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FAVAR Analysis of Foreign Investment with Capital Market Predictors: Evidence on Nigerian and Selected African Stock Exchanges

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Abstract *Econometrically, we analyzed role of selected African stock exchanges in welcoming FDI inflows by estimating time-varying factor augmented vector auto-regression (FAVAR) model for 2006:Q1 to 2017:Q4. Our results support FDI being massively influenced by movements in two stock market predictors namely, stock market's size, that is, total market value of stock market's listed shares calculated by multiplying a stock market's shares listed by current market price of one share and stock market liquidity which is total value of traded shares relative to the size of the economy. By empirical inference, African stock exchanges exhibit inordinate turnover ratio and so these markets are exceedingly liquid. Particularly, transactions at stock exchange are significant indicators for foreign investors and total market value of listed shares in stock markets is linked positively with FDI inflow into Africa. The empirical finding is that viable African stock exchanges are attractive indicator of market concentration and high investment profile in Africa. The study so remarked the requisite to advance the stock exchange in order to boost funds accumulation for investment drive. Also, African governments should project and implement stock market-friendly procedures acceptable to maximize welfares of spillover effects of FDI.*

Key words Stock market transactions, FDI, FAVAR model, listed shares, liquidity, Nigeria

JEL Codes: F46, D20, G26

1. Introduction

There are twenty-nine stock exchanges in Africa, representing thirty-eight nations' capital markets. Africa has two regional stock exchanges namely, Bourse Régionale des Valeurs Mobilières (BRVM) situated in Abidjan, Cote d'Ivoire; and Bourse Régionale des Valeurs Mobilières d'Afrique Centrale (BVMAC) situated in Libreville, Gabon. The BRVM provides services for Benin, Burkina Faso, Guinea Bissau, Cote d'Ivoire, Mali, Niger, Senegal and Togo. Also, BVMAC serves the Central African Republic, Chad, Congo, Equatorial Guinea and Gabon. Twenty-one of the twenty-nine stock exchanges in Africa are members of the African Securities Exchanges Association (ASEA).

Stock exchange is a pivotal cog of financial system of any country. Relatively, FDI is a structure of capital inflow and hence a framework for raising capital for economic development. Previous studies have had random problem of specific data series used to represent real activities of stock exchanges. Erstwhile researches have analyzed relationship between financial market development and FDI using orthodox methods. Most often, these methods drive indefinite and indecisive relationship especially when the random problem of specific data series used to epitomize real activities of stock exchanges has not be dealt with in addition to the fact that role of FDI in economic development has diverse faces.

Accordingly, precaution is taken in the present study to analyze FDI effect of stock exchange predictors by considering FAVAR model which incorporates voluminous time series that interrelate through a few dynamic factors. With FAVAR model, the researchers solves arbitrary problem of specific data series used to represent real activities of stock exchanges. This it does by addressing more than a few econometric issues including factor restrictions imposed on a typical VAR while simultaneously applying the restrictions on factor loadings. This makes the study econometrically illuminating and hence reliable. So, the study aimed at econometrically evaluating role of activities of JSE Limited (Johannesburg), Ghana Stock Exchange, Nairobi Securities Exchange and Nigerian Stock Exchange in attracting FDI inflows into Africa.

1.1. State of the Nigerian Capital Market and the Economy

Nigerian capital market at present gains stability and banks are investing for purpose of rolling money and earning profit (CBN, 2017). The core participants in the market are the NSE, stock brokers, SEC (regulatory), issuing houses, trustees, registrars etc. The investments in the market are done by the insurance companies, pension funds, institutional investors and the individual investors. Though, just like South African ad Ghanaian capital markets, Nigeria capital market is thriving and the country is experiencing some public offers by the banks such as Zenith Bank, the NSE's market capitalization is smaller than GDP. Market capitalization as ratio of Nigeria's GDP provides measure of magnitude of the stock market in the country; hence, it ought to be closer to the country's GDP or as in case of Johannesburg where it is 239% exceeds GDP (World Atlas, 2016).

Nigerian nation scarcely produces but imports with high propensity, as the demand for import rises, the more naira devalues and soonest naira would exchange at N1000 to USD. So, economy that does not produce but only consumes barely survive economic stagnation. Nigeria's market capitalization accounted for 10.5% of GDP in December 2015. This declined to 9.1% in December, 2016. It was high in December 2007 when it recorded 30.9% of the country's GDP (NBS, 2017). The turnover ratio of Nigeria stock exchange was 14.4% in 2016 while All Share closed at 36,680.3 points in Oct 2017 (NBS, 2017).

