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FOREIGN PORTFOLIO INVESTMENT AND STOCK MARKET PERFORMANCE IN NIGERIA

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Abstract

The paper examines the impact of foreign portfolio investment (FPI) on stock market performance in Nigeria using monthly data from year 2006 to 2015. Results from ARDL bound testing approach reveals that FPI have adverse effect on market performance. However, the role of FPI altered during the global financial crisis of 2008 and 2009 as it increased stock price index and reduced market volatility during this period. This suggests that foreign inflows were valued more during the crisis period. Findings also reveal that macroeconomic factors, which include exchange rate, money supply and interest rate, explain stock market index while exchange rate affects stock return volatility. The study offers useful policy implications for government in its liberalization policies and recommends that government should be more cautious in its liberalization policy. The interest of domestic investors should not be undermined while putting measures in place to encourage FPI of longer-term nature.

Keywords: Foreign portfolio investment; Stock market; Stock price index; Stock return volatility.

JEL Classification: G10, G11, G15, G18

1.0 Introduction

Prior to the spread of liberalization policy, many countries imposed restrictions on foreign investment. This is in order to safeguard domestic investors from foreign competition. However, different emerging markets have removed barriers to foreign capital inflow due to rising globalization and this has led to foreign investors spreading their portfolio across different international markets. Foreign investors gain huge benefits from such diversification (Hamao & Mei 2001). Thus, foreign investment benefits the international investors as well as the host country. One stream of literature (Joor & Mir 2014; Owen 2013; Rhee & Wang, 2009) holds that foreign

capital inflow complements and stimulates domestic investment, enhances market liquidity, and reduces the level of information asymmetry. On the other hand, it is held that foreign capital flows are transient in nature and usually cause volatility, which increases uncertainty and disrupts the smooth operation of the host market (Chen, Li, & Wei, 2006; Goudarzi & Ramanarayanan, 2011; Schuppli & Bohl, 2010). This transient nature may also destabilize the economy.

The speculative nature of foreign investors necessitates foreign capital control. Consequently, barriers imposed by different countries suggest that regulators are doubtful of the long-term benefits of foreign investment. It is also held that this speculative nature is more pronounced during crisis. Owen (2013) documents that financial crisis in developing countries is associated with the behaviour exhibited by foreign investors in reaction to crisis in their home countries. Although past finding (Froot, O'Connell & Seasholes, 2001) document foreign investors did not flee emerging markets during crisis, they however noted the rate of foreign portfolio inflows decreased. Similarly, studies (Kim & Wei, 2001; Lee & Chung, 2016) reported that foreign investors are responsible for severe capital flights out of countries affected by financial crisis. Thus, recent global financial crisis raised more concerns on the role of foreign investors in emerging markets as it is widely held that stock markets tend to react more to foreign portfolio flows during crisis. Froot et al. (2001) also opined that "the question of whether emerging market stock prices are vulnerable to international portfolio flows is posed with greater urgency during times of financial upheaval". Inconclusive findings on how foreign investment impact on the host environment necessitates further research in this area. It becomes imperative to examine whether the "hot money" influx by foreign investors have any effect on the performance of domestic markets. Such investigation is considered very important as it is widely documented in the literature that foreign capital flows play a crucial role in the development of any economy, particularly in an emerging market where financial stability is pursued. This is due to the fact that stock markets in emerging countries are easily disrupted by external factors such as foreign portfolio investment (FPI) flows (Huang, 2014).

The need to promote foreign investment in Nigeria led to the abolition of restrictions imposed on free flow of foreign capital into the country. Thus, foreign investors are allowed 100% shareholdings of firms excluding those in oil and gas sector (Sec 17, Nigerian Investment Promotion Commission (NIPC) Decree of 1995). In recent years, the Nigerian market witnessed considerable rise in FPI inflow, which increased from 14.8% in 2007 to 60.1% in 2015 and even recorded higher figures within the specified range. The market has been dominated by foreign portfolio

investment in the past few years with foreign investors having single largest shareholdings in many listed firms (Proshare News, 2013). Anecdotal evidence suggests that the market is significantly affected by any slight variation in FPI as a result of its dominance.

