1.1 Introduction:

Onyendi (2009) sees the rate of interest as the cost of using someone else's money. It is the inverse proportion between a sum of money and what can be obtained from parting with control over the money in exchange of a debt for a stated period of time while Mankiw (1992) defined interest rate as the rate of interest that investors pay to borrow money. Anyanwu and Oaikhenan (1995) opined that the rate of interest is the reward for parting with liquidity for a specified period. Abel and Bernanke (2005) opined that interest rate is a rate of return promised by a borrower to a lender. Dornbusch and Fischer (1978) defined interest as the cost of holding money. Anyanwu and Oaikhenan (1995) opined that there are two types of interest rates: nominal and real interest rates. The market rate of interest is roughly equivalent to the sum of the two forms. The market or nominal rate of interest equals the real rate of interest plus the rate of increase in the price level- the nominal interest plus the rate of increase in the price level. The nominal interest rates are the rate of interest actually paid while the real interest rates are the nominal rates minus the expected rate of inflation. Rose and Marquis (2009) argued that the rate of interest performs a number of important functions to support the smooth, efficient functioning of the economy and they include the facilitation of the flow of current of savings into investments that promote economic growth, allocation of the available supply of credit to those investment projects with the highest returns.

1.2 Statement of problem

Interest rates is an important tool through which government influences the volume of saving and investment. Different interest rates policies have been adopted and applied to stimulate the flow of current savings into investment. Unfortunately, these interest rate policies have not been able to stimulate adequate investment in Nigeria. The study therefore examined the impact of interest rate on investment in Nigeria.

1.3 Objectives of the study

The broad objective of the study was to investigate the impact of interest rate on investment in Nigeria. The specific objectives of the study were:

(i) To investigate the impact of prime rate on investment in Nigeria.
(ii) To examine the impact of interest rate on investment stability in Nigeria.
(iii) To investigate the impact of exchange rate on investment in Nigeria
(iv) To investigate the impact of inflation on investment in Nigeria
(v) To investigate the impact of money supply on investment in Nigeria.

1.4 Hypothesis of the study:

In order to guide the study, the following null hypotheses were formulated:

HO_1: Prime rate does not have any impact on investment in Nigeria.
HO_2: Interest rate does not have any impact on investment in Nigeria.
HO_3: Exchange rate does not have any impact on investment in Nigeria.
HO_4: Inflation does not have any impact on investment in Nigeria.
HO_5: Exchange rate does not have any impact on investment in Nigeria

2.0 LITERATURE REVIEW

2.1 Theoretical literature

2.1.1 The classical theory interest rate: Under this theory, interest rate is determined by the intersection of the investment – demand schedule and the saving schedule, that is, schedule showing the relationship of investment and saving to the rate of interest. There is confusion of actual determination of interest rate since the savings schedule will shift to the right as income rises. So, unless we know the rate of interest, we cannot know the level of income and vice versa as lower interest rate means larger investment through the multiplier and hitherto leads to higher level of real income. Thus, the classical theory fails to proffer a solution.

2.1.2 The Keynesian liquidity preference theory of interest rate: interest rate is determined by the intersection of the supply schedule of money and the demand schedule of money, that is, the liquidity preference schedule. This implies that money supply and money demand schedules cannot give rate of interest unless we already know the income level. The liquidity preference schedule will shift up or down with changes in the level of income. From this, it is readily noted that the indeterminate defect of Keynes levels against the classical theorists also remains applicable to his theory. The implication is that in the Keynesian analysis, an increase in money supply results in a fall of interest rate.

2.1.3 The loanable funds theory of interest rate: the rate of interest is determined by the intersection of demand schedule for loanable funds with the supply schedule for the loanable funds. Loanable fund is that part of total income available to be granted as credit therefore since the supply schedule comprises of voluntary savings, addition to loanable funds through the new money, that is, additional money supply and the idle balance of cash that are not hoarded. It follows that the total supply schedule of loanable funds also varies with income. Hence the theory is indeterminate.

