Exchange Rate Fluctuation and the Performance of SMES in Nigeria

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Abstract. There are high costs of imported raw materials arising from volatile exchange rates which influence the performance of Small and Medium Scale Enterprises (SMEs) in Nigeria. Therefore, this study examined the effect of exchange rate fluctuations on the performance of SMEs in Nigeria. The study specifically examined the long and short run effects of exchange rate fluctuations on the performance of SMEs in Nigeria. The unit root test was used to test for the stationarity of the variable of interest used in the study. The GARCH model was used to estimate the exchange rate fluctuation. Bound co-integration test was used to examine the long-run relationship between exchange rate fluctuation and SMEs performance. Auto Regressive Distributed Lag (ARDL) approach was employed to examine the long and short-run relationship between exchange rate fluctuation and SMEs performance. The results show that a long run relationship exist between exchange rate fluctuation and the performance of SMEs in Nigeria. Also, in the short run, a 1 percent increase in exchange rate fluctuation has 0.96 percent decrease on the performance of SMEs at 5% level of significance. Similarly, inflation and trade openness exhibits positive and negative relationship with SMEs performance indicator. The study concludes that there exists a negative and significant relationship between exchange rate fluctuations and SME performance in the short run. Also, inflation and degree of openness are the major determinants of exchange rate fluctuations in Nigeria. Therefore, it was recommended that SMEs activities should be encouraged by government by giving incentives and subsidies to local manufacturers and by maintaining inflationary and interest policies that will achieve a stable exchange rate.

Keywords: Exchange rate fluctuation, Auto Regressive Distributed Lag (ARDL), Small and Medium Scale Enterprises (SMEs)

JEL: F31, D2

Introduction

By the year 2050 the Nigerian economy was expected to become a developed world economy (Obi et al., 2016). A significant route to achieving this vision is through a well-managed exchange rate policy to achieve fast and sustainable economic growth and development. An unmanaged policy on exchange rates could adversely affect economic growth and development (Rodrik, 2008; Kalu et al., 2019). Hence the exchange rate is an international price measure for an economy's competitiveness. The exchange rate also plays an important part in the allocation of income, spending and production of goods and services. It influences the flow of goods, services, and capital in a country. It has a strong influence on balance of payments, inflation and other macroeconomic variables (Takaendesa, 2006). The choice and management of an effective exchange rate regime is vital to attain macroeconomic stability, growth and development.

The exchange rate plays a major role in a country's economy's growth, and the exchange rate also spurs an economy's diversification and industrialisation. The exchange rate serves as a link between two countries through international trade. The exchange rate is the price of the currency of a country in terms of the currency of another country. This is the rate at which one unit of a nation exchanges currency with another. A country's exchange rate is normally set on the foreign currency (FOREX) market. The FOREX market is a market in which currencies are exchanged on one another. It flourishes with Bureau D'change traders, small and medium-

sized businesses, commercial banks and Central Bank regulated market. The Central bank of every country continues to inject money into the market in order to ensure stability in the market. It is as a result of the fluctuations in the foreign exchange market that exchange rate is important if countries must engage in international trade. From time to time, fluctuations occur in the foreign exchange market due to demand for/of currencies, inflation, interest rate etc. These fluctuations are what determines the exchange rate at any particular time. For example, the Naira to Dollar exchange rate might look like this; N364 to $1, N365 to $1, N360 to $1, N300 to $1, N366 to $1, and so on (CBN, 2018) This goes on till the end of the day. The fluctuations in exchange rate determine whether the exchange rate will rise or fall.

Small and Medium Enterprises (SMEs)

SME stands for small and medium-scale enterprises. These are companies that employ from 11 to 100 people and have an annual turnover of N5 million to N500 million (SMEDAN, 2003). SMEs is regarded as the backbones for diversification and also industrialization process. What happens to the SMEs production process has a direct effect on the general performance of the enterprise and the country at large. SME output plays a major role in an economy such that a negative effect on its manufacturing process will adversely affect the country's economic development. In modern economies, SMEs act as catalysts and have several crucial economic transformation benefits (Ajibefun, 2008). One way that he does this is through his results. An SME's output shows how far it can go in the course of diversification as well as in the process of industrialisation. Small and medium-sized enterprises, in particular those which attract little foreign direct investment, are the lifeblood of developing economies. Equally, these businesses provide employment for vast portions of local populations and are a critical engine of economic growth and poverty reduction.