As highlighted above, there exists dominance of shareholdings and stock market transactions by foreign investors in the Nigerian market. Consequently, the stock market nearly collapsed due to aggravation of the market crisis, which resulted from huge withdrawal of funds by foreign investors. Proshare News (2013) reported USD3.92 billion as total outflow of foreign portfolio investment in year 2008 and this represents about 81% of total foreign portfolio investment recorded in the same year. The volatile nature of foreign investors suggests that this investor category poses risks to the market and this undermines the purpose of opening the market to foreign flows. However, studies on foreign capital flows in Nigeria have majorly focused on foreign direct investment (FDI) while scant studies have been conducted on foreign portfolio investment. Consequently, the need arises to ascertain whether or not foreign portfolio investment have any effect on the performance of the Nigerian Stock Exchange. Therefore, this paper examines the impact of FPI on the performance of the Nigerian stock market. The Nigerian market is an emerging market and the second largest stock market in Africa. The full liberalization of the Nigerian capital market, persistent rise in percentage of FPI, and dominance of the market by foreign institutional investors make it an ideal laboratory to test the effect of FPI on the market performance. More so, the market is regarded as the largest market in West Africa (AFDB, 2015).

2.0 Literature Review

2.1 Theoretical Considerations

Contrary to the claim of "Lucas Paradox" that capital does not flow from developed countries to developing countries, the Neo Classical theory of capital flow predicts that capital should flow from countries where capital is abundant to capital scarce countries. Theoretically, it is expected that such flow to developing markets will reduce the information asymmetry in the host market (Sevil, Ozer & Kulah, 2012). This is as a result of the advanced technical know-how inherent in advanced countries. The traditional school of thought on capital flow believes that capital flows are significant for the growth of emerging market economies. According to this school of thought, there should be no form of restriction and capital should be allowed to flow freely across borders. However, the sceptics/critics school of thought holds that free capital flows lead to crisis where there is no proper economic framework and policy response. Thus, the latter school of thought is sceptical over the role of capital inflows.

However, the corollary theory of capital flow argues that even if capital flows do not have direct benefit, they have indirect merits. Based on the argument of the corollary school, foreign investors request for release of more information, appointment of independent directors and better corporate governance (Eichengreen, 2007). Presence of foreign investors offers more corollary benefits emanating from their advanced technological and organizational know-how. The foreign investors also strengthen competition, enhance efficiency, and encourage development of new products (Prasad, Rajan & Subramanian, 2007). Thus, it is expected that their presence will lead to deepening of financial markets and improved market performance. This study hinges on the argument of the corollary theory of capital flows as corollary benefits of foreign investment is expected to enhance the performance of the stock market.

2.2 Empirical Evidence

Existing literature has employed different measures of stock market performance. Indicators of market performance employed by past studies include share index, market capitalization, stock return, market volatility, and market liquidity. Taking stock price index as a measure of performance, studies (Desemder, Crespi-Cladera & Garcia-Cestona, 2009; Gumus, Duru & Gungor, 2013) document that FPI positively affects performance. Similarly, several studies (Hasan & Nazir, 2008; Owen, 2013; Froot et al., 2001; Poshakwale & Thapa, 2007) report that foreign inflows have positive effect on stock market return. This derives from increased participation by foreign investors causing higher demand by them and consequently pushing stock prices up. In line with this, Sevil et al. (2012) found that buying behaviour of foreign investors resulted in excessive market returns. Apart from current stock returns, it has been observed that FPI also impacts on future stock returns. Wang and Lee (2015) reported that short selling activities of foreign investors predict short-run future returns. Similarly, Froot et al. (2001) found FPI to have positive forecasting power for future equity returns particularly for emerging markets. However, the authors argued that stock prices are consistent with flow persistence as it was observed that transitory foreign inflows have negative impact on future stock returns. In line with the finding which indicates that FPI impacts positively on stock returns, Agudelo and Castano (2010) contend that the positive impact results from the fact that markets with relative low level of development and integration are more sensitive to foreign inflows. Contrary to studies that document that FPI positively affects stock market performance, Pal (2006) found no support that FPI can enhance performance (measured by market capitalization) of the Indian market and the economy at large.

Another strand of literature explained the effect of FPI on market performance by investigating whether foreign flows cause market volatility or not. Based on the argument that speculative behaviour by foreign investors destabilizes market, Prasanna and Bansal (2014) document that foreign institutional investment lead to increase in market volatility. However, Chen et al. (2006) reported that such destabilizing role does not affect a segmented market. This is due to the fact that foreign capital is not transient where the market is segregated for domestic and foreign investors.

