

# **Interplay of Foreign Inflows, Financial Deepening and the Volatile Exchange Rate in Nigeria**

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## **Abstract**

*The study examined the interplay between foreign inflows, financial deepening and the exchange rate. Data were sourced from the International Monetary Fund and Central Bank of Nigeria database for the period 1980-2019; giving 40 observations. The variables used are foreign inflows, financial institutions index, financial market index and exchange rate volatility; and the vector error correction technique was employed to analyze the data. The unit root test reveal that all the variables were stationary at first difference; the VECM indicates that financial institutions index and Exchange rate volatility are negative but significant while financial market index is negative and insignificant. In the short run, foreign inflows congregates to a long run equilibrium track at an adjustment speed of -20.4920%. This implies that the Nigerian financial system is quite low in attracting investment inflows; and these inflows are in turn affected by volatility in the exchange rate. Overall, the study found strong support for exchange rate volatility and financial market index in explaining foreign inflows in Nigeria. Consequently, the study recommends that the Nigerian Central Bank should initiate policies on the effective management of the volatile exchange rate; and also bring in visible monetary policies that will ensure loans are obtainable and easily reached by private investors. In addition, the Securities and Exchange Commission should also offer variety of tailor-made products in the financial market that will encourage active trading by both foreign and domestic investors.*

**Keywords:** *Foreign Investment, Volatility, Financial system, Index, VECM.*

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## **I. Introduction**

All over the globe, countries try to attract foreign inflows in the form of direct and portfolio investments, with the expectation of new technologies, employment creation, global integration and productivity that will quicken promotion of growth in the economy (He and Sun, 2013). Foreign inflows involve investment into various sectors of a nation's economy by individuals or companies of another country, either through acquisition of a target company in the host country or by expansion of operations of an existing business. Hermes and Lensink (2003) argue that foreign inflows makes developing countries to benefit from transfer of new technology; and as such fosters the pace of growth and development of host countries as well as their innovative capability. With foreign inflows, economies tend to create new brands for themselves by means of providing trainings' for human capital improvement (Olulu-Briggs and Odi, 2011). Additional, foreign portfolio investments in shares bonds and money market instruments by foreigners also engenders stock market development. A look at the Nigerian Stock Exchange revealed that total foreign transactions increased by 30.62% from N47.52billion (about \$120.78million) to N62.07billion (about \$151.23million) between January and February 2021 (NSE, 2021; Nordea Financial Services, 2021)); while the UNCTAD world investment report (2020) shows that the total stock of FDI flows to Nigeria was estimated at USD 98.6 billion in 2019. This goes to prove that Nigeria is among the most promising poles of growth in Africa and attracts numerous investors from the USA, United Kingdom, China, France and the Netherlands. Hence, the activities of foreign investors triggers the supply of more financial and real assets in an economy. Thereafter new borrowers emerge, and the financial system develops further (Shaw, 1973). This helps to stimulates faster growth through higher investments (both from within the economy and foreign inflows), which will result to better standards of living.

The finding by Olulu-Briggs and Odi (2011) assert that preceding the financial growth of an economy to a significant extent attracts foreign outlays. This means that a financially deep economy can act as a vital source for the attraction of foreign inflows. Financial deepening occurs when a nation improves on its delivery of financial services to her citizens. The supply-led hypothesis of Mckinnon and Shaw (1973) view financial deepening as when banks and non-banking institutions in the financial environment engage in activities like the mobilization of savings, lend to the real sector to increase liquidity, promote economic efficiency as well as transfer productive activities from the urban to rural regions for better industrialization. In a recent study, Desbordes and Wei (2017) assert that the level of financial deepening plays a key role among host countries in

attracting foreign inflows because firms frequently rely on external sources of financing rather than internal to meet upfront fixed costs. To Islam, Liu, Khan, Reza, Yahia, and Nasrin (2018), financial deepening is when firms have access to funding of both capital assets requirements and raw materials for further production; when local suppliers are able to interact with financial mechanisms to encourage FDI; and when the financial system encourages local players to compete with FDIs by way of new innovations and research.

