivity of the asset to factor n & RPn = risk premium.

Empirical Review

In view of the interest that this topic has drawn to researchers, there are many studies in the finance literature, which studied the relationship between macroeconomic variables and the stock market. Starting from Pakistan, Khan and Ali (2015) investigated the nexus between exchange rate and stock market prices in Karachi Stock Exchange from January 1992 to February 2013. The generalized autoregressive conditional heteroscedasticity (GARCH) and Granger Causality analysis confirmed that a bidirectional relationship exists between the Pakistan Rupee and the KSE-100 stock index. Korsa and Fosu (2016), used error correction model to examine the relationship between exchange rates movements and stock market capitalization in Ghana between 1990 – 2013. The study was an ex-post facto research in design. Ghana stock exchange market capitalization was the dependent variable while Ghana Cedi exchange rate to the United States Dollar was the independent proxy. The results of the study discovered a significant negative effect of exchange rates on stock market. The study recommended that the Central Bank of Ghana and other agencies should pursue policies that will favour the real sector to prevent further depreciation of the local currency.

In Nigeria, Udoka, and Bassey (2018), examined the influence of gross domestic product, exchange rate, interest rate and inflation rate on average stock price using the augmented dickey fuller unit root test and autoregressive distributed lag models in testing secondary data covering between 1986 – 2014. The study model revealed no long run relationship between the explanatory and explained variables, and therefore suggested policies that will promote capital market investment in the country. Okoro (2017), conducted an ex-post facto work in investigating the effect of selected macroeconomic proxies on Nigeria all-share index using the ordinary least squares and spanning the years 1986-2015. Non of the variables (gross domestic product, money supply, interest rate, inflation rate and exchange) proved to exert any effect on the dependent variable as they all returned as insignificant coefficients. It was recommended that Nigerian companies should channel enough efforts on increasing their profits so as to attract more investors. In India, Kedia and Vashisht (2017), studied to check the relationship between the Bombay Stock Exchange Index as the regressand while inflation rate, interest rate and exchange rate were used as the regressors between 2005 – 2014. The analysis was conducted through multiple ordinary least squares regression estimation. There was no proof of a strong relationship between the dependent and independent variables, which was interpreted to mean, that changes in interest rate, inflation rate and exchange rate does not affect movement in Bombay Stock Exchange Index. John (2018), modelled the effect of money supply, interest rate, exchange rate and inflation rate on Nigerian stock market capitalization using annual time series data from 1981 to 2016.

Methodology

This study adopted ex-post facto research design, which fits well to address the study objective; The population comprised all the listed companies at the Nigeria Stock Exchange (NSE). The study covered 32 years period from 1988 - 2019. The major source of secondary data used for this study was extracted from the Central Bank of Nigeria (CBN) 2019 Statistical Bulletin, the Securities and Exchange Commission (SEC) official website, the Nigerian Stock Exchange (NSE), World Development Indications and the Energy Information Administration.

Result and Discussions

Unit Root Test Result

The unit root test was conducted using Augmented Dickey – Fuller (ADF) technique

Table 2: Summary of Unit Root Test Results

Variable	Order of Integration	ADF Test Statistics	Critical ADF Test Statistics
MCT	I(0)	-4.259614	-3.562882**
EXR	I(1)	-5.144902	-4.356068*
INT	I(1)	-3.508215	-3.218382***
INF	I(1)	-6.498309	-4.416345*
COP	I(0)	-5.876755	-4.356068**
FPI	I(1)	-4.629604	-4.374307*

Note: MacKinnon critical values for the rejection of hypothesis of unit root are in parenthesis in Columns 1 and 2 and the tests include intercept with trend; * significant at 1%; ** significant at 5%;*** significant at 10; Mackinnon critical.

Source: Author's Computation, 2020 (Eviews-10)

The ADF test indicates that three of the variables (EXR, INT, INF and FPI) were found stationary at first difference and at 1%, 10%, 1% and 1% level of significance respectively. Hence, the unit roots for ADF test were rejected at the first difference for the four variables.

