

MACROECONOMIC DETERMINANTS OF STOCK MARKET DEVELOPMENT IN NIGERIA: (1981-2017)*

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Abstract: For the stock market to contribute effectively and efficiently in its role of capital formation, the macroeconomic environment in which it operates must be conducive and growth supportive. Hence, this study examine macroeconomic determinant of stock market development in Nigeria for the period of 1981 to 2017. The study employed the ARDL bound testing technique to investigate the long run and short run relationship between the dependent variable (stock market development) and independent variables (GDP, banking sector development, stock market liquidity, foreign direct investment, inflation rate and savings rate). The result of the study found out that in both the short run and long run, key macroeconomic determinants of stock market development in the context of the Nigerian Stock Exchange Market are banking sector development, stock market liquidity, foreign direct investment and to an extent the income level (GDP). While inflation rate which measures macroeconomic stability, and savings rate do not significantly explain stock market development. This study therefore recommended amongst others that policymakers should strive to sustain the stability of the economy in order to promote the growth of stock market development in the short run and long run.

1 Introduction

Stock markets have been recognized as a conduit for investments in an economy due to the role they perform in capital formation which is a prerequisite for economic growth and development. The stock market serves as a platform for raising and allocation of funds needed for investment, thereby creating opportunities for investors. According to Oseni and Nwosa (2011), it is where the elements of development of an economy interact with each other. Therefore an integral part of every economy (Saleem and Alifiah, 2017). Because it reveals the activities of economic and political drivers, making it a mirror and barometer of any economy (Singh, 2010; Dev and Shakeel, 2013). Studies have shown that the stability of the stock market is necessary for economic growth of both developing and developed countries. However, the stock market has been known to be sensitive to economic conditions within which it operate. Therefore, macroeconomic conditions are expected to affect the development of the stock market (Al-Majali and Al-Assaf, 2014).

Theoretical approach support the role of domestic economic fundamentals in determining the performance and growth of stock market (Sharma and Mahendru, 2010). It is well documented in research that stock prices react to information on corporate control, regulatory policies and macroeconomic conditions (Cutler, Poterba and Summers, 1988). Traditional valuation of stock is based on its present value

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which is derived from the discounted expected future cash flow streams. The expected future cash flows are however, sensitive and subjected to changes in macroeconomic conditions (Mehr-un-Nisa and Nishat, 2012). The linkage between macroeconomic variables and stock prices is provided by the arbitrage pricing theory developed by Ross (1976). Fundamental macroeconomic variables such as gross domestic product, interest rates, inflation rates, exchange rates, money supply, and external debts have been documented in empirical studies to affect stock market prices (Laichena and Obwogi, 2015). These economic indicators either boost or reduce the confidence of local and foreign investors in the stock market.

Stock markets of emerging economies over the past few decades have witnessed remarkable growth as indicated by the value and volume of trade in the markets along with the level of capital inflows from developed markets, thereby providing numerous opportunities for investments (Beckmann, Berger and Czudaj, 2015; Raza, Shahzad, Tiwari and Shahbaz, 2016). The development of the stock market is vital as it provides more opportunities for greater mobilization of funds and better efficiency in resource allocation (Inanga and Emenuga, 1997 as cited in Okoro, 2017). Thus, in order to ensure stability and development in the stock market, emerging economies like Nigeria have over the years witnessed several reforms. Nevertheless, investment returns in the stock market of developing economies continue to be more reactive to changes in economic fundamentals due to their fragile and volatile nature (Ahmed, 2008; Kirui, Wawire and Onono, 2014). This makes them even more unpredictable and unstable unlike the stock markets of developed economies, which are known to be more stable.

In recent years, macroeconomic variables performance in Nigeria have been poor. Presently, the situation has been exacerbated by the recent decline in global oil price due to the oil-dependent nature of the Nigerian economy. Key indicators such as the GDP experienced negative growth rate consistently over the quarters of 2016, thereby, increasing inflation rate to double digit and pushing the depreciation of the exchange rate to a new height. All these could potentially limit the development of the stock markets as well as impede on its role in contributing to the development of the economy. Developing countries like Nigeria are still yet to fully exploit the potential benefits of the stock market due to some problems which are yet to be fully identified. This study attempts to identify these problems from the macroeconomic perspective by addressing questions such as: what are the macroeconomic determinants of stock market development and to what extent have macroeconomic variables affected the development of the stock market in Nigeria? While there are numerous empirical studies on the impact of macroeconomic variables on stock market prices and returns in Nigeria, studies on macroeconomic variables as determinants of stock market development are scarce. Conflicting results from existing empirical studies also necessitate further investigation. The result of this study would not only provide information to investors on factors affecting their investment, it would as well help policy makers in formulating policies which could help develop the stock market.

