Exchange Rate Volatility: The Effects on Residential Real Estate in Calabar Metropolis

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ABSTRACT
Exchange rate is a very important factor in any economy. Fluctuating exchange rate prices of commodities are unstable including residential real estate. In an economy faced with persistent uncertainty, the effect of Nigeria exchange rate is audible to the deaf and visible to the blind. The study investigated the effect of exchange rate volatility on residential real estate in Calabar Metropolis. Purposive sampling technique was employed in gathering data for the study. 200 questionnaires were issued to the respondents and 185 were successfully retrieved and personal interview also carried out with the respondents to verify if exchange rate fluctuation has affected their housing prices. Ordinary least square (OLS) model was built using SPSS 20 and Minitab 17 statistical software to analyze the responses obtained from the respondents. The findings of the study shows an autocorrelation between the variables tested. The coefficient shows 81% for hypothesis one and 90.5% for hypothesis two. This implies that exchange rate volatility has a significant effect on residential real estate in Calabar Metropolis. Above all, it is recommended that government and stakeholders ensure that housing prices are not decided by personal perception of Landlords/Landladies.
Keywords: Exchange Rate, Volatility, Residential Real Estate, Rent, Housing Prices.

INTRODUCTION
Exchange rate volatility also referred to as exchange rate fluctuation is a period in which the values of domestic currency appreciates or depreciates. Exchange rate volatility is also defined as some of the factors that affect inflow of investments into emerging economies (Osinubi & Anmoghionyeodiwe 2009).Exchange rate is relatively important and influences external competitiveness of domestic goods. Exchange rate volatility greatly influences investments in such a way that a country with a high degree of exchange rate volatility has a high volatile stream of profits than a country with a low degree of exchange rate (Diala, Kalu & Igwe-kalu 2017). Exchange rate has been given a close consideration on its impact on GDP, inflation, trade openness, FDI and economic growth with little or no consideration on how it affects housing prices in Nigeria. Over the years, policy makers have been confronted with the challenge of determining an appropriate exchange rate through which the domestic economy is linked to the global economy.

The exchange value of a country's currency is largely determined by economic forces (called economic fundamentals), with political factors playing only complementary roles. Thus, attempts to impart greater value to a currency by political means probing into the underlying economic forces may lead to greater instability in the foreign exchange market and unsustainability in the rates. For instance, an increase in the terms of trade causes output in the non-tradable sector to decline causing an excess demand in non-traded goods and shifting the internal balances locus upward. Simultaneously, the external balances (downward sloping) locus shifts upwards as well, reflecting the necessity of having an appreciated exchange rate to maintain sustainable trade balance. Hence, exchange rate volatility has significant consequences on a country's economy particularly in the real estate subsector (Diala, Kalu &Igwe-kalu 2017). Despite the perceived implications of the exchange rate regime to long-run growth and economic stability, the existing theoretical and empirical literature on Africa (Nigeria in particular, considering the level of the country's economic integration through trade and foreign capital inflows) offers little guidance.

Objectives of the Study
This study was exclusively carried out to examine the effects of exchange rate volatility on residential real estate in Calabar Metropolis, Cross River State, Nigeria from 2008 to 2017. The secondary objectives are:
i.   To ascertain the effects of exchange rate volatility (US Dollars/ Nigerian Naira) on residential real estate.
ii.   To determine relationship between exchange rate volatility and the prices of residential real estate.

Conceptual Framework
Exchange rate depicts the price of one currency to another. It is a measure of ratio between a unit of one currency and the value of a different currency to which exchange can be made within a period of time (Ngerebo-a & Ibe, 2013). Obi, Oniore&Nnadi (2016) posit that the choice and management of exchange rate regime is a vital instrument in safeguarding macroeconomics stability, sustainable development and competiveness. Using Generalized Method of Moments (GMM) to examine the reliability between exchange rate and output growth in Nigeria from 1970-2014. The authors found out the deregulated exchange rate regime spur economic growth in Nigeria. Floating exchange rate has a negative impact on private domestic investment in Nigeria (Bakare, 2011). Olowe (2009) submitted that the Nigerian foreign exchange market is characterized by high volatility persistence; thus, it becomes imperative to evaluate how this fluctuation affects commercial real estate investment income in Nigeria. This also raises the need for investigation on exchange rate volatility on residential real estate. Diala et al. (2017) posit that exchange rate volatility has a significant positive impact on low income residential real estate investment returns aggregate. The findings of Diala et al (20147) negate previous submissions from Lee & Thomas (2006), Addae-Dapaah&Loh (2005), Lee (2001). The implication therefore is that, exchange rate volatility and residential real estate returns move in on the same direction. Wogu& Kalu (2011) suggest that commercial offices and shops provide the best real estate

