Does Financial Deepening Matter in the Nexus between Exchange Rate Volatility and Foreign Investment? Insight from Nigeria

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Abstract

This study empirically explores the role of financial deepening in the nexus between exchange rate volatility and foreign investment in Nigeria from 1986Q1 to 2020Q4 using the Autoregressive Distributed Lag Cointegration procedure. Our result shows that exchange rate volatility stimulates foreign investment in the short run while it reduces foreign investment in long run. However, the combined effect of financial deepening and exchange rate volatility shows that financial deepening helps to alleviate the adverse effect of volatile exchange rate in the long run. This study suggests that the depth of the financial sector matters in easing the adverse effect of exchange rate volatility on foreign investment in the long run. Therefore, policymakers are encouraged to further strengthen the financial sector by introducing appropriate regulations and reforms to broaden the depth of the financial sector in order to boost the confidence of foreign investors in the economy.

Keywords: Exchange Rate Volatility; Financial Deepening; Foreign Investment; Nigeria
JEL Classification Codes: F31, F65, F21

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1. Introduction

The last three decades have witnessed an upsurge in cross-border investment as a result of a growing number of diverse multilateral and bilateral agreements, culminating in global and regional financial integration and trade. In an integrated economy of such, exchange rates assume a vital role in securing cross-border financial assets and investments. With the ongoing globalization and expansion in trade and capital flows, the exchange rate has evolved as a key indicator of the price competitiveness of economies in the economic policy arena (Gelman, Jochem, Reitz, and Taylor, 2014). Moreover, since the end of the Bretton Woods period of fixed exchange rates, the significance of exchange rates has improved in several ways. Flows of global trade and capital are reliant on currency valuation and susceptible to related volatility. The investor's decision to involve in cross-border investment is built in part on the existing state of foreign exchange markets and also on future prospects of these markets. Therefore, a possible constraint to foreign investment is exchange rate volatility which amplifies the risks of cross-border investments.

Scholars (Fowkes, Loewald and Marinkov, 2016; Hanusch, Nguyen and Algu, 2018) have argued that exchange rate volatility could be favorable to investors depending on the movement. Exchange rate that follows a random walk would probably move in a favorable way than in an adverse direction (Fowkes, Loewald and Marinkov, 2016). However, the uncertainties and shocks globally have escalated investors' risk aversity which has made foreign investors cautious of high exchange rate risk exposure. Moreover, a high degree of exchange rate volatility in a country creates a riskier stream of returns. Hence, given the partial irreversibility of investment, delaying investment is beneficial to obtain additional information. Considering that direct investments are limited in quantity, economies with high-level exchange rates risk will attract less investment than economies with more steady exchange rates (Foad, 2005). In Nigeria, the economy has been facing high exchange rate volatility over the years, particularly following the introduction of the economic liberalization policy in 1986. This high volatility in the exchange rate market, among other things, creates risky operating environs which may be ascribed to the rationale that Nigeria has not been able to draw investment inflow to its maximum potential despite the huge investment opportunities (Obi, 2016; Osinubi and Amaghioyeodiwe, 2009). This is perhaps because the economy is perceived by investors as a high-risk market for investment. Besides, investors perceived volatility in the exchange rate as an indicator of instability in the underlying economic fundamentals of a country (Breedon, Pétursson and Rose, 2012; Villers, 2015).

To this end, a plethora of studies have been conducted on the effect of exchange rate volatility on foreign investment in Nigeria (see, Amasoma, Nwosa and Fasoranti, 2015; Udoh and Egwaikhide, 2008; Osinubi and Amaghioyeodiwe, 2009). Nevertheless, there is still no undivided agreement amongst researchers on the slope of the link. For instance, some of the prevailing studies (Chowdhry and Wheeler, 2008; Amasoma et al., 2015) have shown a positive and significant influence of exchange rate volatility on foreign investment whereas other studies (see, Funyina, 2015; Ruzima and Boachie, 2018; Martins, 2015; Keneth, Muniu and Kosgei, 2017) found an adverse relationship between exchange rate volatility and foreign investment. Still, a number of studies have submitted that exchange rate volatility is not significant in influencing foreign investment (Osinubi and Amaghioyeodiwe, 2009). Despite the divergence in the theoretical and empirical views, the weight of evidence to date still tilts strongly in favour of the argument that exchange rate volatility could discourage the inflow of investment. However, a major gap in the earlier literature on Nigeria is the fact that they failed to take into account the role of financial deepening. Studies have demonstrated that the magnitude of the effect of volatile exchange rates on foreign investment largely depends on the

functioning of the financial system (Jehan and Hamid, 2017; Khraiche and Gaudette, 2013). The presumption is that a well-functioning financial system helps reduce the risk factor attached to volatility, and offers better hedging facilities to investors; hence, affords a healthier investment environment which in return boosts investment inflow of all types (Aghion et al. 2009). Countries with well-functioning financial system are in the best position to reap the benefits of these foreign investments and minimise the risk of exchange rate volatility; the more financially developed an economy is, the less adversely it is affected by exchange rate volatility (Aghion et al, 2009).

