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Causal Relationship between Exchange Rate Dynamics and Stock Prices: Empirical Evidence from Nigeria

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Abstract

The dynamic linkage between exchange rate and stock prices has attracted considerable attention from researchers worldwide over the decades but with controversial results. As a contribution, this study empirically examined the relationship between exchange rate dynamics and stock prices in Nigeria, using monthly data from January, 1985 to December, 2016. Johansen cointegration test confirmed a long run linear relationship between exchange rate and stock prices, while Granger causality test result indicated a unidirectional causality running from exchange rate to stock prices during the period. These findings have policy implications for the implementation of exchange rate and foreign exchange control policies in Nigeria. The study infers that there is need for consistent deliberate effort by the government to strengthen the real sectors of the Nigerian economy with export potentials to increase productivity and export in order to stabilize foreign exchange rate of naira as this will attract domestic and foreign investment in the Nigerian stock market.

Keywords: Causal Correlation, Exchange Rate Dynamics, Stock Prices, Granger Causality, Nigeria

JEL Classification: C12, C32, F31, G11, G15

Contribution/Originality:
This study is one of very few studies which have investigated the relationship between exchange rate dynamics and stock prices in Nigeria using Johansen cointegration and Granger causality tests; and it is the first to use monthly data from January, 1985 to December, 2016. Thus, the paper has contributed in terms of stock market development and exchange rate policy.

1.0 Introduction

The collapse of Bretton Woods's system paved way for the relaxation of foreign capital controls and the adoption of flexible exchange rate systems. As such, the relationship between exchange rate and stock market performance has become a matter of economic concern in both emerging and developed economies. This is because the relationship between exchange rate and stock prices is critical in economic development (Srivastav, Agraval, Srivastava, 2010); and exchange rate system has opened up capital market and financial markets integration (Nguyen, Bui & Nguyen, 2016). However, beside the remarkable economic openness brought by the exchange rate regime, over the years, it has perpetually remained a source of financial crisis to Nigerian economy. This is because the domestication of flexible exchange rates (managed flexible exchange) regime, devaluation of the Naira in 1986 as part of the implementation of Structural Adjustment Programme (SAP) and persistent over-dependence on imports, exchange rate has become more volatile against major currencies of the world. The spill over effects of the volatility poses significant threat to the Nigerian financial system.

The relationship between the stock market performance and the exchange rate behaviour can be traced through ''flow oriented'' models of exchange rate determination (Dornbusch & Fisher, 1980) and "stock-oriented) model (Branson, 1983; Frankel, 1983). However, several studies have been conducted in both developing and developed economies on the relationship between exchange rates and stock prices; but researchers have found contradictory results regarding the existence of

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relationship and the direction of relationship. Some of the studies found evidence of a negative relationship, others of a positive relationship, and others found no relationship at all. This has made the unsettled environs of monetary and financial economics literature. Some of the earlier studies (e.g., Aggarwal, 1981; Giovannini & Jorion, 1987); Roll, 1992) showed a significant positive relationship between the variables. But studies such as Soenen & Hennigar (1988), Lin (2012), Tsagkanos & Siriopoulos (2013), Boako, Omane-Adjepog & Frimpong (2015), showed a significant negative relationship between the variables, while other studies (such as, Franck & Young, 1972; Solnik, 1987; Chow, Lee & Solt, 1997; Bhattacharya & Mukherjee, 2003; Suriani, Kumar, Jamil, & Muneer. (2015) found no significant relationship between the variables.

Similarly, Bahmani-Oskooee & Sohrabian (1992), Nieh & Lee (2001) found no long-run relationship between the variables. This implies that there is no empirical harmony among the researchers regarding the connections between stock prices and exchange rates which justify the need for more research in this area. As noted by Živkov, Njegić & Mirović (2016), the interest of international investor is to be familiar with the relationship between domestic stocks, as well as national currency, since negative correlation causes the magnification of the gain/losses in the stock market expressed in some solid currency, while positive correlation may offset overall risk.