2.1.4 Neo-classical theory of interest (Pigou): Interest rate is the intersection of the demand schedule for money, with the supply schedule of savings. Supply schedule, here, is saving made out of present income. This is the excess of total income over total consumption. Consumption and savings are applied by Pigou in interest rate determination. It means that income from all sources has a role to play in income creation process. It then appears that savings is the same as loanable funds and hence the same interest applies to the theory.

2.1.5 IS-LM framework (J.R Hicks) Hicksian theory: interest rate is determined by the combination of intersection of the Keynesian viewpoint on the demand side with the neo-classical formulation of savings schedule at various levels of income on the supply side. IS-curve, and the LM-curve refer to functions relating to two variables- income and the rate of interest. So, income and the rate of interest are determined together at the point of intersection of these two schedules. In fact, at the point of intersection, it could have been confirmed that income and the rate of interest relate such that actual savings equal to desired savings. Thus, the IS-LM function/framework is the locus of all rates of income and interest rates for which both the expenditure and monetary sectors are simultaneously in equilibrium.

2.1.6 The monetarist's theory of interest rate: To them, interest rate is not only determined by money supply and money demand but also by price expectation, so they accept the monetary phenomenon but reject money supply demand for money intersection as determination of interest rate as opined by Keynes. The monetarists were of the view that an increase in the stock of

money has three effects- liquidity effect, income effect and price expectation/anticipation effect. According to them, the immediate impact observed when money supply is increased is the fall in interest rate, that is, Keynesian liquidity preference effect. This increase in in liquidity. Demand for goods and services will be stimulated upwards. This will lead to rise in income on the economy, that is, income effect. This income increase will exact pressure on goods and services and hence price rise. Price rises due to expectations effect. Then there will be the tendency for people anticipating inflation in the nearest future. Price rise will stimulate rise in interest rate (lending rate). So, price expectation may also be a factor for increase interest rate (Onyendi, 2009).

2.2 Conceptual literature

Interest is the price paid for capital. Interest rate measures the cost of borrowing over a specified period of time. As a convention, interest rate is usually expressed as an annual percentage rate. Since capital is financed through borrowing and lending, interest can also be considered the price of credit. The rate of interest represents the terms of trade between the present and future. A high interest rate means that the future is cheap relative to the present goods while a low interest rate means that present goods are cheap relative to future goods. As a price of credit or borrowing, the interest rate indicates the terms of trade between things today and things tomorrow. It is a price that links the links the present and the future (Ruffin and Greary, 1983). Samuelson and Samuelson (1980) argued that the yield of capital is the interest rate per annum which is a pure percentage per unit of time. The market rate of interest is the percentage returns per year which has d which has to be earned to be paid on any safe loan of money, which has to be yielded by any safe bond or other securities and which has to earned on the valued of any capital asset in any competitive market where there are no risks or where all risk factors have already been taken care of by special premium payments to protect against and compensate for any risks. According to Anyanwu and Oaikhenan (1995), the rate of interest is the reward for parting with liquidity for a specified period. It is the inverse proportion between a sum of money and what can be obtained for parting with control over the money in exchange for a debt for a stated period of time. Interest rates as the prices paid for the right to borrow and use loanable funds are the cost of holding money, that is, they are prices that must be paid to get people to forego willingly the advantages of liquidity. Abel and Bernanke (2005) defined interest rate as a rate of return promised by a borrower to a lender. Dornbusch and Fischer (1978) see interest as the cost of holding money. According to Onyendi (2009), the rate of interest is the cost of using someone else's money. It is the inverse proportion between a sum of money and what can be obtained from parting with control over the money in exchange of a debt for a stated period of time. Mankiw (1992) defined interest rate as the rate of interest that investors pay to borrow money.