For example, with 2014 statistical rebasing exercise, Nigeria became the largest economy in Africa, with GDP of 502 billion USD in 2013. The country recorded real growth rates of 6.56 percent and 6.18 percent in Q1 and Q2, 2013, respectively (AfDB, 2013). This was short of the 6.63 percent and 6.66 percent projected for the periods by the country's NBS. Evidently, in 2015, Nigerian economy came to be defined by recession and devaluation vis-a-vis the US dollar (Umoru and Akhabue, 2017). Given that Nigeria has monocultural economy and the commodity in question is oil, the revenue generating process of the country became truncated when oil price in international market started dwindling.

The consequence is devaluation which exacerbates inflationary tendency in the country. In Nigeria today, inflation is double digit, about 16.15 percent as at October, 2017 and inflation erodes value of money. As a matter of fact, in Nigeria, inflation and unemployment are rising but GDP is retarding. A possible explanation is lower-than-expected oil output occasioned by oil theft, and pipeline vandalism. For example, in 2015, oil sector recorded an average daily production of 2.11 (mbpd) in Q2 of 2015 as against 2.29 (mbpd) in the Q1. The government's excessive dependence on oil, which brings in more than ninety percent of export earnings, has indeed exposed the economy to foremost risks amidst diminishing oil prices. Strikingly, Nigeria has been staggered by derisory power supply, scarce infrastructure, delays in the passage of legislative reforms, restricting trade policies, ubiquitous corruption, inconsistent economic policy regulatory environment and insecurity.

Though, fiscal and monetary authorities have marginally responded in curbing corruption and deficit funding and also positive dynamics in the agricultural sector have to an extent helped the economy recover and exit recession. However, the recovery is becoming feeble and is almost being disrupted by a military conflict in Niger Delta region coupled with fact that structural changes that are needed to advance an efficient private sector notwithstanding recent reforms have not materialized.

2. Literature review

The association between stock exchanges and FDI flows have been confirmed in bountiful studies such as OECD (2000), Haussmann and Fernandez-Arias (2000), Mauro (2000), Krkoska (2001), Masih *et al.* (2002), Claessens *et al.* (2002), Baker *et al.* (2009), Naceur *et al.* (2007), Shahbaz *et al.* (2008), Chousa *et al.* (2008), Adam and Tweneboah (2009), Kalim (2009), Al Nasser and Soydemir (2010), Raza *et al.* (2012) etc.

Haussmann and Fernandez-Arias (2000) emphasized FDI as a substitute for stock exchange development. Hence, FDI adversely affect stock exchange development. OECD (2000) and Mauro (2000) established that stock market is a stable factor of investment growth in unindustrialized economies. Krkoska (2001) found a bidirectional causal relationship between FDI and stock exchange development in developing countries. To Masih *et al*. (2002), growth in capital markets is a significant determinant of investment outflows from countries to abroad. Claessens *et al.* (2002) found that FDI had a stronger positive relationship with higher levels of stock market development. According to and Asiedu (2002), stock exchange induces additional investment by funding industrious projects that lead to allocate investment proficiency. This is corroborated by Paudel (2005) who opines that stock markets, due to their liquidity, enable firms to acquire capital quickly, hence facilitating capital allocation and investment.

In his study, Robert (2008) found FDI flows to depend on movement at stock exchange in host and source countries. Baker, Foley and Wurgler (2009) found that FDI is positively correlated with movements on the source-country's stock markets. This has been upheld by Al Nasser and Soydemir (2010). Succinctly, some studies namely, Adam and Tweneboah (2009), Kalim (2009), Raza *et al*. (2012) have remarked that FDI and stock market are complementary not substitute opposing the view, Haussmann and Fernandez-Arias (2000).

3. Methodology of research

3.1. Non-Random Walk Theory, Model and Methodology

The study is rooted on non-random walk financial theory of Lo and Mackinlay (2002) asserting that stock market prices are predictable based on consideration that prices move in trends and hence analysis of past prices can be used to forecast future price trend in a manner of behavioral financial study. So, investors should invest because the market is anticipatable to a point. Going further, theory upholds bidirectional link between FDI and the capital market and that growth in stock exchange is an indication of market vitality and favourable investment climate for FDI inflow.