An overview of Nigeria's financial system has shown that the financial deepening of the country seems to be improving over the years but the question that is begging for an answer is that, is the level of financial deepening in the country enough to dampen the effect of exchange rate volatility? Using a ratio of domestic credit to the private sector as an indicator of financial deepening, Nigeria's domestic credit to the private sector was 18.83% in 2020. Though Nigeria's domestic credit to the private sector fluctuated substantially in recent years, it tended to increase through 1986-2020 period ending at 18.83% in 2020. But still fell below other African nations like Egypt's 27.10% and South Africa's 107.8% in 2020. This shows that even though there has been some improvement, the level of financial deepening in Nigeria is still low despite government efforts through various reforms. Besides, while a deeper financial system can help in reducing the detrimental effects of exchange rate volatility on foreign investment, a shallow financial system could propagate exchange rate volatility, hence, reducing foreign investment. A gap still exists as extant studies have yet to ascertain how exchange rate volatility and financial deepening interact to determine foreign investment in Nigeria. This is important as it may help in shaping policy options, given that the policymakers have been aiming at reducing the swing in the exchange rate and renewing investors' confidence in the country.

The remaining part of this article is sectionalised as follows. An overview of the exchange rate in Nigeria is presented in section 2, Section 3 discusses the theoretical issues and empirical evidence, Section 3 covers the theoretical and empirical evidence, and section 4 discusses the methodology. Results and discussion are presented in section 5, while section 7 reports the conclusion of the paper.

2. Exchange Rate Movement in Nigeria (1986 – 2020)

The liberalisation strategy of the exchange rate under the SAP structure presented the path to a flexible exchange rate system in Nigeria in 1986. Under this framework, foreign exchange rate management became liberalised and the exchange was permitted to be decided by the power of demand and supply. The selection of the flexible exchange rate system created noteworthy instability in the exchange rate of the Naira against the US dollar.

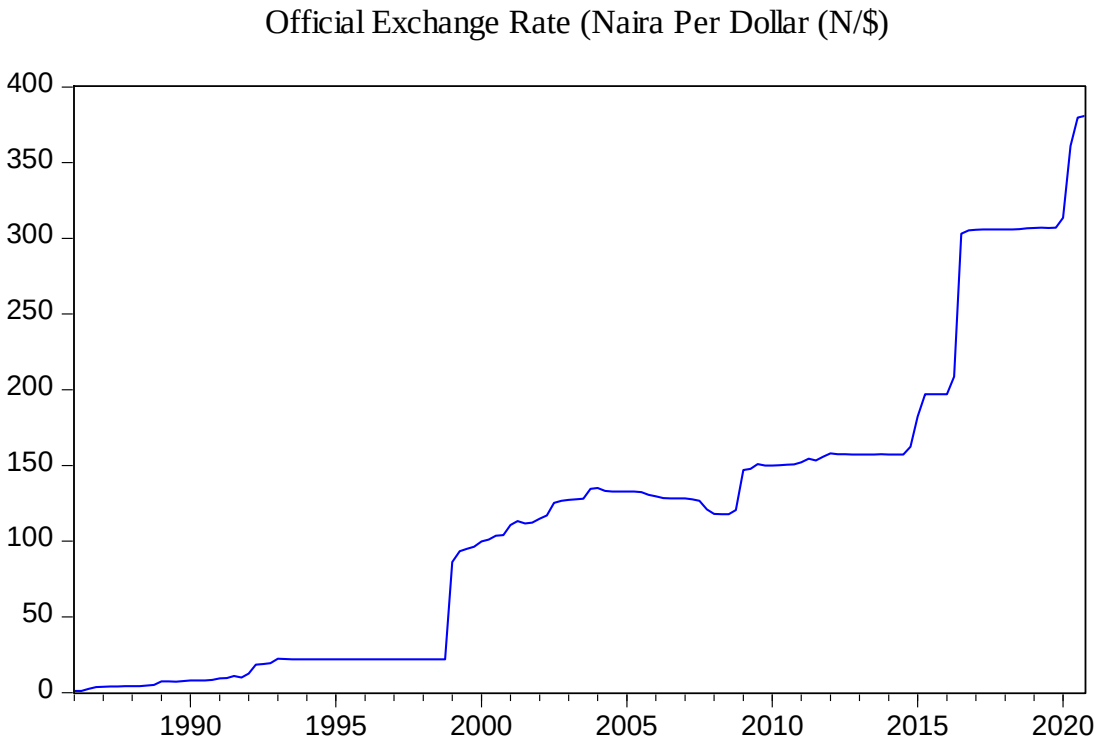

Figure 1: Official Exchange rate in Nigeria (1986–2020)
Source: Central Bank of Nigeria Statistical Bulletin (2020, Edition)