Cointegration Test Result

Table 3: Summary of Co-integration Estimates

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.048309	10%	2.37	3.2
k	3	5%	2.79	3.67
		1%	3.65	4.66

Source: Authors Computation, 2020 (Eview-10)

Using the bound test, it indicates the F-statistic value of 5.048 is greater than the upper and lower bound of 3.67 and 2.79 at 5%. This implies that long run relationship exists among the variables. This led to the rejection of the hypothesis of no co-integration among the variables which implies that there exist a long run relationship between macro-economic variables and stock market movement in Nigeria.

Statistical Test of Hypotheses

The five hypotheses used for this study were tested using the Wald-test statistical tool with 5% level of significance The decision rule is that we accept the null hypothesis if the critical p-value is greater than 0.05, otherwise reject the null hypothesis.

Table 4: Results of Wald Test

Variables	Test Statistics	Value	Df	Probability
EXR	F-statistic	164.6061	(4, 2)	0.0060
	Chi-square	658.4246	4	0.0000
INT	F-statistic	107.4042	(4, 2)	0.0092
	Chi-square	429.6166	4	0.0000
INF	F-statistic	124.0819	(4, 2)	0.0080
	Chi-square	496.3277	4	0.0000
COP	F-statistic	143.9192	(3, 2)	0.0069
	Chi-square	431.7577	3	0.0000
FPI	F-statistic	208.2876	(3, 2)	0.0048
	Chi-square	624.8628	3	0.0000

Source: Authors Computation, 2020 (Eviews-10)

Discussion of Findings

Findings from the study showed that there is a significant relationship between exchange rate and Equity Market Capitalization. A possible explanation to this is that a stronger domestic currency enhances the stock market in Nigeria, as foreign investors' confidence

will be built. The findings from this study is in tandem with the results of Korsa and Fosu (2016), which discovered a significant negative effect of exchange rates on stock market performance. More so, the study showed that there is a significant relationship between interest rate and equity market capitalization. The implication of this result is that prime lending rates which determines the rate at which credit are made available for private sector investments significantly affects the equity stock market. This finding contradicts Udoka et al (2018), which revealed no long run relationship between interest rate and stock market in Nigeria. Furthermore, the study revealed that there is a significant relationship between inflation rate and equity market capitalization. The implication of this result is that the higher the cost of production, the more it impacts significantly on the investments made in the capital markets. The result also showed that crude oil price has a significant effect on equity market capitalization. As the oil price rise in the international market, the more foreign exchange revenues are accrued and generated for increased investment in the capital market. This negates the work findings of Ojikutu et al (2017). Lastly, foreign portfolio investment was discovered to have a significant effect on equity market capitalization. This aligns with Agu et al (2019) which found foreign portfolio investment to significantly affect market capitalization between 1986-2017 in Nigeria. The implication of this significant impact is that as the more foreign capital flows into the country, it gets invested in the stock market leading to growth of the market.

Conclusion and Recommendations

Based on the above findings, the study made the following recommendations:

i. There is need to formulate a sustainable foreign exchange policy that will promote the stability of the Nigerian Naira and stocks performance in Nigeria.
ii. The Federal government should continue to pay particular attention to interest rate stability as one of the key macroeconomic policy objectives in order to curb inflation that could impact negatively on stock market movement.
iii. Policies to tame domestic inflationary pressures should be vigorously pursued in a bid to counter its negative influences on the stock market movements.
iv. As regards to crude oil price, aggressive diversification of the economy should be made from its mono-cultural dependence on oil whose price is largely influenced by the vagaries of international oil market. These fluctuations tend to always have a negative impact on stock market investments.
v. Regulatory authorities are also encouraged to enforce policies that will further propel capital market development through equity market capitalization.

References

Acikalin, S., Aktas, R., & Unal, S. (2008). Relationships between stock markets and macroeconomic variables: An empirical analysis of the Istanbul stock exchange, *Investment Management and Financial Innovations, 5* (1), 8-16.

Adegbite, E. O. (2007). *Essentials of money and banking*, Lagos, Nigeria: Chumek Ventures Publishers.