Recently, researchers, policy makers, and investors in Nigeria have renewed interest on the subject. The upsurge of these interests are said to be associated with the huge supply gap in the Nigerian foreign exchange market created by fluctuation in crude oil price which is the country's major source of foreign earnings. These shocks exert significant influence on the cash flow, decision on portfolio investment, performance of stock market, output and profitability of firms in Nigeria. Therefore, the need to further investigate the causal relationship between exchange rate dynamics and stock price is very imperative. This will help in the formulation of monetary and fiscal policies. Understanding this relationship will help domestic as well as international investors for hedging and diversifying their portfolio. Also, fundamentalist investors have taken into account these relationships to predict the future trends for each other (Phylaktis & Ravazzolo, 2005; Mishra, Swain & Malhotra, 2007; Nieh & Lee, 2001).

In the light of this background, this study attempts to answer three related questions: What is the long-run relationship between the stock market prices and foreign exchange rate dynamics in Nigeria? What is the direction of causality between these variables and what are the implications of the research findings? This paper is different from previous studies reviewed in the sense that, fairly long run monthly data was employed. The choice of the period covers major economic events, policies and financial reforms in the Nigerian financial sector. Also, the inclusion of 2015-2016 periods that marked the beginning of recent economic recession in Nigeria makes the paper more interesting. Answers to the above three questions would have policy implications for the implementation of exchange rate and foreign exchange control policies. And as noted by Phylaktis & Ravazzolo (2005), understanding the dynamic links between stock and foreign exchange markets should also assist multinational corporations in managing their foreign exchange exposure.

The rest of the paper covers: Section 2, which presents theoretical framework and review of empirical literatures; Section 3, which describes the methodology and data employed. Section 4 contains the results and discussion of findings while Section 5 is the summary and conclusion of the paper.

2.0 Literature Review

2.1 Theoretical Framework

Two theories linking exchange rate fluctuations to stock prices, namely, the "flow-oriented" and "stock-oriented" models are discussed in this paper. The flow-oriented model, also called "good markets theory" was developed by Dornbusch & Fischer (1980); it postulates that exchange rate movements cause movements in stock prices. The model looks specifically at the balance of trade between countries, and asserts that exchange rate dynamics influences the output and hence competitiveness of firms. If firms are more competitive, this has a direct positive effect on their stock prices, since stock prices represent future cash flow streaming for the company. This implies that a change in stock price is explained by change in exchange rates. In effect, "flow theory" hypothesises 'unidirectional' causality running from exchange rates to stock prices, and that the relationship is positive. Under a floating exchange rate regime, however, exchange rate appreciation reduces the competitiveness of export markets and impacts negatively on the domestic stock market. Contrariwise, if the country is import denominated, exchange rate appreciation may have positive effect on the stock market by lowering input costs (Yau & Nieh, 2006). The reverse will be the case if local currency depreciates.

On the other hand, the "stock-oriented" model or the "portfolio balance" theory proposed by Branson (1983); Frankel (1983) assumes that changes taking place in the stock market have impact on the exchange market through the liquidity and the wealth effects. The theory assumes that a rise in domestic stock prices would attract capital flows, which increase the demand for domestic currency and cause exchange rate to appreciate. In other words, a decrease in stock prices reduces the wealth of local investors, which lowers their demand for money. Banks then react by lowering interest rates which dampen capital inflows, reducing the demand for local currency, and hence depreciates the local currency. As pointed by Haughton (2013), since domestic and foreign assets are not perfect substitutes in the portfolio balancing effect, as investors adjust their portfolio ratio of domestic to foreign assets in response to changes in economic conditions, the exchange rate respond accordingly. "Stock-oriented" model postulates that movements in stock prices Granger-cause movements in the exchange rate via capital account transactions.

Whereas the flow theory holds that exchange rate movement causes stock prices to oscillate, the stock theory states that exchange rates are determined by market mechanism. Stock price is expected to affect exchange rate with a negative correlation since a decrease in stock prices reduces domestic wealth, which leads to a fall in domestic money demand and interest rate. Also, the decrease in domestic stock prices induces foreign investors to lower demand for domestic assets and domestic currency. These shifts in demand and supply of currencies cause capital outflows and the depreciation of domestic currency (Umoru & Asekome, 2013). According to Ali *et al (*2013), innovations taking place in the equity market is transmitted to exchange market. For instance, increase in stocks prices will result to increase in demand for exchange rates and attraction of both local and foreign investors to invest in the domestic economy and vice versa. By implication, exchange rates will be influenced by the capital inflow. Therefore, considering the extant theories and the fact that Nigeria largely depends on imports which to greater extend defines the performance of all the economic sectors, a priori expectation of the study was based on the "flow theory".