The official exchange rate of the Naira experienced considerable volatility from 1986 to 2020 as shown in Figure 1. The volatility in the official exchange rate is mostly positive depicting an exchange rate depreciation. In other word, the official exchange rate depreciated more times than that it appreciated between the period of 1986 and 2020. However, exchange rate was stable between the period of 1994 to 1998, in which the exchange rate was fixed at ₦21.89 to a US dollar. Also, there was relative stability in the exchange rate from 2017 to 2019 as it stood at an average of ₦306 to a US dollar at the official market. The relative stability appears to have been brought about by higher crude oil earnings and the Central Bank of Nigeria's increased dollar injections into the foreign exchange market. With the advent of COVID-19 pandemic in the last quarter of 2019, the exchange rate volatility rose sharply. This volatility in exchange rate movement is a recognized challenge facing the Nigerian economy, given that instability whether positive or negative raises risk, and this risk could dampen investors' confidence. Hence, it is not desirable for the economy.

3. Literature Review

3.1 Theoretical Review

Theoretically, there is a probable negative link between exchange rate volatility and foreign investment, due to the fact that foreign investors are uncertain about the benefits and cost of making investments that is irreversible or partially irreversible in the destination country (Dixit, 1989; Kohlhagen, 1977). The logic is that investors need compensation for the extra risks that exchange rate instabilities present when undertaking an investment. Higher exchange rate unpredictability reduces the certainty equivalent to expected exchange rate level, as detailed by Cushman (1988). Since certainty corresponding levels are applied in the anticipated profit functions of investors that make decision to invest at present for profit to be realised in the future times. If exchange rates are extremely volatile, the projected earnings of investment declined; thus, capital inflows decrease in destination country accordingly (Caporale, Ali, and

Spagnolo, 2015). Thus, according to the risk aversion approach, direct investment declines as exchange rate volatility rises. Accordingly, given that there is a limited prospective direct foreign investment, direct investment will flow from the countries with high level of exchange rate volatility into the countries with a more stable currency (Foad, 2005). Nevertheless, risk-aversion argument is more appropriate to short-run exchange rate volatility because firms are unlikely to be capable of adjusting factors in the short-run (Mackton, Odondo, Nyongesa, 2018). Also, with risk averse investors the ability to diversify risk is another probable determinant of the effect of volatility on investment decisions; deep financial system offers higher risk diversification opportunities and better hedging facilities to investors which helps reduce the risk factors attached to volatility (Serven, 2003). Thus, it decreases the detrimental impacts of volatility - such as that is associated with the relationship among exchange rate – investments. In other words, low financial deepening in the presence of high exchange rate volatility will aggravate the negative effect of volatility on investment flows while a country with well deepened financial system will have less adverse effect of the exchange rate volatility on the investments.

3.2 Brief Review of Empirical Literature

In the empirical literature, numerous studies have been conducted on this subject matter, however, existing studies are inconclusive. Caporale, Ali, and Spagnolo (2015) explored the impact of exchange rate risk on equity and bond flows for a number of industrialised countries including the euro area. The study showed that there exists a negative effect of volatility exchange rate on flows of equity in the United Kingdom, Sweden, and the European countries, nonetheless it has a direct impact in Australia. Furthermore, Funyina (2015) in his study examined how capital inflow reacts to exchange volatility in Zambia. The study applied monthly data which covers the duration between 1992- 2012 linking to foreign direct investment, exchange rate, foreign portfolio investment, and gross domestic product. The study illustrated that a significant negative relationship existed between the nominal exchange rate volatility and inflows of external capital into Zambia's economy (foreign direct investment and foreign portfolio investment). Ruzima and Boachie (2018) examined the impact of exchange rate volatility on private investment in the BRICS bloc. The result showed that volatility resulting from exchange rate volatility had a negative effect on private investment in both random and fixed effects as well as GMM estimations. Similarly, Martins (2015) by the means of the ARDL model opened that in the short run as well as the long run, real effective exchange rate volatility had a statistically significant and negative impact on FDI Inflows in Brazil. Keneth, Muniu, and Kosgei (2017) examined the short and long-run effects of exchange rate volatility on foreign direct investment in Kenya and found that exchange rate volatility had a negative effect on foreign direct investment.

