Stock Market Development, Foreign Direct Investment and Macroeconomic Stability: Evidence from Nigeria

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Abstract
Stock market development is not only important in economic development of a nation, it is also an important indicator of future economic activity and a nation’s economic strength. This paper employs the Johansen co-integration and the error correction mechanism (ECM) techniques to examine the impact of foreign direct investment and macroeconomic stability (exchange rate and inflation rate) on the level of development of the Nigerian stock market over the period 1981-2010. The results reveal that a long run relationship exists between the variables and FDI was found to have a positive but insignificant impact on stock market development. The results also demonstrate that inflation rate has a negative insignificant effect but exchange rate has a significant and negative relationship with stock market development. The paper recommends that foreign firms operating in the Nigeria’s oil and gas and telecommunication sectors should be encouraged to be listed to promote the development of the market. This should be complemented with policies that will promote macroeconomic stability to attract more foreign direct investment and making the contribution of the foreign direct investment meaningful to the economy.

Keywords: Stock market development, FDI, macroeconomic stability, error correction model, Nigeria.

1. Introduction
Stock market plays an important role in the development of every economy’s financial system and serves as an avenue for financing projects and investments capable of providing job opportunities, reducing poverty, and accelerating economic growth. Stock markets are the best indicators to estimate future economic activity and stock market health is also a measure of economic strength of a country (Raza, Iqbal, Ahmed, Ahmed, & Ahmed, 2012). Also, empirical evidence confirmed the positive impact of stock market development on economic growth in foreign countries (Beck & Levine, 2004; Capasso, 2006; Levine & Zervos, 1996; Levine & Zervos, 1998) and Nigeria (Donwa & Odia, 2010; Ibrahim, 2011; Ologude, Elumilade, & Asaolu, 2006). Therefore, this positive impact of stock market development on economic growth makes the question of what are the determinants of stock market development very important to economic policy. As a result, several studies investigated the impact of foreign direct investment (FDI) and macroeconomic stability on stock market development (Adam & Tweneboah, 2009; Garacia & Liu, 1999; Yartey, 2008). The current study focuses on the impact of FDI, macroeconomic stability on stock market development in Nigeria.

In Nigeria, largest share of the FDI goes to the oil sector. In fact, more than 60% of the FDI inflows into Nigeria are directed towards the extractive (oil) industry and Nigeria has been losing international market shares even in its traditional (agricultural) exports since the 1970s (Ogunmuyiwa, Onabanjo & Ogunleye, 2011). Also, the macroeconomic variables have not been always impressive. For instance, the composite price index has increased from 117.9 in 2003 to 216 in 2009 (45% increase), the value of the Naira to the Dollar (the most traded foreign currency in Nigeria) has been depreciating from 128 Naira to 1 US dollar and 149 Naira to 1 US dollar in 2003 and 2009, respectively (Central Bank of Nigeria, 2009).

Giving the nature of the FDI flow and unfavorable macroeconomic condition, this study aims at examining the impact of FDI and macroeconomic variables (exchange rate and inflation rate) on the development of Nigerian stock market for a period of 30 years (that is, 1981-2010). The remainder of this paper is organized as follows. Next section gives an overview of the Nigerian stock market. While section three reviews related literature; section four discusses the research methodology and section five deals with the empirical analysis. The last section provides conclusion and policy implications of the study.

2. Overview of the Nigerian Stock Market
The Nigerian stock market known as Nigerian Stock Exchange (NSE) was established in 1960 as the Lagos Stock Exchange. The name was changed to NSE in 1977. NSE has six branches in the major commercial cities (namely Lagos, Kaduna, Port Harcourt, Kano, Onitsha, Ibadan, Abuja and Yola) of Nigeria, each branch with a
trading floor. Lagos branch was opened in 1961; Kaduna, 1978; Port Harcourt, 1980; Kano, 1989; Onitsha, 1990; and Ibadan 1990; Abuja, 1999 and Yola, 2002. The Lagos branch is the headquarters of the NSE. NSE started operations in 1961 with 19 securities listed for trading. As at the end of 2010, the NSE closed with a total annual market capitalization of 62.84 billion USD.