2 Glimpse of the Nigerian Stock Exchange Market

The Nigerian Stock Exchange (NSE) was founded in 1960 as the Lagos Stock Exchange, on September 15, 1960, following the recommendations of the Barbark committee of 1958. Operations began officially on August 25, 1961 with 19 listed securities made up of 3 equities, 6 federal government bonds and 10 industrial loans. However, informal operations had commenced earlier in June, 1961. The volume for August, 1961 was about 80,500 pounds and it rose to about 250,000 pounds in September of the same year with the bulk of the investments in government securities. The name was changed from the Lagos Stock Exchange to the Nigerian Stock Exchange in December, 1977 following the recommendations of Dr. Pius Okigbo's led financial review committee of 1975/76 and several trading floors were opened across Nigeria. The NSE is a self-regulatory organization (SRO) and also regulated by the Securities and Exchange Commission (SEC) which has the mandate of Surveillance over the exchange to forestall breaches of market rules and to deter and detect unfair manipulations and trading practices. The SEC also administers the Investments and Securities Act of 2007. During the 2000s, the market began a robust climb on the back of strong GDP growth and the influx of foreign capital into the country.

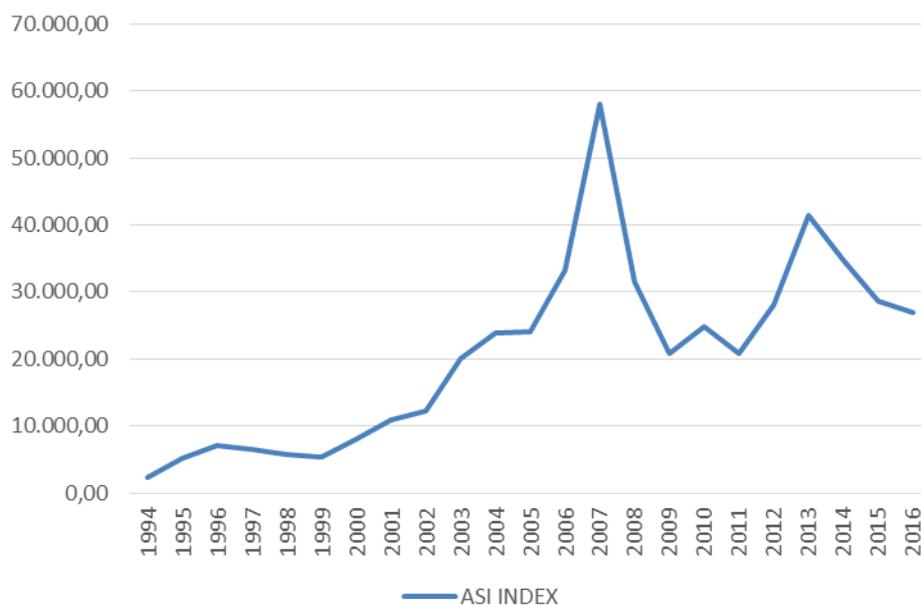
As at the first quarter of 2018, the NSE is the third largest in Africa with an increase in Market Capitalization from N16.88 trillion (\$90.68 billion) in the fourth quarter of 2014 to N24.87 trillion (\$81.36 billion) and the largest exchange in West Africa (NSE fact sheet, 2018, 2014). There are 171 listed equities, 91 listed bonds and 9 listed ETFs with 166 listed companies from 11 industries.

Year	Equity Capitalization N'Billion	NSE ASI index
1998	256.9	5,672.70
2004	1,925.90	23,844.50
2007	10,180.30	51,330.50
2008	6,957.50	55,949.00
2010	7,913.80	24,770.50
2014	11,477.70	34,657.20
2016	9,246.90	26,874.60

Source: CBN Statistical Bulletin (2016)

As regards the movement of the NSE ASI index, there was a massive increase from 1998 to 2008 with an upsurge from 5,672.70 points to 55,949 points. However, the financial crisis of 2008 led to a downward trend in the ASI with more than 40% drop from 2008 to 2010. It then recovered and increased in 2014 to 34,657.20 points, and again suffered a drop in 2016 to 26,874.60 points which can be attributed to recession. It is the interest of this study to then examine the macroeconomic factors responsible for the developments in the NSE development.

Figure 1: ASI INDEX



Source: CBN Statistical Bulletin 2016, NSE Fact Sheet, 2016

3 Literature Review

This section contains a review of prior studies on macroeconomic determinants of stock market development from developed and developing economies. One of the earliest studies on the subject matter is by Garcia and Liu (1999). They used pooled data from fifteen industrial and developing countries from 1980 to 1995. The study revealed that real income, saving rate, financial intermediary development and stock market liquidity are important determinants of stock market development. Hsing (2014) in a study in Estonia reported that stock market index is positively affected by the debt/GDP ratio, real GDP and the German stock market index and is negatively associated with the exchange rate, the domestic interest rate, the expected inflation rate, and the euro area government bond yield. Al-Mamun (2013) attempted to augment the determinants of stock market development in global growth generator (3G) countries excluding Nigeria, Iraq and Vietnam. Using a panel ARDL model for the eight selected countries over a period of 1980-2011, the study showed evidence supporting macroeconomic variables like foreign direct investment, real interest rate as significant determinants of the stock market development in the long run. In finding the connection between macroeconomic variables and market capitalization in Pakistan, Muhammad, Sonia and Tayyaba (2017) found out that there is strong correlation between market capitalization, foreign direct investment, money supply and oil prices. Also, regression analysis revealed that money supply and GDP have positive and significant relationship with market capitalization while oil prices indicated a negative and significant relationship with market capitalization.

