



PORTFOLIO INVESTMENT INFLOWS, ECONOMIC RECESSION AND STOCK MARKET RETURNS REACTION

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Abstract

The study examined the stock market returns reaction to portfolio investment in Nigeria, using monthly data drawn from January 2015 to December 2021. The Autoregressive Distributed Lag (ARDL) model was applied for statistical analysis. The study found that stock market returns reacted positively to both domestic and foreign portfolio investment inflows in Nigeria. Additionally, it was established that economic recession also negatively affected stock market returns. Therefore, it could be concluded that domestic and foreign portfolio investment inflows are expected to result in both short and long run effects on stock market returns in Nigeria. Thus, it is recommended that supervisory bodies should evolve measures that will facilitate increase in mobilisation of domestic investment to mitigate uncertainty that was experienced during periods of economic crises either local or international.

Keywords: Domestic, Economic Recession, Foreign, Portfolio Investment, Stock Return

JEL Classification Code: O16

1. Introduction

Stock market returns are expected to react differently to factors that could affect investors' estimation of risk and returns. Factors that are estimated by the investors as favourable are expected to positively affect stock returns, conversely factors that are deemed by the investor to contain unfavourable information could result in negative stock returns. Giritli and Ibrahim (2020) opined that investors are interested in stock markets with prospect of optimal return and minimal investment risk, thus result in appetite for international diversification. Firms' stock returns tend to react differently to international and local events based on market efficiency and local macroeconomic conditions peculiarities.

At the domestic level in recent years, Nigeria has experienced two sessions of economic recessions. These were occasioned by the decrease in global crude oil price that led to reduction of foreign exchange earnings, which led to economic decline with its multiplier effects. Shang (2021) noted that economic slowdown could result in lowering consumer confidence and business outlook, which consequently could lead to lower consumption and investment spending. The proportion of domestic and foreign portfolio investments in stock market may convey information about market conditions, which may contain

information that could affect investors' investment decision and consequently influence stock returns. Recent evidences on portfolio investments suggest that high volatility in portfolio investment signifies large reversal of foreign capital flows which increases the risk of borrowers being faced with the risk of liquidity runs (Nwosa & Adeleke, 2017), that could have negative effect on stock returns. Furthermore, Gathenya (2015) asserted that foreign investors' entry increases the liquidity of local market, and makes the base of investors broader, thus increasing risk sharing. Kim and Yi (2015) noted that increased foreign access to domestic equity markets stimulates more research and information production by local and foreign analysts, brokerages and other market participants. It also spurs local firms to disclose more and better information.

After two consecutive negative gross domestic product growths, the Nigeria economy in second quarter of 2016, experienced economic recession. In the corresponding period, Nigeria domestic portfolio investments decreased from ₦881 billion in 2015 to ₦634 billion by year ended 2016. Conversely, foreign portfolio investment decreased from ₦1.025 trillion in 2015 to ₦518 billion in 2016 (NSE, 2021). Though, portfolio investment have experienced fluctuation in growth level over the years, but

figures suggests that in period of economic recession 2016 and 2017 domestic investment was higher than foreign portfolio investment. (NSE,2020). In 2020, when Nigeria economy experienced yet another round of economic recession, domestic portfolio investment increased from ₦165.14 billion in January 2020 to ₦ 199.32 billion in December 2020, while foreign portfolio investment dropped from ₦70.32 billion in January 2020 to ₦ 69.92 billion in December 2020. Thus, in view of the foregone realities, this study seeks to assess the effects of domestic and foreign portfolio investment on stock market return, by incorporating the interactive effect of domestic economic recession. Therefore, it is hypothesized in null forms that economic recession does not significantly affect the relationship between domestic portfolio investment and stock market returns. Additionally, economic recession does not significantly affect the relationship between foreign portfolio investment and stock market returns.