investments in Nigeria in the period of exchange rate fluctuation. This is because it provides investors with stable income and commercial properties occupied by tenants have a long term lease making cash flow fairly predictable even during recession (Ciochetti, Fisher & Ciao, 2003). Previous findings are contradictory as Eme &Johson,(2012) found no evidence of a strong relationship between exchange rate and output growth. The findings are in line with Aghion, Bacchetta, Ranciere& Rogoff (2009). This is argued by Asher (2012), Azeez, Kolapo&Ajayi (2012), and Diala et al (2017) who posit that exchange rate fluctuation has a positive effect on real estate and the economy at large.

Exchange Rate: A Review

Exchange rate fluctuation has gained considerable concern in research since 1970; as a result of the shifting of exchange rate from fixed to floating regime in developing countries due to the adoption of structural adjustment policy. Exchange rate is seen as the price in terms of one currency against another currency or claims that it can be bought or sold (Ngerebo-a and Ibe, 2013).The rate is expressed as the amount of one currency that is necessary to purchase one unit of another currency. The increase and decrease of real exchange rate indicate strength and weakness of currency in relation to foreign currency and this serves as a yardstick to comparison of industrial competitiveness in the global market ((Mordi, 2006).
When examining the movement of exchange rate within a period of time, the shifting from the benchmark or equilibrium is termed exchange rate volatility and the misalignment of exchange rate which is as a result of multiplicity of market parallel as regards to the financial market. Nigeria has developed inflationary pressures as a result of currency devaluation due to the continual search for a realistic exchange rate and this has depressed the Nigerian economy (Obadan, 2006).
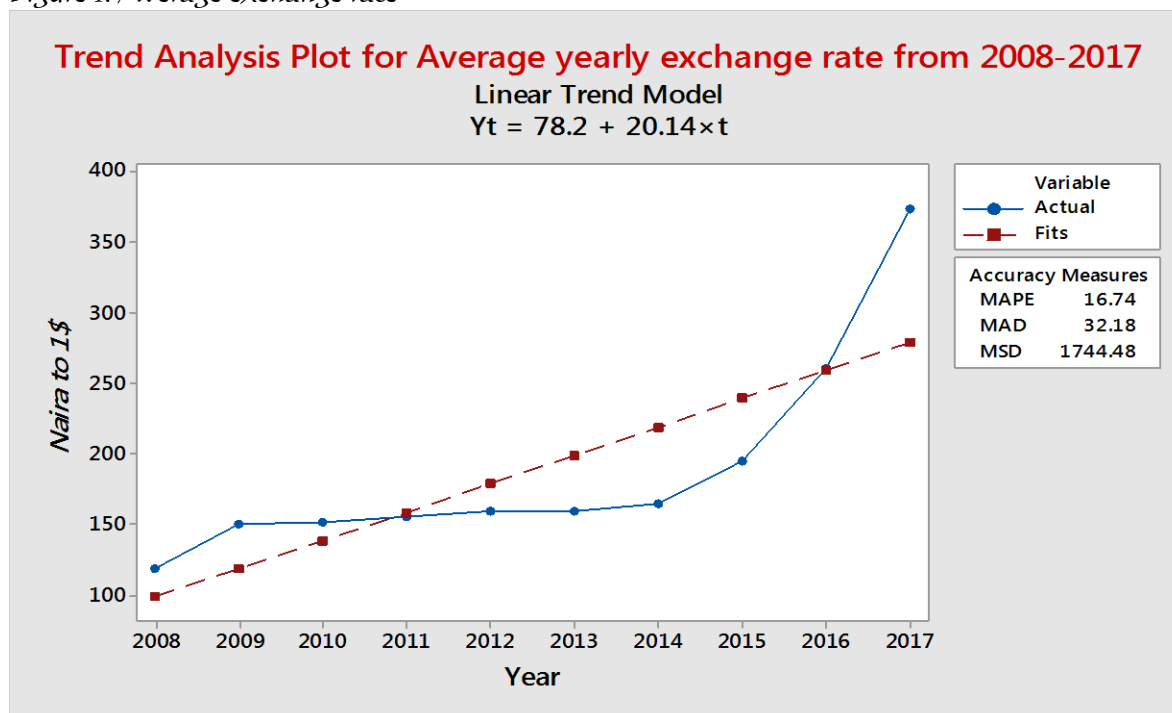
The exchange rate policy in Nigeria has experienced several changes, developing from a fixed parity in 1960 when it was equally tied with the British Pound sterling. Following the devaluation of the Pound sterling, the US Dollar was included in the parity exchange. The parity exchange with the British Pound was later suspended in1972 due to the emergence of a stronger US Dollar, also following in 1973, Nigeria reverted to a fixed parity with the British Pound following the devaluation of the US Dollar in 1974, Nigeria decided to hire the Naira to the Pound sterling and the US Dollar in order to reduce the effect of devaluation (Eze & Okpala 2014). In the 1970s there was continual appreciation of the nominal exchange rate of the Naira triggered by constant increase in the price of oil in the global market. This appreciation in the nominal exchange rate gave rise to over reliance on imports with its accompanying capital flight, discouraging non-oil exports which also led to balance of payment problems and depletion of external reserves (Osaka, Masha &Adamgbe2003; Obi, Oniore &Nnadi, 2016).