A dynamic panel study was carried out on selected European countries by Sukruoglu and Nalin (2014) in relation to macroeconomic determinants of stock market development for the period 1995-2011. The empirical findings suggested that income, monetization ratio, liquidity ratio, saving rate and inflation affect stock market development. While monetization ratio and inflation have negative effects,

income, liquidity ratio and saving rate exhibited a positive effect on stock market development. Dev and Shakeel (2013) on the determinants of the growth of stock market in Pakistan used liquidity in the market measured by market volume, foreign investors' portfolio investment (FIPI) and discount rate as the explanatory variables. The result showed that market capitalization which was used as a proxy for size of the stock market is positively and significantly affected by FIPI and market volume, while discount rate is insignificant in explaining the growth of the stock market in Pakistan. Owiredu, Opong and Asomaning (2016) investigated macroeconomic determinants of stock market development in Ghana using quarterly data for the period 1992 to 2012. The findings revealed that macroeconomic indicators such as the real income (GDP per capita income), domestic saving, financial intermediary growth, macroeconomic stability (inflation) and private capital flows were insignificant in contributing to the development of the stock market except for stock market liquidity. In a similar study in Ghana, Acquah-Sam (2016) used principal component analysis, structural equation modelling through path analysis to test the interactions of some selected macroeconomic variables and capital market development. The study found out that capital market development is positively affected by gross capital formation and GDP growth, and negatively affected by Treasury bill rates. However, inflation and foreign direct investments were insignificant predictors of capital market development.

In a recent study, Ho and Odhiambo (2018) analyzed the macroeconomic drivers of stock market development in the Philippines. Using the ARDL bounds testing procedure, the empirical results revealed that trade openness has a negative impact on Philippine stock market development in the long run, while banking sector development and the exchange rate both have positive impacts on the development of the Philippine stock market in the short run. Zhou, Zhao, Belinga and Gahe (2015) applied the Calderon-Rosell model to investigate the macroeconomic factors affecting the stock market development in Cameroon. The result of the study indicated that stock market liquidity and financial openness are significant determinants of stock market development. However, contrary to the result of Ho and Odhiambo (2018), banking sector development did not positively and significantly determine stock market development of Cameroon under the period reviewed. Su, Bui and Nguyen (2016) employed a panel data of 36 developing countries for the period 2003 to 2014 and applied two-way General Method of Moments to explore the determinants of stock market development. The findings showed that economic growth, domestic credit and stock market liquidity are positive determinants of stock market development while money supply is a negative determinant.

Kemboi and Tarus (2012) investigated macroeconomic determinants of stock market development in Kenya for the period 2000 to 2009. The result also showed that income level, banking sector development and stock market liquidity are vital determinants of the development of the Nairobi Stock market. Yartey (2008) also reported that income level, gross domestic investment, banking sector development, private capital flows, and stock market liquidity are important determinants of stock

market development in emerging market countries. Whereas Shadnan Khan (2017) in a research on macroeconomic determinants of stock market development of South Asian countries found out that saving and income level are insignificant determinants of stock market development, while financial intermediary development, macroeconomic stability and foreign direct investment are significant determinants. Ho (2017) on macroeconomic determinants of Stock market development in South Africa using ARDL bounds testing procedure also showed that banking sector development and economic growth have positive long-run impact, whereas inflation rate and trade openness have negative long-run impact on stock market development. In the short run, the results find that economic growth have positive impact, while inflation rate, real interest rate, and current period of trade openness have negative impact on stock market development. However, Shrestha and Subedi (2014) indicated that inflation and broad money supply growth positively affect the performance of stock market in Nepal while interest rate has a negative influence. Using a sample of Sub-Saharan African countries, Matadeen (2017) attempted to identify the main macroeconomic determinants of stock market development from an African perspective. By applying Panel Vector Error Correction Model, the result showed that banking sector development, stock market liquidity, investment and macroeconomic stability are crucial determinants of stock market development in the region. However, while savings rate is also a significant determinant, its effect is detrimental to the growth of equity markets in the region. Bayar (2016) assessed the major macroeconomic determinants behind stock market development in Turkey using ARDL co-integration. The study found out that economic growth and stock market liquidity both have positive impact while inflation has a negative influence on stock market development in the long run.

Malaolu, Ogbuabor and Orji (2013) attempted to detect the determinants of stock movements in Nigeria from some selected monetary variables. The two step Engle-Granger co-integration test was employed on time series data for the period 1985 to 2010. The result showed that overall, macroeconomic variables (real exchange rate, real interest rate and money supply) are not significant determinants of stock price movements in Nigeria in the long run except for inflation rate. Okoro (2017) used ordinary least square to analyse the relationship between macroeconomic factors and stock market performance in Nigeria for the period 1986 to 2015. The findings concluded that the selected macroeconomic factors which include GDP, money supply, interest rate, inflation rate and exchange rate are not significant predictors of stock market performance in Nigeria. The result of Okoro (2017) provides support for the result of Malaolu et al (2013). However, study by Ayunku and Etale (2015) reported that market capitalization, credit to private sector, exchange rates, inflation and savings rate are important determinants as they significantly affect the development of the stock market in Nigeria. Similar result was also documented by Ita and Joe (2013) on macroeconomic factors influence on stock market development. The study showed that macroeconomic factors such as national savings rate, inflation rate, economic growth rates and financial intermediary development influenced stock market development during the period 1970-2011.