2. Literature Review and Theoretical Framework

Stock returns tend to react differently to varying stock market portfolio investment, as there are divergent argument on stock returns reaction to foreign and domestic portfolio investments especially in emerging markets. Nevertheless, despite conventional held expectations on portfolio investment effect on stock returns, some studies have shown that portfolio investment have no effect on stock returns. For instance, Agu, Calistus and Clement (2019) noted that there is no long run relationship between foreign portfolio investment and stock market returns in Nigeria. Adebisi and Arikpo (2017) found that financial market performance has no long run and short run causal relationship with foreign portfolio investment in Nigeria. Loice (2017) indicated that foreign portfolio equity outflows had no effect on stock returns of listed financial institutions in Kenya. Other studies found a positive effect on stock return, such as Kim and Jo (2019) revealed that foreign investors trading behaviour of stock price showed a positive feedback. Najmudin and Sulistyandari (2019) found that dynamic relationship between each domestic market and world market has a positive effect on stocks returns volatility, global financial crisis period. Iriobe, Obamuyi and Abayomi (2018) found that foreign portfolio equity investment has a significant positive influence on the Nigerian stock market. Ikezam (2018) found that net foreign portfolio investment, foreign portfolio investment

in equities and exchange rates have positive relationship with all share price index. Aditya (2016) found that positive significant relationship exists between the foreign institutional investment flows and the index. Loncan and Caldeira (2015) found that the effect of foreign portfolio capital flows on index's returns was statistically positively significant.

Many other studies found negative effect on stock returns, which include Ikezam (2018) that foreign portfolio investment in bonds and foreign portfolio investment in government securities have negative relationship with all share price index. In addition, net foreign portfolio investment, portfolio investments in bonds and government securities has negative relationship with market capitalization. Kim and Yi (2015) found that stock price synchronicity decreases significantly with the intensity of trading by foreign investors and domestic institutional investors. The study concluded that foreign and domestic short-term institutions in emerging markets are more actively involved in information-based trading than domestic long-term institutions. Thus, it could be observed that except Najmudin and Sulistyandari (2019) that focused on period of global financial crisis as there tend to be high portfolio investment volatility, others seems not to take into consideration economic condition variations in examining the relationship between portfolio investment and stock returns. The inconclusive findings of previous studies may largely be attributed to inability to control for varying economic or business cycle, which could reshape investor's future estimation of the market. Therefore, this study seeks to advance the frontier of knowledge on portfolio investment and stock market returns taking into consideration varying economic conditions.

To examine the relationship between portfolio investment and stock market return. The study was anchored on portfolio diversification theory, which focused basically on the role of risk in investment decision. The theory developed by Markowitz (1952) posit that a firm faced with varying investment projects is by expected returns and the possibility of mitigating risk to minimal level. That is, if risk neutrality assumption held, risk becomes another variable that investment decision is made. This means that the choice of investment project is not only guided by expected rate of return but also by risk. Therefore, due to risk aversion, a rate of return differential will not induce capital flow in one direction until the

differential disappears through arbitrage. As capital mobility will be constrained by the desire to minimize or reduce risk, which is achieved by diversification (Agarwal, 1980).

3. Methodology

The study applied Autoregressive Distributed Lag (ARDL) model to examine the effect of economic recession on the relationship between portfolio investment and stock market returns in Nigeria. The study used monthly time series data for the period January 2015 to December 2021. Data were collected from Nigeria Stock Exchange (NSE) and Central Bank of Nigeria websites (CBN). Stock market returns is employed as the dependent variable, while the independent variables are economic recession and portfolio investment flows. Portfolio investment flows is measured by domestic and foreign portfolio investments inflows. The study also controlled for macroeconomic stability using real exchange rate and global crude oil price. Dummy variables were used to represent economic recession, real effective exchange rate. The All Share Index (ASI) that serves as proxy for stock market returns was compounded into monthly returns by taking the percentage change in their logarithmic form through application of the formula stated below:

$$r_t = \ln\left(\frac{ASI_t}{ASI_{t-1}}\right) \dots \dots \dots 1$$

Where:

LN is the natural logarithm operator;

r_t is the compounded return at time t

P_t and P_{t-1} are the daily stock index at the two successive days t and $t-1$ respectively.

