

The Impact of Stock Market Development on Foreign Direct Investment in Nigeria: An Application of Autoregressive Distributed Lag Model

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Abstract: Stock market development is essential for economic growth and prosperity in developing economies like Nigeria. Foreign Direct net flow plays a vital role in promoting economic growth through boosting the stock market development of both emerging economies, as well as developed nations. The largest numbers of the emerging economies are integrated and pursuing their international operations due to foreign direct investment. This paper investigates the impact of the stock market variables on foreign direct investment using autoregressive distributed lag (ARDL) in the presence of structural breaks (dummies) in Nigeria. The study utilized annual time series data from 1970 to 2013. The data were generated from World Bank and Central Bank of Nigeria (CBN). The result suggests that the foreign direct investment (FDI) has a significant positive long-run impact on the value of the total stock transaction, but has a negative and significant effect on the rate of stock returns. However, the relationship between FDI and market capitalization ratio is not statistically significant. Based on these findings the stock market value of the total transaction promotes FDI and thus boosts economic growth and development in Nigeria.

Keywords: time series, FDI, ARDL, Structural Break, Stock Market.

INTRODUCTION

Foreign direct investment has for long regarded as the one of the most important strategies for achieving high economic growth and development [1]. It serves as a facilitator of economic growth and development by providing the opportunity for promoting the integration economy into global financial and capital market. Exports base production, expansion of employment, generation of technological progress through the building and efficiency spillovers to various local firms or business organizations could be promoted by FDI [2].

Fast growing economies like Singapore, China, South Korea, Hong Kong, etc. have witnessed incredible growth as a result of high levels of their FDI [3]. Even in other developing countries including Nigeria, FDI contributes as an engine for growth and development. For instance, the Nigerian National Bureau ofStatistic [4] stated that FDI amounted to \$1.0 billion before rising to \$6.9 billion, \$7.7 billion and \$8.6 billion in 2007, 2008 and 2009 respectively. In 2010, The figure decreased to \$ 6.1 billion. The service sector of the economy attracted more foreign investment than the other area of the economy. Tourism and hospitality industry attracted the least foreign investment during the reference period. Portfolio investment by foreign countries in Nigeria stood at \$9.3

billion in 2006 rose to \$14.9 billion and \$17.7 billion in 2007 and 2008, respectively. The figures dropped to \$1.5billion in 2009 and \$4.5billion in 2010. Interestinglyequity investment topped the list of portfolio investment. The next was bonds market and money market.

On the other hand, All-Share-Index can be used to represent the performance of the stock exchange Movement. There is an increase in Nigerian All-Share-Index in 2006 and reached its peak in 2007 with a sharp decrease in 2008, 2009 and 2010. The decline was due to the bearish view of shareholders, which was informed by the global economic crises in 2008 and reached its peak in 2009. Foreign investors invested in the market because of high demand for capital by their countries of origin. Market capitalization which is the extended of capital sourcing from the economy of Limited Liability Companies witnessed positive growth between 2006 and 2007 and dropped in 2008 and 2009. There was a slight increase in 2010. The increase was due to the public confidence in the market while the decline was attributable to the drop in the value of shares because of the global financial crises. Value of new issues continued to rise till 2008 when it fell to 50 percent in 2009 and rose again in 2010. The decrease in 2009 again was as a result of the global economic crises.

The Federal Government of Nigeria decided to give emphases on various policies such as fiscal, monetary and physical incentives and embarking on the Structural Adjustment Programmed (SAP) in 1986 [5]. The aim of the SAP was to deregulate, restructure and diversify the productive base of the economy in order to prevent the mono-cultural economy and to increase the inflow FDI. The effort is also aimed to lessen the dominance of unproductive investments in the public sector so as to lay proper foundation for sustainable noninflationary or minimum inflationary growth [5]

Traditional finance theory holds that average prices across world capital markets are equalized. The equality is brought through agile portfolio investors, fund managers, including individuals and other institutions that do not take controlling positions in their saving investments. As a result, traditional foreign direct investment theories assume that the more slowly moving FDI flows are not so substantial degree, a reflection of cross-border arbitrage. Instead, the foreign direct investment literature focuses on the other (clearly important) effects, such as host-country market size, production scale economies, trade and investment barriers shifting comparative advantages and tax rates.

LITERATURE REVIEW

Empirical studies show that the effects of FDI on economic growth depend on the absorptive capacity of host countries including domestic financial market development. An economy with an efficient financial system enhances resource allocation and improves the absorptive capabilities of a recipient country in enjoying the gains embodied in FDI inflows [6]. Thus, from the literatures countries with better and efficient financial system attract more foreign investors than those that have the opposite.

Ezeoha [7] investigates the relationship between stock market development and level of investment in Nigeria. That is, whether the stock market plays a uniform role in attracting both domestic and foreign. The paper uses extrapolated macroeconomic quarterly data from the period of 1970 to 2006. The study adopted the Johansen Co-integration to finding the relationship. It indicated that the development of the Nigerian Stock Market over the years of the study was able to spur growth in domestic private investment flows but unable to do so in foreign private investment. The finding contradicted to the complementary role of FDI.