Most of the studies (Al-Mamun (2013); Muhammad et al (2017); Sukruoglu and Nalin (2014); Dev and Shakeel (2013); Ho and Odhiambo (2018); Su et al (2016); Kemboi and Tarus (2012); Yartey (2008); Shrestha and Subedi (2014); Matadeen (2017); Bayar (2016)) reviewed agreed that foreign direct investment, economic growth, stock market liquidity, trade openness, inflation, savings rate and banking sector development are significant determinants of stock market development, while studies such as Owiredu et al (2016), Acquah-Sam (2016), Zhou et al (2015) and Shadnan and Khan (2017) showed mixed results. Empirical studies in Nigeria regarding the subject matter is scarce as earlier stated. Existing studies have focused on the relationship between stock market prices and macroeconomic variables (Asaolu and Ogunmuyiwa, 2010; Oseni and Nwosa, 2011; Malaolu et al 2013; Onakoya, 2013; Abdulkarim, 2014; and Inyiyama and Nwoha, 2014). A study by Ayunku and Etale (2015) only assessed the impact of stock market development on economic growth and failed to examine the relationship in the opposite direction. Okoro (2017) on the other hand, failed to proxy stock market development by market capitalization which according to Levine and Zervos (1996) and Dermirguc-Kunt and Levine (1996) (as cited by Garcia and Liu, 1999) is less arbitrary than other individual measures and indexes of stock market development.

4 Research Method

This study adopted using Autoregressive Distributed Lag (ARDL) of Pesaran, Smith and Shin (2001), because it allows a linear combination of different order of integration and generate robust and reliable results whether the sample size is small or large. Macroeconomic variables such as real gross domestic product, banking sector development, stock market liquidity, foreign direct investment, inflation rate and savings rate are selected as determinants of stock market development. Stock market development is proxy by market capitalization which is a better proxy for general development in the market.

The Calderon-Rossell Model (1991) provided a model linking economic growth and stock market liquidity as the main determinants of stock market development. However, in recent years, the model has been modified to incorporate other stock market determinants (Yartey, 2008; Kemboi and Tarus, 2012; Zhou et al 2015; Acquah-Sam, 2016). According to the Calderon-Rossell (1991) model, market capitalization is defined below;

$$Y = PV \tag{1}$$

where: Y is market capitalization in local currency, P is the number of listed companies in the stock market and V is the local currency average price of listed companies

The model was formally presented as follows:

$$Y = PV = Y(G, T) \tag{2}$$

$$V = V[G, P], P = P(T, V) \tag{3}$$

The exogenous variable **G** represents per capita GNP in local currency and

variable T represents the turnover ratio (which is equal to the value of total shares traded divided by market capitalization and it is used for measuring stock market liquidity). The endogenous variables are V and P

The structural equations are then expressed in the following reduced behavioral model:

$$\text{Log } Y = \theta_1 \text{Log } G + \theta_2 \text{Log } T \quad (4)$$

The component of the reduced form model is expressed as follows:

$$\text{Log } V = \alpha_1 \text{Log } G + \alpha_2 \text{Log } T \quad (5)$$

$$\text{Log } P = \varpi_1 \text{Log } G + \varpi_2 \text{Log } T \quad (6)$$

Equation 4 can be written as:

$$\text{Log } Y = \text{Log}(PV) = \alpha_1 \text{Log } G + \alpha_2 \text{Log } T + \varpi_1 \text{Log } G + \varpi_2 \text{Log } T \quad (7)$$

Factorizing we have:

$$\text{Log } Y = (\alpha_1 + \varpi_1) \text{Log } G + (\alpha_2 + \varpi_2) \text{Log } T \quad (8)$$

where:

$$\theta_1 = \alpha_1 + \varpi_1 \quad (9)$$

and

$$\theta_2 = \alpha_2 + \varpi_2 \quad (10)$$

Equation 8 shows the impact of economic growth G , and stock market liquidity T on stock market development Y . The model shows that stock market development is the result of the combined effect of economic growth and liquidity on both prices and the number of listings.