Anyanwu and Oaikhenan (1995) opined that there are two types of interest rates: nominal and real interest rates. The market rate of interest is roughly equivalent to the sum of the two forms. The market or nominal rate of interest equals the real rate of interest plus the rate of increase in the price level- the nominal interest plus the rate of increase in the price level. The nominal interest rates are the rate of interest actually paid while the real interest rates are the nominal rates minus the expected rate of inflation. Mankiw (1992) sees nominal interest rate as the interest rate that is usually reported without a correction for the effects of inflation while real interest rate is the interest rate corrected for inflation. It is the difference between the nominal interest rate and the rate of inflation. Samuelson and Nordhaus (2010), argued that nominal interest rate (sometimes also called the money interest rate) is the interest rate on money in terms of money while Onyendi (2009) opined that the nominal rate of interest or the market rate of interest is the rate actually paid while the real interest rates are the nominal rates less the

expected rate of inflation. Mankiw (1992) sees nominal interest rate as the rate of interest that investors pay to borrow money while real interest rate is the nominal interest rate that is corrected for inflation.

Rose and Marquis (2009) argued that the rate of interest performs a number of important functions to support the smooth, efficient functioning of the economy and they include:

(a) It facilitates the flow of current of savings into investments that promote economic growth. For example, banks can attract household savings by offering interest on deposits. These funds can then be made available to small businesses to expand their operation with increasing employment and output.
(b) Interest rates allocate the available supply of credit to those investment projects with the highest returns. A firm computes the rate of return on a project that would expect its production line. If the interest rate is too high, then the cost of borrowing could cause on otherwise profitable project to become a loser. Therefore, the interest rates allow only those projects with the greatest profit potential to be funded.
(c) Adjustments in interest rates can bring the supply of money into balance with demand. A household needs money to conduct its purchases of goods and services. If there is more money in supply in the economy than is demanded by households, a decrease in the interest rate would occur that would reduce the opportunity cost of holding money and thereby increase the demand for money
(d) Interest rates are important tool of government policy through their influence on the volume of saving and investment. If the economy is growing to lower interest rates in order to stimulate borrowing and investment. On the other hand, an economy experiencing rapid inflation has traditionally called for a government policy of higher rates to slow borrowing and spending and encourage more savings.

Onyendi (2009), opined that higher or lower interest rate can be determined by the following factors:

(i) Savings and consumption: the higher the savings, the lower the interest rate. Conversely, the higher the consumption level, the higher the interest rate.
(ii) Investment demand: the higher the level of investment, the higher the level of interest rate and vice versa.
(iii) Demand for money or liquidity preference: the higher the liquidity preference, the higher the demand for money, the lower the interest rate and vice versa.
(iv) Quantity of money or money supply: two schools of thought (Keynes and monetarist). According to Keynes, increase in money supply leads to decrease in interest rate and vice versa. According to monetarist, increase in money supply results in an increase in interest rate. This is because market rate of interest is made up of real interest rate and the rate of inflation.

2.3 Empirical literature

Ereha (2010) examined variations in interest rate and investment determination in Nigeria. The study was necessitated by the fact that previous studies only examined the effect of interest rate on investment determination without accessing the bi-casual effects of these macroeconomic variables. Investment decision is seen as demand for credit in an economy and the study

calculated the annual variance of interest rate from monthly interest rate data for the period 1970 – 2002 and examined the determinants of interest rate variation and its impact on investment determination. The study employed dynamic model of two equations using instrumental variable technique of estimation. Data for the study were extracted from the World Development indicator. The study revealed that variation in interest rate played a negative and highly significant role in investment decision in the economy and demand for credit also had negative and significant influence on interest rate variations on both the short run and long run. Although the study deduced that investment has an indirect relationship with interest rate variation, other variables such as debt burden, economic stability, foreign exchange, shortage and lack of infrastructure affect gross domestic investment. The study recommended that improvement in these key macroeconomic variables was a necessary condition towards facilitating investment in Nigeria.

Majed and Ahmad (2010) investigated the impact of real interest rate on investment level in Jordan over the period (1990- 2005). A cointegration analysis with three variables (investment level, real interest rate, and income level) was employed. Two-unit root tests (Phillips-Perron test and Augmented DickeyFuller test) were exploited to check the integration order of the variables. The Johansen Cointegration test was mainly used. And for the purpose of supporting the results, the dynamic relationships among the variables were explained through presenting variance decomposition and impulse responses. The results were found to be in line with the economic theory and some other studies in the sense that real interest rate has a negative impact on investment, where it is found that an increase in the real interest rate by 1% reduces the investment level by 44%. On the other hand, the income level has a positive impact.