Adaraola and Grace [8] carried out research on the impact of foreign direct investment on capital market development in Nigerian. The study employs

market capitalization as a proxy for stock market development. The result of the ordinary least squares revealed the existence of a positive relationship between foreign direct investment and capital market development in Nigeria. However, the results contradict the finding of Ezeoha [7]. Lack of co-integration and low beta weight in their analysis lead them to conclude that foreign direct investment does not long-run growth in the developing country like Nigeria does not worth the while.

Raza [9] investigated the role of FDI in Pakistan stock markets. The study observed the effect of the foreign direct investment along with domestic savings, exchange rate and inflation in the country. To estimate the empirical relationships among variables the study adopts an ordinary least square (OLS) method of regression through applying annual time series data for the period 1988-2009 in the country. The results find a positive impact of foreign direct investment along with other independent variables in the development of Pakistan Stock markets. The exchange rate result shows that with an increase in the exchange rate depreciation of local currency, then there will be an adverse impact on the stock exchange. The finding is in conformity to the empirical result of Ali [10] who observed a positive impact on foreign direct investment and stock market development in Pakistan.

Anfomum [11] explore the impact of FDI on gross fixed capital formation, infrastructural development, exchange rate, total export and gross domestic product. The study employs ordinary least square equation, a co-integration and Granger causality techniques to determine the relationship. The outcome of the results revealed that in all five equations, the foreign direct investment has a positive correlation with other variables mentioned above. The Ganger causality outcome indicates the presence of unidirectional causality running from economic growth in foreign direct investment. The finding is in line with the complementary roles of foreign investment on the stock market.

Umar and Ibrahim [12] examine stock market development, foreign direct investment and macroeconomic stability in Nigeria over the period of 1981-2010. The explained variable used in the empirical study is the market capitalization ratio as a proxy for the stock exchange. Independent variables are net inflow foreign direct investment as a percentage of GDP, nominal exchange rate and inflation rate. The empirical work employs the Johansen co-integration and the error correction mechanism (ECM) to examine the relationship. The results show an insignificant positive relationship between FDI and the Nigerian stock market development. This finding is not in

conformity with the empirical study of Kalim [13] that indicated a significant positive relationship between FDI and market capitalization.

Maduka [14] examines the relationship between financial development and foreign direct investment in Nigeria. The study sourced the data from the World Development Indicator database of World Bank and Federal Bureau of Statistics and the Nigerian Central Bank Statistical Bulletin. He used annual time series data from the period of 1970 to 2008. The study estimated the long-run equilibrium relationship between the variables using Johansen and Juselius [15] co-integration tests while the short-run relationship was observed using the dynamic vector error correction model. The findings indicate that financial development does not encourage FDI in Nigeria, and at the same time, FDI is not promoting the growth of financial assets in Nigeria. There is a need for development of the country's financial sector so as to attract more FDI inflow to the local environment.

Raza et al. [16] observe whether Stock Market is Sensitive to Foreign Capital Inflows and Economic Growth in Pakistan, where they utilized annual time series data from the period of 1976 to 2011. An autoregressive distributed approach confirms the valid long run relationship between considered variables. The results indicate that the foreign direct investment, workers' remittances, and economic growth are significant and positively relate to the stock market capitalization in the long run as well as in short-run. The result is in line with the empirical finding of Kothari and Pankaj Bhatt [17] who indicated the appositive relationship.

Abzari et al. [18] used the data from the period of 1996 to 2009 to investigate whether foreign direct investment (FDI) can simulate the impact of corruption on financial development in developing countries. To explore the relationship panel data, techniques are employed on a sample of 8 developing countries. The empirical analysis shows that corruption affects financial development significantly and negatively. Furthermore, in-flowing the foreign commodity and capital and making competition in the states of the sample, highlight the negative impact of corruption on the development of the financial sector. The study takes ten years data into consideration. However, the study contradicted the study of Sameera [3].

Sultana and Pardhasaradhi [19] carry out a study on the impact of Foreign Direct Investment (FDI) and Foreign Institutional Investment on the stock market of India (Sensex and Nifty). In order to analyse the collected data, the statistical tools such as correlation and Multi regression OLS model are used.

The findings conclude that there is a very high positive correlation between FDI & Sensex and FDI & Nifty, and the correlation is found to be significant. This result is similar to the expected a priori.

Shahbaz et al. [20] examine the impact of foreign direct investment in the Pakistan stock market. Annual time series data from different sources with a sample period range from 1971 to 2006 was used. The authors utilized market capitalization as a dependent variable representing the stock market while foreign direct investment, gross domestic saving, gross national product per capital and the rate of inflation are used as an independent variable. To analyse the data, the method of autoregressive distributed lag (ARDL) approach for co-integration was employed. The empirical results indicate a significant positive relationship between FDI and market capitalization in the long-run. The result infers the complementary role of FDI in the stock market development in Pakistan. Savings also show a strong positive relationship with the stock market development in the long-run. In the short run, FDI and economic growth have a positive impact on the stock exchange development. The stock market development is inversely linked with the Inflation and gross domestic saving, and they are statistically insignificant.