Table 1: Nigerian Stock Market Performance 2000-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Market Capitalization in USD</th>
<th>Market Turn Over in USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>4,644,172,906.74</td>
<td>262,800,000.00</td>
</tr>
<tr>
<td>2001</td>
<td>5,956,060,010.11</td>
<td>496,060,000.00</td>
</tr>
<tr>
<td>2002</td>
<td>6,343,603,275.95</td>
<td>475,270,000.00</td>
</tr>
<tr>
<td>2003</td>
<td>10,519,078,162.56</td>
<td>858,420,000.00</td>
</tr>
<tr>
<td>2004</td>
<td>15,896,842,473.20</td>
<td>1,665,970,000.00</td>
</tr>
<tr>
<td>2005</td>
<td>22,091,904,236.70</td>
<td>1,937,360,000.00</td>
</tr>
<tr>
<td>2006</td>
<td>39,805,158,622.17</td>
<td>3,558,830,000.00</td>
</tr>
<tr>
<td>2007</td>
<td>105,673,634,073.71</td>
<td>16,774,190,000.00</td>
</tr>
<tr>
<td>2008</td>
<td>74,553,597,879.47</td>
<td>19,948,967,473.28</td>
</tr>
<tr>
<td>2009</td>
<td>54,649,527,662.08</td>
<td>4,574,719,427.15</td>
</tr>
<tr>
<td>2010</td>
<td>62,843,740,662.81</td>
<td>5,279,086,090.28</td>
</tr>
</tbody>
</table>


Table 1 above shows the performance of NSE from 2000 to 2010. From 2000 to 2007, the market capitalization and the turnover kept on increasing from USD 4.64 to USD 102.67 respectively which can be attributed to the then government policies that encouraged investment and the reform in the banking sector which has high proportion of the market capitalization. This is because banks account for about 60% of the listed securities in the NSE. Therefore, whatever affects the banking sector may also have profound impact on the market capitalization. In 2010, the market capitalization decreased to 62.84 billion USD. This can be mainly attributed to the financial crisis that had great impact on the banking sector of Nigeria. Similarly, from 2000 to 2008 the market turnover that indicates the total value of shares traded during a given period, increased from 262.80 million USD to the peak of USD 19.95 billion respectively. In 2010, the turnover decreased to 5.28 USD billion.

3. Literature Review

Favorable investment environment attracts FDI and boost stock market. Aseidu (2002); Ajayi (2006); Dinda (2009); Wahid, Sawkut, Seetanah (2009) discussed the determinants of FDI and all these studies have a concession that FDI is attracted more to countries that are less risky for investment and countries with good institutions and fuels the development of the stock market through different channels. Adam and Tweneboah (2009); Kalim (2009); Raza et al. (2012) all found a positive significant relationship between FDI and stock market development. Based on the above, FDI and the stock market are complementary not substitute. For instance, FDI can be positively related to the participation of firm in capital markets, since foreign investors might want to finance part of their investment with external capital or might want to recover their investment by selling equity in capital markets. Also, giving the fact that foreign investors partly invest through purchasing existing equity, the liquidity of the stock markets will likely rise. Thus, the value traded domestically and internationally might both increase depending on where these purchases take place. In a contrary view, Haussmann and Fernandez-Arias (2000) emphasized that FDI tends to be larger in countries that are riskier, financially underdeveloped and institutionally weak. Under this view, FDI is considered as a substitute for stock market development. Hence, FDI should have a negative relationship with the stock market development.