The Nigerian government has given in effort to maintain a stable exchange rate. The Naira has continued to depreciate from 0.61 Naira in 1981 to 2.02 Naira in 1986. To solve the problem of over-valuation of the Naira, in September 1986 under the Structural Adjustment Programme, the Second Tier Foreign Exchange Market (SFEM) was implemented to usher

in a mechanism for exchange rate determination and allocation in order to ensure short term stability and long-term balance of payment equilibrium (Eze&Okpala2014).

In 1990, the Naira exchange for ₦7.901 as against one US Dollar. In 1994 the policy of guided deregulation pegged the Naira at ₦21.886, in 1999 it was ₦86.322 while in 2004, it went for ₦135.50 per one US Dollar. Thereafter, the exchange rate appreciated to ₦132.15 and later ₦118.57 in 2008, in the last quarter of 2009, the Naira depreciated to ₦150.0124, while in December 2012, it exchanged for ₦158 depreciating to ₦160.14756 in August 2013and ₦168 in December 2013 in the open market. This is caused by the high demand for Dollar and excess supply of Naira. In 2015, the Naira went for ₦199.11 per one US Dollar, in 2016, a Dollar exchanged for ₦450 and in the first quarter of 2017, it went for ₦490 per one Dollar even though it was fluctuating (Laude, 2016). The record shows a persistent increase and decrease of the value of Naira which have had an adverse effect on the Nigerian economy.

Figure 1: Average exchange rate

Trend Analysis Plot for Average yearly exchange rate from 2008-2017
Linear Trend Model
$Yt = 78.2 + 20.14 \times t$

Source: Authors' analysis based on CBN statistical bulletin data 2017
The chart reveals a continual depreciation in the Naira value to USD for the past ten (10) years. The actual line indicates a cyclical variation on the regression line of Naira to US Dollarfrom 2008 to 2017.

Residential Real Estate in Nigeria

Real estate simply refers to property comprising of land and the buildings on it, along with its natural resources such as crops, minerals or water; immovable property of this nature; an interest vested in this (also) an item of real property, (more generally) buildings or housing in general(Wikipedia.com). Also, the business of real estate; the profession of buying, selling, or renting land, buildings or housing. This paper focuses on the residential real estate. Low income residential real estate refers to properties built solely for dwelling purpose for the low income earners. Residential real estate covers a large portion of real estate investment. More than 80% investment in real estate is concentrated on residential buildings in Nigeria and the world at large (Kalu, 2005). Igboko (1992) observed that residences make up the single largest unit of real estate investment both in rural and urban settlements. Exchange rate volatility has a significant positive impact on residential real estate investment returns and the prices determination of houses. Real estate investors and intending investors profit and anticipated income move in the direction of exchange rate (Diala et al 2016; 2017). Previous studies contradicts, Lee (2001), Addae-Dapaah & Loh (2005) and Lee & Thomas (2006) argue that exchange rate volatility does not have a significant correlation with economic growth considering several macroeconomic factors. Building is an integral part of man, as man must seek shelter. Exchange rate movement can increase or decrease the prices of residential houses due to the fact that some building materials especially in Nigeria are imported. This depicts that a fall in the Naira value will mean increase in the cost of building materials. The exchange rate fluctuation in the long run will determine real estate returns and the price tag of residential houses.

With rising demand for foreign currency, the Naira started a free fall which caused crisis in the real estate market. It generated waves of demand that put tenants and landlords at crossroads and pitched businesses against investors. For example, a few property owners who were used to bringing in foreign investors or funds to invest in real estate with the assurance that their dividends would be Dollar-denominated could no longer do so due to the Central Bank of Nigeria's discretionary Dollar allocation policy. The investment terrain became unpredictable because of local currency volatility (UbosiEleh& co estate surveyors and valuers2017).