Contrary to the evidence that indicates increase in volatility resulting from foreign flows, other studies (Agudelo & Castano, 2010; Choe, Kho & Stulz, 1999; Hamao & Mei, 2001; Stulz, 1997; Wang & Lee, 2015) found no convincing evidence to indicate that foreign portfolio flow increases volatility of equity returns. Particularly, the findings of Hamao and Mei (2001) disputes the claim that trading by foreign investors increases market volatility more than trading by domestic investors. In line with the findings that indicate that foreign investors do not increase volatility of stock returns, some studies (Aimpichaimongkol & Padungsaksawasdi, 2013; Li, Nguyen, Pham & Wei, 2011; Schuppli & Bohl, 2010) reported that large foreign ownership plays stabilizing role in emerging markets. Li et al. (2011) argued that the stabilizing role emanates from the commitments of large shareholders to their investment, which creates strong incentives and consequently reduces market volatility.

Similarly, Aimpichaimongkol and Padungsaksawasdi (2013) argued that the stabilizing role derives from the informational advantage the foreign investors have compared to their domestic counterparts. The authors argued that as large block holders, the foreign investors are closer to the management of the firm. In line with this argument, negative relationship exists between foreign investors and stock return volatility (Aimpichaimongkol & Padungsaksawasdi, 2013; Li et al., 2011). It is documented that the findings were more evident for the large foreign investors.

Some other studies employed stock market liquidity as an indicator of market performance. These studies (Hasan & Nazir, 2008; Lee & Chung, 2016) have shown that foreign investors play a positive role in emerging markets as market liquidity increases with rise in foreign ownership. On the other hand, Wang and Lee (2015) document that the activities of foreign investors do not enhance market liquidity. In the same vein, other strand of literature (Prasanna & Bansal, 2014; Rhee & Wang, 2009) reported that foreign investors influence market liquidity in the negative direction. These studies argue that the negative impact is due to information asymmetry between foreign and local investors.

Although considerable evidence exists in the literature as highlighted above that foreign investors may impact positively on the host market, Huang (2014) however reported that the ability of FPI to influence the market weakened during crisis. Foreign investors pull out their funds from the host country during recessions causing crash down of stock market prices (Hsu, 2013). Contrarily, other findings contradict the notion that foreign investors destabilize the market further during financial crisis. For example, Somuncu and Karan (2004) argued that these foreign investors engaged in negative feedback trading which enhanced market stability. Such investment behaviour stems from the high level of experience and information advantage, which foreign investors have relative to the domestic investors. In the Nigerian market, very scant evidence exists in this regard. For example, only few studies (Eniekezimene, 2013; Scott & Ovuefeyen, 2013) have reported that foreign portfolio investment impacts positively on capital market growth in Nigeria. The present study differs from the earlier studies conducted in the market in some aspects. First, findings of the earlier studies did not extend beyond year 2011. Thus, this study extends findings till the most current year for which data is available (year 2015). Second, the prior studies measured capital market growth using market capitalization. However, our study extends the existing finding in the Nigerian market by considering market volatility alongside stock market index as measures of market performance. Third, the previous studies did not take into cognizance other factors that may influence market performance. These other macroeconomic factors, which may impact on market performance in establishing the explanatory power of FPI on the market, are however considered in this study. Macroeconomic factors that have been established by prior literature to influence market performance include exchange rate, inflation, money supply, interest rate, real gross domestic product (real income) and foreign direct investment. Most importantly, the study differs from existing studies conducted in the market as it examines whether and how crisis alters the role of FPI in explaining stock market performance.

3.0 Data and Model Specification

The study is centred on the Nigerian Stock Exchange (NSE) over the period of 2006-2015. The sample period is chosen to cover the years of persistent increase in foreign portfolio flow into the market. Within this period, the market also witnessed high volatility, which anecdotal evidence suggests may be due to panic withdrawal of funds by foreign investors emanating from the financial crisis. Data on market indices and foreign portfolio investment were extracted from the NSE website while data on macroeconomic variables were obtained from Central Bank of Nigeria's website. Monthly data (Jan 2006-Dec 2015) is employed for all variables.