Adenuga (2020) examined the impact of interest rates on investment in Nigeria from 1986 to 2018, using co-integration and vector error correction approach. The specific objectives of the study were to estimate the short-and long-run elasticities as well as the error correction mechanism of interest rate, inflation rate and exchange rate on investment in Nigeria. The outcome of the study validated the hypothesis that interest rate has impact on investment in Nigeria, albeit with mixed results as the first lag period of all the three indicators used indicated positive relationship with the growth of investment but the lag of the second period all indicated negative impact on investment. The error-correction equation of investment indicated a feedback of 53.1 per cent, of the first period lag but 47.1 per cent, of second period lag. Also, the error-correction term indicated low speed of adjustment with only 2.0 per cent. Based on these findings, the study recommended among others that the regulatory body should mandate banks to channel their mobilised savings to investors in form of loans at reasonable interest rate. Hence, the pointer should be to identify those constraints and bottlenecks that are making it difficult for banks to make loans available to investors. The issue of high interest rate with hidden transaction costs must be vigorously addressed by the monetary authorities

Anokwuru, (2017). investigated the relationship between Interest rate and Domestic Private Investment in Nigeria. The aim of the study was to examine the impact of interest rates and Private Domestic Investment in Nigeria from 1980 to 2015. Ordinary Least Square Regression was adopted to determine the relationship among the variables employed in the study. Gross Domestic Product served as the independent variable while the Real Interest Rates and Prime Lending Rates were the independent variables. The findings showed that the Real and Prime Lending Rates are negatively related to Private Domestic Investment and statistically significant at 5%. The coefficient of determination showed that only 23% of the variation in the private domestic investment was accounted for by interest rates. This showed that the predictive power of the model is very weak. The study concluded that the success of promoting the Private Domestic Investment does not depend only on interest rates though it should not be neglected.

Based on these findings, the study recommended amongst others that monetary authorities should promote policies to improve deposits and also make available loanable funds as this plays a vital role in promoting Private Domestic Investment in Nigeria

Emerenini and Davis (2015) investigated the Impact of Interest rate on Investment in Nigeria. Multiple regression was used as the statistical method for their study. Their study which revealed that high interest rate negatively affect investment. The study made the following suggestions: that relevant monetary authority should evolve policies that will encourage savings and reduce prime lending rate to genuine investors, among others. The study also recommended that since there is a direct relationship between income and savings, relevant authority should consider economic policies that will increase income level of the people in order to mobilize investment.

Osuji (2020) examined the impact of interest rate liberalization on investment in Nigeria from 1961 to 2017 using error correction model and variance decomposition of vector autoregressive model. The empirical findings of his study showed that interest rate liberalization has no significant impact on investment in Nigeria. The result of the study also showed that prime lending rate had a negative insignificant impact on investment in Nigeria both in the pre and post liberalization period. Private sector credit and nominal exchange rate were also observed to be insignificant factors explaining variations in investment in Nigeria. However, national income and government expenditure exerted a positive and negative significant impact on investment respectively. The study therefore recommended that government through the Central Bank of Nigeria should use her monetary policies to influence interest rate in such a way as to stimulate investment growth in the country instead of allowing it to be freely determined by the market forces as the theory on liberalization suggests.