In this research paper, SMEs are conceptualized as those businesses operating in the informal sector of the Nigerian economy. SMEs like manufacturing is driven by their high sensitivity to exchange rate shock or fluctuation (Van Wijnbergen, 1986; Vachani, 1994) and the fact that SMEs are more likely to access formal sources of finance in line with recent developments in the financial sector. The interest in small and medium-sized enterprises is further driven by the recognition among scholars (Rada, 2007) of Nigeria 's urgent need to transform its economy, in particular the manufacturing sector, from a low to high value-added industry that catalyzes economic growth (Brixiova, 2010; Gagoitseope & Pansiri, 2012; Alvarez & Barney, 2014). SMEs have a major role to play in the process of transformation as innovation drivers (Schumpeter, 1950, 1961; Blackburn et al., 2013), and their role in the cycle of economic transformation must be combined with the policy of exchange rate deregulation to decide if this policy is valid for SMEs because of the different market climate in place in Nigeria.

Exchange Rate and SMEs

It is a major catalyst that boosts the performance of SMEs which rely on raw materials imported. Here the SMEs are the ones who bear the burden of fluctuations as they are dependent on their raw materials for their imports. Practically all small and medium-sized enterprises in Nigeria depend on raw material imports for production. SMEs are directly or indirectly influenced by the exchange rate. Nonetheless, SMEs are at a disadvantage due to excessive exposure to some of the risks associated with operating in a globally increasingly interdependent setting. Prominent among these exposures are uncertainties about the magnitude of future cash flows due to possible changes in output and input prices which in turn is, to a great extent, a result of the variability and volatility of exchange rates (Gatawa & Mahmud, 2017).

Exchange-rate fluctuations determine whether the raw material prices will be high or low. For example, an increase in the exchange rate will result in an increase in the cost of raw materials being imported, which means that the cost of production also increases the price of commodities Inadequate raw materials for local production: in Nigeria, small and medium-sized enterprises are heavily dependent on imports for their raw material supply, the inability to supply these raw materials locally has become a chronic problem (Ajibefun & Daramola, 2003). These imports are charged in foreign currencies which have an unpredictable exchange rate. Thus, this apparent fluctuation is bound to adversely affect activities in the sector that is dependent on external sources for its productive inputs. Infrastructural deficit, inadequate funding and Government Policy. This study examined the effect of exchange rate fluctuations on the performance of SMEs in Nigeria. The study specifically examined the long and short run effects of exchange rate fluctuations on the performance of SMEs in Nigeria.

SMEs are conceptualized in this research paper as those companies that work in the informal sector of the Nigerian economy. SMEs like manufacturing are motivated by their high vulnerability to exchange-rate shocks or fluctuations (Van Wijnbergen, 1986; Vachani, 1994) and by the fact that SMEs are more likely to access structured financing sources in line with recent developments in the financial sector. The interest in small and medium-sized enterprises is further driven by the recognition among scholars (Rada, 2007) of Nigeria 's urgent need to transform its economy, in particular the manufacturing sector, from a low to high value-added industry that catalyzes economic growth (Brixiova, 2010; Gagoitseope & Pansiri, 2012; Alvarez & Barney, 2014). SMEs have a major role to play in the process of transformation as innovation drivers (Schumpeter, 1950, 1961; Blackburn et al., 2013), and their role in the process of economic transformation must be coupled with the policy of exchange rate deregulation to decide if this policy is valid for SMEs because of the specific market climate in place in Nigeria.

Foreign Exchange Regimes in Nigeria

Nigeria's exchange rate regime has undergone a great many changes. This emerged from a set parity in 1960, when it was tied exclusively to the British Pound Sterling. After the Pound Sterling devaluation the US dollar was included in the parity swap by 1967. In 1972, due to the emergence of a stronger US dollar, the exchange of parity with the British Pound was suspended (Kalu, et al, 2019). In 1973, after the devaluation of the US dollar, Nigeria returned to a fixed parity with the British Pound. In 1974, Nigerian currency was bound to both the pound and the dollar in order to reduce the impact of devaluation of a single individual currency. Almost throughout the 1970s there was persistent appreciation of the nominal exchange rate of the naira occasioned by increases in the price of oil in the international market. These appreciations in the nominal exchange rates gave rise to over-reliance on imports with its accompanying capital flight, discouraging non-oil exports which ultimately led to Balance of Payments problems and depletion of external reserves. The increase in the marginal propensity to import collapsed the agricultural sector in Nigeria (Azeez et al., 2012).