2.2 Empirical Literature

The contradictory results regarding the existence of relationship and the direction of relationship between exchange rate and stock prices have prompted many studies to investigate the relationship in both developed and developing economies. For instance, Umoru & Asekome (2013) examined the relationship between stock prices and exchange rate in Nigeria from 2008 to 2011. They found a bi-

directional causal relationship between exchange rate and stock prices. Other studies conducted by Granger, Huang & Yang (2000); Pan *et al*. (2007); Nieh & Yau (2010) reported similar result. Furthermore, other studies that confirmed bi-directional causal relationship between exchange rate and stock prices include; Kumar (2010), Bahmani-Oskooee & Sohrabian (1992); Andreou, Matsi & Savvides (2013). On the contrary, studies conducted by Nagayasu (2001); Ajayi, Friedman & Mehdian (1998) found unidirectional causal relationship running from stock prices to exchange rate.

The study by Elhendawy (2017) investigated the relationship between stock prices and exchange rate dynamics in Egypt. The study found evidence of causation from stock market price to exchange rate. Ali *et al*. (2013) also, studied the causal relation between exchange rates and stock prices in BRIC countries before, during and after the 2009 financial crisis. Their finding shows that before the financial crisis, India and Russia results indicated causality from stock market to foreign exchange market. On the other hand, there was absence of causal relation for China, while a bi-directional relation was confirmed in Brazil. Furthermore, their findings show that results for Brazil and China records no changes, while in Russia, stable relationship existed during and after the crisis. However, Indian result indicated impact of spill over effect of the crisis.

Differently, Olugbenga (2012) studied the effect of exchange rate volatility on the development of stock market in Nigeria and found significant positive causality moving from stock market performance to exchange rate in the short run. Also, in a study that considered G7 countries, Nieh & Lee (2001) examined the relationship between exchange rate and stock market and reported that there was no long run correlation between exchange rate and stock prices during the period of investigation. However, in the short, the study confirmed absence of correlation between exchange rate and stock market in USA and evidence of correlation between the two variables for other G7 countries was reported. While, Zubair (2013) used Nigerian monthly data from 2001 to 2011 to investigate the relationship between stock market index and monetary indicators (exchange rate and M2). The study found non-existence of causality between ASI and exchange rate before and during the global financial crisis. According to the author, absence of the direct linkage between ASI and Exchange rate shows that the market was inefficient and perhaps not derived or guided by the fundamentals. The finding is consistent with the result of Nigerian studies conducted by Okpara & Odionye (2012).

Moreover, Adjasi & Biekpe (2005) employed VAR to examine the relationship between stock prices and exchange rate changes in Nigeria, South Africa, Kenya, Ghana, Mauritius and Egypt. They found non-existence of stable long run correlation between exchange rates and stock market prices for all the countries. Similar result was reported by Siami-Namini (2017). Cuestas & Tang (2015) also investigated the relationship between exchange rate changes and stock returns in China using MS-SVAR approach and found a unidirectional causal correlation running from stock markets to exchange rate markets.

Similarly, Ajayi & Mougoue (1996) examined the inter-temporal relation between stock prices and exchange rates for the developed countries by using daily data from April 1985 to July 1991. They study established that an increase in aggregate stock price has a negative short-run effect on domestic currency value because of inflation expectations, but increases in domestic stock prices induces domestic currency appreciation in long-run. However, currency depreciation has a negative short-run and long-run effect on the stock market.

Also, Abdalla & Murinde (1997) investigated the relationship between stock prices and exchange rate in Korea, Pakistan, Phillippines and India. Their finding confirmed unidirectional causality from exchange rates to stock prices in three countries out of four developing countries. They found that exchange rates Granger-cause stock prices in Korea, Pakistan, and India, while stock prices Granger-

cause exchange rates in the Philippines. In another study, Tabak (2006) examined causal relationship between exchange rate and stock prices in Brazil using monthly data. According to the study, there was causal relation running from exchange rate to stock prices during the period investigated. The result is consistent with outcome of study conducted by Walid *et al.* (2011); Alagidede, Panagiotidis & Zhang (2010); Fedorova & Saleem (2010); Morales (2008).