Macroeconomic environment is an important factor in the development of the stock market as well as FDI attraction. Garcia and Liu (1999) investigated the macroeconomic factors that determine stock market development in a sample of Latin American and Asian countries. The results of their study indicate that GDP growth, domestic investment, and financial intermediary sector development are important factors that determine stock market development. Similarly, Billmeier and Massa (2007) investigated the macroeconomic determinants of stock market capitalization in a panel of 17 countries in the Middle East and Central Asia and found that good institutions and remittances have a positive and significant impact on the stock market capitalization. Other studies investigated the role of FDI and macroeconomic stability in stock market development found a long run relationship between macroeconomic stability (exchange rate and inflation rate) and stock market development.
The macroeconomic variables determine the value of stock prices. Fama (2012) found that stock prices are the reflector of various variables such as inflation, exchange rate, interest rate and industrial production. The decision by multinational firms to locate their investment in a given country depends on a wide range of country-specific macroeconomic, social, and political variables (Al Nasser & Garza, 2009). It is a common trend for stock prices of quoted companies to rise and fall or fall and rise twice or thrice within a year. The stock prices of quoted companies on the NSE are affected either positively or negatively by internal and external economic factors. According to Corrado and Jordan (2002) as cited in Aje and Daferighe (2009), some of the factors influencing stock prices behavior includes company profits; political factors; and economic performance. Others are interest rates; inflationary rate; real GDP; and taxes. Investment in the stock market is long-term in nature; any development that could affect the stability of the polity or economy usually has serious impact on the stock prices. In recent times, the NSE has consistently lost points and the prices of stocks have experienced sharp decline. The downward trend in the market performance was attributed to varying reasons in line with those stated above. As confirm by Aje and Daferighe in Nigeria real GDP, interest rate and inflation rate have an impact on stock prices of quoted companies as reduction in interest and inflation rate resulted in increased stock prices, increased real GDP has a positive impact.

Asaolu and Ogunmuyiwa (2011) found a weak relationship between the macroeconomic variables (external debt, inflation rate, fiscal deficit, exchange rate, foreign capital inflow, investment and industrial output) and average share price in Nigeria. The findings further pointed out that the share price is not influenced by the macroeconomic variables with the exception of an exchange rate that was found to have an impact on the share price. Thus, giving the undiversified FDI inflow and unfavorable macroeconomic environment, the current study brings together the FDI and macroeconomic variables in the same model to determine their impact on the Nigerian stock market development.

4. Research Methodology

The objective of this study is to examine the impact of FDI exchange rate and inflation rate on the stock market development in Nigeria. The study uses documented data from World Bank World Development Indicators and Central Bank of Nigeria (CBN) statistical bulletin. The variables used are measured as follows:

1. Stock market development is captured by market capitalization (MC) as a percentage of GDP. The MC is the total market value of listed shares, and it is less arbitrary than any other measure of stock market development. Previous studies have used this measure (see Adam & Tweneboah, 2009; Al Nasser & Garza, 2009; Boyd et al., 2001; Kalim, 2009; Levine & Zervos, 1998; Raza, et al., 2012).

2. FDI is measured as net inflow FDI as a percentage of GDP. Previous studies have used the same proxy for FDI and found a positive and significant relationship between FDI and stock market development (see Adam & Tweneboah, 2009; Kalim, 2009; Raza et al., 2012).

3. Nominal Exchange Rate (EXR): The relationship between exchange rate and stock prices is important, because changes in exchange rate may lead to changes in stock prices. Also, weak currency discourages FDI. An over-valued exchange rate or highly distorted foreign exchange rate will discourage exports and negatively affect foreign direct investment (Omankhanlen, 2011). Due to the importance of currency risk to foreign investors, this study used Nigerian Naira-U.S. dollar exchange rate as a measure of macroeconomic stability in Nigeria. Also, the dollar is the most foreign traded currency in Nigeria. Raza et al. (2012) found a significant negative relationship between EXR and MC.

4. Inflation rate (INF) is another measure of macroeconomic stability and one of the important macroeconomic variables that affect the decision of foreign investors in the stock market. INF refers to the annual percentage changes in consumer prices, and it has employed in past studies on stock market (see Naceur et al., 2007). Empirical studies show that inflation plays a significant role in stock market development (see Kalim, 2009; Raza et al., 2011). The higher the volatility of the economy (inflation change) the lesser the incentives companies and investors would have to invest in the stock market and vice versa. This study uses a log linear modeling specification. This is because findings with this specification are sensitive to functional form (Kalim, 2009). Also, Layson (1983) argued that log linear is superior to linear form and gives more favorable results. To determine the impact of FDI and other macroeconomic variables on stock market, the model is specified as follows:

\[ \text{LnMC} = \alpha_0 + \alpha_1 \text{LnFDI} + \alpha_2 \text{LnEXR} + \alpha_3 \text{LnINF} + \mu \] \hspace{1cm} (1)