The study adopts the time varying FAVAR methodology which combines the standard structural VAR analysis with factor analysis for large data. The choice of the FAVAR methodology derived from the fact that it addresses the simultaneity effect of FDI and the stock market.

3.2. FAVAR Model & Methodology

Following Bernanke *et al.* (2005), we specify in matrix format, the following FAVAR model:

$$\begin{bmatrix} M_t \\ Z_t \end{bmatrix} = \begin{bmatrix} \Phi(L) & 0 \\ \Lambda\Phi(L) & D(L) \end{bmatrix} \begin{bmatrix} M_{t-1} \\ Z_{t-1} \end{bmatrix} + \begin{bmatrix} e_t^M \\ e_t^Z \end{bmatrix} \tag{1}$$

where M_t is an (r x 1) vector of unobserved common factors with r < n, Z_t is an (n x 1) vector of stationary variables which include total market value of stock market's listed shares, total value traded and FDI flows, Λ is an (n x r) matrix of the loading coefficients, D(L) is an (n x n) lag polynomial of order *p* and Φ(L) is an (r x r) matrix lag polynomial of order *q*.

The e_t is an (n x 1) vector of idiosyncratic disturbances, and μ_t is an (r x 1) vector of the disturbances driving the common factors.

$$\begin{bmatrix} e_t^Z \\ e_t^Y \end{bmatrix} = \begin{bmatrix} I \\ \Lambda \end{bmatrix} \mu_t + \begin{bmatrix} 0 \\ \upsilon_t \end{bmatrix} \tag{2}$$

The covariance matrix is given by:

$$E(e_t e_t^{'}) = \begin{bmatrix} \sum_\mu & \sum_\mu \Lambda^{'} \\ \Lambda \sum_\mu & \Lambda \sum_\mu \Lambda^{'} + \sum_\upsilon \end{bmatrix} \tag{3}$$

Where,

$$\sum_\mu = E(\mu_t \mu_t^{'})$$
$$\sum_\mu = E(\upsilon_t \upsilon_t^{'})$$

The factor-augmented vector moving average (FAVMA) representation for Z_t is derived by inverting the FAVAR representation in equations (1) and (2) for current and lagged values of μ_t and υ_t :

$$Z_t = \psi^j(L)\mu_{jt} + A(L)\upsilon_{Zt} \tag{4}$$

Where

$$A(L) = [1 - D(L)L]^{-1}$$
$$\psi^j(L) = [1 - D(L)L]^{-1} \Lambda [1 - \Phi(L)L]^{-1}$$

Given that each variable in Z_t is affected only by its own idiosyncratic shock, all other idiosyncratic shocks will not have any effect across horizons. The structural impulse response coefficients *Zj* and Ψ_j are defined from:

$$\psi^{Z}(L)=\sum_{f=0}^{\infty}\psi_{f}^{Z}L^{f}=[I-D(L)L]$$

$$\psi^{J}(L)=\sum_{f=0}^{\infty}\psi_{f}^{J}L^{J}=[I-D(L)L]^{-1}\lambda(L)[I-\Gamma_{1}L]^{-1}\Gamma_{0} \tag{5}$$

The contemporaneous response of Z_t to common shocks is given by:

$$\psi_{0}^{J}=\Lambda_{0}\Gamma_{0}=\begin{pmatrix}\lambda_{0,1,1}\,\lambda_{0,1,2}\,\cdots & \lambda_{0,1,q}\\ \lambda_{0,q,1}\;\;\lambda_{0,q,1}\cdots & \lambda_{0,q,q}\\ \lambda_{0,N,1}\;\;\lambda_{0,N,2}\cdots & \lambda_{0,N,q}\end{pmatrix}\begin{pmatrix}\Gamma_{0,1,1} & \cdots\;\Gamma_{0,1,q}\\ \Gamma_{0,q,1} & \cdots\;\Gamma_{0,q,q}\end{pmatrix} \tag{6}$$