In Nigeria, Osemene, and Arotiba, (2018) explored the influence of exchange rate volatility on foreign portfolio investment over the period of 2007 to 2016 in Nigeria. The findings showed that volatility in the official rate exercised a positive influence on foreign portfolio investment inflow into the country, meanwhile, volatility in the BDC revealed an adverse effect on foreign portfolio investment inflow. Similarly, Amasoma, Nwosa, and Fasoranti (2015) investigated the effect of exchange rate volatility and foreign capital inflow in Nigeria between 1981 and 2010. The findings revealed that exchange rate volatility had a deterministic and positive influence on direct foreign investment in the long run while it had a negative but insignificant effect on foreign direct investment in the short run in Nigeria. However, Udoh and Egwaikhide (2008) explored the effect of exchange rate volatility, inflation volatility, and other key macroeconomic variables on foreign direct investment in Nigeria over the period of 1970 - 2005. Using the GARCH model, their findings presented that inflation volatility and exchange

rate volatility negatively affect foreign direct investment in Nigeria. Aside from these mixed and inconclusive findings, studies have highlighted the important role of financial development in alleviating or amplifying the effect of exchange rate volatility on foreign direct investment.

Studies had demonstrated that the magnitude of influence volatility in exchange rate rests on the functioning of the financial system. A deep financial system offers higher risk diversification opportunities and better hedging facilities to investors which helps reduce the risk factors attached to volatility. The first empirical evidence provided by Serven (2003) established that exchange rate volatility adversely affects foreign investment in developing countries. However, the study further posited that the impact of exchange rate volatility on investment hinged on financial development and the extent of economic openness. Also, Khraiche and Gaudette, (2013), in their article titled foreign direct investment, exchange rate volatility and financial development. The findings of the study showed the relationship between exchange rate volatility and foreign investment in countries with lower financial development lean toward being significant and positive, however, the impact is not significant for economies with greater financial development.

In an attempt to investigate the role of financial development in the relationship between exchange rate volatility and capital inflow Jehan and Hamid (2017) evaluated the effect of exchange rate volatility on capital inflows headed for developing economies by including the role of financial development in covering the period of 1980–2013. By the means of the dynamic system GMM method of estimation, the results of the study showed that exchange rate volatility reduces inflows of both physical and financial capital headed for developing economies. Moreover, the indirect effect of the volatility of the exchange rate through the use of financial development, on the other hand, turned out positive and significant. The result of the study corroborated the study piloted by Serven (2003) who found that financial development moderates the negative effect of exchange rate volatility on foreign investment, whereas, the result is in contrast with the findings of Khraiche and Gaudette, (2013).

The assessment of the empirical studies is instructive and raises a few observations: First, controversies still surround the effect of exchange rate volatility and foreign investment. Additionally, it is observed that empirical literature on the role the financial deepening could play in the relationship between exchange rate volatility and foreign investment is scanty and the results of existing studies are inconclusive. Also, most of the extant literature adopted a panel data analysis which lumped together countries with different levels of exchange rate uncertainties and financial deepening. The relationships cannot be generalized across countries because economic policies pertaining to these variables tend to be country-specific. Hence, this study fills the gap in the existing studies by assessing the role of the financial deepening in the nexus between exchange rate volatility and foreign investment in Nigeria.

4. Methodology

Drawing from previous studies (Udoh and Egwaikhide 2008, Jehan et al, 2017), this study specifies a simple model that connects exchange rate volatility, financial deepening, and foreign investment as follows;

$$F_t = \delta + \theta OP_t + \tau EXR_t + \chi INF_t + \sigma Y_t + \psi FD_t + \vartheta h_t + u_t \quad (1)$$

Where F is foreign investment, OP is international oil price, EXR is real effective exchange rate, INF signifies inflation rate, Y stands for economic growth, FD represents financial deepening, h stands for exchange rate volatility, subscript t is time and μ represents the error

term. To capture the moderating effect of financial deepening in the nexus between exchange rate volatility and foreign investment. Equation (1) is adapted with the insertion of an interaction term between exchange rate volatility and financial deepening as follows:

$$F_t = \delta + \theta OP_t + \iota EXR_t + \chi INF_t + \sigma Y_t + \psi FD_t + \vartheta h_t + \alpha(h_t * FD_t) + u_t \quad (2)$$

From equation (2) FD * h represents the interactive term that plays a moderating role in the link between exchange rate volatility and foreign investment. From Equation 2, the apriori expectations of the variables are as follows; ϑ is expected to exert a negative effect on foreign investment, while ψ is anticipated to exert a positive influence on foreign investment if the financial sector is well deepened, whereas the weak financial sector is anticipated to have an insignificant or negative effect on foreign investment. With respect to the interaction term (α), a negative sign implies that a lower level of the financial sector combined with exchange rate volatility decreases foreign investment. On the other hand, a positive effect indicates that deepened financial sector helps to alleviate the adverse effect of exchange rate volatility on foreign investment. An insignificant effect of the interaction term (α) alludes that the financial sector plays no moderating role in the link.