Shi et al. [21] examine whether the foreign investment influences the stock market development with particular reference to Australia. The sample of the study covers 22 years that is from 1984 to 2005. The analysis uses panel data regression consisting of a cross-section country pair observed over the period of the research. The result indicates that the flow and the level of bilateral FDI between countries explain country-pair stock market integration. In particular, more bilateral FDI level and flow increase Australian stock market integration with its major trade partners. However, foreign direct investment to GDP, personal remittances received to GDP and external debt-GDP ratios were observed to be significant, but negatively related to market capitalization ratio as examined by Scott and Ovuefeyen [22] in Ghana.

Arcabic et al. [23] explored the existence and characteristics of short-term and long-run relationship between the foreign direct investment and Croatia stock market. The authors applied the Engle-Granger [24] and Johansen co-integration approaches. The result of the two long-run co-integration tested suggests the absence of a long-term relationship among observed variables in Croatia. A two-variable VAR model investigates the short-run relationship, and the results obtained are consistent with the theoretical assumptions.

In 2010, Akujuuobi and Akujuuobi [25] examined the impact of foreign direct investment in the Nigerian Capital Market. Market capitalization was utilized as a proxy for the stock exchange. The level of foreign direct investment in different sectors such as in agriculture, mining, construction, e.t.c. was used as independent variables.

The significant finding is as follows

- i. Foreign direct investment is a desirable phenomenon, especially with its positive effect on the economy, in general.
- ii. FDI has both positive and negative influence on the capital market in Nigeria.
- iii. FDI in the agriculture, forestry and fishery, trading and business services, miscellaneous and the mining and quarrying sectors, contribute significantly to capital market development.
- iv. With the insignificant nature of the contribution of FDI from the manufacturing and processing sector, it suffices to say, therefore, that the Nigerian industry is yet to feel the desired impact of the cross-border capital flow.

The main purpose of the study carried out by Hajilee and Al Nasser [26] is to investigate the relationship between financial (stock market and bank) development and foreign direct investment. The analysis used data from 14 Latin American countries over the period 1980-2010. The study used The total stock market capitalization as a percentage of GDP (SMC), and the stock market value traded (SMV). To find the relationship bounds testing Approach to co-integration is applied while Granger causality is used to observe the nature of the causality. For example, our findings imply that the stock market development in Bolivia and Brazil carries a negative significant coefficient while in El-Salvador and Guatemala the estimated coefficient is positive. Meanwhile, its impact on FDI in countries like Chile, Ecuador, Mexico, Peru, Uruguay and Venezuela is mixed. Lack of developed financial market limits the economic capability of those states in attracting FDI.

Acheampong and Wiafe [27] examined the impact of foreign direct investment (FDI) on the stock market development in Ghana. The autoregressive distributive model adopted a quarterly time series

data from 1990 to 2010. The complementary hypothesis were vindicated. Foreign direct investment had a positive impact on the stock market development, and this is in line with the complementary hypothesis in the short run. Also, there was a bi-directional causal relationship between FDI and stock market development. The study recommended that environment to stimulate the flow of FDI and encourage the re-investment of surpluses so that the development of equity market can increase economic growth.

Scott and Ovuefeyen [22] empirically observed the effect of foreign finance resource inflow into the Nigerian and Ghana stock market. The study used data covering the period 1988 to 2011 in Nigeria from 1991 to 2011 for Ghana using a market capitalization ratio as a proxy for the stock market. The author used multiple linear regression techniques to observe the relationship. Foreign portfolio investment, personal remittances received official development assistance and aid to GDP, were positively related to market capitalization. The correlation between official development assistance (ODA) and aid to GDP ratio and market capitalization in Nigeria was statistically insignificant. The positive correlation between ODA and aid to GDP indicates that, of all the forms of foreign finances considered, ODA has been the most relevant in the development of Ghana's stock exchange.

METHODOLOGY

Variables of the Model

This empirical study is to explore the long-run and the short-run relationship between foreign direct investment and equity market development in Nigeria. The variable used in the study is; foreign direct investment, net flows (FDI), market capitalization ratio (MR), rate of stock turnover ratio (RT). The value of the stock transaction of GDP (VT) and a dummy variable which is a proxy for late 1980s structural adjustment changes. FDI is used as a dependent variable while MR, RT, and VT as independent variables. The trend of this variable explains below

Foreign Direct Investment in Nigeria 1970 To 2013

The figure 1 below shows the value of foreign direct net flow in Nigeria over the period of the study. This variable used in many empirical findings such as Arcabic et al. [23]. Acheampong and Wiafe [27] and Hajilee and Al Nasser [26] as a proxy for foreign direct investment. The value of FDI rose to the highest peak in 1992.