Wahu and Suyuan (2015) tested the interest rate impact on investment in Jiangsu Province of China. For long run, nexus Johansen Co-integration test was employed. The study used vector error correction model (VECM) to find short run association over the period of 2003-2012. The results indicated that there is a long-term relationship association among variables. It has negative relation in the long run but positive in short run. The study recommended that investors in enterprises should make correct and informed decisions according to the change of interest rate; the government of Jiangsu should also make flexible investment policies and pay more attention to interest sensitive industries

3.0 Methodology Multiple regression analysis was used in the study. Time series data spanning from 1981 to 2019 was sourced from the Central Bank of Nigeria statistical bulletin. The data was analysed using E-views 9

3.1 Model specification: In order to investigate the impact of interest rate on investment in Nigeria, the model for this study was specified thus; GCF = f (PRIME, INT, INF, MS) …. (1)
Where: GCF = Gross capital formation (proxy for investment)
PRIME = Prime rate
INTR = Interest rate
INF = Inflation Recurrent expenditure
MS = Money supply
The model in its econometric linear form can be written as:
GCF = b0 + b1PRIME + b2INT + b3INF + b4MS + U …… (2)
U = stochastic or random error term
bo = constant intercept
b1 – b4 = coefficients of associated variables

The theoretical expectations about the signs of the coefficients of the parameters are as follows: b1<0, b2<0, b3<0, b4>0,

The Augmented-Dickey Fuller (ADF) and Phillips-Perron unit root tests were employed to ensure data stationarity and avoid the problem of spurious regression since the data for the analysis is time series. The Johansen test for co-integration was also employed to investigate whether there is existence of long run relationship among the variables in the model.

Table 1: Result of Augmented Dickey-Fuller unit root test

Variables	ADF test statistic	1% critical value	5% critical value	10% critical value	Order of integration
GCF	-4.917428	-3.626784	-2.945842	-2.611531	1(2)
PRIME	-5.069706	-4.262735	-3.552973	-3.209642	1(0)
INTR	-5.10661	-4.262735	-3.552973	-3.209642	1(0)
INF	-4.554256	-4.309824	-3.574244	-3.221728	1(0)
MS	-5.106252	-4.226815	-3.536601	-3.200320	1(1)

Source: Author's computation

The unit test result presented on table 1 showed that GCF was stationary at second difference while PRIME, INTR and INF were stationary at levels. The result also showed that MS was stationary at first difference. This is because their various ADF test statistic were greater than their various 1%, 5% and 10% critical values in absolute terms.

Table 2: Johansen co-integration test result

Date: 10/24/21 Time: 19:18
Sample (adjusted): 1983 2019
Included observations: 37 after adjustments
Trend assumption: Linear deterministic trend
Series: GCF PRIME INTR EXR INF MS
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic
None *	0.758137	124.4144
At most 1 *	0.570334	71.89724
At most 2	0.431743	40.64161

At most 3	0.277215	19.72990
At most 4	0.174547	7.718066
At most 5	0.016633	0.620609

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

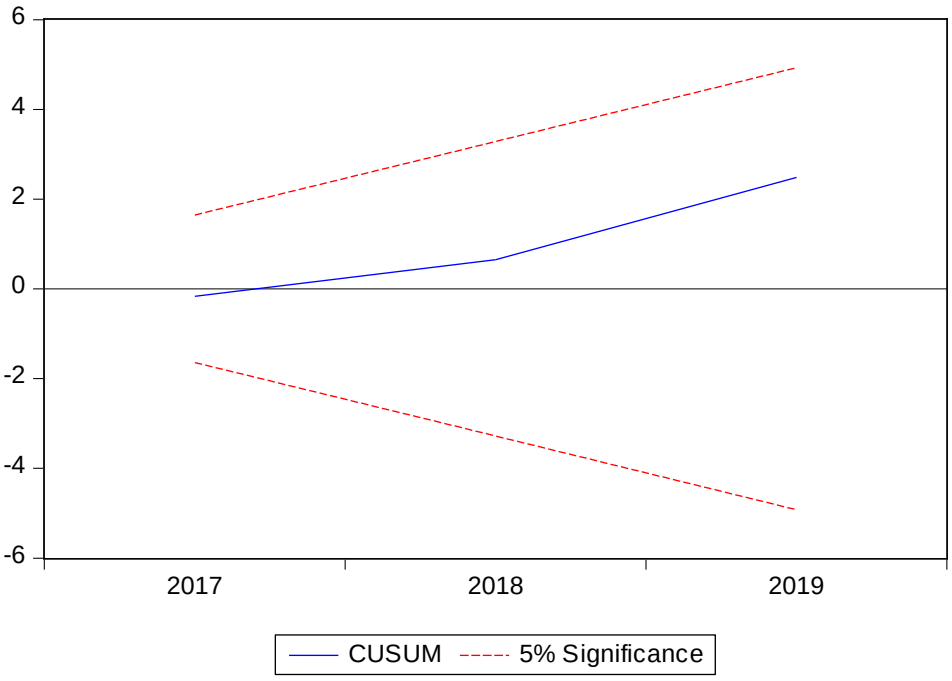
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic
None *	0.758137	52.51714
At most 1	0.570334	31.25563
At most 2	0.431743	20.91171
At most 3	0.277215	12.01183
At most 4	0.174547	7.097457
At most 5	0.016633	0.620609