In 1978, the naira was pegged to a basket of twelve currencies representing the main trading partners of Nigeria. In 1985, however, the proposal for 1978 was jettisoned in favour of quoting the naira against the dollar. Prior to 1986, the prevalent exchange-rate policies promoted the naira's overvaluation. In September 1986, in the framework of the Structural Adjustment Program Package, the naira was deregulated to resolve the problems associated with the overvaluation. The introduction of the Second Tier Foreign Exchange Market (SFEM) was intended to boost the execution of the Structural Adjustment Programme. SFEM had been expected to introduce a mechanism for determining and allocating exchange rates to ensure short term stability and long term Balance of Payments equilibrium. According to Mordi (2006), SFEM's main goals include achieving a realistic naira exchange rate through the market

forces of demand and supply, more efficient resource allocation, stimulating non-oil efforts, encouraging foreign exchange in flow and discouraging outflows, eliminating currency trafficking by wiping out the unofficial parallel foreign exchange market and improving it. A number of modifications have been made to achieve SFEM 's objectives, from the Foreign Exchange Market (FEM) to the Autonomous Foreign Exchange Market (AFEM), the Dutch Auction System and the Dutch Wholesale Auction System.

Theoretical Framework

Optimal Currency Area (OCA) Theory

The original and key theoretical basis for exchange-rate regimes relied on the principle of the Optimal Currency Region (OCA), which was supported by Mundell and McKinnonas and cited by Akpan and Atan (2012) and Ufoeze et al., 2018). It is based on concepts of the shock symmetry, the degree of openness and the mobility of the labor market. It stipulates that a fixed exchange rate system can improve trade and output growth by decreasing the risk of exchange rates and hence the hedging costs. It would also improve investment by lowering interest-rate currency premiums. Nevertheless, growth in trade and output could be reduced by ending or preventing the necessary relative price adjustment process. Recent exchange rate policies are based on monetary theory, and the balance of payments approaches of the asset market (or portfolio balance). They suggest that the exchange rate is a phenomenon entirely financial and determined by financial flows. Earlier traditional theories of exchange rates suggest that the determination of the exchange rate is based on trade flows which in the long run will determine the exchange rate movement. Most policy makers have however shifted interest to the more exchange rate theories. Notwithstanding, the traditional theories remain crucial in the long run.

Purchasing Power Parity

The Purchasing Power Parity (PPP) shows the price-exchange-rate association. The origin of PPP theory can be traced back to the Sixteenth Century Salamanca School in Spain. Yet its development as an exchange rate theory could be attributed to Cassel 's work. Cassel first recommended PPP as a theory to adjust parities of exchange rates pre-World War I. For countries that resolved to return to the gold standard system after the war had ended, he proposed this theory. Some modification became important because during and after the war some countries that abandoned the gold standard system experienced different inflation rates.. As an exchange rate determination theory, the simple and most powerful form of PPP (i.e. absolute PPP) was based on the ‘law of one price’. The Absolute PPP suggests that exchange rate would amend to equate the prices of national baskets of goods and services between two nations. This occurs as a result of the market forces determined by arbitrage. The purchasing power parity (PPP) is also referred to as the inflation theory of exchange rates. This theory proposes that the exchange rate would adjust so that the price of a specific good or service will be unchanged no matter where you buy it. Consequently, the PPP theory is oftentimes regarded as the ‘law of one price’.

The Monetary Model of Exchange Rates

The monetary exchange rate model suggests the exchange rates are determined by the process of balancing the stock of total demand and money supply in each country. Therefore the demand for money is believed to be stable in the long term and to have a positive relationship with national income. However, it proposes an inverse interest rate relationship. A country's money supply is determined by multiplier times its monetary base. In addition to its international reserve, the monetary base equals the domestic credit created by the monetary

authorities. An unsustainable surplus of money in the economy typically results in a loss of savings or a deficit in the balance of payments under fixed exchange rates and a devaluation of the nation's currency under flexible exchange rate. The opposite occurs during an excess demand for money in the economy. This theory therefore propounds that the exchange rate is determined by the domestic monetary authority and is an extension of the simple quantity theory of money.

Empirical Review

Oyovwi (2012) studied the effect of exchange rate volatility on economic growth in Nigeria. The study employed time series annual data from 1970 to 2009. The Generalised Autoregressive Conditional Heteroscedasticity (GARCH) technique was used to generate exchange rate volatility. The study found that in the short run, economic growth was positively and significantly related to exchange rate volatility, while in the long run, there was a negative relationship between the two variables. Azeez et al. (2012) investigated the effect of exchange rate volatility on macroeconomic performance in Nigeria. Secondary data was obtained from 1986 to 2010. The variables included; Real GDP as the dependent variable, while Exchange Rate (EXR), Balance of Payment (BOP) and Oil Revenue (OREV) were the independent variables. It employed the Ordinary Least Square (OLS) and Johansen cointegration to test for the short and long run effects respectively. The results revealed EXR was positively related to GDP, that OREV was also positively related GDP while BOP was negatively related to GDP.