5 Model Specification

Following Calderon-Rossell model (1991), this study modified the model in order to incorporate more variables as determinants of stock market development. Therefore, the following model is adopted for this study;

$$\text{MRK}_t = \beta_0 + \beta_1 \text{GDP}_t + \beta_2 \text{BSD}_t + \beta_3 \text{SML}_t + \beta_4 \text{FDI}_t + \beta_5 \text{INF}_t + \beta_6 \text{SVR}_t + \mu_t \quad (11)$$

where:

- β_0 = intercept/constant
- $\beta_1 - \beta_7$ = parameters/coefficients of the explanatory variables
- μ_t = stochastic term

Description of Variables

Dependent Variable

Stock Market Development: In line with other studies, (Levine and Zervos, 1998; Yartey, 2008; Kemboi and Tarus, 2012; Zhou et al 2015; Acquah-Sam, 2016) stock market development is measured using market capitalization as a proportion of GDP. According to Levine and Zervos (1996) and Dermirguc-Kunt and Levine (1996) (as cited by Garcia and Liu, 1999), it is less arbitrary than other individual measures and indexes of stock market development. Market capitalization equals the value of listed shares divided by GDP. The assumption behind this measure is that overall market

size is positively correlated with the ability to mobilize capital and diversify risk on an economy wide basis.

Independent Variables

Gross Domestic Product (GDP): It measures the income level. Real income has been found to be highly correlated with the size of the stock market. This study uses the log GDP per capita in Naira to measure the income level. It is expected that the higher the income level, the more investors are likely to invest in the stock market.

Banking Sector Development: In order to capture the relationship between banking sector development and stock market development, a measure of banking sector development is included. Most studies use M2 relative to GDP as a measure of financial depth. However, according to King and Levine (1993) (as cited by Zhou et al, 2015), this measure does not tell us whether the liabilities are those of the central bank, commercial banks or other depository institutions. As a result, this study uses the value of domestic credit provided by the banking system to the private sector relative to GDP as a measure of banking sector development. Garcia and Liu (1999), Yartey (2008) and Kemboi, and Tarus (2012), reported a positive relationship between banking sector development and stock market development. The stock market and the banking sector both channel savings into productive investment, hence, they are both complements and substitutes for capital mobilization for economic growth (Demirguc-Kunt & Levine, 1996 as cited by Acquah-Sam, 2016).

Stock Market Liquidity (SML): According to Yartey (2008), the SML is a measure of market depth. Liquidity in the stock market helps to measure the ease and speed at which investors can access and turn their investments into cash. The higher the liquidity, the higher the confidence in the market. Two measures of stock market liquidity are commonly used and these include, value traded ratio (which is equal to the value of total shares traded divided by GDP) and stock turnover ratio (which is calculated by dividing the total value of shares traded by market capitalization). However, this study proxies market liquidity using value traded ratio because it measures stock transactions relative to the size of the economy (Yartey, 2008; Levine and Zervos, 1998).

Foreign Direct Investment: over the past few decades, due to financial liberalization and globalization around the world, emerging markets are now open to foreign investors who are becoming the major participants in the markets. Errunza (1982) (as cited in Zhou et al, 2015) argued that the long term impact of foreign capital inflows on the development of the stock market is broader than the benefits from initial flows and increased investor participation. Foreign investment is associated with institutional and regulatory reform, adequate disclosure and listing requirements and fair trading practices. The increase in informational and operational efficiency is expected to inspire greater confidence in domestic markets. This increases the investor's base and participation and leads to more capital flows. Capital flows is measured in this paper using foreign direct investment as a percentage of GDP and net private capital flows as a percentage of GDP. Adam and Tweneboah (2009), Zhou

et al (2015) and Acquah-Sam (2016) revealed the existence of a positive relationship between foreign direct investment (FDI) and stock market development.

Inflation Rate: This has been widely used as a measure of macroeconomic stability (Garcia and Liu, 1999; Yartey, 2008; Zhou et al, 2015). A stable macroeconomic environment increases the confidence of firms and investors to participate even more in the stock market (Zhou et al, 2015). For this study, inflation rate is used to measure macroeconomic stability. According to Fisher hypothesis, stock returns are expected to be positive related to inflation. Yartey (2008) empirical result support the position of Fisher, however, McCarthy, Najand and Seifert (1990) found a negative relationship between inflation and stock market development.

Savings Rate: This study measures savings as gross domestic savings as percentage of GDP. Expectedly, the higher the savings, the higher the amount of capital flows through the stock market.

6 Estimation Technique

The study collected time series annual data for the period covering 1981 to 2016. The study made use of secondary data sourced from CBN statistical bulletin, journals and articles. In order to investigate the dynamic linkage between macroeconomic variables and stock market development in the Nigeria stock exchange market, this study adopted the autoregressive distributed lag (ARDL) cointegration approach, or bound testing method, that was proposed by Pesaran et al. (2001). ARDL cointegration approach has numerous benefits as relative to other cointegration estimation methods. The flexibility of ARDL model is appealing, as it can be used regardless of whether underlying variables are integrated $I(0)$ or $I(1)$, but not $I(2)$. Secondly, unlike other cointegration approaches, the ARDL technique are not sensitive to the size of sample, and is comfortably applied even under a small sample size. Thirdly, ARDL cointegration approach can distinguish explanatory and explained variables, and enables testing the existence of linkage between the underlying variables. Furthermore, it has better statistical properties by providing unbiased estimates and valid t-statistics. Various diagnostic tests are carried out in order to generate the Best Linear Unbiased Estimator. These tests include the Augmented Dickey Fuller (ADF) Unit root test which is to test the stationarity of the variables and their order of integration, the Autocorrelation LM test to check for the autocorrelation in the residuals, Heteroscedasticity test and Normality tests.