Pre-estimation diagnostic tests were conducted to determine statistical properties of data. Correlation analysis was also carried out to determine if

$$\ln ASX_t = \alpha_0 + \sum_{i=1}^p \beta_1 \ln ASX_{t-i} + \sum_{i=1}^p \beta_2 \ln DPI_{t-i} + \sum_{i=1}^p \beta_3 REER_{t-i} + \sum_{i=1}^p \beta_4 OILP_{t-i} + \sum_{i=1}^p \beta_5 ECRE_{t-i} + \delta \ln ASX_{t-i} + \delta \ln DPI_{t-i} + \delta REER_{t-i} + \delta OILP_{t-i} + \delta ECRE_{t-i} + ECM_{t-1} + \mu_t \dots \dots \dots 4$$

Furthermore, long run relationship was also established for equation 3. Therefore, ECM was estimated. Equation

$$\ln ASX_t = \alpha_0 + \sum_{i=1}^p \beta_1 \ln ASX_{t-i} + \sum_{i=1}^p \beta_2 \ln FPI_{t-i} + \sum_{i=1}^p \beta_3 REER_{t-i} + \sum_{i=1}^p \beta_4 OILP_{t-i} + \sum_{i=1}^p \beta_5 ECRE_{t-i} + \delta \ln ASX_{t-i} + \delta \ln FPI_{t-i} + \delta REER_{t-i} + \delta OILP_{t-i} + \delta ECRE_{t-i} + ECM_{t-1} + \mu_t \dots \dots \dots 3$$

multicollinearity problem exist between explanatory variables.

To used ARDL model for estimation t data must be stationary at levels $I(0)$ or at first difference $I(1)$. Augmented Dickey-Fuller (ADF) and Phillip-Perron test (PP) tests were employed for stationary test. Co-integration was also conducted using bound test, while lag length criteria was determine base on Akaike Information Criterion (AIC). The result of ARDL bound test was interpreted as recommended, using the $I(1)$ upper critical bound value and $I(0)$ lower critical bound value $I(0)$. Long-run relationship exists between variables if the estimated F-statistic value is greater than upper critical bound value. Conversely, if the F-statistic value lies between the upper and lower critical bounds, it suggests inconclusiveness of the analysis is. Furthermore, if the estimated F-statistic value lies below the lower critical bound, therefore no long-run relationship exists between the variables. The level of significance was tested using 5% level of significance. To perform bound test for co-integration for effect of domestic portfolio on stock market returns, the conditional ARDL (p, q_1, q_2) models is specified in logarithmic form:

$$\ln ASX_t = \alpha_0 + \alpha_1 \ln DPI_t + \alpha_2 REER_t + \alpha_3 OILP + \alpha_4 ECRE + \mu_t \quad 2$$

Furthermore, to perform bound test for co-integration for effect of foreign portfolio on stock market returns, the conditional ARDL (p, q_1, q_2) models is specified in logarithmic form:

$$\ln ASX_t = \alpha_0 + \alpha_1 \ln FPI_t + \alpha_2 REER_t + \alpha_3 OILP + \alpha_4 ECRE + \mu_t \quad 3$$

Since long run relationship is established, the ECM was estimated. Equation 2 is re-specified to include error correction term (ECM), which is stated in the following form:

3 is re-specified to include error correction term (ECM), which is stated in the following form:

Where:

LNASX: Log All Share Index Returns (Representing Stock Market Returns)

LNFPFI: Log Foreign Portfolio Investment Inflows

LNDPI: Log Domestic Portfolio Investment Inflows

REER: Real Exchange Rate

ECRE: Economic Recession (Dummy Variables)

OILP: Global Crude Oil Price

α, β and δ : are coefficients of the model

μ is the white-noise error term;

t denotes the time subscript.

p, q = optimal lag orders

ε_{it} = Vector of the error term

4. Results Discussion

Descriptive statistics test was conducted to examine the distributional properties of data; correlation analysis was conducted to ensure the explanatory variables are not highly correlated.

Table 1: Descriptive Statistics

	LNASX	LNDPI	LNFPFI	REER	OILP	ECRE
Mean	9.42	90.74	38.52	80.24	60.53	0.38
Std. Dev.	0.23	57.15	28.45	10.78	19.88	0.57
Skew.	0.59	1.86	2.92	0.89	1.31	1.33
Kurtosis	2.38	5.33	11.39	2.56	4.17	2.56

Source: Extract from E-views Output

The results of descriptive statistics as shown in table 1, shows that the highest mean of 90.74 and standard

deviation of 57.15 lies in LNDPI. All the variables shown in the table are all positively skewed.