Furthermore, Mansor (2000) investigated Malaysian markets and found no long-run relationship between stock prices and exchange rates, but he found a short-run causal relationship from stock prices to exchange rates in bivariate cases. He also found a bi-directional causality in some multivariate models. A similar study by Wu (2000) using stock prices and exchange rates of Singapore portrayed a unidirectional causality from exchange rates to stock prices.

In Korea, Hwang (2003) examined the relationship between stock prices and exchange rates and reported that domestic currency devaluation has a negative short-run effect on stock prices. It means that there is only one-way temporal linkage from exchange rates to stock prices. Using the data on Indian stock prices and macroeconomic aggregates in the foreign sector including exchange rate, Bhattacharya & Mukherjee (2003) found no significant relationship between stock prices and exchange rates. In another study, Muhammad & Rasheed (2003) examined the relationship between stock prices and exchange rates of four South Asian countries: Bangladesh, India, Pakistan and Sri-Lanka. They employed cointegration, vector error correction modeling technique and standard Granger causality tests, and found no significant relationship between the variables either in short-run or long-run in Pakistan and India. However, the study found a bidirectional relationship in case of Bangladesh and Sri-Lanka.

Also, Nath & Samanta (2003) examined the causal relationship between returns in stock market and foreign exchange market in India. They found no causal link though there was a strong causal influence from stock market return to forex market return. In another study, Rjoub (2012) found bidirectional relationships between exchange rate and Turkish stock prices while Impulse response results indicated the temporary nature of shocks. In their study, Umoru & Asekome (2013) found a positive co-integrating relationship between the Naira-US$ exchange rate movement and the Nigerian stock market prices with bi-directional Granger causality, while Doong, Yang & Wang (2005) failed to find a cointegration relationship between the exchange rates and stock prices in six emerging Asian countries. The study however, reported a bidirectional causality relationship in Indonesia, Korea, Malaysia, and Thailand.

Furthermore, Phylaktis & Ravazzolo (2005) studied the long-run and short-run dynamics between stock prices and exchange rates and the channels through which exogenous shocks impact on these markets in a group of Pacific Basin countries. Employing cointegration methodology and multivariate Granger causality tests, they found that stock and foreign exchange markets are positively related and that the US stock market acts as a conduit for these links. Also, Aydemir & Demirhan (2009) investigated the causal relationship between stock prices and exchange rates in Turkey. Their results revealed bidirectional causal relationship between exchange rate and all stock market indices. While the negative causality existed from national services, financials and industrials indices to exchange rate, and positive causal relationship existed from technology indices to exchange rate during the period studied. On the other hand, negative causal relationship from exchange rate to all stock market indices was determined.

The study by Rahman & Udinn (2009) investigated the interactions between stock prices and exchange rates in three emerging countries of South Asia named as Bangladesh, India and Pakistan. Empirical result shows that exchange rates and stock prices data series are non-stationary and

integrated of order one. The Johansen test result showed no cointegrating relationship between stock prices and exchange rates. The outcome of Granger causality test showed that there was no way causal relationship between stock prices and exchange rates in the countries.

In a cross countries study, Alagidede *et al.,* (2010) investigated the nature of the causal linkage between stock markets and foreign exchange markets in Australia, Canada, Japan, Switzerland, and UK. Cointegration tests found no evidence of a long-run relationship between the variables. Three variations of the Granger causality test were carried out; and causality from exchange rates to stock prices was found for Canada, Switzerland, and United Kingdom; weak causality in the other direction was found only for Switzerland. The Hiemstra-Jones test was used to examine possible nonlinear causality and the results indicated causality from stock prices to exchange rates in Japan and weak causality of the reverse direction in Switzerland.

Moreover, Kose, Doqanay & Karabacak (2010) used Granger (1969) causality testing methodology to investigate the existence and direction of relationship between stock prices and exchange rates for Turkish financial market using five (5) international currencies: US dollar, Euro, Japanese Yen, Pound Sterling, Swiss Franc and two baskets of currencies under secretariat of Foreign Trade of Turkey. Their results indicated a uni-directional causality running from stock prices to exchange rates. Kutty (2010) examined the relationship between stock prices and exchange rates in Mexico. The Granger causality test shows that stock prices led exchange rates in the short run, and there was no long run relationship between these two variables. This finding corroborates the results of Bahmani-Oskooee & Sohrabian's (1992) conclusion, but contradicts the findings of other studies which reported a long term relationship between exchange rates and stock prices.