Taking all the pertinent variables into consideration, the ARDL description of Equation 2 is stated thus:

$$\begin{aligned}\Delta F_t = {} & \kappa_0 + \kappa_1 F_{t-1} + \kappa_2 OP_{t-1} + \kappa_3 EXR_{t-1} + \kappa_4 INF_{t-1} + \kappa_5 Y_{t-1} + \kappa_6 FD_{t-1} + \kappa_7 h_{t-1} + \kappa_8 (h * FD)_{t-1} \\ & + \sum_{i=1}^{n} \eta_i \Delta F_{t-i} + \sum_{i=0}^{n} \theta_i \Delta OP_{t-i} + \sum_{i=0}^{n} \tau_i \Delta EXR_{t-i} + \sum_{i=0}^{n} \chi_i \Delta INF_{t-i} + \sum_{i=0}^{n} \sigma_i \Delta Y_{t-i} + \sum_{i=0}^{n} \psi_i \Delta FD_{t-i} \\ & + \sum_{i=0}^{n} \vartheta_i \Delta h_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta (h * FD)_{t-i} + u_t \end{aligned} \quad (3)$$

Where κ_0, Δ, and μ represent the drift parameter, difference operator and the error terms in that order. Also, κ_j (i = 1, 2..., 7) characterises the long-run components of the model, whereas the influences in the short-run are the coefficient estimates of the variables attached to the first difference sign, n signifies the maximum lags chosen automatically by means of the Akaike Information Criterion.

4.2 Data Description

In this study, quarterly data from 1986Q1 to 2020Q4 are employed. The description of the variables is presented in Table 1.

Table 1. Data Measurement and Sources

Variable	Variable	Source	Measurement
Foreign Investment (F)	Foreign Direct Investment	WDI	Foreign direct Investment, net inflow (% of GDP)
Exchange Rate Volatility (*h*)	Exchange rate	IFS	Generated using GARCH (1, 1).
Financial Deepening (FD)	Credit to the private sector	CBN	Private-sector credit (% of GDP)
Other Variables	Exchange Rate (EXR)	IFS	Real effective exchange rate
	International Oil Price (OP)	CBN	Brent crude oil price
	Inflation Rate (INF)	CBN	Inflation rate (%)
	Economic Growth (Y)	CBN	GDP at current price

Note: All variables are measured apart from inflation rate at the log level so as to minimize the scale effect

5. Results and Discussion

5.1. Preliminary Tests

Before proceeding to the examination of the role of financial deepening in the relationship between exchange rate volatility and foreign investment, the main characteristics of the variables are explored. The results of the descriptive statistics are reported in Table 2. The mean and median of the variables are very close. The mean and median values suggest a high consistency among the variables employed in the study. The values of standard deviation which measures the degree of stability/volatility of the variables indicate that the inflation rate is the most volatile among the variables. This shows evidence of macroeconomic instability in the country. The coefficients of skewness denote the variables positively. This hints that all the variables show elements of asymmetries in their data distributions, none is symmetrical in data distribution. Additionally, the kurtosis coefficients for FD, Y, and OP suggest that the variables are platykurtic relative to normal distribution. This is because their coefficients are less than 3. It implies that the data distribution is less converged around the mean than a normal distribution. Meanwhile, the kurtosis coefficients for F, INF, and EXR exceed the value of 3, which suggests that it is leptokurtic relative to normal. The indication of this is that the data distribution is more clustered around the mean than the normal distribution.

Table 2. Descriptive Statistics

	F	FD	EXR	Y	OP	INF
Mean	1.659	2.374	4.609	12.187	3.581	16.213
Median	1.450	2.154	4.538	11.803	3.398	9.256
Maximum	5.791	3.125	5.883	15.725	4.847	89.567
Minimum	0.195	1.760	3.831	9.456	2.421	-3.452
Std. Dev.	1.238	0.450	0.408	2.085	0.709	20.781
Skewness	1.670	0.380	0.987	0.299	0.241	1.609
Kurtosis	5.727	1.458	4.035	1.564	1.684	4.630