Table 2: Correlation Matrix

	LNDPI	LNFPFI	REER	OILP	ECRE
REER	0.2	0.38	1		
OILP	0.15	0.42	-0.15	1	
ECRE	-0.21	-0.3	-0.09	-0.58	1

Source: Extract from E-views Output

The result of correlation analysis as shown in table 2, indicates that highest correlation coefficient of -0,58 in absolute value lies between ECRE and OILP. This is still within acceptable threshold value of 90 percent (Tabachnick & Fidell, 2013). This indicates that the data

derived for variables used in the study are statistically appropriate for estimation. The data used were also subjected to unit root were examined using Augmented Dickey-Fuller (ADF) and Phillip-Perron unit root test.

Table 3: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Unit Root Tests

	ADF	PP	Level.
LNDPI	-5.5028	-5.6342	0
LNFPFI	-4.5049	-4.6011	0
LNASX	8.4961	-6.5371	1
ECRE	-8.1104	-8.1104	1
REER	-7.7624	-7.7624	1
OILP	-5.5166	-5.2636	1

Source: Extract from E-views Output.

The results of stationarity tests as shown in table 3, depicts that the variables are stationary at levels and first

difference. Therefore, it will be appropriate to apply ARDL model for estimation.

Table 4: VAR Lag Order Selection Criteria (LNDPI)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	66.96	NA	0.06	-1.74	-1.54	-1.67
1	101.22	58.84*	0.005*	-2.77*	-2.47*	-2.67*
2	101.71	0.79	0.004	-2.69	-2.37	-2.55
3	102.03	0.18	0.004	-2.63	-2.37	-2.50

Source: Extract from E-views Output

The appropriate lag length for estimation of the effect of domestic portfolio investment on stock market returns was determined using Akaike Information Criterion (AIC).

The result in table 4 shows a lag length of -1 is appropriate.

Table 5: ARDL bounds test for Co-integration (LNDPI)

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.6702	10%	1.94	3.05
		5%	2.27	3.43
		2.5%	2.57	3.81
		1%	2.97	4.25

Source: Extract from E-views Output

The bounds test for co-integration between domestic portfolio investment and stock market returns shows that the F-statistics of 6.6702 is greater than I(0) and I(1) bound at 0.05 level of significance. This indicates

existence of co-integration between the variables. That is long run relationship exist between the variables, thus Error Correction Model (ECM) is specified.

Table 6: Short-run estimation results for LNDPI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.0008	0.0067	-0.0108	0.9913
D(LNASX(-1))	0.8421	0.2653	2.4751	-0.0087
D(LNDPI(-1))	-0.0005	-0.0006	1.9437	0.0349
D(REER(-1))	0.0006	0.0011	0.7351	0.4434
D(OILP(-1))	-0.001	0.0005	-0.2091	0.8148
D(ECRE(-1))	-0.0542	0.015	-0.9597	0.33
ECM(-1)	-0.943	0.3851	-2.3661	0.0004
R-squared	0.1202			
Adjusted R-squared	0.0275			
F-statistic	1.4011			
Prob (F-statistic)	0.2039			

Source: Extract from E-views Output

The result of short run estimation between domestic portfolio investment and stock market returns in table 6 shows negative significant P value of 0.0004, and a negative ECM coefficient of -0.943. The result indicates

that the model corrects its short run disequilibrium by 94 percent speed of adjustment return to the long run equilibrium.

Table 7: Long-run model for LNDPI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.2323	0.9344	13.1221	0.0000
LNDPI	0.0572	0.1565	5.6814	0.0000
REER	0.0645	0.158	5.8095	0.0000
OILP	0.0593	0.1572	4.4924	0.0004

ECRE	-0.0656	0.1878	-2.9129	0.0003
R-squared	0.8015			
Adjusted R-squared	0.7822			
F-statistic	38.5722			
Prob (F-statistic)	0.0000			

Source: Extract from E-views Output

The result of long run effect of domestic portfolio investment on stock market returns as shown in table 7 depicts positive significant relationships between LNDPI and LNASX. The result also shows that ECRE has

negative effect on stock market returns. This suggests that in period of economic recession, stock markets experience decreases in returns.