In another development, the question on stability of exchange rate remains a key aspect that shapes trade and investment. Kanu and Nwadiubu (2020) defined exchange rate volatility as the tendency by which foreign currencies appreciate or depreciate, thereby affecting the profitability of foreign exchange trades. This means that the constant fluctuations of the naira vis-à-vis the US dollar which affects profit in foreign exchange market can be seen as exchange rate volatility. Chang and Tan (2008) added that despite the type of regulatory framework adopted, exchange rate affects macroeconomic basics like industrial output, export, import, current account balance etc. Tamunonimim and Ibe (2013) also view exchange rate volatility as one of the key aspect of pricing policy that affects foreign inflows in the form of foreign direct and portfolio investments. The risk aversion theory supports that a volatile exchange rate decreases the inflow of foreign investments because it lowers the expected returns on investment (Goldberg and Kolstad, 1995). Thus, if firms are risk averse, they will have to postpone their investments or completely refuse to invest in such foreign markets (Campa, 1993). Osinubi and Amaghionyeodiwe (2009) in their study decried that the high uncertainties associated with the exchange rate in Nigeria has created a risky business environment and is the reason she is unable to attract sufficient foreign investments despite investments opportunities in mostly all of its sectors. On the other hand, if the exchange rate is stable, there will be improvement in economic activities relating to trade, capital and investment (Emerson, Aros, Italiane, and Reinchenback, 1992).

In the words of Asiedu (2003), the level of FDI attracted by Nigeria is relatively small when compared with the resource base and potential needs. This can be acclaimed to the level of financial deepening as the Nigeria financial system has not grown to the extent of accommodating the rising needs of liquid assets by investors and the unpredictable volatility of exchange rate (Osinubi and Amaghionyeodiwe (2009). Moreover, the Nigerian economy is practicing a managed float exchange rate system because its rate is volatile and so the central bank intervenes minimally by buying and selling currencies in order to help preserve a currency band and promote stability (CBN, 2021)

Most, previous studies have shown positive, negative and unclear relationships among the variables studied. Kanu and Nwadiubu (2020), Kalu and Anyanwaokoro (2020), Iwegbu and Nwaogwugwu (2019) and Aderemi (2019) found negative relationship whereas that of Usman and Adejare (2013) was positive. This gives inconsistency in the result. Still, based on reviewed literature, none of the researchers has focused on the interplay between foreign inflows, financial deepening and the volatile exchange rate in Nigeria. This gives a further justification for this study. Consequently, this study is poised to investigating this interaction using contemporaneous data on financial deepening index varying 1980 to 2019 from the International Monetary Fund statistic database (2021).

## **II. Literature Review**

### **2.1 Exchange rate volatility and foreign flows.**

As previously mentioned, most past literature on the subject matter have revealed negative, positive or ambiguous results; and so there are no clear-cut studies on the effect of exchange rate volatility on foreign inflows. (Osinubi and Amaghionyeodiwe, 2009). Dixit and Pindyck (2012) instituted the ‘irreversibility narrative’ that a negative relationship exist between exchange rate volatility and foreign inflows because foreign investments experience ‘uncertain streams of incomes’ in the face of volatility. Hence, irreversible investment decisions needs time to acquire additional information about the project before embarking on it. Foad (2005) also believed in the irreversibility literature and put forward that a country with high exchange rate volatility will lose its inflows to countries with a more stable one. Chen, Rau, and Lin (2006) employed the real options model and found that a volatile exchange rate deter outward FDIs of Taiwanese firms into China. Qamruzzaman, Karim, and Wei (2019) utilized quarterly data in the Bangladesh economy and found that the appreciation of exchange rate decreases FDI inflows and results to more negative shocks. Olulu-Briggs and Sunday (2021) adopted the gravity model and the Madura & Fox approach in a 38 years sample period and found that exchange rate volatility is negative and insignificant; and as such affect trade flows. Kanu and Nwadiubu (2020) found inverse relationship between import, export and exchange rate; presence of volatility clusterings’ and shocks due to fluctuations. Aderemi (2019) establish that foreign direct investment has significant but negative relationship with a volatile exchange rate. Abba and Zhang (2012) found significant negative effect of exchange rate volatility on economic growth and trade flows among sub-Saharan African countries. Ibikunle and Akhanolu (2011) saw an inverse and statistical insignificant relationship between aggregate trade and volatility of exchange rate in Nigeria. Nwinee and Olulu-Briggs (2016) reveal that changes in real effective exchange rate negatively affect investments and international trade. Also, a rise in exchange rate

affects capital flows negatively which may lead to a suboptimal stock market performance. Pain and Van Welsun (2003) is of the view that a volatile exchange rate has a long-lasting impact on FDI flows. Vita and Abbott (2007) strongly confirm that FDI flows into the UK is negatively impacted by exchange rate volatility, regardless of the sector in which the investment is situated. Schmidt and Broll (2009) reveal that higher foreign inflows is the reason exchange rates are volatile in host countries. Sharifi-Renani and Mirfatah (2012) undertook the exchange rate volatility and FDI study in Iran and recommend for better exchange rate policies to promote its stability and attract more FDIs. Wang (2013) studied on the BRIC economies using the ARDL model and found a negative long-run relationship between foreign direct investment and exchange rate volatility in Russia and India.