Adesanmi, A. A. (2018). The impact of national and global macroeconomic factors on emerging stock markets: A multi-statistical analysis of the MINT countries, *Thesis Submitted to London School of Commerce and Cardiff Metropolitan University in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy.*

Adu, D. A. (2012). Effect of macroeconomic variables on stock market return Ghana: An analysis using arbitrage pricing model. *A Thesis to the Institute of Distance Learning, Kwame Nkrumah University of Science and Technology, in Partial Fulfilment of the Requirement for the Degree of Commonwealth Executive Master of Business Administration*.

Agu, A. O., Ogu, C., & Ezeanyeji, C. I. (2019). Foreign portfolio investment and stock market returns in Nigeria, *IOSR Journal of Economics and Finance, 10* (6), 1-9.

Akinmulegun, S. O. (2018). Capital market development and foreign portfolio investment inflow in Nigeria (1985–2016), *Advances in Economics and Business, 6* (5), 299-307.

Almonen, H. (2015). Role of stock market in the economy of a country, *International Journal of Management and Commerce Innovations, 3*(2), 609-611.

Asekome, M. O., & Agbonkhese, A. O. (2015). An macroeconomic variables, stock market bubble, meltdown and recovery: Evidence from Nigeria, *Journal of Finance and Bank Management, 3*(2), 25-34.

Assagaf, A., Murwaningsari, E, Gunawan, J., & Mayangsari, S. (2019). The effect of macroeconomic variables on stock return of companies that listed in stock exchange: Empirical evidence from Indonesia, *International Journal of Business and Management, 14* (8), 108-116.

Binswanger, M. (2000). Stock market booms and real economic activity: Is This Time Different?, *International Review of Economics and Finance*, *9*(2000), 387-415.

Carino, C. J. F., Ong, C. K. C., & Orbeta, M. C. G. (2013). Philippines: Time series analysis of stock market returns and their macroeconomic impacts for Years 2002 through 2011, *A Paper Presented to Dr. Cesar C. Rufino and Submitted to School of Economics, De La Salle University – Manila, In Partial Fulfilment of ECOMET 2 Course Requirement*, 1-57.

CBN (2020). *Central bank of Nigeria statistical bulletin, 2019*, Retrieved from https://www.cbn.gov.ng/documents/Statbulletin.asp

Chen, N., Roll, R., & Ross, S. A. (1986). Economic forces and the stock market, *The Journal of Business*, *59* (3), 383-403.

Ditimi, S., Sunday, K., & Emma-Ebere, O. (2018). Dynamic interrelationship between macroeconomic fundamentals and stock prices in Nigeria, *Journal of Finance and Marketing, 2* (1), 50-59.

Fama, E. F. (1965). The behaviour of stock market prices, *The Journal of Business, 38* (1), 34-105.

Fama, E. F. (1981). Stock Returns, real activity, inflation and money, *The American Economic Review, 71* (4), 545-565.

Gumus, G. K., Duru, A., & Gungor, B. (2013). The relationship between foreign portfolio investment and macroeconomic variables, *European Scientific Journal, 9* (34), 209-226.

Inyiama, O. I., & Nwoha, C. (2014). Macroeconomic variables and share price movements in Nigeria brewery industry: Evidence from Nigerian Breweries Plc, *European Journal of Accounting, Auditing and Finance Research, 2* (5), 19-32.

Islam, K. U., & Habib, M. (2016). Do macroeconomic variables impact the Indian stock market?, *Journal of Commerce &Accounting Research, 5* (3), 10-17.

John, E. I. (2018). Macroeconomic determinants of stock market performance in Nigeria: An econometric approach, *Indonesian Journal of Applied Business and Economic Research, 1* (1), 47-58.

John, E. I. (2019). Effect of macroeconomic variables on stock market performance in Nigeria, *Journal of Economics, Management and Trade, 22* (6), 1-14.

Kedia, N., & Vashisht, A. (2017). An empirical study of relationship between Indian stock market and inflation, interest rates and exchange rate, *GE-International Journal of Management Research, 5*(4), 83-91.

Khan, R. E. A., & Ali, R. (2015). Causality analysis of volatility in exchange rate and stock market prices: A case study of Pakistan, *Asian Economic and Financial Review, 5* (5), 805-815.