The general specification for the functional relationship examined in this study is as given *MP = (FPI, CR, FPI * CR, LEXC, EXV, INT, LMS)*

Specifically, the models estimated are given in equations (1) and (2). The dependent variable *MP* represents stock market performance and it is measured by natural logarithm of monthly stock index (*LSI*) and stock returns volatility (*SRV*) in models (1) and (2), respectively. In line with prior studies, stock return volatility is defined as the series of first differences of natural logarithm of stock price.

$$lSI = a + b\,FPI_t + c\,CR_t + d\,FPI * CR_t + e\,lEXC_t + f\,INT_t + g\,LMS_t + \varepsilon_t \quad (1)$$

$$SRV = a + b\,FPI_t + c\,CR_t + d\,FPI * CR_t + e\,EXV_t + f\,INT_t + g\,LMS_t + \varepsilon_t \quad (2)$$

The main explanatory variable is *FPI,* which represents foreign portfolio investment. *FPI* is measured as the percentage of foreign portfolio shareholdings relative to total shareholdings in the market. Based on the argument that foreign portfolio investment may destabilize host market further during crisis, we interact *FPI* with the period of global financial crisis {declared as March 2008 until December 2010 (Lin, 2012)} represented by dummy variable *CR*. The dummy is assigned one for crisis period and zero otherwise. Thus, *FPI*CR* is included in the model to see whether there is any change recorded in the explanatory role of FPI (if any) during crisis. In addition, other explanatory variables (*LEXC, EXV, INT* and *LMS)* have been included in the model, as prior studies in the literature have established the significance of these variables (though with mixed findings) on market performance. Moreover, inclusion of such variables enables to reduce the problem of model misspecification. The nominal exchange rate is in natural logarithm form represented by *LEXC* and is measured as the relative price of Nigerian currency (Naira) to US dollar. *EXV* is the return on exchange rate, defined as the series of first differences of natural logarithm of nominal exchange rate.*INT* represents interest rate that is measured as the monetary policy rate. *LMS* denotes the natural logarithm of money supply and the broad money supply is taken as its measure.

This study employs the autoregressive distributed lags (ARDL) and bound testing approach to establish whether the proxies of market performance have long run association with the explanatory variables. Therefore, the following unrestricted ECM models (equations 3and 4) required for bound testing were estimated.

$$\Delta lnSI_t = \beta_0 + \sum_{j=1}^{n} \Sigma\beta_1 \Delta lnFPI_{t-j} + \sum_{j=0}^{n} \beta_2 \Delta CR_{t-j} + \sum_{j=0}^{n} \beta_3 lnFPI * CR_{t-j} + \sum_{j=0}^{n} \beta_4 \Delta lnEXC_{t-j} + \sum_{j=0}^{n} \beta_5 \Delta lnINT_{t-j} + \sum_{j=0}^{n} \beta_6 \Delta lnMS_{t-j} + \gamma_1 lnFPI_{t-1} + \gamma_2 CR_{t-1} + \gamma_3 lnFPI * CR_{t-1} + \gamma_4 lnEXC_{t-1} + \gamma_5 lnINT_{t-1} + \gamma_6 lnMS_{t-1} + \varepsilon_t \quad (3)$$

$$\Delta SRV_t = \beta_0 + \sum_{j=1}^{n} \Sigma\beta_1 \Delta lnFPI_{t-j} + \sum_{j=0}^{n} \beta_2 \Delta CR_{t-j} + \sum_{j=0}^{n} \beta_3 lnFPI * CR_{t-j} + \sum_{j=0}^{n} \beta_4 \Delta EXV_{t-j} + \sum_{j=0}^{n} \beta_5 \Delta lnINT_{t-j} + \sum_{j=0}^{n} \beta_6 \Delta lnMS_{t-j} + \gamma_1 lnFPI_{t-1} + \gamma_2 CR_{t-1} + \gamma_3 lnFPI * CR_{t-1} + \gamma_4 EXV_{t-1} + \gamma_5 lnINT_{t-1} + \gamma_6 lnMS_{t-1} + \varepsilon_t \quad (4)$$

Where ln = natural logarithm; n =optimum lag length; Δ = first difference operator; β_0 = constant term; $\beta_1 \ldots \beta 6$= short run coefficients; $\gamma_1 \ldots \gamma_6$ = long run coefficients; $[_t$ = error term. The starting point of different co-integration techniques is to ascertain the order of integration for each variable. Consequently, Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001) introduced the ARDL approach based on the recognition that different tests may yield different outcome. Unlike the other approaches, this approach is applicable to different orders of co-integration and therefore, unit root pre-testing can be avoided (Kumar, 2010; Raji, Jusoh & Jantan, 2014).