The entry is contemporaneous effect of factor *k* on series *i,* and the *(k; j)* entry of is effect of j[th] common shock on factor k. In general, will not be an identity matrix. Matrix of factor loading is represented as:

$$\Lambda=\begin{pmatrix}\Lambda_{1}\\ \Lambda_{1}\\ \Lambda_{1}\end{pmatrix},J_{t}=\begin{pmatrix}j_{t}\\ j_{t-1}\\ j_{t-\max(h,s)}\end{pmatrix},\Phi_{J}=\begin{pmatrix}\Gamma_{1} & \Gamma_{2} & \ldots\;\Gamma_{0}\\ I_{q} & 0\ldots & 0\\ 0 & I_{q}\;\ldots & 0\end{pmatrix},\Lambda_{i}=\left(\Lambda_{i0,}\,\Lambda_{i1},\ldots,\Lambda_{is}\right) \tag{7}$$

In effect, the reduced form errors are themselves linear combinations of structural shocks and vector of reduced form common shocks. So,

$$z_{it}=[1-\delta_{i}(L)L]Z_{it} \quad \text{and} \tag{8}$$

$$J_{t}=\Phi_{j}J_{t-1}+e_{jt};\; e_{Jt}=Ge_{jt}$$

The FAVAR model requires an operational identification to give economic interpretations of factor disturbance, μ_t. Hence, factor disturbances are linked to underlying structural shocks, denoted as ε_{jt} in equation (9). Since common shocks are unorthogonalized and mutually correlated, we seek a matrix *W* such that:

$$\varepsilon_{jt}=W\mu_{jt} \tag{9}$$

Where *W* an invertible (r x r) matrix, and vector of the structural shocks ε_{jt} has a mean of zero and an identity covariance matrix of which $E(\varepsilon_{t}\varepsilon_{t}^{'})=I$. The identification of structural shocks ε_t amounts to an estimation of elements in *W* with adequate restrictions. Given the orthogonal condition, the time-varying FAVAR model of Z_t in structural shocks form is:

$$Z_{t}=\psi^{j}(L)\varepsilon_{jt}+\psi^{Z}(L)\varepsilon_{Zt} \tag{10}$$

Upon achieving identification, equation (10) can be utilized to examine what extent the variables in Z_t respond to the shocks ε_t and Ψ over time by means of impulse response and variance decomposition analysis. The empirical version of equation (10) can be specifies as:

$$Z_{ts}=\beta_{yy.s}(L)Z_{t-1,s}+\sum\beta Z_{j,s,k}(L)\varepsilon_{jkt}+\mu_{yt,s} \tag{11}$$

Where $\beta's$ are the *q* principal components of *N* residuals with the estimated contemporaneous response to the *q* unorthogonalized shocks given as:

$$A_{j0}=\begin{pmatrix}\delta_{yj,0,1,1}\,\delta_{yj,0,1,2}\;\cdots & \delta_{yj,0,1,q}\\ \delta_{yj,0,q,1}\;\;\delta_{yj,0,2,q}\cdots & \delta_{yj,0,q,q}\end{pmatrix}$$

By construction, the method achieves exact identification using the Wold instrumental ordering of the *q* variables by imposing causal structure through the ordering of variables. Using block ordering method, we categorized our data into *q* blocks as in Z = [Z_1, Z_2, Z_3, …, Z_q] such that data organized into *q* blocks so that the block lower-triangular exclusion restriction is obtained:

$$\varepsilon_{jt}^0 = \begin{pmatrix} \phi_{11}^0 & \phi_{12}^0 & \cdots & \phi_{1N}^0 \\ \phi_{11}^0 & \phi_{22}^0 & \cdots & \phi_{2N}^0 \\ \phi_{q1}^0 & \phi_{q2}^0 & \cdots & \phi_{qN}^0 \end{pmatrix} \begin{pmatrix} \varepsilon_{Z_{1t}} \\ \varepsilon_{Z_{1t}} \\ \varepsilon_{Z_{1t}} \end{pmatrix}$$

The identification status was achieved through estimation of *W* by imposing Wold instrumental ordering on blocks of variables through the relationship $P^*(0) = \Lambda W^{-1}$

Empirical methodology adopted is ADF test was applied to estimate unit root coefficient based on equation (12):

$$\Delta c_t = h_1 + h_2 t + \Im c_{t-1} + h_i \sum_{t=1}^{m} \Delta c_{t-1} + \varepsilon_t \qquad (12)$$

$$\Delta c_{t-1} = (c_{t-1} - c_{t-2}),\ \Delta c_{t-2} = (c_{t-2} - c_{t-3}) \qquad (13)$$

Where c_t is a time series, it is a linear time trend; *Δ* is the first difference operator, $\Im_t$ is the trend, *m* is the optimum number of lags in *c* and ε_t is the random error term. These tests determine whether the estimate of $\Im$ is equal to zero on basis of if calculate-ratio (value) of coefficient $\Im$ is less than τ critical value from ADF table, then *c* is said to be stationary.