Considering monthly data set of the Nairobi Securities Exchange stock price index and the nominal Kenya shillings per US dollar exchange rates from November 1993 to May 1999, Kisaka & Mwasaru (2012) found that exchange rates Granger-causes stock prices in Kenya. Tsai (2012), using a quantile regression model to provide more details of the relationship, found negative relationships between the stock index and exchange rate in Malaysia, Singapore, South Korea, the Philippines, Taiwan, and Thailand, while Zhao (2010) found no long-term equilibrium relationship between real effective exchange rate and stock price. Similarly, Ullah & Ali (2014) empirically investigated the relationship between exchange rate and stock index in Pakistan. The Granger causality test revealed bidirectional relationship between exchange rates and stock index.

In Kenya, Odoyo, Raymond & Kenneth (2014) used the Pearson product-moment correlation coefficient method to determine the degree of correlation between stock prices and exchange rates. Their results indicated that there was a positive relationship between exchange rates and share prices during the period under consideration. Also, Suriani *et al.* (2015) investigated the relationship between the stock market and exchange market of Pakistan. KSE-100 index was used as a substitute of Stock Prices while currency rate of Pak Rupee against US Dollar (Rs/US$) was taken for exchange rate exposure. The study found no relationship between exchange rate and stock price; and both variables were independent of each other.

While in Romania, Saman (2015) examined the interaction between the stock market and the foreign exchange market, from March 2000 to March 2014. The study employed a threshold error-correction model based on two distinct regimes extended to incorporate asymmetries related to short-term good or bad news from the two markets. The empirical evidence showed that there was a long-run equilibrium between the two variables during the time period investigated. There were also short-run non-linear relationships sensitive to short-term good or bad news in the regime with fewer observations, called 'extreme regime'.

In a paper, Huy (2016) examined the causal relationship between exchange rates and stock prices during pre and post financial crisis in Vietnam using Johansen & Juselius (1990) co-integration test, Toda & Yamamoto (1995) procedure, and Variance decompositions (VDCs) as methods of analysis. The study found a unidirectional causal relationship from stock prices to exchange rates. Similarly, Nkoro & Uko (2016) investigated the relationship between exchange rate and inflation volatility and stock prices volatility in Nigeria, using time series quarterly data from 1986Q1-2012Q4 to model the GARCH (1,1) – S model of an extended GARCH-X. They found a negative relationship between stock market prices volatility and exchange rate (and inflation volatility) in Nigeria.

Additionally, Živkov, Njegić & Mirović (2016) investigated the dynamic conditional correlation (DCC) between stock returns and exchange rate in four East European emerging markets. The estimated negative DCC parameters in all scrutinized countries confirmed that portfolio balanced theory has predominance in the short run in all selected economies. DCC parameters revealed significant time-varying behaviour, especially during the major crisis periods. By embedding dummy variables in the variance equations, they concluded that global shocks affect the volatility of DCCs. The results suggested that exchange rate conditional volatility has higher influence on DCC than stock conditional volatility

Likewise, Bagh, Azad, Razzaq, Liaqat & Khan (2017) examined the impact of exchange rate volatility on Pakistan Stock Index (PSX) using correlational research design. Monthly data from 31st of January, 2003 to 31st December, 2015 were analysed. The study found a positive and statistically significant relationship between exchange rate volatility on stock index of Pakistan.

In another recent study of G7 countries, using Quantile Granger causality test, Luo & Luo (2017) found (i) no long-run significant relationship between the stock price index and exchange rate; (ii) In Canada, Italy, and U.S.A., the relationship is bidirectional; (iii) In France and Japan, the relationship is unidirectional, from the stock price index to the exchange rate; (iv) In Germany and U.K., the relationship is unidirectional in the opposite direction. They also found that portfolio balance effects at different quantiles exist in Germany (at low and median quantiles) and U.S.A. (at high quantile). The study showed neither effect in France and Japan.

Recently, Sakemoto (2017) examined both linear and nonlinear relationships between stock prices and exchange rates in Asian countries, and found that nonparametric causality test was more robust to a nonlinear relationship. The empirical results revealed that most countries have bi-directional causality relationships between stock prices and exchange rates. Some relationships were not captured by the linear model. Their results support the theoretical model which shows dynamic interactions between stock and exchange rate markets. After controlling for the volatility effects, only one country showed the bi-directional causality relationship. Their findings suggest that controlling for exchange rate markets may be helpful to mitigate turmoil during a financial crisis.