Usman and Adejare (2012) investigated the effect of foreign exchange regimes on industrial growth in Nigeria. They used time series data obtained from CBN Statistical Bulletin. The data covered the period 1985 to 2005. Variables for the study included Gross Domestic Product (as dependent variable); World Price Index, Per Capita Income, and Net Export were the independent variables respectively. The OLS and correlation were employed as estimation techniques. The study concluded that Exchange rate had significant effect on the economy represented by the GDP. Jibrin et al. *(*2017) studied the impact of exchange rate fluctuation on gross domestic product GDP and other macroeconomic aggregates in ECOWAS. The study period was from 1990 to 2014 for a sample of ten (10) West African countries. The ten (10) countries included Benin Republic, Burkina Faso, Cape Verde, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria and Sierra Leone. The Ordinary Least Square (OLS) was employed for analysis. The result showed that exchange rate had a significant impact on GDP in four countries namely Benin, Guinea Bissau, Liberia and Nigeria. Adeniran et al. (2014) studied the impact of exchange rate fluctuation on the Nigerian economic growth. The study employed secondary data from 1986-2013. The ordinary least square (OLS) was used to analyse the data. The study revealed that exchange rate had no significant impact on economic growth in Nigeria.

Akpan and Atan (2012) investigated the effect of exchange rate movements on real output growth in Nigeria. They obtained quarterly data for the period 1986 to 2010. A Generalised Method of Moments (GMM) technique was used to analyse the data. The study found that there was no significant relationship between changes in exchange rate and output growth. The study also analysed empirical literature relating to the impact of foreign exchange on different sectors of the economy. Gatawa and Mahmud (2017) analysed short and long-run impacts of exchange rate fluctuations on agricultural exports volume in Nigeria. The time scope covered 1981-2014. The GARCH was used to estimate the volatility of exchange rates, and other diagnostic tests. The ARDL was the technique of analysis. The results revealed that official exchange rate had a significant impact on agricultural export volumes. Jongbo (2014) studied the impact of real exchange rate fluctuation on industrial output of the manufacturing sector in Nigeria. The Ordinary Least Square (OLS) method of regression was employed in analysing the data. The data set covered the period 1990 to 2012. The results showed that real

exchange rate had a significant impact on industrial output. Olufayo and Fagite (2014) explored the impact of exchange rate volatility on the export performance of both oil and non-oil sectors in Nigeria. The study covered the period from 1980-2011. They used ARCH, GARCH and SUR (Seemingly Unrelated Regression method) to measure the volatility of exchange rate and to estimate the coefficient of the two system equation. The ARCH and GARCH results suggested that the exchange rate was volatile. Also, the SUR model suggested that exchange rate volatility had no significant impact on both oil and non-oil sectors in Nigeria respectively.

Tille (2006) believes that the impact of exchange rate shifts is highly heterogeneous across sectors. While depreciation stimulates substantial competitiveness and welfare gain for agents with a high exposure to foreign competition, only agents with just domestic exposure or competition are adversely affected. He drew from the Mundell-Fleming model of 'beggar-thy-neighbour' effect, which suggests that a country can only benefit from the depreciation of its currency through competitive gain at the expense of its neighbours. Obstfeld and Rogoff (1995) observed that the movements in competitiveness stemming from exchange rate fluctuations do not necessarily imply that one country gains at the expense of another country's loss; however, Corsetti and Pesenti (2000) and Tille (2001) demonstrated that a country that depreciates its currency can experience adverse terms-of-trade if its domestically produced goods are poor substitutes for imported goods. Cook and Devereux (2016) argues that when the zero-bound constraint on nominal interest rates is binding and policy lacks an effective 'forward guidance' mechanism, a flexible exchange rate system may be inferior to a single currency area in helping to adjust to macroeconomic shocks. With monetary policy constrained by the zero bound, a flexible exchange rate exacerbates the impact of shocks.

According to Kim and Ying (2007) "With financial liberalization and improvement in information technology, devaluation may be more likely to be contractionary than before as it worsens the balance sheet of financial and non-financial business firms with heavy foreign-currency liabilities and results in serious interruption of external financing through a loss of credibility with international financial investors" (p. 281). This situation clearly depicts the situation in Nigeria where the manufacturing sector is import-dependent on production equipment and raw materials (Akinlo & Odusola, 2003; Awokuse, 2008).