The study tested for co-integration using the Johansen's technique. This entails testing for incidence or otherwise of long-run stability between series of same order of integration through co-integration equation. Methodologically, if c_t is a vector of *n* stochastic variables, then there exists an *m*-lag vector auto-regression in order of *m* given by:

$$c_t = o_t + \Delta_1 c_{t-1} + \ldots + \Delta_m c_{t-i} + \varepsilon_t \qquad (14)$$

Where c_t is an nx1 vector of variables that are integrated of order one. This *VAR* can be written as:

$$\Delta c_t = o_t + \delta c_{t-1}[\sum_{i=1}^{m} D_i - \mathrm{I}] + \sum_{i=1}^{m-1} \Gamma_i \Delta c_{t-i} + \varepsilon_t \qquad (15)$$

$$\Gamma_i = -\sum_{j=i+1}^{m} D_j$$

The study utilizes Johansen and Juselius (1990) trace and maximum Eigen value tests. The trace statistic is given as:

$$J_{trace}(r) = -n \sum Ln(1-\zeta) \qquad (16)$$

Where *n* is number of sample observations and ζ 's are estimated Eigen value from the matrix. The maximum Eigen value test (ζ max) is given by:

$$J_{\max}(r, r+1) = -nLn(1-\zeta_{r+1}) \qquad (17)$$

The test upholds *r* co-integrating vectors against *r + 1* co integrating vector.

3.3. Data Description and Sources

The study uses quarterly data on FDI stock (fdi) and stock market size (skz) and liquidity (lqt) for Nigeria, South Africa, Ghana and Kenya over the period of 2006:Q1 to 2017:Q4. We calculated FDI stock via value adjustment using market prices of quoted stocks. Data on capital market predictors were obtained from publications of World Bank.

4. Estimation Results and Analysis

4.1. Stationarity Results

The results in Table 1 show that none of the variables was an I(0) variable but rather I(1). Table 1 shows the results from the Augmented Dickey-Fuller unit root test. We determined our lag length using AIC. Critical view of test results shows that null hypothesis of unit root is acceptable for all the variables in our study.

Table 1. Test Results

Variables	τ_{ADF}	$\tau_{ADF}(\Delta)$	*Remarks*
fdi	-2.823	-5.698	*I(1)*
lqt	-3.656	-4.853	*I(1)*
skz	-2.089	-7.264	*I(1)*

4.2. Co-integration Results

Table 2 shows the results from the co-integration tests with p-values (From Table 2), the rank of Π is an evidence for co-integration between stock market variables and FDI. Both trace and max tests reject the null of zero co-integrating vectors. The proposition of one co-integrating vector cannot be rejected. Established uniquely on trace and max evidence, there exists one co-integrating vector.

Table 2. Test Results

Null Hypothesis	J_{trace} (r)	J_{max} (r, r+1)
r = 0	*139.042* *(0.000)*	*147.359* *(0.042)*
r = 1	*84.341* *(0.001)*	*128.560* *(0.000)*
r = 2	*52.340* *(0.061)*	*76.291* *(0.084)*
r = 3	*39.527* *(0.245)*	*56.639* *(0.025)*

Going further on econometric practice, we tested whether observed co-integrating vector fulfils any of the co-integration restrictions to permit an intercept in the co-integrating relationship and not deterministic trend in our data. The results are in Table 3 and the p-values. According to these results, the restriction that δ' = (0 1) is rejected while the restriction δ ' = (1 0) is acceptable.

Table 3. Results on Co-integrating Vector

Restriction	Test statistic
δ ' = (0 1)	*12.492* *(0.000)*
δ ' = (1 0)	*0.572* *(0.834)*

The inference from the analysis is that observed outcome of a co-integrating vector does not advance empirical support for co-integration between FDI and stock exchange market (SEM) predictors. Somewhat, empirical evidence highlights FDI and SEM predictors has been integrated of diverse orders. This extensively eases our risk of spuriously inferring that near-integrated variables were co-integrated.