Source: Authors

Having analysed the descriptive statistics, the stationarity properties of the variables are investigated to ensure that the methodology and estimation procedure adopted in the study is appropriate. Accordingly, the Augmented Dickey-Fuller and Phillip Perron tests are employed and the outcomes are reported in Table 3. The results from the ADF and PP unit root tests reveal that foreign investment (F), exchange rate volatility (h), and exchange rate (EXR) are stationary at level, that is, the variables are I(0) series. However, variables such as financial deepening (FD), inflation rate (INF), economic growth (Y), and international oil price (OP) are only stationary after the first difference, that is, the variables are I (1) series. These outcomes establish that the variables are of mixed order of integration but none surpasses the integration of order one. The results of the unit root tests validate the adoption of the ARDL procedure; thus, ARDL bound testing technique proposed by Pesaran, et al., (2001) is utilised in the study. The outcomes of the ARDL bound test are reported in Table 4. The results show that the F-statistic (9.4493) exceeds the lower as well as the upper bounds critical values (2.96 and 4.26 respectively) at a 1% significance level. These outcomes prove that there exists a long-run association among the variables.

Table 3. Unit root tests for stationarity with intercept and trend, 1986-2020

Variable		ADF		PP	
		Level	1ST Difference	Level	1ST difference
F	Intercept	-3.444***		-3.532***	
	Intercept and Trend	-3.754**		-3.724**	
h	Intercept	-6.463***		-3.333**	
	Intercept and Trend	-6.575***		-3.479**	
FD	Intercept	-1.024	-11.719***	-1.093	-11.726***
	Intercept and Trend	-2.306	-11.686***	-2.533	-11.689***
EXR	Intercept	-3.772***		-3.815***	
	Intercept and Trend	-3.959***		-3.906***	
Y	Intercept	-1.705	-11.665***	-1.709	-11.665***
	Intercept and Trend	-1.861	-11.719***	-1.847	-11.719***
OP	Intercept	-1.534	-10.697***	-1.551	-10.666***
	Intercept and Trend	-2.037	-9.607***	-2.205	-10.665***
INF	Intercept	-1.994	-4.441***	-2.071	-7.608***
	Intercept and Trend	-2.654	-4.418***	-3.449**	-7.575***

Note: significant level is at 1% (***) and 5% (**)
Source: Authors'

Table 4. Bound Test for Cointegration

Test Statistic	Value	K
F-statistic	9.4493	7
Selected Lags	(1, 1, 3, 1, 1, 0, 1)	
Level of Significance	Lower Bound	Upper Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	3.84
1%	2.96	4.26

K depicts the number of exogenous variables in the model
Source: Authors'

5.2. The Role of Financial Deepening in the Nexus between Exchange Rate Volatility and Foreign Investment

The subsection focuses on the moderating the role of financial deepening in the nexus between exchange rate volatility and foreign investment in Nigeria using the ARDL model. The outcomes of the short-run and long-run effects are shown in Table 5. The outcome shows that the lagged coefficients of foreign investment are positive and significant. This implies that previous value foreign investment is a positive driver of the current net inflow of foreign investment in Nigeria. This outcome supported the assertion of Jehan and Hamid (2017) and Kariuki (2015) which reported that foreign investors give preference to countries that previously exhibit a continuing pattern of foreign investment. In the short run, the results show that the exchange rate volatility (h) effect on foreign investment is negative at lag zero and lag three (-5.4484 and -0.3172 respectively) but only statistically significant at lag zero. In contrast, the coefficients of lag one and lag three are positive (1.6141 and 5.9868 in that order) but only statistically significant at lag three. The sum of the short-run coefficients is positive (1.8353) and statistically significant at a 1 percent level using the Wald test. This implies that exchange rate volatility stimulates foreign investment in the short run. This is in line with the submission that countries whose exchange rates are adversely associated with international returns to capital (e.g., oil-exporting nations), could profit from their role as portfolio hedges (Bayoumi, Bartolini and Klein, 1996). Therefore, an oil-exporting nation like Nigeria may experience an increase in foreign investment in the presence of exchange rate volatility on the ground of diversification.

However, the effect is reversed in the long run, as the result shows that exchange rate volatility (h) exerts an adverse effect on foreign investment. This result reveals that if exchange rate volatility persists, exchange rate volatility tends to reduce foreign investment in the long run. To put it in another way, it means that while investors may absolve past short-run volatility, chronic exchange rate volatility induces their decision to invest negatively. This result is also corroborated by the finding of Tchorek et al. (2017) which revealed that exchange rate volatility in the host country reduces investment inflow. Other literature also supports the negative long-run effect with strong evidence from other countries. For instance, Jehan and Hamid (2017); Zardashty (2014); Latief and Lefen (2018) found a significant negative effect of exchange rate volatility on FDI. Also, this empirical result is consistent with results previously found in research by Okwuchukwu (2015) and Udoh and Egwaikhide, (2008) in Nigeria; that volatility in the host country unfavourably affects flows of capital which confirms the negative affiliation between exchange rate volatility and FDI.