The ARDL bound testing procedure employs the equation:

$$\begin{aligned}
 \Delta LMRK_t = & \beta_0 + \sum_{i=0}^n \beta_1 \Delta LMRK_{t-1} + \sum_{i=0}^n \beta_2 \Delta LGDP_{t-1} + \sum_{i=0}^n \beta_3 \Delta LBSD_{t-1} \\
 & + \sum_{i=0}^n \beta_4 \Delta LSVR_{t-1} + \sum_{i=0}^n \beta_5 \Delta LINF_{t-1} + \sum_{i=0}^n \beta_5 \Delta LSML_{t-1} \\
 & + \sum_{i=0}^n \beta_5 \Delta LFDI_{t-1} + \alpha_1 LMRK_{t-1} + \alpha_2 LGDP_{t-1} + \alpha_3 LBSD_{t-1} \\
 & + \alpha_4 LSVR_{t-1} + \alpha_5 LINF_{t-1} + \alpha_5 LSML_{t-1} + \alpha_5 LFDI_{t-1} \\
 & + \mu_t
 \end{aligned} \tag{4}$$

where μ , β and α are the white-noise error term, the short run coefficients, and the long run coefficients of the model, respectively, and Δ is the first difference operator. In addition, t denoted time period. The maximum number of lags in the model is chosen based on the Akaike Info criterion (AIC).

7 Empirical Result

Descriptive Statistics

In order to give a brief overview of the time series data, the descriptive statistics for the dependent and independent variables were presented in table 1. The explained variable is stock market development (MRK) measured by market capitalization as a percentage of GDP, while the explanatory variables are: log of gross domestic product (GDP), banking sector development (BSD), stock market liquidity (SML), foreign direct investment (FDI), inflation rate (INF) and savings rate (SVR). The descriptive statistics presents the mean, standard deviation, minimum and maximum value. On average, MRK is 10.03%, its minimum value is 3.05% and its maximum value being 39.95% over the period 1981 to 2016. The log of GDP averaged 8.27 over the period, minimum value is 4.98 and maximum value is 11.45. BSD has an average of 10.35%, minimum value of 5.9% and a maximum value of 20.7%. SVR maintained an average of 8.83%, minimum value of 3.34% and maximum value of 23.25%. Inflation rate (INF) averaged 20.61%, and has a minimum value of 0.22% and maximum value of 76.76%. SML has an average of 7.18%, a lowest value of 0.27% and highest value of 42.88%. FDI maintained an average of 6.08%, a lowest value of 0.07 and highest value of 18.73% over the period 1981-2016. From the table 1, INF has the highest standard deviation of 18.91% which shows the rate of instability in the economy. Meanwhile, the log of GDP has the lowest standard deviation of 2.24% during the entire period covered.

Table 1: Descriptive Statistics for Variables

Variables	Mean	Std. Dev.	Min.	Max.
MRK	10.02924	8.524776	3.053461	39.95013
LogGDP	8.268006	2.239235	4.975569	11.45259
BSD	10.35143	4.990837	5.900000	20.70000
SVR	8.825714	3.827835	3.340000	23.25000

INF	20.60971	18.91034	0.220000	76.76000
SML	7.182978	10.00126	0.265141	42.88137
FDI	6.057419	7.078032	0.074097	18.72963

Source: Author's Computation (2018) via EVIEW 9 Package

Unit Root Test Result

Table 2: Augmented-Dickey-Fuller (ADF) Test
Null Hypothesis: Variable has a Unit root

Variables	Augmented Dickey-Fuller test statistic		Order of Integration
	Level	First Difference	
MRK	-1.868031	-6.477611***	1(1)
LogGDP	-0.643910	-3.086936**	1(1)
BSD	-0.252102	-4.886752***	1(1)
SVR	-2.220649	-6.368255***	1(1)
INF	-3.118961**	-3.211953**	1(0)
SML	-2.509132	-5.879620***	1(1)
FDI	0.510290	-5.593981***	1(1)
\Asymptotic critical values*:			
1% level	-3.639407		
5% level	-2.951125		
10% level	-2.614300		

Source: Author's Compilation via EVIEW 9

*Note: * implies significant at 10% level, ** implies significant at 5% level and *** implies significant at 1% level*

The Augmented Dickey Fuller (ADF) test as presented in table 2 reveal that all variables are non-stationary at level but stationary at first differences except for INF which is stationary at level. This means that the hypothesis of unit root is not rejected for all variables at the 5% level of significance in level. Hence, stock market development and the five selected macroeconomic variables are integrated of the same 1(1) order except inflation which is 1(0). The result of the ADF test signifies that we can proceed to conducting cointegration test using the ARDL bound testing approach which gives room for linear combination of different order of integration. Therefore, the study then employs the ARDL method of estimation to explore the short run and long-run relationships among the variables.