Table 8: VAR Lag Order Selection Criteria (LNFPI)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	72.02824	NA	0.012223	-1.5669	-1.36295	-1.48499
1	110.5883	69.68677	0.004945	-2.4720	-2.23887	-2.37834
2	113.1792	4.620047*	0.004761*	-2.510343*	-2.248059*	-2.404972*
3	113.8438	1.168978	0.004801	-2.50226	-2.21083	-2.38518

Source: Extract from E-views Output

The appropriate lag length for estimation of the effect of foreign portfolio investment on stock market returns was

determine using Akaike Information Criterion (AIC). The result in table 8 shows a lag length of -2 is appropriate.

Table 9: ARDL bounds test for Co-integration (LNFPI)

Test Statistic	Value	Signif.	I(0) Bound	I(1) Bound
F-statistic	4.4343	10%	1.76	2.55
		5%	2.47	3.34
		2.5%	2.76	3.54
		1%	2.34	3.74

Source: Extract from E-views Output

The bounds test for co-integration between foreign portfolio investment and stock market returns shows that the F-statistics of 4.4343 is greater than I(0) and I(1) bound at 0.05 level of significance. This indicates that co-

integration relationship between the variables. That is long run relationship exist between the variables. This suggests that Error Correction Model (ECM) is specified.

Table 10: Short-run estimation results (LNFPI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.0094	0.0430	-0.2459	0.8048
D(LNASX(-1))	-0.0089	0.1335	-0.0167	0.9852
D(LNASX(-2))	0.7002	0.3303	2.0872	0.0324
D(LNFPI(-1))	0.008	0.0079	1.4897	0.1507
D(LNFPI(-2))	0.0079	0.0079	1.1031	0.2849
D(REER(-1))	0.0082	0.0094	0.3449	0.7445
D(REER(-2))	0.0089	0.0095	0.687	0.5069
D(OILP(-1))	-0.0078	-0.0062	-0.1595	0.8722
D(OILP(-2))	-0.0084	-0.0062	-0.599	0.5487
D(ECRE(-1))	-0.035	0.0319	-0.7007	0.4831
D(ECRE(-2))	-0.0597	0.0309	-1.3609	0.173
ECM(-2)	-0.8404	0.3488	-2.3446	0.0149

R-squared	0.2036			
Adjusted R-squared	0.0243			
F-statistic	1.1703			
Prob (F-statistic)	0.3032			

Source: Extract from E-views Output

The result of short run estimation between foreign portfolio investment and stock market returns in table 10 shows a statistically negative significant P value of 0.0149 and a negative ECM coefficient of -0.8404. The

result indicates that the model corrects its short run disequilibrium by 84 percent speed of adjustment return to the long run equilibrium. The negative sign of the error correction term shows a move back to equilibrium.

Table 11: Long-run estimation results for LNFPI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.3390	0.8564	13.2399	0.0000
LNFPI	0.0010	0.0005	2.2739	0.0257
REER	0.0076	0.0020	3.9166	0.0002
OILP	0.0023	0.0009	2.4755	0.0154
ECRE	-0.1331	0.0349	-3.8139	0.0003
R-squared	0.6933			
Adjusted R-squared	0.6700			
F-statistic	29.7652			
Prob. (F-statistic)	0.0000			

Source: Extract from E-views 10 Output

The result of long run effect of LNFPI on stock market returns as shown in table 7, depicts positive significant relationships between LNFPI and LNASX. The result also shows that ECRE has negative effect on stock market returns. This also indicates that in period of economic recession, stock markets experience decreases in returns.

5. Conclusion and Recommendations

The study examined effect of domestic and foreign investment inflows on stock market returns in Nigeria. The study concluded that domestic portfolio investment led to increase in stock market return in Nigeria, during

period of economic recession in both short and long run. This indicates that that as improved domestic portfolio investment resulted in increase in stock market returns. Furthermore, the study concluded that foreign portfolio investment resulted in improved stock market return in Nigeria in both short and long run. This could mean that improved inflow of foreign portfolio investment led to increase in stock market returns performance. Therefore, the study recommended that effort should be made by market operators to hedge the NSE from exposure to economic crisis, through improved providing incentives that will mitigate the outflow of investments.

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