Given these advantages, we employ bound testing approach to long run relationship. As required in the ARDL approach, bound test is applied as an initial approach to ascertain long run relationship between the proxies of market performance and the explanatory variables. The null hypothesis, which indicates lack of co-integration among the variables, is defined as H_0: $d_1=d_2=d_3=d_4=d_5=d_6=0$. It is tested against the alternate hypothesis, which indicates long run relationship among the variables, given as H_1: $d_1 \neq d_2 \neq d_3 \neq d_4 \neq d_5 \neq d_6 \neq 0$.

To test the hypothesis, we estimate equations (3) and (4) and compare the estimated F-statistic with the two critical values. Based on critical values provided by Pesaran et al. (2001), a band covering possible classifications of variables into I(1) which is the upper bound and I(0) which is the lower bound are given. The null hypothesis will be rejected given that F-statistic exceeds the upper level of the band, thus suggesting co-integration. On the other hand, the null hypothesis will be accepted

given that F-statistic falls below the lower level of the band. This suggests lack of co-integration. The decision will be inconclusive on condition that F-statistic is within the range of the upper and lower band.

4.0 Results and Discussion

Although unit root pre-testing may not be necessary since ARDL is capable of being applied to variables of different integration orders, we however, conducted unit root tests to determine existence of unit root and form of non-stationarity. It also enables us to ascertain that variables are either I(0), I(1) or mixed. This was achieved using the Augmented Dickey-Fuller (ADF) tests and Phillips Perron (PP). Specifically, the latter approach was employed to rectify the issue of higher order autocorrelation and heteroskedasticity.

Table 1 - Unit Roots Test Results

Variables	Model Type	Levels		First differences	
		ADF Statistic	PP Statistic	ADF Statistic	PP Statistic
SRV	Constant	-2.7848*	-11.4805***	-13.8678***	-36.4816***
	Constant/Trends	-2.9581	-11.5151***	-13.8127***	-36.3425***
LSI	Constant	-1.5268***	-1.8309	-9.6200***	-9.6641***
	Constant/Trends	-1.6199	-1.8982	-9.6169***	-9.6611***
EXV	Constant	-6.9736***	-6.8647***	-11.8552***	-56.5589***
	Constant/Trends	-6.9840***	-6.8677***	-11.8040***	-57.4705***
LEXC	Constant	-0.5719	-0.1806	-6.9736***	-6.8647***
	Constant/Trends	-2.6938	-2.2752	-6.9840***	-6.8677***
LMS	Constant	-2.7814*	-2.9976**	-10.4208***	-10.4108***
	Constant/Trends	-2.2321	-2.2076	-10.7984***	-10.8127***
INR	Constant	-1.5374	-1.6710	-10.4517***	-10.4835***
	Constant/Trends	-1.8903	-1.9773**	-10.7984***	-10.4983***
FPI	Constant	-1.5609	-0.9753	-10.4619***	-10.5763***
	Constant/Trends	-2.1473	-1.1499	-10.8974***	-6.98767***

Notes: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 1 presents the results of unit root test. Results presented in Table 1 were obtained using automatic lag selection. Thus, the table presents results for levels as well as for first difference. At levels, ADF statistics indicate presence of unit roots for log of exchange rate *(LEXC)*, interest rate *(INT)* and foreign portfolio investment *(FPI)*. Similar results were obtained under PP statistics at levels except for interest rate, which has no unit root under the PP statistics. However, all variables under

ADF and PP statistics became stationary at first difference. Thus, the null hypothesis, which states that each variable has unit root (at either 1% or 5% significance level) is rejected.

Having established stationarity of all variables (at first difference), the study proceeds to conduct ARDL bound test. The approach is employed to ascertain the existence of long run relationship among the explanatory variables and the proxies of stock market performance (*LSI* and *SRV*). To do this, we imposed maximum lag length of eight and estimated equations (3) and (4) using the adjusted R^2, Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) in order to avoid bias restriction in lag selection. The use of the three lag selection criteria is important since only an appropriate lag selection will be capable of identifying the true dynamics of the models (see, for example, Akinlo, 2005; Bahmani-Oskooee, 2001).

Panels 1 (where *LSI* is a dependent variable) and 2 (where *SRV* is a dependent variable) of Table 2 show estimated F-statistic alongside the critical values. In panel 1, F-statistic in the models selected by the adjusted R^2 (6.69) and AIC (6.69) criteria are higher than the upper bound critical value at 1% level (4.43). In addition, F-statistic in the model selected by the SBC is greater than the upper bound critical value at 5% level. Thus, based on the three criteria, we reject the null hypothesis that there is no co-integration among the explanatory variables (*LEXC, LMS, INT, FPI, CR* and *CRFPI*) and log of stock price index.