In another study, Odusola and Akinlo (2001) argued that the collapse of the exchange rate can result in inflation in two ways. This can be through higher import prices or an increase in inflationary expectations that are often accommodated through accelerated wage indexation mechanisms. They adopted a vector auto-regression (VAR) analysis with six variables (official exchange rate, parallel exchange rate, prices, income, money supply, and interest rate) to investigate the impact of exchange rate depreciation on output level in Nigeria. The study reveals a contractionary impact of depreciation on output level in the short term. Thereafter, the depreciation of the exchange rate generated expansionary impact on the output levels both in the medium- and long-term periods. The result of the analysis also indicates that the positive shocks of official exchange rate were followed by significant increases in general price level. The results suggest that the adoption of a flexible exchange rate system by a country does not necessarily expand output, particularly in the short term. For output to be negatively related to the depreciation of the exchange rate, Odusola and Akinlo (2001) proposed fiscal discipline, confidence and credibility on the part of the government to pursue a reform program. This is because the Nigerian government is noted for its inability to carry through economic policy programs to a conclusive end (Ikpeze et al., 2004).

Blackburn et al. (2013) analyzed the processes involved in business planning, examined the challenges and problems faced by Nigerian entrepreneurs in business planning of Nigeria's Small and Medium Enterprises (SMEs); and how proper planning can promote their businesses. Primary data was collected through structured questionnaire administered to the manager of some selected Small and Medium scale businesses in Ile-Ife and analyzed using descriptive

statistics such as tables, charts, frequencies, percentages The findings show that most entrepreneurs find out the demand of the market more than setting goals and objectives. Also results showed that economic instability and access to sources of finance are major challenges facing SME's; and proper planning can increase the productivity and profitability of Small and Medium scale Enterprises in Nigeria. The study concluded that effective planning has a significant effect on the performance of small and medium enterprises in Nigeria. Therefore, it was recommended that specialized government sponsored institutions should be set up to help SME's firms by providing planning packages to entrepreneurs tailored to customized needs.

Since Nigeria is heavily factor-input import dependent, the inability to locally source the required inputs in the manufacturing sector in the country is a chronic problem. Consequently, the exchange rate plays an important role in the ability of the economy to attain a realistic growth in the manufacturing sector.

Akpan and Atan (2012) examined the impact of exchange rate management on the growth of SMEs in Nigeria. Ordinary Least Square (OLS) multiple regression analysis, using E-view was employed. The study covered the periods of 1986-2010 with the use of time-series data. The empirical result of this study shows that depreciation which forms part of the structural adjustment policy (SAP) 1986, and which dominated the period under review has no significant relationship with the SMEs productivity. It was found that in Nigeria, exchange rate appreciation has a significant relationship with domestic output. And that exchange rate appreciation will promote SME performance. It was also ascertained from the estimated regression line that there is a positive relationship between the manufacturing gross domestic product and inflation. It is recommended that government should direct its exchange rate management policy towards exchange rate appreciation in order to reduce the cost of production in the SMEs that depend heavily on foreign inputs while there should be total ban of importation on consumer and intermediate goods that can be produced locally. Since SMEs depends much on foreign inputs, and for the importation of these foreign inputs not be continuous, efforts should be geared towards improving the level of technology, increasing agricultural production, and developing local raw materials in the country.

Methodology

This study attempts to investigate the long run and short run effect of exchange rate fluctuations on the performance of SMEs in Nigeria. However, the data for this study were obtained mainly from secondary sources, particularly from Central Bank of Nigeria (CBN) statistical bulletin and World Bank Database (WDI, 2017).

Model Specification

$$SMES_t = \alpha_0 + \alpha_1 EXCF_t + \alpha_2 INTR_t + \alpha_3 INFL_t + \alpha_4 DCPS_t + \alpha_5 TOPN_t + \varepsilon_t$$

$$\Delta SMES_t = \alpha_0 + \sum_{i=1}^{p} \gamma_i \Delta SMES_{t-i_t} + \sum_{i=0}^{q_1} \delta_i \Delta EXCF_{t-i} + \sum_{i=0}^{q_2} \delta_i \Delta INTR_{t-i} + \sum_{i=0}^{q_3} \delta_i \Delta INFL_{t-i} + \sum_{i=0}^{q_4} \delta_i \Delta DCPS_{t-i} + \sum_{i=0}^{q_5} \delta_i \Delta TOPN_{t-i} + \rho ECM_{t-1}$$

Where

Δ = the first-difference operator and $ECM_{t-1}$is an error correction term.