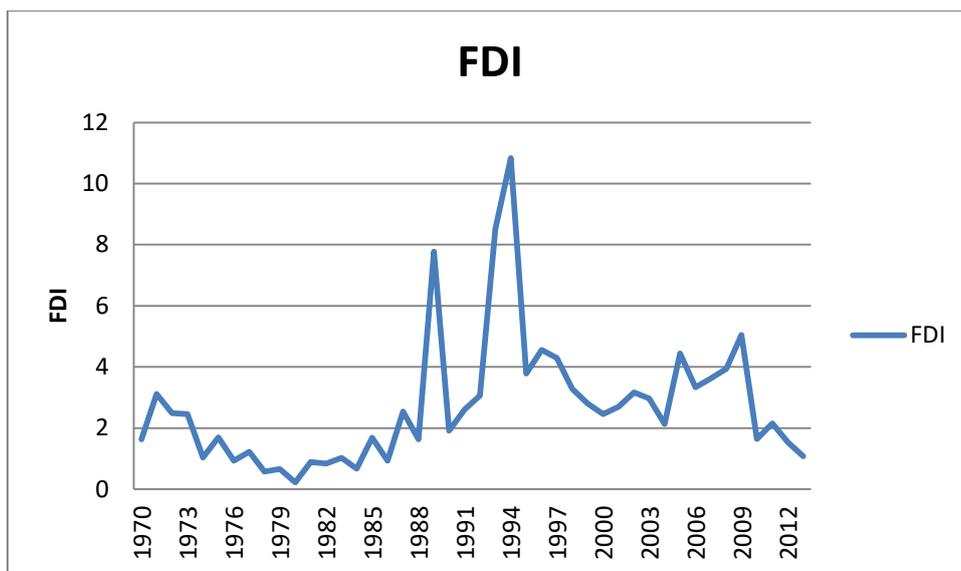


Fig- 1: plot of foreign Direct Investment. (Source: CBN, NSE)

Market Capitalization Ratio in Nigerian Stock Market 1970 To 2013

The overall market capitalization had risen from 1,698.1 million Naira in 1980 to 7030.8 billion more in 2009. The below figure shows the market capitalization ratio. It is calculated by dividing the

market capitalization by GDP. During the period of the study, the MR was highest in 1991 as a result of the positive effect of SAP. The variable was also used by Scott and Ovufeyen [22], Shahbaz et al. [20], Bala et al. [28] and Hajilee and Al Nasser [25]. The trend is shown in figure 2

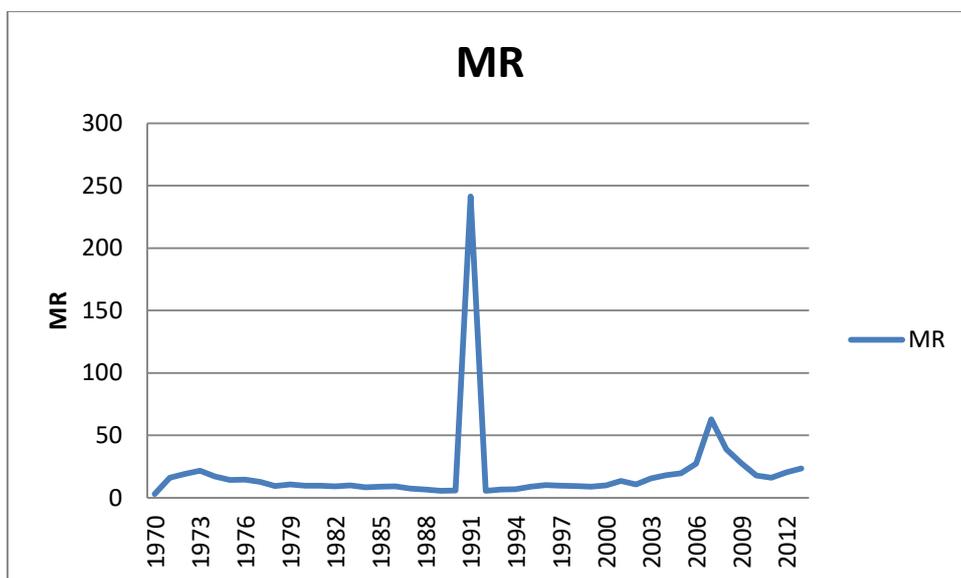


Fig- 2: plot of Market Capitalization. (Source: CBN and NSE)

Value of the Stock Transaction Ratio in Nigerian Stock Market 1970 To 2013

At the commencement of operations, the NSE started trade with 0.3 million share sworth N1.5 million. The volume and value have continued to grow steadily

to 138.07 billion shares worth over N2086 billion by 2007 (NSE2008). As shown below the values reach their highest peak in 2012. Hajilee and Al Nasser [26] used market capitalization ratio in his empirical study. The figure 3 shows the VT trend in Nigeria