Similarly, F-statistic in the models selected by the three criteria (Adj R^2=7.20; AIC=7.55; SBC=33.55) are higher than the upper bound critical value at 1% level. Therefore, we reject the null hypothesis that no co-integration exists among the explanatory variables (*LEXC, LMS, INT, FPI, CR,* and *CRFPI*) and stock return volatility. The above results indicate existence of co-integration among the explanatory variables and the proxies of stock market performance.

Table 2 - Results of Bound Tests for Co-integration

Model selection criterion	Estimated models	Bound CV (10%)	Bound CV (5%)	Bound CV (1%)
	F-statistic	1(0) 1(1)	1(0) 1(1)	1(0) 1(1)
	Panel 1: Model 1: *Dependent Variable = LSI*	2.12 3.23	2.45 3.61	3.15 4.43
Adjusted R^2	F_{LSI} (LEXC, LMS, INT, FPI, CR, CRFPI) = 6.685437***			
AIC	F_{LSI} (LEXC, LMS, INT, FPI, CR, CRFPI) = 6.685437***			
SBC	F_{LSI} (LEXC, LMS, INT, FPI, CR, CRFPI) = 3.933923**			
Panel 2: Model 2: *Dependent Variable = SRV*				
Adjusted R^2	F_{SRV} (EXV, LMS, INT, FPI, CR, CRFPI) = 7.20024***			
AIC	F_{SRV} (EXV, LMS, INT, FPI, CR, CRFPI) = 7.55278***			
SBC	F_{SRV} (EXV, LMS, INT, FPI, CR, CRFPI) = 33.5500***			

Notes: The figures in parentheses are the t-statistics. ** and *** indicate significant at the 5% and 1% level, respectively. *LSI*= log of stock price index; *SRV*= stock return volatility; *FPI* = Foreign portfolio investment; *CR* = Crisis dummy variable: *CRFPI*= Interaction term of crisis and FPI; *LEXC* = log of nominal exchange rate; *EXV*= return on exchange rate; *INT* = monetary policy rate; *LMS* =log of money supply.

Table 3 shows the results of error correction terms obtained from the short run dynamics of models (1) and (2) in panels 1 and 2, respectively. In both models, panels 1 and 2, all the coefficients of error terms turn out to be negative and significantly different from zero at the 1% and 5% levels irrespective of any model selected by the criterion considered. The coefficient of the error correction term indicates the speed of adjustment from short run to long run equilibrium.

In panel 1, it corrects the previous disequilibrium at the speed of 59% monthly in the case of models selected by the adjusted R^2 and AIC criteria and 49% in the model selected by the SBC criterion. In panel 2, the speed of adjustment to long

un level appears to be higher ranging from 63% to 84% across the models selected y the three criteria. With the error terms (for both models) being significant and egative, it further buttresses the earlier conclusion of the presence of co-integration mong the variables.

Table 3 – Error Correction Model Results

Model selection criterion			
	Adjusted R^2	AIC	SBC
Panel 1, Model 1: Dependent variable = LSI			
LEXC, LMS, INT, FPI, CR, CRFPI	-0.591	-0.591	-0.499
	(-3.419)***	(-3.419)***	(-2.386)**
Panel 2, Model 2: Dependent variable = SRV			
EXV, LMS, INT, FPI, CR, CRFPI	-0.732	- 0.845	-0.632
	(-6.829)***	(-6.949)***	(-15.236)***

Notes: The figures in parentheses are the t-statistics. ** and *** indicate significant t the 5% and 1% level, respectively. *LSI*= log of stock price index; *SRV*= stock eturn volatility; *FPI* = Foreign portfolio investment; *CR* = Crisis dummy variable: *CRFPI*= Interacted variable; *LEXC* = log of nominal exchange rate; *EXV*= return n exchange rate; *INT* = monetary policy rate; *LMS* =log of money supply.

n line with the results obtained above, the study adopted the Akaike Information Criteria in estimating the long run relationship. Vrieze (2012) contends that with AIC, the risk of selecting a very bad model is minimized as this criteria helps to elect the model that best approximates the "true model". However, before proceeding to estimating long run relationship, the study conducted diagnostic ests to avoid reporting spurious results. We test for possible presence of serial correlation and heteroskedasticity to avoid drawing incorrect conclusions from est results. The p-values shown in parenthesis indicate that our residuals are not serially correlated and that there is no problem of heteroskedasticity in the model selected by AIC.