A positive relationship between exchange rate volatility and foreign inflows is in support of the fact that FDIs are export substituting. This means that multinational companies source their raw materials locally in volatile periods in order to avoid currency risks associated with exports (Markusen, 1995; Stokman and Vlar, 1996). Usman and Adejare (2013) prove that exchange rate volatility has a positive and statistical significant relationship with the GDP. Bilawal, Ibrahim, Abbas, Shuaib, Ahmed, Hussain, and Fatima (2014) found a 67% positive significant relationship between Exchange rate uncertainties and Foreign Direct Investment. Waziri, Nor, Mukhtar and Mukhtar (2017) opine that exchange rate impact positively on the exportation of agricultural raw materials and economic growth in Nigeria.

Chaudhary, Shah, and Bagram (2012) employed the GARCH model on Asian countries and found mixed results. However, for most of the countries, no relationship was found between exchange rate volatility and FDIs.

## **2.2 Financial deepening and foreign flows**

A wide literature also exist between financial deepening and foreign inflows. The results have shown either significant or uncertain results. Fry (1980) drew a pooled series of 7 less developed Asian nations and provide strong evidence that a financial developed nations would ordinarily attract foreign inflows. Ndebbio (2004) conducted a cross-country regression for 34 Sub Saharan African countries and confirmed the existence of a shallow financial depth. It recommends for improved policies towards growing real money balances and the exclusion of certain restraints on financial development so that the quantity of investments is improved. Di Giovanni (2005) reveal that the size of the financial market shows how deep that country is and this helps to stimulate international M&A flows by domestic firms who intend to invest abroad. Baharumshah and Almasaied (2009) established that financial deepening significantly affect economic growth. They suggest that the Malaysian government should encourage foreign investment to trigger growth. Nzotta and Okereke (2009) prove that over their 22 sample years, financial deepening index is low in Nigeria; which may retard growth. Odhiambo (2011) explored the relationship between financial deepening, foreign capital inflows and economic growth in Tanzania; and found a bidirectional link between financial deepening and foreign flows. Nwinee and Olulu-Briggs (2016) argue that GDP's response to negative shocks from FDI is because banks are unable to lend to the private sector. Trabelsi and Cherif (2017) opine that for a developing country to have financial depth and attract foreign inflows, the institutional environment and private sector must be strengthened. Islam *et al* (2018) utilized the IMF financial deepening index and argue that, in the case of China, there exist only a positive but insignificant short run relationship between growth, financial deepening, FDI and innovation performance. Liu, Islam, Khan, Hossain, and Pervaiz (2020) employed the IMF financial deepening index to argue that though financial deepening has a substantial and positive influence on drawing foreign investments, a nation with an index below a threshold of 0.1803 are less attractive to foreign investors.

## **III. Methodology**

This explains the methods, techniques and the materials employed in conducting the research. The study adopted the *ex post facto* research design which gives no room for the alteration of collated data. Annual series were sourced from the statistical database of the reputable Central Bank of Nigeria and International Monetary Fund from period 1980 to 2019 in Nigeria. The reason for the long 40 years sample period was because power is greater with a bigger sample size. (Kothari and Warner, 2006). To calculate the volatility in exchange rate, the Görg and Wakelin (2001) method was adopted; which is, the standard deviation of the exchange rate. This is, the average log of monthly variations; that result to annual values (Osinubi and Amaghionyeodiwe, 2009). Furthermore, the IMF index on financial institutions and financial markets adopted by Liu *et al* (2020); was used to proxy for financial deepening (IMF, 2021).

In order to empirically analyse the data, the study carried out the following robust test to adequately provide results for the research questions as well as make better summaries: descriptive statistics, unit root test, Vector Error Correction Model and the VEC causality test. The reason for describing the data is to observe trends and how they have progressed overtime, along with deviations from mean values that may have reversed. Also, the unit root test establish whether the series are stationary or not. The VECM demonstrates if any long or

short run dynamics exist among the variables. Finally, the VEC causality displays the direction of movements that have occurred. Data on foreign inflows was also logged to create uniformity. In line with the specific objectives of the study, the functional model is presented thus:

$$\text{LnFIFL} = f(\text{FDP}_{\text{index}}, \text{EXRV}) \tag{1}$$

Where  $\text{FDP}_{\text{index}} = f(\text{financial institutions index (FID), financial market index (FMD)})$