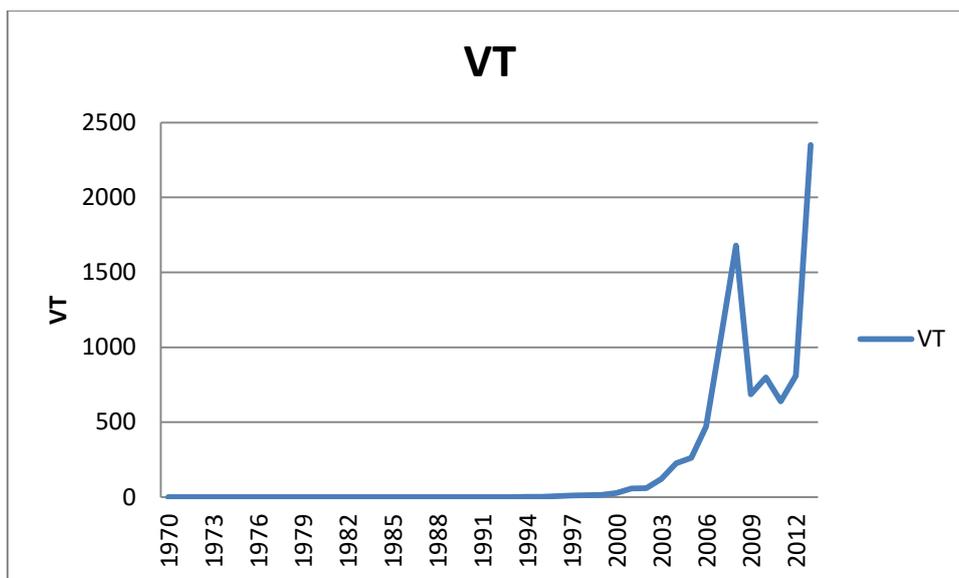


Fig-3: Plot of Value of the Stock Transaction Ratio. (Source: CBN and NSE)

Data

The authors used annual time series data covering 1970 to 2013. The variables employed in the study are foreign direct investment, net flows (FDI), market capitalization ratio (MR), rate of stock turnover ratio (RT), the value of the stock transaction to GDP (VT) and a dummy variable. The data are generated from the central bank of Nigeria, Nigerian Stock Exchange (NSE) and United Nation Statistical database. The authors have transformed all the variables into natural logarithms in order to capture their elasticity and control the robustness of the time series data.

Model Specification

The model of the study includes the following variables; FDI, MR, RT and VT and a dummy variable. The functional relationship of the model is as follows:
 $FDI = f(LNMR, LNRT, LNV, SAP)$

In Equation, (1) is the value of inward foreign direct investment flow of the county, which we assume it depends on the stock market development measures (MR, RT, VT, and SAP). The idea that the financial sector development, including the stock market leads to an increase in inward FDI and integration into the

international economy. Ideally, we would expect that our estimation leads to positive coefficients for all variables. However, it is also expected that market deficiencies, lack of depth and transparency, and the absence of regulatory procedures give an adverse result in some countries. For the sake of econometric analysis, the functional equation will be transformed into a linear function as:

$$\ln fdi_t = \beta_0 + \beta_1 \ln mr_t + \beta_2 \ln rt_t + \beta_3 \ln vt_t + tb \varepsilon_t$$

ARDL Bound Testing Approach

The ARDL approach to co-integration as first developed by Pesaran and Pesaran [29], Pesaran and Shin [30] Pesaran *et al.* [31] has been applied with the help of unrestricted vector error correction model. The aim is to investigate the long run and the short run relationship between foreign capital inflows and stock market variables. The ARDL technique has several advantages over the other co-integration methods. ARDL approach can be adopted irrespective of whether underlying variables are purely $I(0)$, $I(1)$ or mutually co-integrated. ARDL has estimated better small sample properties. The study developed The ARDL model for estimations as follows:

$$\Delta \ln fdi_t = \beta_0 + \sum_{i=1}^n \alpha_1 \Delta \ln fdi_{t-i} + \sum_{i=1}^n \alpha_2 \Delta \ln mr_{t-1} + \sum_{i=1}^n \alpha_3 \Delta \ln rt_{t-1} + \sum_{i=1}^n \alpha_4 \Delta \ln vt_{t-1} + p_1 \ln fdi_{t-1} + p_2 \ln mr_{t-1} + p_3 \ln rt_{t-1} + p_4 \ln vt_{t-1} + tb + \varepsilon_{2t} \dots \dots \dots 1$$

$$\Delta \ln mr_t = \beta_0 + \sum_{i=1}^n \alpha_2 \Delta \ln mr_{t-1} + \sum_{i=1}^n \alpha_1 \Delta \ln fdi_{t-i} + \sum_{i=1}^n \alpha_3 \Delta \ln rt_{t-1} + \sum_{i=1}^n \alpha_4 \Delta \ln vt_{t-1} + p_1 \ln mr_{t-1} + p_2 \ln fdi_{t-1} + p_3 \ln rt_{t-1} + p_4 \ln vt_{t-1} + tb + \varepsilon_{2t} \dots \dots \dots 2$$