Table 4 - Results of Diagnostic Tests

Panel 1: Model 1	
Test	AIC
Serial Correlation	1.713 (0.424)
Heteroskedasticity	1.403(0.496)
Panel 1: Model 2	
Serial Correlation	2.650(0.266)
Heteroskedasticity	5.901 (0.052)

Note: The figures in parentheses are p-values

After establishing joint co-integration among the explanatory variables and the outcome variable, estimated coefficients that show long run relationship between each variable and the dependent variable are presented in Table 5. As shown in the table, results are presented into panels. In panel 1, the results obtained show that foreign portfolio investment (FPI) recorded negative and significant co-efficient. Negative co-efficient obtained for FPI indicates decline in market performance as FPI increases. This finding negates the argument of the corollary school of thought where it is expected that increased presence of foreign investors will enhance market performance. However, it matches the position of the sceptics' school of thought, which holds that free flow of capital may have negative implication for the host economy. In line with this school of thought, we infer that the negative impact of FPI on market performance is probably due to improper economic framework and inefficient policy response to increase in foreign portfolio investment inflow.

Estimates of long run relationship which reveals negative impact of FPI on market performance is consistent with some prior findings (Chen et al., 2006; Goudarzi & Ramanarayanan, 2011; Pal 2006; Prasanna & Bansal, 2014; Rhee & Wang 2009; Schuppli & Bohl, 2010). Besides FPI, negative coefficients obtained shows that stock market index declines with depreciation of domestic currency (rise in exchange rate), interest rate, and crisis. On the other hand, stock index rises as money supply increases.

Interestingly, results show that the role of FPI in explaining share index is altered during crisis. Positive coefficient of crisis interaction with foreign portfolio investment (CRFPI) indicates that inflow of more foreign funds during crisis has positive impact on share index. Thus, we infer that as much as the dominance of foreign investors is undesirable, withdrawal of funds by them is more undesirable during crisis.

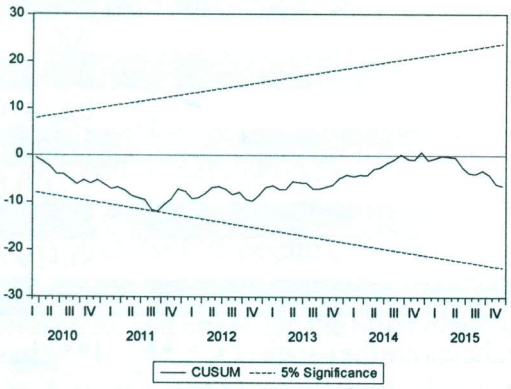
Table 5 - Estimated Results of Long Run Relationship

Panel 1, Model 1; Dependent Variable = LSI	
Variables	AIC
LEXC	-1.665 (-3.233)***
LMS	0.832(2.686)***
INT	-0.066 (-2.081)**
FPI	-0.023 (-2.933)***
CR	-1.627 (-5.418)***
CRFPI	0.021(2.282)**
C	7.216 (2.046)**
Panel 2, Model 2; Dependent Variable = SRV	
Variables	AIC
EXV	0.222 (2.700)***
LMS	0.184 (0.573)
INT	-0.023 (-0.338)
FPI	-0.010 (-1.118)
CR	3.605 (5.648)***
CRFPI	-0.119 (-5.094)***
C	1.985 (-0.415)

Notes: Figures in parentheses are the t-statistics. *, ** and *** indicate significant at the 10%, 5% and 1% level, respectively. *LSI*= log of stock price index; *SRV*= stock return volatility; *FPI* = Foreign portfolio investment; *CR* = Crisis dummy variable; *CRFPI*= Interacted variable; *LEXC* = log of nominal exchange rate; *EXV*= return on exchange rate; *INT* = monetary policy rate; *LMS* =log of money supply.

Panel 2 of Table 5 shows how FPI and other explanatory variables explain stock market volatility. Only three variables (crisis, crisis*FPI, and exchange rate) were found significant. Results show that during crisis, stock volatility increases. Although FPI itself is found to be insignificant in explaining volatility of stock returns, its role is altered during crisis. Finding on interaction of FPI with crisis (CRFPI) is in line with our inference in panel one as the negative coefficient of CRFPI shows that higher presence of FPI during crisis reduces market volatility. This result supports the earlier findings of Somuncu and Karan (2004) where it was reported that foreign investors play stabilizing role during crisis. Our results also show that higher exchange rate subjects the market to higher volatility.