Where \( \mu \) = is the error term. Ln refers to natural log.
4.1 Unit Root Test

The importance of testing unit roots in economic time series has been recognized and given proper treatment in the literature. A unit root in series data would have substantial implications on modeling and on our understanding of the response of economic systems to shocks. Therefore, it would be important to detect its presence. Specifically, in order to avoid spurious regression, the need to establish that variables in the model are stationary and ensure the validity of the usual test statistic (T-statistic and F-statistic) and $R^2$. Stationarity could be achieved by appropriate differencing and this appropriate number of differencing is called the order of integration. In conducting the unit root test, we employ the Phillips-Perron (PP henceforth) and Augmented Dickey-Fuller (ADF henceforth) tests. The E-views software is used in all our analyses.

The results of the unit root test in table 2 and 3 above reveal that all the variables are not stationary at their level. Specifically, the values of both PP and ADF statistics are higher than the critical values of the test statistics at the 1%, 5% and 10% level, respectively. This implies the acceptance of the null hypothesis of the presence of a unit root in the variables at the level. Having found the variables to be non stationary at level, they were then subjected to a stationary test at first difference. The test reveals that all the variables are stationary at first difference. This indicates that the variables are integrated of the same order I(1) which satisfies the condition for co-integration among them. Thus, the variables can be subject to co-integration test.

4.2 Co-integration Test

The theory of co-integration deals with the long run equilibrium relationship between the time series that are non-stationary at level. In other words, a long-term relationship means that the non-stationary variables are co-integrated if they move together and converges to equilibrium over time. Thus, even if relevant time series themselves are non-stationary, a linear combination of them may be stationary. This combination is called the co-integration equation and includes co-integration vector. Next, we employed the Johansen co-integration test to ascertain the long run relationship among the variables in the model.

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>Critical Value</th>
<th>0.05 Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.784984</td>
<td>70.09422</td>
<td>47.85613</td>
<td>0.0001</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.424863</td>
<td>27.05697</td>
<td>29.79707</td>
<td>0.1002</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.304722</td>
<td>11.56887</td>
<td>15.49471</td>
<td>0.1788</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.048515</td>
<td>1.392463</td>
<td>3.841466</td>
<td>0.2380</td>
</tr>
</tbody>
</table>

Trace test indicates 1 co-integrating eqn(s) at the 0.05 level.
According to Engle and Granger (1987), if the dependent variable (stock market development) and independent variables (FDI, EXR and INF) are found to be co-integrated, then there must exist an associated error correction mechanism (ECM) that may take the following form:

$$\Delta y_t = \varphi_{10} + \sum_{j=0}^{q} \varphi_{1j} \Delta y_{t-j} + \sum_{i=0}^{s} \varphi_{2i} \Delta y_{t-i} + \rho_{11}\mu_{t-1} + \epsilon_{1t}$$

$$\Delta y_t = \varphi_{20} + \sum_{j=0}^{q} \varphi_{2j} \Delta y_{t-j} + \sum_{i=0}^{s} \varphi_{1i} \Delta y_{t-i} + \rho_{21}\mu_{t-1} + \epsilon_{2t}$$

Where $\Delta$ denotes the first difference operator, $\mu_{t-1}$ and $\eta_{t-1}$ are error correction terms, $s$ and $q$ are the number of lag lengths (determined by AIC) and $\epsilon_{1t}$ and $\epsilon_{2t}$ are random disturbance terms. Here $i$ begins at one and $j$ begins at zero in order for the series to be related within a structural ECM (Engle & Yoo, 1991). The error correction terms $\mu_{t-1}$ and $\eta_{t-1}$ (which are the residual series of the co-integrating vector normalized for $\mu_{t-1}$ and $\eta_{t-1}$) measure deviations of the series from the long-run equilibrium relations. For the series to converge to the long-run equilibrium relation, $\Omega_{\rho_1, \rho_2} \leq 1$, $\rho_{1} \geq 1$ should hold. However, co-integration implies that not all $\rho_1, \rho_2$ should be zero. Thus, the ECM to be estimated is:

$$\Delta \text{LnMC} = \alpha_0 + \alpha_1 \Delta \text{LnFDI} + \alpha_2 \Delta \text{LnEXR} + \alpha_3 \Delta \text{LnINF} + \mu_{t-1}, \ldots$$