$$\Delta \ln r t_t = \beta_0 + \sum_{i=1}^n \alpha_1 \Delta \ln r t_{t-1} + \sum_{i=1}^n \alpha_2 \Delta \ln m r_{t-1} + \sum_{i=1}^n \alpha_3 \Delta \ln f d i_{t-i} + \sum_{i=1}^n \alpha_4 \Delta \ln v t_{t-1} + p_1 \ln r t_{t-i} + p_2 \ln m r_{t-1} + p_3 \ln f d i_{t-i} + p_4 \ln v t_{t-i} + t b + \varepsilon_{2t} \dots \dots \dots 3$$

$$\Delta \ln v t_t = \beta_0 + \sum_{i=1}^n \alpha_1 \Delta \ln v t_{t-1} + \sum_{i=1}^n \alpha_2 \Delta \ln r t_{t-1} + \sum_{i=1}^n \alpha_3 \Delta \ln m r_{t-1} + \sum_{i=1}^n \alpha_4 \Delta \ln f d i_{t-i} + p_1 \ln v t_{t-i} + p_2 \ln r t_{t-i} + p_3 \ln m r_{t-1} + p_4 \ln f d i_{t-i} + t b + \varepsilon_{2t} \dots \dots \dots 4$$

The F-statistics bound will be used to observe the long-run relationship between the variables in the model. However, the hypothesis which is the form of the null and alternate is as follows:

$$H_0: \rho_1 = \rho_2 = \rho_3 = \rho_4 = 0$$

$$H_1: \rho_1 \neq \rho_2 \neq \rho_3 \neq \rho_4 \neq 0$$

To reject or accept the null hypothesis the Pesaran tabulated critical values are to be compared with F-statistics. The decision rule is:

1. If the F-statistic is less than the Pesaran tabulated lower bound I(0) then there is no co-integration
2. If the F-statistic is greater than the Pesaran tabulated upper bound I(1) then there is co-integration
3. The result is inconclusive if the value of the F-statistic is within the I (0) and I (1).

Furthermore, we tried to show the stability of both short-run and long-run elasticities by applying the CUSUM and CUSUMSQ tests. The CUSUM and CUSUMSQ tests show how stable the ARDL model is. The model is stable if the CUSUM and CUSUMSQ curve is within the two boundaries

THE EMPIRICAL RESULTS

ADF and Phillip Peron Unit Root Test on Level

To check the stationary properties, we use Augmented Dickey-Fuller (ADF) and Phillip Perron (PP) unit root tests. Table 4.1 represents the results of stationary tests. First, these tests are applied at the level of the variables, then on their first difference. The table 1 shows the unit root test on the level. The test shows that the log form of MR, FDI and VT are non-stationary at level in both of the tests (ADF and Phillip-Perron). However, the log of RT variable is stationary in both ADF and Phillip-Perron. Thus, on the level, there is I (0) and I (1)

Table-1: Result of unit roots on levels

Result for Unit Roots Tests on Levels				
Variables	ADF			Phillip-Perron
	Constant	Constant & trend	Constant	Constant & trend
LNPCI	-0.174	-0.276	-0.624	-0.476
LNMR	-5.439*	5.669*	-5.525*	-5.708*
LNRT	-3.372**	-3.757**	-3.326**	-3.737**
LNVT	-0.169	-1.547	0.169	-1.510
Critical-values				
Constant	-3.661 (1%)	-2.960 (5%)	-2.619 (10%)	
Constant & trend	-4.273 (1%)	-3.557 (5%)	-3.212 (10%)	
None	-2.641 (1%)	-1.952 (5%)	-1.610 (10%)	

ADF and Phillip Peron Unit Root Test on First Difference

The test in table 2 shows that all variables in both ADF and Phillip-Perron are stationary and thus,

integrated at first difference. The outcome implies that the series of variables may exhibit a valid long run relationship. All the variables are stationary at the one percent level of significance

Table 2: Result of unit root tests in the first difference

Result of unit roots tests in the first difference				
Variables	ADF		Phillip-Perron	
	Constant	Constant & trend	Constant	Constant & trend
LNPCI	-5.595*	-6.065*	-5.682*	-6.066*
LNMR	-10.479*	-10.332*	-34.746*	-36.60*
LNRT	-8.581*	-8.479*	-6696*	-6.723*
LNVT	-6.697*	-6.724*	-6.697*	-6.724*
Critical-values				
Constant	-3.661 (1%)	-2.96. (5%)	-2.619 (10%)	
Constant & trend	-4.273(1%)	-3.557 (5%)	-3.212 (10%)	
None	-2.64 (1%)	-1.95(5%)	-1.610(10%)	

VAR Lag Order Selection Criteria

Autoregressive distributed lag method for co-integration is used to estimate the long-run relationship between foreign direct investment and stock market variables. According to Pesaran *et al.* [31]the first step is to determine the optimal lag length criteria of the

variables. The study used Akaike Information Criterion (AIC) to determine the optimal number of lags in the conditional ECM (error correction model). The table 3 below shows that the order of lag chosen is two (2) based on AIC

Table 3 VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-71.92484	NA	0.001171	4.601505	4.782900	4.662539
1	44.97735	198.3795	2.61e-06	-1.513779	-0.606804*	-1.208609
2	70.21231	36.70540*	1.56e-06*	-2.073473*	-0.440920	-1.524169*