More recently, Bala & Hassan (2018) used Autoregressive Distributed Lag (ARDL) model and Granger Causality tests to examine the linkage between exchange rates and stock market in Nigeria from 1985 to 2015. The results show that exchange rate exerted significant positive impact on stock market, while there was unidirectional causality running from exchange rate to stock market. However, Phylaktis & Ravazzolo (2005) have noted that the lack of causal relationship between the stock and foreign exchange markets in a country might be due to the omission of an important variable from the system, which acts as a conduit through which the real exchange rate affects the stock market, invalidating the results of some of the previous studies.

From the preceding review of empirical literature, one can see that there are many previous studies that investigated the causal relationship between stock prices and exchange rate in Nigeria over the years. No doubt, there exist methodological and time period gaps resulting from diverse analytical techniques (such as VECM, Granger causality, ARDL). More so, most of the studies employed short run annual data, while others used either short run monthly or daily data. Though this study further adds to the existing literature, it is different from the previous ones in the sense that; a fairly long run monthly data was employed. To the best of the authors'' knowledge, the most recent study on the topic stopped at 2015. Thus, the extension of the investigation to 2016 which characterized the continuation of economic recession, downward swing in the oil price, and devaluation of the nation's currency, made the study the most recent and important.

3.0 Data and Methodology

3.1 Source of Data

The paper employed monthly data from January, 1985 to December, 2016 obtained from the Central Bank of Nigeria Statistical Bulletin of 2016.

3.2 Estimation Technique

The paper employed Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) for the conduct of unit root test in order to determine the stationarity of data used. Johansen (1988); Johansen & Juselius (1990) cointegration test approach was used to determine the long run relationship between the variables captured in the model. This methodology is extensively discussed in the literature and therefore has not been discussed here (see the above references for details). Granger causality test approach was used to examine the causal correlation between exchange rate dynamics and stock prices.

3.3 Model Specification

Granger causality test approach proposed by Engle & Granger (1987) was employed to examine the causal correlation between exchange rate dynamics and stock prices. The bivariate linear auto-regression models are specified as follows:

$$\mathrm{LogEXR_t} = \varphi_0 + \sum_{k=1}^{P} \varphi_k \,\mathrm{LogSP_{t-1}} + \sum_{k=1}^{p} \gamma_k \,\mathrm{LogEXR_{t-1}} + \varepsilon_t \qquad (1)$$

$$\mathrm{LogSP} = \alpha_0 + \sum_{k=1}^{P} \alpha_k \,\mathrm{LogEXR_{t-1}} + \sum_{k=1}^{p} \delta_k \mathrm{LogSP_{t-k}} + \mu_t \qquad (2)$$

Where; LogEXR refers to the natural logarithm of official exchange rate of naira to US dollars, while LogSP is the natural logarithm of Stock Prices (proxied by All Share Index in the Nigerian Stock Exchange Market). All the variables were logged in order to convert them to same unit. φ and α are the constant terms, k = 1, . . ., p, is the lag order, while ε and μ represent the error terms or uncorrelated stationary random process. Also, φ_k, γ_k, α_k, and δ_k are the coefficients of the variables, while t denotes time period.

4.0 Result and Discussions

4.1 Unit Root Test Results

In order to ascertain the stationarity of the series, we conducted unit root tests using Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) approaches at 0.05 significant level. The results are presented in Table 1. The variables were not stationary at level, except at first difference; and hence the need to conduct cointegration test.

Table 1: ADF and PP Unit Root Test Results

Variable	Level		1st difference		Stationarity
	ADFProb. Values	PP Prob. Values	ADF Prob. Values	PP Prob. Values	
LEXR	0.0987	0.0890	0.0000	0.0000	I(1)
LSP	0.1175	0.1318	0.0000	0.0000	I(1)

Source: Author's Computation using Eviews 8.

4.2 Cointegration Test Result

The cointegration test results are presented in Tables 2 and 3.