$SMES$ = SMEs Performance Indicator

$EXCF$ = Exchange Rate Fluctuation

$INTR$ = Interest Rate

$INFL$ = Inflation Rate

$DCPS$ = Domestic Credit to Private Sector

$TOPN$ = Trade Openness

$RGDP$ = Real Gross Domestic Product
$MSUP$ = Money Supply

Results and Findings

Descriptive Result

Variable	Observations	Mean	Maximum	Minimum	Std. Dev.
SMES	47	1.12	2.47	-0.07	0.76
EXCR	47	56.94	180.30	0.51	66.45
EXCF	47	0.07	0.08	0.04	0.01
INFL	47	16.32	72.80	0.23	18.18
INTR	47	11.13	28.02	3.25	5.10
TOPN	47	0.47	0.82	0.17	0.17
DCPS	47	2400519.83	16075990.38	441.00	4330852.97
MSUP	47	3392382.17	20908816.11	979.30	6112276.55
RGDP	47	29277542.52	69780692.72	13598427.25	17018494.05

Source: Author's Computation 2018, underlying data from World Development Indicator (WDI) Database and CBN annual report

The Short Run Effect using Error Correction Model (ECM)

Following the result of the long-run co-integration, the short-run dynamic model estimated in this study shows that ECT (-1) value is -0.891. The ECT (-1) value is negative and significant at 1% level. This negative and significant value confirms the stability of the model. Alternatively, it means that the variables are co-integrated and moves towards long run equilibrium. This implies that the current value of SMES in Nigeria will adjust to change in the explanatory variables. Also, it shows that the speed of adjustment of disequilibrium in the short run towards long run equilibrium is about 89.1 percent. Focusing on the coefficient of the explanatory variables, the result shows that in the short run; negative and significant relationship exists between exchange rate fluctuation (EXCF) and the SMES performance indicator at 5% level. This indicates that a unit increase in EXCF will lead to about 0.96 unit decrease in the performance of SMES in Nigeria. Similarly, the result shows that negative and relationship exists between trade openness (TOPN), interest rate (INTR) and the performance indicator at 1% and 10% levels respectively while inflation rate (INFL) shows a positive relationship with SMES in the short run.

ARDL Cointegrating and Short Run Form

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCF)	-0.957677	0.367499	-2.605930	0.0131
D(INTR)	-0.046532	0.023469	-1.982699	0.0549
D(INFL)	0.021704	0.006563	3.306928	0.0021
DLOG(DCPS)	-0.063947	0.039436	-1.621560	0.1134
D(TOPN)	-2.524414	0.877414	-2.877107	0.0066
CointEq(-1)	-0.891440	0.130442	-6.833973	0.0000
Cointeq = SMES - (-0.1899*EXCF -0.0522*INTR + 0.0243*INFL -0.0717				
*LOG(DCPS) + 0.5398*TOPN + 3.3810)				

Source: Author's Computation 2018, underlying data from World Development Indicator (WDI) Database and CBN annual report

ARDL Analysis for Exchange Rate Determinants

In order to establish the determinant of exchange rate fluctuation in Nigeria this study employed Autoregressive distributed lag (ARDL) approach. In this model, the dependent variable is the exchange rate fluctuation (EXCF) while the independent variables are real gross domestic product (RGDP), inflation rate (INFL), interest rate (INTR), trade openness (TOPN), money supply and the lag of exchange rate fluctuation (EXCF). The selected ARDL representation for the model presented in is ARDL (1, 1, 1, 3, 1, 3) (see the appendix). However, from the result in Table 13, the R^2 (co-efficient of determination) is 0.970 implying that about 97.0 percent of the variations in EXCF is explained by the explanatory variables. The F-statistics (59.376; p = 0.000) is highly significant at 1% level. This confirms the efficacy of the model.

Error Correction Model (ECM)

After the result of the long-run cointegration, the short-run dynamic model estimated in this study shows that ECT (-1) value is -0.891. The ECT (-1) value is negative and significant at 1% level. The negative and significant value of the error correction term which is -0.891 (p = 0.000) indicate that the model is stable at 1% significance level. Also, the negative and significant value indicates that about 89.1% of the errors are corrected yearly. Alternatively, this confirms that a long run relationship exist between EXCF and the explanatory variables.