The study proceeds to testing for stability of long run coefficients. Presence of instability may emanate from inappropriate modelling of the short run dynamics (Akinlo, 2005; Bahmani-Oskooee, 2001). To achieve this, we apply the CUSUM and CUSUMSQ tests proposed by Brown Dublin and Evans (1975) to the residuals of our two models. The test results based on the cumulative sum of recursive residuals for model 1 are depicted in Figure 1. Similarly, those for model 2 are depicted in Figure 2. To establish stability, it is expected that the cumulative should remain within the two critical lines at 5% significance level. Otherwise, there is problem of instability.



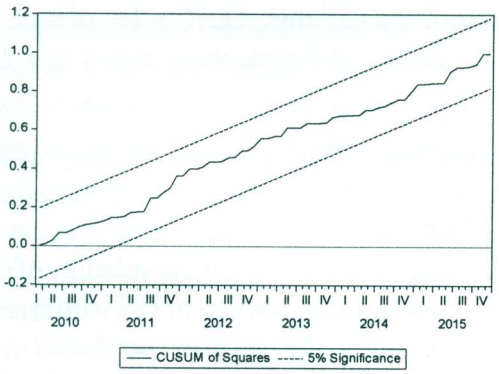


Figure 1- Plot of cumulative sum of recursive residuals for model 1

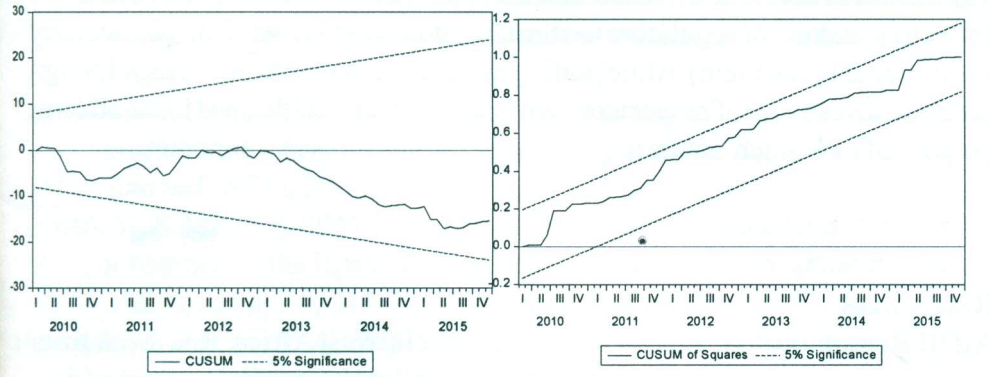


Figure 2 - Plot of cumulative sum of recursive residuals for model 2

Figures 1 and 2 show that both CUSUM and CUSUMSQ plots are within the two critical bounds or lines. This suggests stability of parameters for models 1 and 2.

5.0 Conclusion

In this paper, we investigated the effect of FPI and other variables on Nigerian stock market performance (proxied by stock price index and stock return volatility). In achieving this, we employed monthly data from year 2006 to 2015. Empirical results drawn from ARDL bound testing approach reveal that there exists joint co-integration among stock market performance and the explanatory variables (foreign portfolio investment, exchange rate, exchange rate volatility, money supply, interest rate, crisis, and crisis interaction with foreign portfolio investment) in both models. In the first model (model 1), findings indicate that FPI and all other explanatory variables significantly influence stock market index in the long run. In particular, foreign portfolio investment (FPI) recorded negative and significant co-efficient but its role in explaining share index is altered during crisis. That is, positive coefficient of crisis interaction with FPI (CRFPI) indicates that the presence of more foreign investors during crisis have positive impact on share index.

In the second model (model 2), findings show that only three explanatory variables (exchange rate, crisis, and crisis interaction with FPI) significantly affect stock return volatility in the long run. Specifically, FPI that appears to have negative impact on stock market has its role altered during crisis. This is further confirmed by results, which show that higher presence of FPI during crisis reduces market volatility and vice-versa. Thus, we conclude that foreign inflows are more appreciated in the market during crisis. Consequently, there is need for government

to be cautious in its liberalization policy while seeking growth of the stock market. The interest of domestic investors should not be undermined. Thus, the need arises for policy makers or regulators to stimulate domestic investment (particularly institutional investment) while putting measures in place to encourage foreign portfolio investment of longer term as it is widely believed that it is the short term purpose of FPI which causes negative implications for the host market.

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