Table 1.1: Average retail rents per square metre (2015/2016)

2015	Location	2016
$68/₦13,396	LAGOS	$68/₦19,176
$55/₦10,835	ABUJA	$55/₦15,510
$50/₦9850	PORTHARTCOURT	$50/₦14100
$38/₦7486	ENUGU	$38/₦10716
$37/₦7289	WARRI	$37/₦10434
$35/₦6895	KANO	$35/₦9870

Source: Adopted from UbosiEleh& co estate surveyors and valuers (2017).

The table above reveals a 43% increase in monthly average rent per square metre across the selected states in the geo-political zones. The increase in rental charge can be caused by several other factors outside exchange rate fluctuation and can reliably be caused by the continual loss of value of the Naira to USD over the past two years. Year-in-year observation reveals more Naira to obtain the same value of USD.

METHODOLOGY
This study employed the purposive sampling technique. The technique is best suitable for this nature of study due to the inability of the researcher to meet the respondents at the same time. The one-on-one interview method and a carefully structured open-ended questionnaire was issued out giving the respondents room to give unbiased answers to the research questions that sought to determine the relationship between exchange rate volatility and real estate as well as housing prices. All residential real estate owners in Calabar metropolis form the entire population of the study. The inability of the researchers to reach all the prescribed population limited the sample size to200 respondents who were purposively selected from the study area. The respondents included residential house owners in Calabar metropolis. In order to achieve the objectives of the study, descriptive statistics was used to tabulate the responses of the respondents, ordinary least square regression was employed in testing the formulated hypothesis using Statistical Package for Social Sciences (SPSS 20) and Minitab 17 statistical software.

Model Specification
$Y_{t1} = \beta_o + \beta_1(\blacktriangle ERv) + \mu_t$ model1
$Y_{t2} = \beta_o + \beta_1(\blacktriangle ERv) + \mu_t$ model2
where:
Y_{t1} = Residential real estate returns
Y_{t2} = Prices of residential houses
β_o = beta constant
β_{t1} = Exchange rate volatility
$\mu_{t=}$ stochastic error term
Variable definition:
Y_{t1} and Y_{t2} represent residential real estate returns and prices of residential houses respectively at time t, while β_{t1} represent exchange rate at time t. The model correlates exchange rate fluctuation and the constant changes in real estate prices and rents.

Data Analysis
In line with the objectives of the study, to evaluate whether there is any relationship between exchange rate volatility and residential real estate. The model developed was tested for statistical significance using the R square model fitting and the test for autocorrelation using Durbin Watson. The coefficient variation reveals the response test of the respondents based on the research questions.

Descriptive Statistics showing the degree of responses to the research questions

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q1	185	2.00	1.00	3.00	332.00	1.7946	.05371	.73052	.340	.004	-1.066	.041
Q2	185	2.00	1.00	3.00	328.00	1.7730	.05748	.78181	.423	.001	-1.244	.001
Q3	185	2.00	1.00	3.00	342.00	1.8486	.05832	.79318	.277	.011	-1.358	.011
Q4	185	2.00	1.00	3.00	361.00	1.9514	.05699	.77517	.084	.003	-1.326	.003
Q5	185	2.00	1.00	3.00	345.00	1.8649	.05726	.77887	.241	.002	-1.312	.014
Q6	185	2.00	1.00	3.00	348.00	1.8811	.05771	.78499	.213	.001	-1.345	.011
Q7	185	2.00	1.00	3.00	340.00	1.8378	.05557	.75590	.279	.002	-1.201	.016
Q8	185	2.00	1.00	3.00	355.00	1.9189	.06030	.82021	.151	.005	-1.498	.041
Q9	185	2.00	1.00	3.00	365.00	1.9730	.05707	.77623	.047	.001	-1.334	.005
Q10	185	2.00	1.00	3.00	340.00	1.8378	.05557	.75590	.279	.003	-1.201	.012
Valid N (listwise)	185											