The results also show that financial deepening has a positive but statistically insignificant influence on foreign direct investment in Nigeria in the short run as well as in the long run. These findings give the hint that multinational firms appear not to rely on Nigeria financial sector when making decision to invest in the Nigeria's economy. This suggests that the financial sector in Nigeria has not deepened enough to attract foreign investment into the country. The inability of the financial sector to stimulate foreign investment into the country may be due to high inconsistency in the rate of development of the Nigerian financial sector. These results negate the findings of Akinlo (2017) and Jehan and Hamid (2017) which reported that an advanced financial system boosts the level of FDI.

Regarding the moderating effect of financial deepening in the nexus between exchange rate volatility and foreign investment, the short-run coefficients of the interactive term of financial deepening and exchange rate volatility have a positive and significant effect on foreign investment at lag zero, while lag one, two and three (-0.2126, -0.0289 and -0.7501 respectively) are negative but only lag three is significant. The combined effect is negative (-0.2143) and significant at a 1 percent level. The implication of these findings is that a lower level of financial deepening combined with exchange rate volatility decreases foreign investment in the short run. On the other hand, the long-run coefficient is positive and statistically significant. This implies that financial deepening is a key factor in alleviating the adverse effect of exchange rate volatility on foreign investment in the long run. This shows that further deepening of the financial sector help to ease the risk effect associated with the influence of exchange rate volatility on foreign investment in the country. By implication, the deepening of the financial sector which allow for hedging of uncertainties, reduction of information asymmetry, and risk management and diversification reduces the adverse effect of exchange rate volatility on foreign investment in the long run. The findings confirm the presumption that the deepening of the financial system has essential benefits in reducing the adverse impact of exchange rate volatility. These outcomes of the study support the position of Serven (2003), Jehan and Hamid (2017), and Aghion et al., (2009) whose studies showed that at higher level of financial development, the adverse impact of exchange rate instability on capital flows will be less.

Other variables included in the model also have different influences on foreign investment in Nigeria. Exchange rate exerts a negative and significant influence on foreign investment in the short run as well as in the long run. This suggests that an appreciation of the domestic currency (Naira) encourages foreign investment into the economy. This could possibly be rationalized by the fact that the nominal return that asset yields in foreign currency would be the main consideration as against the price of the asset as a factor explaining foreign investment. Moreover, periods of depreciation of the exchange rate (Naira) in the country are accompanied by a drop in international oil prices, high inflation, and a slow growth rate. Therefore, while it is true that a country undergoing economic turmoil would find its currency weakened and its assets less expensive, few foreign investors would see this as an opportunity for investment. This outcome is in line with the studies that submitted that currency appreciation spur FDI growth (Boateng, et al., 2015; Akinlo, 2017). Our finding is in contrast to extant studies (Udomkerdmongkol et al. 2009; Ang, 2008; Jehan and Hamid 2017) which found that inflows of FDI are associated with the currency depreciation of the host country. Gross Domestic Product stimulates foreign investment inflow in the country both in the short run and long run. As the economy expands, investors become more confident regarding future economic activities and will invest more (ÇEviS and Camurdan, 2007). Similarly, increasing oil price boost foreign investment in the short run as well as in the long run. This result is in line with the study of Bianca (2008) whose findings show that oil prices are positively related to

investment in countries that are net oil exporters and whose revenues are thus increased by a rise in oil prices. Collectively, the sum of the coefficients of the inflation rate (-0.0056) exerts a negative and significant effect on foreign investment based on the Wald test. However, the effect is positive and significant in the long run. This implies that inflation impedes foreign investment in the short run in Nigeria, while it stimulates foreign investment in the long run. The coefficient of error correction term which is significantly and negatively signed confirms the presence of cointegration and long-run relationship amongst the variables. This result shows that the speed of adjustment to the state of equilibrium within a year after a shock is 53%. The diagnostic statistics reported in Table 7, indicate that the probability value of the Breusch-Godfrey serial correlation test and heteroskedasticity test of the estimated model exceed the 5% level of significance which implies the absence of serial correlation problem and heteroskedasticity problem. These diagnostic tests confirm the reliability and acceptability of the ARDL estimates.