4.3. FAVAR Results

Table 4 reports the fractions of the variation explained by the four principal components. The first *PC* accounts for about 79.6% of total variation and about 40% of variation in the individual country's FDI. The second *PC* explains only 10.8% of total variation in block 1.

In block 2 of regional total market value of listed shares (TMVLS), about 50% of total variation is attributable to *PC1*. In Nigeria, *PC1* accounts for 36% of variation in TMVLS while *PC1* and *PC2* contributed only 6% and 9% respectively. In Ghana and South Africa, first and third *PC* is most influential determinants of FDI.

Table 4. Principal Components Results Analysis

Variables	PC_1	PC_2	PC_3	PC_4
fdi				
Eigenval	79.60	0.25	0.06	0.56
Prop	0.98	0.38	0.08	0.18
Cum Prop	0.92	0.12	0.02	0.12
NGR_fdi	0.56	0.36	0.86	0.16
SFA_fdi	0.74	0.14	0.24	0.04
GHN_fdi	0.59	0.22	0.69	0.39
KYA_fdi	0.58	0.48	0.27	0.28
Variables	PC_1	PC_2	PC_3	PC_4
skz				
Eigenval	45.60	2.63	0.26	0.06
Prop	0.38	0.15	0.28	0.08
Cum Prop	0.32	0.42	0.42	0.02
NGR_skz	0.36	0.23	0.16	0.09
SFA_skz	0.34	0.04	0.25	0.03
GHN_skz	0.79	0.52	0.39	0.00
KYA_skz	0.28	0.12	0.30	0.58
Variables	PC_1	PC_2	PC_3	PC_4
lqt				
Eigenval	94.36	0.76	0.51	0.92
Prop	0.65	0.02	0.40	0.08
Cum Prop	0.72	0.22	0.50	0.82
NGR_lqt	0.82	0.05	0.06	0.06
SFA_lqt	0.74	0.00	0.04	0.03
GHN_lqt	0.99	0.02	0.09	0.00
KYA_lqt	0.96	0.02	0.30	0.03

In block 3, first PC contributed about 96% of total value traded in stock exchange market (SEM) as measured by turnover ratio. So, market value of listed shares causes inflows to rise in African stock markets. FDI initially increases following a positive shock to total value traded in stock market and begins to decrease after the fourth quarter. Though, shocks to TMVLS causes inflow to rise immediately, while the effects are somewhat mixed as the forecast horizon increases. In variance decomposition analysis, shock to regional liquidity, that is, total value traded in stock markets was the main cause of short-run movements in FDI.

Table 5. Results of Common Factors

r =1	0.05	0.03	-0.10	0.07
r = 2	0.09	-0.12	-0.14	-0.12
r = 3	0.48	-0.56	-0.29	-0.25
r = 4	0.56	-0.72	-0.78	-0.18
r = 5	0.35	-0.43	-0.23	-0.09
r = 6	0.67	-0.28	-0.32	-0.21
r = 7	0.29	-0.15	-0.52	-0.43
r = 8	0.341	-0.73	-0.03	0.59
r = 9	0.57	-0.19	-0.67	0.72
r = 10	0.46	-0.63	-0.72	0.27

Table 6 present the forecast error variance decompositions with one-standard errors generated by bootstrap replications. In panel 1, shock to liquidity as measured by total value traded in stock exchange is mostly remarkable predictor of FDI inflows accounting for more than 62% of the fluctuation inflow of FDI across the African nations at the contemporaneous horizon.

As forecasting horizon increases, shock to total market value of listed shares increases in all countries. For South Africa, shock to value traded account for an enormous proportion of the variation in FDI inflows. The panel 2 shows that shock to total value traded accounts for the bulk of short-run variations in the FDI inflows in Nigeria. In Nigeria, Kenya and Ghana, the idiosyncratic shock contributes significantly to the forecast error variance of FDI inflow. In the forecast error variance of Table 7, shock to liquidity in the stock markets is most significant that explains the forecast error variance of FDI inflow in all the countries. The shock to liquidity was also significant in explaining variation in FDI inflow for every other country.

In Table 8, liquidity shock contributed enormously to variation in FDI inflow. Precisely, idiosyncratic shock explains between 48% and 69% of the contemporaneous variation in FDI across countries. In sum, shocks to TMVLS and total value traded in the stock exchange explain a large percentage of variability in FDI for all countries. The idiosyncratic shocks manifestation implies heterogeneity in stock market transactions of various countries in the study.