Mathematically;

$$\text{LnFIFL} = \alpha_0 + \beta_1\text{FID} + \beta_2\text{FMD} + \beta_3\text{EXRV} \tag{2}$$

Econometrically;

$$\text{LnFIFL}_t = \alpha_0 + \beta_1\text{FID}_t + \beta_2\text{FMD}_t + \beta_3\text{EXRV}_t + U_t \tag{3}$$

Where, LnFIFL = Natural logarithm of foreign inflows, FDPindex = Financial Deepening index, FID = Financial Institutions index, FMD = Financial Markets index, EXRV = Exchange rate volatility,  $\beta_1, \beta_2$  and  $\beta_3$  = Estimation parameter,  $\beta_0$  = Constant parameter,  $U_t$  = Stochastic error term,  $\beta_1, \beta_2 > 0; \beta_3 < 0$

#### IV. Results and Discussion

**Table 4.1: Summary of Descriptive Statistics**

	LNFIPL	FID	FMD	EXRV
Mean	11.05507	0.205500	0.182750	-0.106411
Std. Dev.	2.898001	0.039933	0.046409	19.19978
Kurtosis	2.163138	1.517442	3.746284	14.29433
Jarque-Bera	4.466265	3.675473	1.735197	283.4516
Probability	0.107192	0.159177	0.419959	0.000000

*Source: E-views10 output*

Table 4.1 displays that the level of exchange rate volatility and foreign inflow vary significantly from their mean values when compared to others (financial institutions index and financial market index). This may be instituted by the ‘irreversibility narrative’ that a negative relationship exists between exchange rate volatility and foreign inflows because foreign investments experience ‘uncertain streams of incomes’ in the face of volatility (Dixit and Pindyck, 1994). Kurtosis was utilized to express the level of peakedness of the distribution. Foreign inflows and financial institutions were leptokurtic given that their values were less than 3; and financial market index and exchange rate volatility were platykurtic given that their values are greater than 3. The normality of the distribution is determined by the Jarque-Bera statistics; thus, all the variables were normally distributed except that of exchange rate volatility which has its value to be less than 5 per cent significant level.

**Table 4.2: Unit Root Test**

Variables	ADF Test Statistics	T-CRITICAL @ 5%	P-value	Order of Integration
LNFIPL	-5.421876	-2.943427	0.0000	I(1)
FID	-6.526167	-2.941145	0.0000	I(1)
FMD	-6.072994	-2.941145	0.0000	I(1)
EXRV	-7.468781	-2.941145	0.0000	I(1)

*Source: E-views10 output*

Table 4.2 displays the stationarity of all the variables at first difference at the 5% significant level; which is a requirement for the co-integration and error correction test.

In order to carry out the VECM, the number of cointegrating equations is determined which is then included in the VECM analysis. From the estimates, there exist only one cointegrating equation which is quite sufficient for the VECM analysis.

**Table 4.3: Vector Error Correction Model**

Vector Error Correction Estimates	
Standard errors in ( ) & t-statistics in [ ]	
Cointegrating Eq:	CointEq1
LNFIPL(-1)	1.000000
FID(-1)	-25752452
	(9818082)
	[-2.62296]

FMD(-1)	-15869905
	(8874836)
	[-1.78819]
EXRV(-1)	-168596.5
	(30831.9)
	[-5.46824]
C	7791791.
Error Correction:	D(FIFL)
CointEq1	-0.204920
	(0.10334)
	[-1.98297]

Source: E-views10 output

Table 4.3 shows that in the long run FID and EXRV were negatively related (-2.5752452 and -168596.5) and significant to LNFIFL with t-values of -2.62296 and -5.46824 respectively. However, FMD was negatively related (-15869905) and not significant to LNFIFL with t-values of -1.78819. In the periods of variations, in the short run, foreign inflows congregates to a long run equilibrium track at an adjustment speed of 20.4920%; significant at the 5% level of -1.98297.

#### 4.4 VEC Granger Casualty/Block Exogeneity Wald Test

The VEC Granger Casualty/Block Exogeneity Wald Test was used to determine the preceding effect and movements among the variables.

**Table 4.4: VEC Granger Casualty/Block Exogeneity Wald Test**

VEC Granger Causality/Block Exogeneity Wald Tests			
Dependent variable: D(LNFIFL)			
Excluded	Chi-sq	Df	Prob.
D(FID)	7.952835	2	0.0188
D(FMD)	16.07169	2	0.0003
D(EXRV)	8.251755	2	0.0161
All	29.56197	6	0.0000

Source: E-views10 output

Table 4.5 shows the result of the VEC Granger Casualty/Block Exogeneity Wald test. From the estimation, movements in financial institutions index, financial market index, and exchange rate volatility determines movements in foreign inflows. On the whole, all the variables have significant explanatory power for foreign inflows.