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

SOURCE: Computer analysis using EViews 9

The trace test indicates that there are 2 co-integrating equations at 0.05 levels while Max-eigen indicates that there is 1 co-integrating equation at 0.05 levels. These results showed that there is a cointegration among the variables. In the other words, GCF has a long run relationship with PRIME, INTR, EXR, INF and MS.

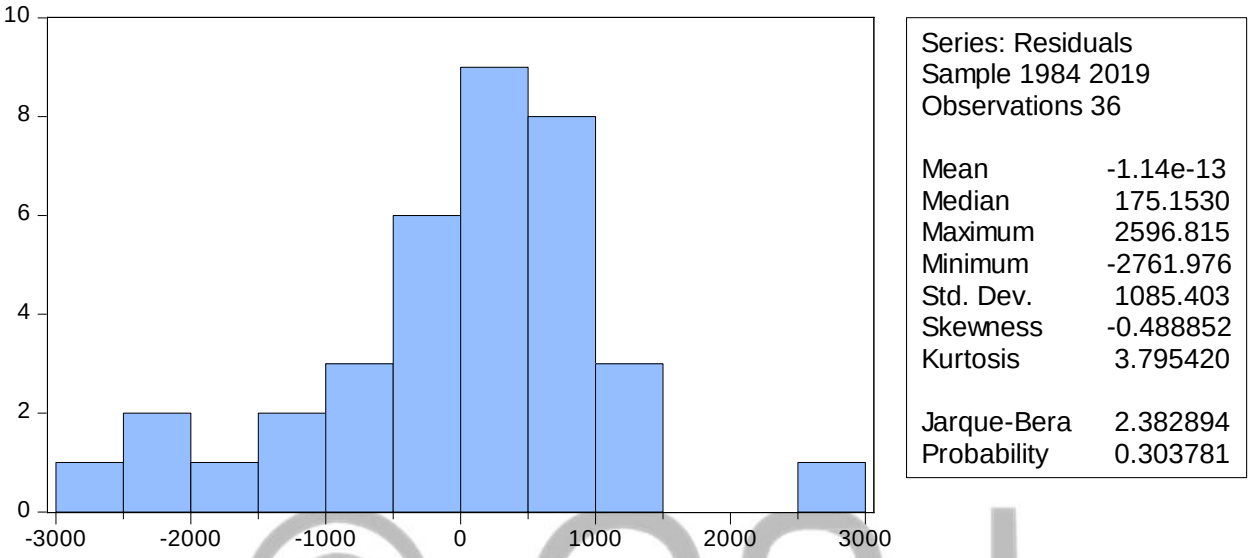
Table 3: Model stability test



Source: Computer analysis using E-views

To investigate the existence of a possible structural instability, the study used the Cusum test on table 3 and found that the cumulative sum remained within the area between the two critical lines showing that test did not detect any systematic eventual movements and that the coefficients values reflect structural stability.

Table 4: NORMALITY TEST



Source: computer analysis using E-views 9

Table 4 above, shows that there exists normal distribution of the residuals as the probability (0.303781) of Jaque-Bera statistics is greater than 5%. This is encouraging as it exposes that our OLS estimates are unbiased, t-statistics and confidence intervals are robust as well as prediction intervals.