Table 6. Forecast Error Variance Decomposition at Contemporaneous Horizon

Variables	skz	lqt	ids
NGR_fdi	28.26 [17]	48.26 [12]	0.26 [19]
SFA_fdi	21.54 [12]	25.54 [10]	5.54 [12]
GHN_fdi	42.39 [13]	33.39 [05]	3.39 [13]
KYA_fdi	23.58 [12]	89.58 [02]	32.58 [10]
NGR_lqt	23.60 [17]	93.60 [27]	43.60 [17]
SFA_lqt	25.24 [20]	95.24 [20]	25.24 [10]
GHN_lqt	26.09 [18]	26.09 [26]	26.09 [16]
KYA_lqt	39.68 [14]	49.68 [26]	49.68 [12]
NGR_skz	12.36 [13]	24.36 [23]	20.36 [13]
SFA_skz	28.34 [12]	65.34 [06]	25.54 [15]
GHN_skz	26.79 [11]	46.79 [03]	22.69 [14]
KYA_skz	25.28 [06]	93.28 [29]	32.38 [19]

Table 7. Forecast Error Variance Decomposition at Four-Quarter Horizon

Variables	skz	lqt	ids
NGR_fdi	78.26 [17]	48.26 [12]	13.26 [03]
SFA_fdi	94.54 [12]	32.54 [10]	15.54 [02]
GHN_fdi	92.39 [13]	33.39 [05]	13.39 [03]
KYA_fdi	64.58 [12]	43.58 [02]	12.58 [12]
NGR_lqt	63.60 [17]	46.60 [27]	13.60 [07]
SFA_lqt	55.24 [20]	54.24 [20]	15.24 [03]
GHN_lqt	46.09 [12]	32.09 [26]	26.09 [16]
KYA_lqt	58.68 [17]	27.68 [16]	29.68 [10]
NGR_skz	31.36 [13]	34.36 [23]	10.36 [13]
SFA_skz	21.34 [16]	15.34 [06]	11.54 [04]
GHN_skz	46.79 [13]	36.79 [03]	11.69 [03]
KYA_skz	87.28 [29]	43.28 [29]	11.38 [09]

Table 8. Forecast Error Variance Decomposition at the Eight-Quarter Horizon

Variables	skz	lqt	ids
NGR_fdi	28.26 [17]	38.26 [12]	0.26 [09]
SFA_fdi	21.54 [12]	16.54 [10]	5.54 [02]
GHN_fdi	32.39 [13]	21.39 [05]	3.39 [03]
KYA_fdi	23.58 [12]	73.58 [06]	32.58 [12]
NGR_lqt	23.60 [17]	43.60 [27]	3.60 [17]
SFA_lqt	25.24 [20]	25.24 [20]	5.24 [10]
GHN_lqt	26.09 [16]	16.09 [26]	16.09 [16]
KYA_lqt	19.68 [16]	29.68 [26]	19.68 [09]
NGR_skz	12.36 [13]	24.36 [23]	10.36 [12]
SFA_skz	32.14 [16]	25.34 [06]	1.54 [16]
GHN_skz	43.79 [13]	26.79 [03]	1.69 [03]
KYA_skz	25.28 [29]	13.28 [29]	1.38 [09]

5. Conclusion and Empirical Findings

The study attempts to explore effects of stock market predictors in attracting FDI inflows in Nigerian and selected African stock markets. The results show that FDI is highly influenced by movements in two stock market variables namely, *stock market's size*, that is, TMVLS calculated by multiplying a stock market's shares listed by current market price of one share and *stock market liquidity* which is total value of traded shares relative to the size of the economy.

An in-depth implication is that the African stock markets exhibit inordinate turnover ratio and so these markets are exceedingly liquid. Particularly, transactions at African stock exchange are significant attractions for foreign investors and TMVLS in stock markets is linked positively with FDI inflow into Africa. The empirical finding is that a viable African stock market is an attractive indicator of market concentration and high investment profile in Africa.

By empirical deduction, a viable stock market is an attraction for foreign investors. Subsequently, to boost foreign investment in Nigerian and by extension in Africa, funds accumulation via development of stock exchange is imperative. Through this channel, developments in the stock exchange are transferred to investment decisions. Also, the government should project and implement stock market-friendly procedures satisfactory to maximize welfares of spillover effects of FDI.

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