#### 4.5 Forecast Error of Volatility

For a detail analysis of the shock of each variable to foreign inflows, the study utilized the variance decomposition method.

**Table 4.5: Variance Decomposition Method**

Variance Decomposition of FIFL:					
Period	S.E.	LNFIFL	FID	FMD	EXRV
1	155506.9	100.0000	0.000000	0.000000	0.000000
2	239516.4	75.62530	0.132654	23.99409	0.247953
3	309401.8	75.89845	0.598735	21.67222	1.830603
4	360471.0	74.76351	0.983782	21.90986	2.342847
5	409256.9	74.48046	1.278190	21.41880	2.822541
6	455471.9	73.68121	1.504661	21.82540	2.988731
7	501423.8	73.03661	1.657163	22.16908	3.137152
8	546679.4	72.42536	1.744424	22.59487	3.235351
9	591755.6	71.94895	1.780204	22.94584	3.325006
10	636702.0	71.54482	1.780821	23.27599	3.398373

Source: E-views10 output

Table 4.5 shows that shock to foreign inflows in the 1<sup>st</sup> period was explained entirely by its own volatility. In the 2<sup>nd</sup> period sensitivity to foreign inflow was explained by 76%, 0.13%, 24%, and 0.25% of its volatility, financial institutions index, financial market index and exchange rate volatility respectively. Thus, more of the sensitivity to foreign inflows in exception of itself was explained by financial market index.

#### **4.6 Discussion of findings**

A major reason foreigners need the financial institutions of their host countries is because they want to secure external funding for their fixed cost (Desbordes and Wei, 2017). They need to be assured that the financial depth of a nation is strong enough to attract investment (Trabelsi and Cherif, 2017). However, if financial institutions have a low index or threshold, inflow of investments will also be low (Liu *et al.*, 2020). With low inflows, economic growth is somehow disrupted. Moreover, when such inflows are being affected by variations in exchange rate, then the return on investment will remain highly uncertain which will, in the long run, discourage further investments.

From the findings, financial institution index was negative but significant while financial market index was negative and insignificant. This is an indication that the Nigerian financial institutions is inadequate in its lending behaviour; and thus shallow in its allocation of scarce resources (Igwe, Edeh, and Ukpere, 2014). In addition, the Nigerian financial market is underdeveloped in terms of varied products and services which keeps her below the threshold to attract foreign inflows (Liu *et al.*, 2020). Thus, the Nigerian financial system has the tendency to retard growth (Nzotta and Okereke, 2009); and less capable of bringing in huge investments into the country (Chen *et al.*, 2006; Nwinee and Olulu-Briggs, 2016). In furtherance, exchange rate volatility has a negative but significant relationship with foreign inflows. Exchange rate volatility is an essential aspect for the determination of foreign inflows. Previous findings advocate that countries with significant fluctuations tend to affect foreign inflows adversely (Foad, 2005). This finding is in harmony with Dixit and Pindyck (1994) that a negative relationship exists between exchange rate volatility and foreign inflows. Thus, volatility deters inflows (Olulu-Briggs and Sunday, 2021). As such, most investors will take their investments to more stable economies.

#### **4.7 Limitations**

The limitation of this study is the use of financial market index and financial institutions index as proxy for financial deepening as other determinants were not emphasized. Thus, the ratio of broad money supply to gross domestic product and the ratio of credit to private sector to gross domestic product are other determinants of financial deepening. Hence, the plausibility of these variables can improve the understanding of foreign inflows.

### **V. Conclusion and Recommendation**

The study investigated the interplay of foreign inflows, financial deepening and the volatile exchange rate in Nigeria covering 1980-2019; embracing the Liu, *et al.* (2020) and Georg and Wakelin (2001) method. The variables utilized are foreign inflows, financial markets index, financial institutions index, and exchange rate volatility. The study found strong support for exchange rate volatility and financial market index in explaining foreign inflows in Nigeria. This implies that the Nigerian financial system is quite low in attracting investment inflows; and these inflows are in turn affected by a volatile exchange rate. Based on these results, the Nigerian government should initiate policies on the effective management of the volatile exchange rate; and also bring in visible monetary policies that will ensure loans are obtainable and easily reached by private investors. The Securities and Exchange Commission (SEC) should also offer variety of tailor-made products in the financial market that will encourage trading by both foreign and domestic investors.

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