Source: Authors analysis

Statistics

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
N	Valid	185	185	185	185	185	185	185	185	185	185
	Missing	0	0	0	0	0	0	0	0	0	0
Mean		1.7946	1.7730	1.8486	1.9514	1.8649	1.8811	1.8378	1.9189	1.9730	1.8378
Std. Error of Mean		.05371	.05748	.05832	.05699	.05726	.05771	.05557	.06030	.05707	.05557
Median		2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
Mode		2.00	1.00	1.00	2.00	1.00[a]	1.00[a]	2.00	1.00	2.00	2.00
Std. Deviation		.73052	.78181	.79318	.77517	.77887	.78499	.75590	.82021	.77623	.75590
Variance		.534	.611	.629	.601	.607	.616	.571	.673	.603	.571
Skewness		.340	.423	.277	.084	.241	.213	.279	.151	.047	.279
Std. Error of Skewness		.179	.179	.179	.179	.179	.179	.179	.179	.179	.179
Kurtosis		-1.066	-1.244	-1.358	-1.326	-1.312	-1.345	-1.201	-1.498	-1.334	-1.201
Std. Error of Kurtosis		.355	.355	.355	.355	.355	.355	.355	.355	.355	.355
Range		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Sum		332.00	328.00	342.00	361.00	345.00	348.00	340.00	355.00	365.00	340.00
Percentiles	100	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000

a. Multiple modes exist. The smallest value is shown

Test of Hypotheses
The study is guided by the following hypotheses stated in their null form:

Ho_1: There is no relationship between exchange rate volatility and residential real estate returns

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.810[a]	.656	.655	.00251	.656	349.637	1	183	.000	2.277

a. Predictors: (Constant), Exchange rate volatility
b. Dependent Variable: Residential real estate returns

The adjusted R_2 shows .655 which implies a 65.5% influence of the predictor on the controlled variable. Leaving 35% impact factor to other variables not considered in this study. Thus the model is statistically insignificant. Durbin Watson is 2.277 which proves positive autocorrelation between the dependent and the independent variables.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.825	1	73.825	49.637	.000[b]
	Residual	38.640	183	.211		
	Total	112.465	184			

a. Dependent Variable: Residential real estate returns
b. Predictors: (Constant), Exchange rate volatility

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1.(Constant)	.291	.005		3.378	.001	.121	.461					
Exchange rate volatility	.772	.001	.810	18.699	.000	.691	.854	.810	.810	.810	1.000	1.000

a. Dependent Variable: Residential real estate returns

Ho₂: Exchange rate volatility has no effect on the prices of residential real estate

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.905[a]	.819	.818	.31179	.819	827.126	1	183	.000	2.275

a. Predictors: (Constant), Exchange rate volatility

b. Dependent Variable: Prices of residential houses

The adjusted R_2 shows .818 which implies that the predictor has an 81.8% impact on the dependent variable, leaving 18.2% to variables not considered in this study. Thus the model is statistically insignificant. Durbin Watson is 2.275 which prove positive autocorrelation between the dependent and the independent variables.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	.211	.049		3.529	.001	.093	.328					
Exchange rate volatility	.842	.002	.905	28.760	.000	.784	.900	.905	.905	.905	1.000	1.000

a. Dependent Variable: Prices of residential houses

Hypothesis one shows .81 coefficient standardized Beta and a p-value of .000 which is less than 0.05. Hypothesis two shows a positive correlation between the dependent and independent variables tested. With a .000 p-value which is less than .05, the coefficient reveals that exchange rate volatility has an effect on residential real estate ceteris paribus. The changes in housing prices and real estate returns experienced in the last one decade is highly influenced by the appreciation or depreciation of the Naira to US Dollar. The regressed data shows that other variables not considered in this study affect the status quo of real estate and housing prices in Calabar metropolis. Responses from the respondents to the second question reveals that housing rent increases due to renovations and the increased cost of building materials, "other landlords/landladies have increased their rent" and slimly based on the statement "Dollar don increased".

CONCLUSION

Exchange rate remains very crucial to any economy, even to the ordinary man on the streets. The effects of exchange rate volatility on the Nigerian business sector cannot be overemphasized. As the fall of the Naira against USD triggers increase in prices of goods even in the kiosk beside the roadside. The popular statement "Dollar don rise woo" at many instances has been the root cause of increase in rents paid by tenants and the increase in the prices of houses on sale with a corresponding renovation or improvement in the property structure. Returns from residential real estate is also determined by exchange rate. This, at many times, is caused by the increase in building material as a result of the depreciation in

the Naira worth. The findings of this study are in line with Diala, Kalu &Igwe-Kalu (2017), which reveals a positive correlation between current exchange rate and residential real estate prices. The price tag on houses increase in the direction of exchange rate all things being equal. The study recommends that government and stakeholders see the need to institute necessary and active bodies to control housing prices in line with laid down laws and not allow personal perception to decide how Landlords/landladies place their rent prices.

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