TABLE 5: SHORT RUN RESULT

Dependent Variable: GCF
Method: Least Squares
Date: 10/24/21 Time: 19:04
Sample: 1981 2019
Included observations: 39

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-417.5285	1606.500	-0.259899	0.7966
PRIME	-3722.833	2568.754	-1.449276	0.1567
INTR	3710.325	2566.533	1.445657	0.1577
EXR	-8.897904	11.05836	-0.804632	0.4268
INF	12.98922	26.26895	0.494471	0.6242
MS	0.885065	0.099320	8.911283	0.0000

R-squared	0.923980	Mean dependent var	4513.063
Adjusted R-squared	0.912462	S.D. dependent var	8141.603
S.E. of regression	2408.836	Akaike info criterion	18.55231
Sum squared resid	1.91E+08	Schwarz criterion	18.80825
Log likelihood	-355.7701	Hannan-Quinn criter.	18.64414
F-statistic	80.21982	Durbin-Watson stat	1.013429

Prob(F-statistic)	0.000000

SOURCE: Computer analysis using EViews 9

From the results of the short run result presented on table 5, the coefficient of PRIME is negative and conforms to the aprori expectation. The coefficient of PRIME which is -3722.833 implies that on the average, one unit increase in PRIME will on the average lead to 3722.833 units fall in Gross capital formation (GCF). The t-value of PRIME is -1.449276 with the probability value of 0.1567 > 0.05 (level of significance) shows that PRIME has no significant effect on GCF in Nigeria within the period under study. For INTR, the coefficient is 3710.325. This means that INTR is positively related to GCF and implies that on the average, one unit increase in INTR on the average will to lead 3710.325 units increase in GCf. This does not conform to the aprori expectation. The t-value of INTR is 1.445657 with the probability value of 0.1577 > 0.05 (level of significance) shows that INTR has no significant effect on GCF in Nigeria within the period under study. The result also shows that the coefficient of EXR is negative and is in conformity to the aprori expectation. The result shows that on the average, one unit increase in EXR will on the average leads to 8.897904 unit fall in GCF. The t-value of EXR is 0.49447 with the probability value of 0.6242 > 0.05 (level of significance) shows that EXR has no significant effect on GCF in Nigeria within the period under study. The result also showed that the coefficient of INF is positive and conform to aprori expectation. The coefficient of INF which is 12.98922 implies that a unit increase in INF will on the average leads to 12.98922 units increase in GCF. The result equally shows that the coefficient of MS is positive and this is also in conformity to the aprori expectation. From the result one unit increase in MS will on the average leads to 0.885065 units increase in GCF. The t-value of MS is 8.911283 with the probability value of 0.0000 < 0.05 (level of significance) shows MS has a significant effect on GCF in Nigeria within the period under study. The R-squared value of 0.923980 shows that about 92.4 percent of the total variations in the dependent variable (GCF) were explained by changes in the explanatory variables (PRIME, INTR. EXR, INF and MS). The F-statistic of 80.21982 with the corresponding probability value of 0.000000 measured the adequacy of the regression model and the overall influence of PRIME, INTR, EXR, INF and MS on GCF. Since P = 0.000000 < 0.05 (level of significance), the model was a good fit and the explanatory variables (PRIME, INTR, EXR, INF and MS) jointly exerted a statistically significant effect on the dependent variable (GCF). The Durbin-Watson value of 1.0134291 shows the presence of positive of autocorrelation.