Table 2: Johansen Cointegration Test Result (trace)

Hypothesized no. of CE(s)	Eigenvalue	Max.Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.039953	22.46989	15.49471	0.0038
At most 1*	0.018038	6.935206	3.841466	0.0084

Trace test indicates 2 cointegrating eqn(s) at 0.05 level
* denotes rejection of thehypothesis at the 0.05 level
**MackKinnon-Haug-Michelis (1999) p-values

Source: Author's Computation from Eview 8.

Table 3: Johansen cointegration Test Result (maximum eigenvalue)

Hypothesized no. of CE(s)	Eigenvalue	Max.Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.039953	15.53468	14.26460	0.0313
At most 1*	0.018038	6.935206	3.841466	0.0084

Max-eigenvalue test indicates 2 cointegrating eqn(s) at 0.05 level,
* denotes rejection of the hypothesis at the 0.05 level and
**MackKinnon-Haug-Michelis (1999) p-values

Source: Authors Computation using Eviews 8.

In the light of results shown in Tables 2 and 3, the trace statistic and rank test (maximum eigenvalues) at 5% significant level, indicates 2 cointegrating equations. This implies that there is long run relationship between exchange rate and stock prices. This result contradicts Zubair (2013); Okpara & Odionye (2012) in Nigeria. It also challenges the results of Bahmani-Oskooee & Sohrabian's (1992); Doong, Yang & Wang (2005); Rahman & Udinn (2009); Kutty (2010); Suriani *et al.* (2015); Siami-Namini (2017). Luo & Luo (2017) that failed to find a cointegration relationship between the

exchange rates and stock prices. However, the contradictions of findings could be ascribed to methodological differences, model specifications, data type, measurement, scope and sources. Omission of important variables in the study could also distort the empirical outcome.

4.3 Granger Causality Test Result

Apart from the examination of the long-run linkage of exchange rate dynamics and stock prices, we explored the long-run and short-run dynamics by performing Granger causality tests for cointegrating systems. The Granger causality test result presented in Table 4 shows that exchange rate dynamics granger cause stock prices. This indicates a unidirectional correlation running from exchange rate to stock prices.

Table 4: Pairwise Granger Causality Test Result (Lags: 1)

Null Hypothesis	Obs	F-Statistic	Prob.
LEXR does not Granger Cause LSP	381	4.92181	0.0271
LSP does not Granger Cause LEXR		1.24521	0.2652

Source: Authors' Computation using Eviews 8.

Furthermore, the implication of the relationship is that the volatility of the exchange rate strongly influenced the performance of Nigerian stock market within the study period. The finding of the study is consistent with the submissions of Adjasi & Biekpe. (2005); Oyinlola, Adeniyi & Omisakin (2009); Srivastav Agraval & Srivastava (2010); Olugbenga (2012). The result is however in conflict with findings of Nigerian studies conducted by Adebiyi (2010); Okpara & Odionye (2012); Ajayi, Friedman &Mehdian (1998), where they reported causation running from stock prices to exchange rate. The result is more so at variance with Umoru & Asekome (2013) who found a bi-directional causal relationship between exchange rate and stock prices in Nigeria from 2008 to 2011. Granger *et al.* (2000), Pan *et al*. (2007), Nieh & Yau (2010), Kumar (2010), Bahmani-Oskooee & Sohrabian (1992); Andreou *et al*. (2013) reported similar results. However, the nonconformity of results may be attributed to methodological and time period gaps.

5.0 Summary and Conclusion

This study empirically examined the causal relationship between exchange rate dynamics and stock prices in Nigeria. Finding from cointegration test indicated a long run relationship between the variables. Granger causality test found a unidirectional causal relationship running from exchange rate to stock prices. The implication of this finding is that the performance of the Nigerian Stock market is strongly influenced by the volatility of foreign exchange rate. In this case, Nigeria being an import dependent nation, there is a serious need for consistent deliberate effort by the government to strengthen the real sectors of the economy with export potentials. By doing this, Nigeria's over dependence on import will be reduced, while productive capacity of the economy and export will be boosted. In this case, foreign earnings will be at increase and value of naira will appreciate. This will finally lead to stability of foreign exchange rates of naira to currencies of the world and attract domestic and foreign direct investments in the Nigerian stock exchange market. The findings have

implications for investors, investment managers, regulators, listed companies, financial institutions and other market players. For instance, investors can use this information for speculation and to hedge their return on foreign investment. Monetary authorities in Nigeria can also take into account the role of stock market development in the conduct of its exchange rate policy.

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