Focusing on the coefficient of the explanatory variables, the result shows that in the short run; negative and significant relationship exists between inflation rates (INFL) and exchange rate fluctuation (EXCF) at 1% level. This indicates that a unit increase in INFL will lead to about 0.047 unit decrease in exchange rate fluctuation (EXCF) in Nigeria. Similarly, the result shows that negative relationship exists between current and past values of interest rate (INTR) and the exchange rate fluctuation (EXCF) at 1% levels in the short run in Nigeria.

This study sets to examine the effect of exchange rate fluctuations on the performance of SMEs between the periods of 1986-2017. Long run and short run effect of exchange rate fluctuation on the performance of SMEs were examined and also the determinants of this fluctuation were also examined. The GARCH model was employed to estimate exchange rate fluctuations. Unit root tests were carried out using ADF, PP and KPSS to test for stationarity of the variables. To achieve the stated objectives, Co-integration test and Error Correction Model (ECM) using the Auto Regressive Distributed Lag (ARDL) approach were used to estimate the long run and short run effect of exchange rate fluctuations on the performance of SMEs. The ARDL was also used to examine the determinants of exchange rate fluctuation. The equilibrium exchange rate variables used are inflation, interest rate, trade openness, money supply, real GDP, domestic credit to the private sector.

The unit root tests showed that some of the variables were non-stationary at level but stationary at first difference. The co-integrating results show that the variables are co-integrated and this result guarantees the possibility of a long run relationship between the variables included in the model specified in the study. The result of the analysis showed a negative, but an insignificant relationship exists between exchange rate fluctuation and the performance of SMES in Nigeria in the long-run. Similarly, trade openness exhibits a positive and an insignificant relationship with SMES whereas domestic credit to the private sector exhibits a negative and insignificant relationship with the performance indicator. However, in the short run, a negative and significant relationship exists between exchange rate fluctuation and the SMEs performance.

The ARDL showed that the interest rate and inflation are major determinants of exchange rate fluctuations in Nigeria. By implication, it is the changes in inflation and interest rate that determine the exchange rate fluctuations. From the empirically reviewed work, authors such as (Adeniran.,et al 2014) showed that there exists an adverse effect between exchange rate

fluctuations and performance of SMEs while others like (Jongbo, 2014) showed that exchange rate fluctuations have a positive effect on the manufacturing sector in Nigeria. However, the empirical analysis of the study shows that exchange rate fluctuations have negative but significant effect on the performance of SMEs.

Conclusion

The study verifies the effect of exchange rate fluctuations on the performance of SMEs. This shows that exchange rate is a crucial variable and the SMEs are expected to be the driving force in the drive towards diversification and economic growth. It was observed that the fact that Nigeria is highly dependent on the external sector for import of inputs has made the effect of exchange rate fluctuation worse, especially in manufacturing because capacity to import was constrained by the volatile currency leading to a corresponding decline in output.

The study goes further to conclude that economic factors such as interest rate and inflation rate have a significant negative effect on the performance of Small and Medium Enterprises through volatile exchange rate. The implication of this negative relationship is that a consistent increase in the factors will equally result to attendant decline on the exchange rate and the performance of SMEs in Nigeria, vice versa. Consistent decline in the performance of SMEs would have a negative effect on the gross domestic products and thus resulting in economic crisis.

In order to address the problem of exchange rate fluctuations on the performance of the SMEs, and for them to meet expectations and contribute significantly to economic growth and development, it is required that the following policies should be implemented.

SMEs activities should be encouraged by government by giving incentives and subsidies to local manufacturers and improving the technological and infrastructural development so as to increase their contribution to Gross Domestic product and employment within the country.

The need for local sourcing of raw materials and input through agriculture and other primary production processes should be intensified. A technological policy aimed at developing a local engineering industry is advocated. By so doing, there won't be a need for the importation of raw materials and the link between the industrial sector and the SMEs will be established, leading to expansion of export base which would attract more foreign exchange into the country.

Tariffs and bans should be put in place to regulate the activities of SMEs that rely solely on importation of raw materials. Import duties will reduce the volume of imports and also increase productive capacity of SMEs which will trigger economic growth and diversification as well. With these laws in place, the country will be driven towards a self-sufficient economy where it does not need to rely on imports for production and also for general consumption. With increased production and more efficient technological practices in the SMEs, there would be relative increase in exports, which will therein improve the foreign exchange of the economy.