Kolapo, F. T., Oke, M. O., & Olaniyan, T. O. (2018). Unravelling the impact of macroeconomic fundamentals on stock market performance in Nigeria: An ARDL- bound testing approach, *Journal of Economics, Management and Trade, 21* (3), 1-15.

Korsa, P., & Fosu, P. (2016). The effects of exchange rates movements on stock market capitalisation in Ghana, *Journal of Applied Economics and Business Research, 6* (4), 312-327.

Kuwornu, J. K. M., & Owusu-Nantwi, V. (2011). Macroeconomic variables and on stock market returns: Full information maximum likelihood estimation, *Research Journal of Finance and Accounting, 2* (4), 49-63.

Lawal, A. I., Somoye, R. O., Babajide, A. A., & Nwanji, T. I. (2018). The effect of fiscal and monetary policies on stock market performance: Evidence from Nigeria, *Future Business Journal, 5* (2018), 16-33.

Mahmah, A. E., & Kandil, M. E. (2019). The balance between fiscal consolidation and non-Oil growth: The case of the UAE, *Borsa Istanbul Review, 19* (1), 77-93.

Musa, S. U., & Ibrahim, M. (2014). Stock market development, foreign direct investment and macroeconomic stability: Evidence from Nigeria, *Research Journal of Finance and Accounting, 5* (18), 258-264.

Nkechukwu, G., Onyeagba, J., & Okoh, J. (2015). Macroeconomic variables and stock market prices in Nigeria: A cointegration and vector error correction model tests, *International Journal of Science and Research, 4* (6), 717-724.

NSE (2020). *Listed companies*, Retrieved from https://www.nse.com.ng/issuers/listed-securities/listed-companies.

NSE (2020). *Daily market activity report*, Retrieved from http://www.nse.com.ng/about-us/about-the-nse/home-page.

Nwakoby, C., & Alajekwu, U. B. (2016). Effect of monetary policy on Nigerian stock market performance, *International Journal of Scientific Research and Management, 4* (9), 4530-4542.

Nwala, M. N., Nwagboso, I. C., & Nwankwo, O. (2019). Impact of foreign portfolio investment volatility on total market capitalization in Nigeria, *SSRG International Journal of Economics and Management Studies, 6* (10), 78-91.

Ojikutu, O. T., Onolemhemhen, R. U., & Isehunwa, S. O. (2017). Crude oil price volatility and its impact on Nigerian stock market performance (1985-2014), *International Journal of Energy Economics and Policy, 7* (5), 302-311.

Okoro, C. O. (2017). Macroeconomic factors and stock market performance: Evidence from Nigeria, *International Journal of Social Sciences and Humanities Review, 7* (1), 1-9.

Olofin, S. (2001). *An introduction to macroeconomics*, Ibadan: Nigeria, Malthouse Press Limited.

Omodero, C. O., & Mlanga, S. (2019). Evaluation of the impact of macroeconomic variables on stock market performance in Nigeria, *Business and Management Studies, 5* (2), 34-44.

Onyeisi, O. S., Odo, I. S., & Anoke, C. I. (2016). Foreign portfolio investment and stock market growth in Nigeria, *Developing Country Studies, 6* (11), 2-15.

Ross, S. A. (1976). The arbitrage theory of capital asset pricing, *International Journal of Economic Theory*, *13*, 341-360.

Sharma, A., Giri, S., Vardhan, H., Surange, S., Shetty, R., & Shetty, V. (2018). Relationship between crude oil prices and stock market: Evidence from India, *International Journal of Energy Economics and Policy*, *8* (4), 331-337.

Tripathy, V., & Kumar, A. (2015). Do macroeconomic variables affect stock returns in BRICS markets? An ARDL approach, *Journal of Commerce & Accounting Research, 4* (2), 64-76.

Udoka, C. O., Nya, M. J., & Bassey, J. G. (2018). The effect macroeconomic determinants of stock price movements in Nigeria, *International Journal of Research - Granthaalayah, 6* (1), 203-218.

Worlu, C. N., & Omodero, C. O. (2017). A comparative analysis of macroeconomic variables and stock market performance in Africa, *International Journal of Research in Accounting, Finance and Management Sciences, 7* (4), 95-102.