Table 5. Estimated Long Run and Short Run Coefficients Using ARDL

Variable	Coefficient	t-Statistic	Prob.
Short Run Coefficients			
ΔF(-1)	0.1826**	2.2812	0.0244
ΔF(-2)	0.1984**	2.4696	0.0150
ΔF(-3)	0.1910**	2.4080	0.0176
Δh	-5.4484***	-2.8240	0.0056
Δh(-1)	1.6141	0.6064	0.5455
Δh(-2)	-0.3172	-0.1209	0.9040
Δh(-3)	5.9868***	2.8298	0.0055
ΔFD	0.0029	0.1644	0.8697
Δh*FD	0.7772***	3.1249	0.0023
Δh*FD(-1)	-0.2126	-0.6390	0.5241
Δh*FD(-2)	-0.0289	-0.0876	0.9303
Δh*FD(-3)	-0.7501***	-2.7687	0.0066
ΔEXR	-0.4464***	-4.5839	0.0000
ΔY	0.1405***	5.4577	0.0000
ΔOP	0.0109***	3.9872	0.0001
ΔINF	0.0278***	3.4905	0.0007
ΔINF(-1)	-0.0068	-0.5191	0.6047
ΔINF(-2)	-0.0238***	-2.8025	0.0060
CointEq(-1)	-0.5550***	-7.7393	0.0000
Long Run Coefficients			
h	-15.2241***	-1.6707	0.0001
FD	0.0052	-1.4038	0.8701
h*FD	2.2901***	1.8008	0.0000
EXR	-0.8043***	-4.5376	0.0000
Y	0.2533***	6.0241	0.0000
OP	0.0197***	4.4906	0.0000
INF	0.0474***	7.9749	0.0000

Note: significant level is at 1% (***) and 5% (**)
Source: Authors'

Table 6. Diagnostic statistics

Breusch-Godfrey Serial Correlation LM Test:	1.6756 (0.1128)
Heteroskedasticity Test: Breusch-Pagan-Godfrey	1.3352 (0.1647)

Source: Authors'

The long-run results of the ARDL procedure are subjected to a robustness check using Fully-Modified Least Square (FMOLS). The outcomes of FMOLS in Table 7 are in harmony with the baseline ARDL estimates as shown in Table 5.

Table 7: FMOLS Estimates (Robustness Test)

Variable	Coefficient	t-Statistic	Prob.
h	-8.4945***	-2.8156	0.0056
FD	-0.0161	-0.4399	0.6608
h*FD	1.2222***	3.1639	0.0019
EXR	-0.5323***	-2.7092	0.0076
GDP	0.2208***	4.3913	0.0000
OP	0.0155***	2.9954	0.0033
INF	0.0406***	6.3939	0.0000
R-squared	0.4488		
Adjusted R-squared	0.4238		
S.E. of regression	0.9394		
Long-run variance	1.6589		

Note: significant level is at 1% (***) and 5% (**)
Source: Authors'

6. Conclusion

This paper examines the moderating role of financial deepening in the nexus between exchange rate volatility and foreign investment over a period of 1986 to 2020. The study relies on Autoregressive Distributed Lag (ARDL) as an estimation technique. The outcomes of the study show that exchange rate volatility stimulates foreign investment in Nigeria in the short run. However, the exchange rate volatility significantly reduces foreign investment in the long run. In addition, the results reveal that financial deepening does not play any significant role in drawing foreign investment into Nigeria. Nevertheless, the interactive effect of exchange rate volatility and financial deepening exerts a positive influence on foreign investment in the long run but a negative effect in the short run. This makes the goal of reaping the benefits of financial deepening in reducing the negative effect of exchange rate volatility a long-run priority. The findings of the study further show that exchange rate, economic growth, international oil price, and inflation rate are significant determining factors of foreign investment in Nigeria.

Based on the findings, the study concludes that exchange rate volatility negatively influenced foreign investment in Nigeria in the long run. Nevertheless, the study documents that this effect can be alleviated through the deepening of the financial sector in Nigeria. Therefore, the study recommends that the CBN should implement adequate measures to stabilize the exchange rate so as to create enabling environment and boost foreign investors' confidence in the economy. To achieve this, efforts at diversifying the economy and improving non-oil export earnings

should be strengthened to shift attention away from oil so as to have multiple means of foreign exchange earnings in the country. In addition, there should be further deepening of the financial sector to improve management of risk, diversification opportunities, and broaden financial instruments and derivatives available to mitigate against potential risk exposure inherent in exchange rate volatility in Nigeria. The most effective way is to strengthen financial system supervision and regulation where needed to improve the ease with which investors can diversify their assets and also, to enhance the efficient provision of credit by financial institutions to the real sector. Lastly, governments should work at achieving and maintaining macroeconomic stability since this will promote investor confidence. In particular, policy interventions that will strengthen the productive capacity are needed to enhance the currency value and deal with inflationary pressure.

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