The ARDL F-Bound Test

The next step after lag selection is the ARDL-Bounds Test Approach of co-integration, as adopted by Pesaran *et al.* [31]. The test is to estimate the ARDL model specified in equation (2) with the selected optimum lag length selection criterion. In this study, the authors chose Akaike Information Criterion (AIC). Two Lag order criteria selected lag order of the Conditional Autoregressive Distributed Lag Model. Therefore, the F-test through the Wald test (bound test) is conducted to check how the joint significance of the coefficients specified in equation (2) is. The Wald test is performed by imposing restrictions on the estimated long-run coefficients of foreign direct investment, net flows (FDI), MR,RT, VT and the dummy variable

Pesaran *et al.* and Narayan [32] tabulated lower, and upper bound are selected based on 1%, 5%, and 10% significance level. However, the result in the table 4 shows that the stock market variables MR, RT, and VT are jointlyco-integrated with the dependent variable, FDI. The calculated F-statistic is 9.41. The value is greater than both Pesaran *et al.* [31] and Narayan [32] upper critical bound values which are5.06 and 6.423 respectively. The values shown in figure 7 indicate that there is evidence of long-run co-integration between foreign direct inflow and stock market development in Nigeria. The Ordinary Least Squares Estimation R-Square is 41 % indicating that about 41 % of changes of the stock market variables is caused by foreign direct investment in Nigeria. The model is free from Serial Correlation, Heteroscedasticity and problem of Normality

Table-4 F- Bound Test

Critical Value	Pesaran, <i>et. al.</i> (2001)		Narayan (2005)	
	Lower Bound Value	Upper Bound Value	Lower-Bound Value	Lower-Bound value
1 %	3.6	5.06	4.983	6.423
5 %	2.86	4.01	3.535	4.733
10 %	2.45	3.52	2.893	3.983
F-statistics		9.41 (0.000)		

Before estimating the ARDL long-run and short-run, it is better to assess the diagnostic test of the model. The diagnostic test shows that the model is free from Serial Correlation, Heteroscedasticity and problem of Normality.

Long-run Model Estimation:

After confirming the existence of the long-run co-integration among the variables, the estimated long-run relationship between the variables are expected and the estimated coefficients. The figures 8below shows that there is a significant association between foreign direct investment and three of the independent variables, namely the rate of stock turnover, total value of stock transaction and the dummy variable that captures the structural adjustment programme in Nigeria.Thegrowth model is in a log-linear form. Thus, the coefficient of the dependent variable can be interpreted as elasticity with respect to the flow of foreign direct investment.

The coefficient of the rate of the stock turnover is 0.297. The value implies that, in the long run, holding other things constant, one percent changes in the stock turnover (which is a proxy for stock liquidity) brought

about a 0.297 percent change in foreign direct investment. However, the relationship is an inverse because of the negative sign of LNRT coefficient. Thus, the relationship contradicts with expected a priori, but in line with the findings of Ezeoha [7] and Maduka [14] when regarded turnover ratio as a proxy for the stock market. Their result also showed that there is an adverse relationship between the stock exchange and foreign direct investment.

From the table 5, the estimate shows that there is a significant positive relationship between foreign direct investment and the value of the total transaction. The coefficient of therate of the value of the entire stock transaction is 1.04. It shows that, in the long run, holding other things constant, a 1 % change in the stock total traded brought about a 1.04 % change in foreign direct investment in Nigeria. The findings are in line with the study conducted by Umar and Ibrahim [12], and Anfofum [11]. The outcome of the result shows that the coefficient market capitalization ratio is positive, but insignificant in increasing the foreign direct investment. This result is in line with the findings of Scott and Ovuefeyen [22] but contradicts to the complementary role of FDI in increasing economic growth

$$LNPCI = 0.698 - 0.146LNMR - 0.297LNRT + 1.041LNVT + 0.320TB$$

(0.68) (0.364) (0.002) (0.003) (0.009)

Table-5: The estimates Long Run Coefficient using ARDL Approach

Regressor	Coefficient	Standard Error	[Prob.]
LNMR	.14604	.15754	0.364
LNRT	-.29761	.089570	0.003
DLNVT	1.0409	.30500	0.002
Sap	.32018	.11175	0.009
INPT	.069863	.17048	0.686

The Short Run Model Estimate

Figure 6 estimates the equilibrium of error correction coefficient at -0.98. The estimate is highly significant. The coefficient has the correct sign and indicates a very high speed of adjustment to equilibrium after a shock. The percentage of the disequilibrium is approximately 98 from the previous year’s shock converges back to the long-run equilibrium in the current year. The highly significant Error correction term and its right sign is another proof for the existence of a stable, long-run relationship between the variables Banerjee et al. [33]

The estimated short-run model reveals that current market capitalization and one-year lag are still

negative and insignificant at 5% significance level. It is may be because of the financial is the principal contributor.When stock turnover increases by 1 percent, the FDI decreased by 0.297 percent at the 1 % level of significance. Also, while when the one-year lag of the value of stock transaction is increased by 0.35 percent, the foreign direct investment decreased by 0.35 percent at 5% significance level. The negative relationship of the stock variables maybe as a result of strong financial market development, which adversely limits the economic capability of Nigeria in attracting FDI. Bank financial distress, lack of absorptive e capacity where some major companies are not quoted in the Nigerian stock market could also be the possible explanation.