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Appendices

Stationarity Test

Variable	Test	INTERCEPT		Order	INTERCEPT & TREND		Order
		@Level	@ First Diff.		@Level	@ First Diff.	
SMES	ADF	-5.026***	-9.906***	I(0)	-5.326***	-9.826***	I(0)
	PP	-5.038***	-16.376***	I(0)	-5360***	-16.216***	I(0)
	KPSS	0.287***	0.314***	I(0)	0.042***	0.161***	I(0)
EXCF	ADF	-2.957**	-3.781***	I(0)	-1.727	-4.160**	I(1)
	PP	-2.663*	-3.781***	I(0)	-1.782	-4.110**	I(1)
	KPSS	0.493***	0.344***	I(0)	0.175***	0.080***	I(0)
INFL	ADF	-3.201**	-6.967***	I(0)	-3.158	-6.910***	I(1)
	PP	-3.084**	-11.753***	I(0)	-3.048	-12.967***	I(1)
	KPSS	0.204***	0.425***	I(0)	0.185***	0.078***	I(0)
INTR	ADF	-2.380	-8.561***	I(1)	-2.425	-8.465***	I(1)
	PP	-2.380	-8.622**	I(1)	-2.463	-8.529***	I(1)
	KPSS	0.219***	0.073***	I(0)	0.148***	0.068***	I(0)
RGDP	ADF	0.824	-5.751***	I(1)	-0.649	-6.063***	I(1)
	PP	0.553	-5.840***	I(1)	-0.866	-6.065***	I(1)
	KPSS	0.743	0.267***	I(1)	0.291	0.118***	I(1)
DCPS	ADF	-0.754	-4.979***	I(1)	-2.365	-4.956***	I(1)
	PP	-0.754	-4963***	I(1)	-1.870	-4.886***	I(1)
	KPSS	0.886	0.121***	I(1)	0.087***	0.102***	I(0)
TOPN	ADF	-2.288	-9.011***	I(1)	-1.850	-9.425***	I(1)
	PP	-2.190	-9.011***	I(1)	-1.532	-9.506***	I(1)
	KPSS	0.301***	0.295***	I(0)	0.160***	0.084***	I(0)
MSUP	ADF	-1.175	-3.975***	I(1)	-2.878	-4.046**	I(1)
	PP	-0.860	-4.012***	I(1)	-1.775	-4.059**	I(1)
	KPSS	0.888	0.112***	I(1)	0.079***	0.085***	I(0)

Source: Author's Computation 2018, underlying data from World Development Indicator (WDI) Database and CBN annual report. Note: *, ** and *** imply statistical significance at 1%, 5% and 10% levels respectively

ARDL Bounds Test

Test Statistic	Value	K
F-statistic	6.682536	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Author's Computation 2018, underlying data from World Development Indicator (WDI) Database and CBN annual report

ARDL Estimate for Exchange Rate Determinants

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
EXCF(-1)	1.057961	0.067782	15.60839	0.0000
LOG(RGDP)	1.715535	0.720954	2.379535	0.0244
LOG(RGDP(-1))	-1.848305	0.745817	-2.478228	0.0195
INFL	-0.000672	0.003028	-0.221976	0.8259
INFL(-1)	-0.009027	0.003425	-2.635245	0.0135
INTR	-0.000867	0.010358	-0.083738	0.9339
INTR(-1)	-0.011586	0.012133	-0.954890	0.3478
INTR(-2)	-0.013962	0.013725	-1.017268	0.3177
INTR(-3)	0.031139	0.014682	2.120865	0.0429
TOPN	-0.006986	0.395093	-0.017683	0.9860
TOPN(-1)	-1.145783	0.457610	-2.503841	0.0184
LOG(MSUP)	-0.289509	0.339366	-0.853088	0.4008
LOG(MSUP(-1))	0.856409	0.579385	1.478136	0.1505
LOG(MSUP(-2))	0.759642	0.519531	1.462169	0.1548
LOG(MSUP(-3))	-1.343564	0.285575	-4.704772	0.0001
C	2.374606	4.639338	0.511841	0.6128
R-squared	0.969520	Mean dependent var		7.622567
Adjusted R-squared	0.953192	S.D. dependent var		0.934569
S.E. of regression	0.202195	Akaike info criterion		-0.083877
Sum squared resid	1.144723	Schwarz criterion		0.564919
Log likelihood	17.84529	Hannan-Quinn criter.		0.156728
F-statistic	59.37649	Durbin-Watson stat		1.467500
Prob(F-statistic)	0.000000			

*Note: p-values and any subsequent tests do not account for model selection.Source: Author's Computation 2018, underlying data from World Development Indicator (WDI) Database and CBN annual report