ARDL Bound Test

The ARDL cointegration test is employed to investigate the long run relationship among the variables. The model was estimated and the ARDL bounds test was conducted. The results of the ARDL bounds test which is presented in table 3 indicated that F statistics which is 22.25 was higher than upper bound critical values. So we rejected the null hypothesis (there was no cointegration relationship among the variables) and we concluded that there was cointegrating relationship among the variables. Having found that ΔMCR , ΔGDP , ΔBSD , ΔSVR , INF , ΔSML and ΔFDI are co-integrated, the study estimates the model using the ARDL bounds test

approach. The first step is to determine the optimal lag length for the model using the Akaike Info criterion (AIC). The optimal lag length selected based on AIC is ARDL (2, 0, 2, 0, 0, 2, 2). The long-run and short-run results of the selected model are reported in Table 4 and 5.

Table 3: Results of ARDL Bounds Test

Null Hypothesis: No long-run relationships exist

Estimated equation $MRK = f(GDP, BSD, SVR, INF, SML, FDI)$		
F-statistics	22.25181***	
Optimal lag length	(2, 0, 2, 0, 0, 2, 2)	
Significance level	Critical values	
	Lower bound I0	Upper bound I1
1%	3.15	4.43
5%	2.45	3.61
10%	2.12	3.23

*Note: *** denotes significance at 1%*

The long run coefficients of the model was estimated after a long run relationship among the variables has been established from the bound test result and the result was presented in Table 4. The long run coefficients showed that the key macroeconomic determinants of stock market development in the context of the Nigerian Stock Exchange Market are banking sector development, stock market liquidity, foreign direct investment and to an extent the size of the economy in the long run. The results show that coefficient of gross domestic product is positive and significantly related to stock market development at 10% level of significance. This implies that a percentage increase in GDP increases stock market development by 2.72 percentage points. This means that a growing economy increases the demand for equity investment. On the other, banking sector development is negative and significantly associated with stock market development. A percentage increase in banking sector development leads to decrease in stock market development by 0.499 percentage points. However, stock market liquidity has a positive and statistically significant relationship with stock market development. Likewise, foreign direct investment has a positive and significant association with stock market development. Inflation has a negative but insignificant relationship with stock market development. Savings is positive but insignificant in explaining stock market development.

Table 4: Long Run Coefficients of ARDL (2, 0, 2, 0, 0, 2, 2)

Dependent variable: ΔMRK				
Regressor	Coefficient	Standard error	t-Statistic	Probability
$\Delta \ln GDP$	2.720737*	1.485389	1.831666	0.0846
ΔBSD	-0.498806***	0.161888	-3.081185	0.0068
ΔSVR	0.030891	0.107147	0.288306	0.7766
INF	-0.003163	0.007338	-0.431020	0.6719
ΔSML	0.352254***	0.041217	8.546331	0.0000
ΔFDI	0.601106***	0.128106	4.692277	0.0002
C	-0.226257	0.270891	-0.835232	0.4152

Source: Author's Compilation via EVIEW 9

*Note: * implies significant at 10% level, ** implies significant at 5% level and *** implies significant at 1% level*

The result of the short run coefficients of the model was presented in Table 5. The short run coefficients showed the key macroeconomic determinants of stock market development in the context of the Nigerian Stock Exchange Market are gross domestic product, lagged value of banking sector development, stock market liquidity, lagged value of stock market liquidity and lagged value of foreign direct investment in the short run. Gross domestic product is positively related to stock market development but statistically significant at 10%. The result is in line with the result from the long run coefficients and lend support to the studies of Yartey (2008), Acquah-Sam (2016), and Ho and Odhiambo (2017).

The current value of banking sector development is positive but insignificant in explaining the behavior of stock market development in the short run. However, the lagged value of banking sector development is positive and significantly related to stock market development. This is contrary to the result from the long run result which indicated a negative relationship between banking sector development and stock market development. However, the result is in line with the suggestion by Yartey (2008) that at the early stages of stock market development, the banking sector act as a compliment to the stock market in financing investment. However, as they both develop, the banking sector and the stock market begin to compete with each other and thereby become substitute for financing investment (Al-Mamun, 2013). The long run result however contradict the result of Levine and Zervos (1998), Garcia and Liu (1999), and Ho and Odhiambo (2017).

Domestic savings is positive but insignificantly associated with stock market development both in the short and long run. This is in line with the theoretical expectation that an increase in domestic savings should be associated with the development of the stock market. However, the relationship is insignificant and in line with the result of Yartey (2008) but in contrast with Ita and Duke (2013). Inflation rate which measures macroeconomic instability is negative and

insignificantly related to stock market development. This means that an unstable macroeconomic environment erodes the confidence of investors in the stock market. However, it does not significantly determine the development of the stock market. This implies that the stock market anticipate the effect of macroeconomic instability. This is also the case in the long run result. This support the result of Garcia and Liu (1999), Ita and Duke (2013) and Ho and Odhiambo (2017) but in contrast with Yartey (2008).