Table-6: ARDL Short-Runestimate

Regressor	Coefficient	Standard Error	[Prob.]
dLNMR	-.1356	.1095	[.228]
dLNMR1	-.1932	.1069	[.083]
dLNRT	-.29761	.089570	[.003]
dDLNVT	.086970	.15230	[.573]
dDLNVT1	-.35529	.17123	[.049]
SAP	.018559	.20840	[.930]
INPT	.0698	.1704	[.686]
Ect. (-1)	-.980	0.00	[.083]

Test of the ARDL Stability

Finally, when analysing the stability of the long-run coefficients together with the short run dynamics, the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMsq) are applied. A graphical illustration of the both Cumulative Sum of Square and CUSUMsq is in Figures 4 and figure 5 respectively. According to Pesaran, Shin, and Smith (2001), one has to examine the stability of the estimated

elasticities of the value error correction model. We cannot reject The null hypothesis if the plot of these statistics remains within the critical bounds of the 5 percent significance level Bahmani-Oskooee and Nasir, 2004 [34].It is evident from the CUSUM, and the CUSUMsq curves are within the boundaries, and hence, these statistics confirm the stability of the long-run coefficients of regressors that affect the income distribution in the country.

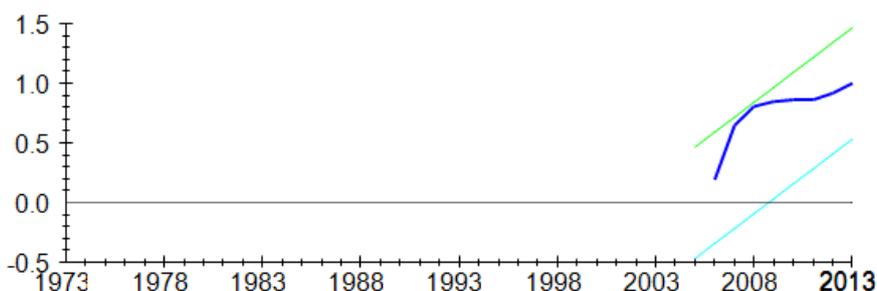
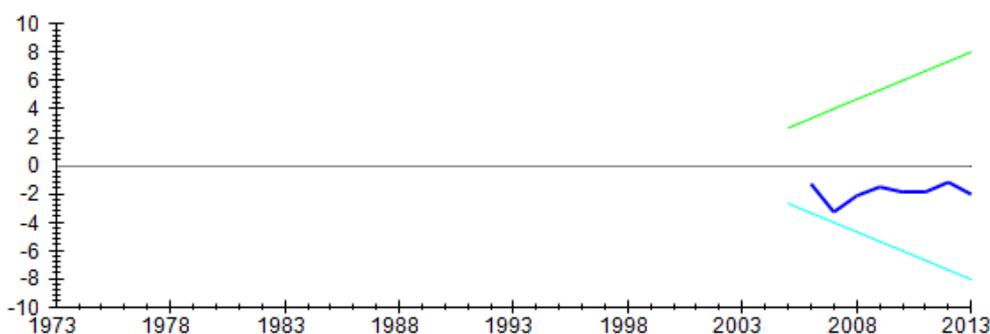


Fig- 4: Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Fig-5: Plot of Cumulative Sum of Recursive Residuals

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

In this study, we apply a time-series analysis (ARDL as adopted by Pesaran [31] for the period 1970-2011. Our result shows that the stock market variables MR, RT, andVT are jointly co-integrated with the dependent variable, FDI. The Ordinary Least Squares Estimation R-Square is 41 % indicating that about 41 %

of changes of the stock market variables is caused by foreign direct investment in Nigeria. The model is free from Serial Correlation, Heteroscedasticity and problem of Normality. The long run estimate shows that there is an adverse relationship between therate of stock turnover and FDI in the long-run while the value of stock transaction is positive and significant. In the short-run, all the stock indicators are inverse and

significant. Both the CUSUM and the CUSUMsq shows that the ARDL model is stable. The main contribution of this paper is an additional step towards the clarification of the so far rather unclear relationship between FDI and the stock market in Nigeria and the nature of their long and short-run

The study recommended Stock market is an essential element of the modern and market-based economic system because it serves as the main channel to collect funds from depositors to borrowers. As FDI is complement to the development of the stock market, the Nigerian government should attract FDI by taking various steps such as

1. Assurance of political stability in the country
2. Adequate provision of infrastructure.
3. Minimize the volatility of foreign exchange and the rate of interest through appropriate and efficient monetary policy.
4. Incentives such as tax exemption, improve the infrastructure in the country, etc.

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