### Table 5: Results of Error Correction Model Estimation (Dependent Variable: MC)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.1406</td>
<td>0.1148</td>
<td>1.2247</td>
<td>0.2326</td>
</tr>
<tr>
<td>$\Delta \text{LnFDI}$</td>
<td>0.2602</td>
<td>0.198</td>
<td>1.3144</td>
<td>0.2011</td>
</tr>
<tr>
<td>$\Delta \text{LnEXR}$</td>
<td>-0.0182</td>
<td>0.0077</td>
<td>-2.356</td>
<td>0.027</td>
</tr>
<tr>
<td>$\Delta \text{LnINF}$</td>
<td>-0.0048</td>
<td>0.0062</td>
<td>-0.7637</td>
<td>0.4525</td>
</tr>
<tr>
<td>$\mu_{t-1}$</td>
<td>-0.6352</td>
<td>0.1853</td>
<td>-3.4281</td>
<td>0.0022</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.4383</td>
<td>Mean dependent variable</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>4.6825</td>
<td>Durbin-Watson stat</td>
<td>1.9969</td>
<td></td>
</tr>
<tr>
<td>Prob. (F-statistic)</td>
<td>0.0062</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results of the ECM in table 5 show that 44% variation in MC is explained by the explanatory variables. The Durbin Watson statistics (1.9969) indicates the absence of autocorrelation. The F-statistics (4.68) is statistically significant at one 1%, implying that the independent variables are jointly significant in explaining the MC. The results also show an insignificant relationship between FDI and Stock market development. This finding is contrary to the ones reported in previous studies (Adam & Tweneboah, 2009; Kalim, 2009; Raza et al., 2012) that a significant positive relationship exists between FDI and MC. The insignificant impact of FDI on stock market is not surprising because the leading sectors of the Nigerian economy in terms FDI are oil and gas including telecommunication. Unfortunately most firms operating in these industries are not listed on the NSE. In fact, Akele (2013) contended that if the oil majors (Shell, Exxon Mobil and Chevron) and telecommunication companies (MTN, GLO, Airtel, and Etisalat) are listed, the capitalization of the market would be one of the largest in among developing countries with its multiplier impact on the economy.

Another revelation by the results is EXR is a negatively and significantly related to MC. This indicates that an increase in the exchange rate (depreciation in the domestic currency, the Naira) leads to higher MC. This is in line with previous studies (see Dimitrova, 2005; Raza et al., 2012). In fact, Masayuki and Iwahasia (2005) claim...
that exchange rate depreciation may encourage the inflow of FDI to the host country. Thus, exchange rate depreciation leads to FDI inflows and consequently stock market development. The results also demonstrate that INF has a negative and insignificant impact on MC. This finding lend support to the argument that if a country has an average inflation of more than 15% (high inflation), any increases in inflation lead a decrease in the stock market development rapidly (Boyd et al., 2001). Interestingly, the average inflation rate in Nigeria during the period under review is 21.38%.

4. Conclusion and Recommendations
The main objective of this study is to investigate the impact of FDI (along with inflation and exchange rate) on Nigerian stock market development from 1981 to 2010. Using the Johansen co-integration and ECM methods, the empirical evidence illustrate that the existence of a long run relationship between the variables. The results also reveal that FDI has an insignificant impact on stock market development. In addition, exchange rate was found have a significant negative impact, while the effect of inflation on stock market is insignificant and negative.

Thus, the paper recommends policies that would encourage foreign firms operating in the oil and gas including the telecommunication sectors to be listed since it would go a long way in attracting more FDI, leading to stock market development. This should be complemented with policies that ensure stable macroeconomic environment. Finally, future research can employ additional variables, different estimation techniques to investigate on the stock market development.

References


Donwa, P., & Odia, J. (2010). An empirical analysis of the impact of the Nigerian capital market on her socio-