Both the coefficient of the current and lagged values of stock market liquidity are positively and negatively related to stock market development respectively. Both relationships are statistically significant. This shows that stock market liquidity is positively and significantly related to stock market development both in the short and long run. This result is consistent with earlier studies and therefore suggest that liquid market provides investors with the opportunity to access their investment with ease, thereby increasing the confidence of the investors in the market (Yartey, 2008; Kemboi and Tarus, 2012).

For the current value of foreign direct investment, the coefficient is positive but insignificantly related to stock market development. However, the lagged value of foreign direct investment is negative and significant in explaining stock market development in the short run.

In addition, the results show that the coefficient the error correction term which measures the speed of adjustment to equilibrium is negative and statistically significant as expected. This implies that, when the variables drift apart from equilibrium level by one percent in the short run, they correct by 2.663 per cent towards the equilibrium level.

Table 5: Short Run Coefficients of ARDL (2, 0, 2, 0, 0, 2, 2)

Dependent variable: ΔMRK				
Regressor	Coefficient	Standard error	t-Statistic	Probability
$\Delta MRK(-1)$	0.748867***	0.195314	3.834171	0.0013
$\Delta \ln GDP$	7.246002*	4.012149	1.806015	0.0887
ΔBSD	0.091190	0.222590	0.409675	0.6872
$\Delta BSD(-1)$	0.560058**	0.231239	2.421989	0.0269
ΔSVR	0.082271	0.2898972	0.283818	0.7800
ΔINF	-0.008423	0.019539	-0.431112	0.6718
ΔSML	0.297318***	0.067529	4.402792	0.0004
$\Delta SML(-1)$	-0.217860***	0.060412	-3.606271	0.0022
ΔFDI	0.198279	0.159830	1.240564	0.2316
$\Delta FDI(-1)$	-1.159968***	0.154859	-7.490499	0.0000
ECM	-2.663250***	0.286879	-9.283541	0.0000

Source: Author's Compilation via EVIEW 9

Note: * implies significant at 10% level, ** implies significant at 5% level and *** implies significant at 1% level

Overall, the regression for the underlying ARDL model fits well, as indicated by the F-stat and adjusted R-squared of 95 per cent. On the diagnostic tests, the result displayed in Table 5 shows that the model passes all the diagnostic tests performed for serial correlation, functional form, normality and heteroscedasticity.

Table 6: Result of Diagnostic Tests

Test	Statistics	P-value
Serial Correlation: CHSQ(2)	0.8925	0.4303
Heteroscedasticity	1.0779	0.4359
F-statistics	47.3248	0.0000
R-squared	0.9750	
Adjusted R-squared	0/9544	

Source: Author's Compilation via EVIEW 9

Figure A.1 in the Appendix shows the plot of Normality histogram test of the residual.

8 Conclusion

The stock market serves as a platform for raising and allocation of funds needed for investment, thereby creating opportunities for investors. Studies have shown that the stability of the stock market is necessary for economic growth of both developed and developing countries. However, the stock market has been known to be sensitive to economic conditions within which it operate. Therefore, macroeconomic conditions are expected to affect the development of the stock market. This paper examine macroeconomic determinants of stock market development for the period 1981 to 2016 in Nigeria. Using the autoregressive distributed lag (ARDL) approach, the short run and long run relationships between stock market development (market capitalization/GDP) and the selected macroeconomic variables which are economic growth (GDP), banking sector development (credit to private sector/GDP), savings rate (gross domestic savings/GDP), inflation rate, stock market liquidity (value of listed shares/GDP) and foreign direct investment (FDI/GDP) was analysed.

The result of the study found out that in both the short run and long run, key macroeconomic determinants of stock market development in the context of the Nigerian Stock Exchange Market are banking sector development, stock market liquidity, foreign direct investment and to an extent the income level (GDP). While inflation rate which measures macroeconomic stability, and savings rate do not significantly explain stock market development. Overall, consistent with previous studies by Garcia and Liu (1999), Yartey (2008), Ita and Duke (2013) and Ho and Odhiambo (2017), the study was able to conclude that macroeconomic variables are positive and significant determinants of the stock market development in Nigeria except for inflation rate.

The findings of the study suggest that the banking sector and the stock market complement each other in the short run but act as substitutes in the long run for

investment financing. In addition, macroeconomic stability measured by inflation rate is a weak predictor of stock market development in both the short and long run. However, from the result of the study, it also shows that monetary policies by the policy makers have not been able to promote and influence the use of equity financing effectively and efficiently. This can be seen from the result of the savings rate and macroeconomic stability measure which are not a significant determinant of the stock market development and income level which shows a weak significant relationship with stock market development.

Based on the empirical findings, policy makers should endeavor to provide policy framework that will promote the use of equity financing both in the short run and long run, as the role of the stock market in the development of the economy cannot be overemphasized. Furthermore, competitive incentive should be promoted in order to attract international investors to participate more in the stock market. Finally, policymakers of the country should strive to sustain the stability of the economy in order to promote the growth of stock market development in the short run and long run. This research paper examine macroeconomic determinant of stock market in Nigeria using annual data for the period 1981 to 2016. Further empirical analysis can be carried out on quarterly data and the impact of both macroeconomic and institutional factors on stock market development should be investigated as studies in this area in Nigeria are very few.

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