Table 6 Over-Parameterised Error Correction Results

Dependent Variable: D(GCF)
Method: Least Squares
Date: 10/24/21 Time: 19:11
Sample (adjusted): 1984 2019
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-76.22291	261.7358	-0.291221	0.7740
D(PRIME)	-5580.964	1454.314	-3.837523	0.0011
D(INTR)	5616.121	1448.432	3.877380	0.0010
D(EXR)	2.592209	13.21794	0.196113	0.8466
D(INF)	-4.336210	12.48758	-0.347242	0.7322
D(MS)	0.732256	0.278742	2.627006	0.0166
D(PRIME(-1))	-7949.447	1850.848	-4.295030	0.0004
D(INTR(-1))	7983.818	1843.612	4.330530	0.0004

D(EXR(-1))	36.84419	13.31428	2.767268	0.0123
D(INF(-1))	-11.26546	12.43458	-0.905979	0.3763
D(MS(-1))	-0.971244	0.405863	-2.393037	0.0272
D(PRIME(-2))	-7489.329	1714.314	-4.368704	0.0003
D(INTR(-2))	7493.907	1711.682	4.378095	0.0003
D(EXR(-2))	34.83112	13.94556	2.497649	0.0218
D(INF(-2))	-4.419873	12.89168	-0.342847	0.7355
D(MS(-2))	0.384394	0.375984	1.022367	0.3194
ECM(-1)	-0.881785	0.311794	-2.828098	0.0107

R-squared	0.921010	Mean dependent var	1027.837
Adjusted R-squared	0.854492	S.D. dependent var	2542.908
S.E. of regression	970.0044	Akaike info criterion	16.89784
Sum squared resid	17877261	Schwarz criterion	17.64562
Log likelihood	-287.1612	Hannan-Quinn criter.	17.15884
F-statistic	13.84607	Durbin-Watson stat	1.620935
Prob(F-statistic)	0.000000		

SOURCE: Computer analysis using EViews 9

In the over parameterized model as shown in table 6, the error correction term ECM (-1) is correctly specified. It is negative and statistically significant. This means that it will be effective to correct any deviations from the long-run equilibrium. Moreover, the negative and statistically significant of the ECM confirms that the variables in the model are co- integrated. The coefficient of the ECM (-1) which is -0.881785 indicates that the speed of adjustment to long run equilibrium is 88.2 percent when any past deviation must be corrected in the present period. This means that the present value of GCF adjusts so fast to changes in PRIME, INTR, EXR, INF ans MS. The coefficient of determination (R^2) in the over parameterized model is 0.921010. This means that about 92.1 percent of the variations in the dependent variable (GCF) is explained jointly by the explanatory variables in the model. The F-statistic of 13.84607 with probability of 0.000000 is significant. This means that the explanatory variables in the model (PRIME, INTR, EXR, INF and MS) are jointly significant. The Durbin Watson statistic of 1.620935 means the absence of autocorrelation. The coefficient of PRIME in the current period is negative and statistically significant on the current GCF and is also in conformity with the aprori expectation while. the coefficient of PRIME in the one period lag and in the two periods lag are all negative and statistically significant on the current GCF and also in conformity with the aprori expectation. The coefficient of INTR in the current period is positive and statically significant on the current GCF and is also not in conformity with the aprori expectation. The coefficient of INTR in the one period lag and the two periods lag are all positive and statistically significant to the current GCF and also not in conformity with the aprori expectation. The coefficient of EXR in the current period is positive and statistically insignificant on the current GCF. The coefficient of EXR in the one period lag and two periods lag are positive and statistically significant on current GCF. They are also in conformity with aprori expectation. The coefficient of INF in the current period is negative and statistically insignificant tot the current GCF an is also contrary to the aprori expectation. The coefficient of INF in the one period lag and in the two periods lag are all negative and statistically insignificant to the current GCF and also contrary to the aprori expectation. The coefficient of MS in the current period is positive and statistically significant to the current GCF and is also in conformity with the aprori expectation. The coefficient of MS in the one period lag is negative and statistically significant and is contrary to the aprori expectation while its coefficient in the two periods lag is positive and statistically significant on the current GCF and is in conformity to the aprori expectation.

The next step is to perform the parsimonious model which is a stepwise reduction of jointly insignificant variables in the over parameterized model until parsimony is achieved. In other word, the parsimonious model would be built by estimating the equations of only those variables found to be significant in the over-parameterized model. This is presented in table 7

Table 7. Parsimonious Error Correction Result

Dependent Variable: D(GCF)
Method: Least Squares
Date: 10/24/21 Time: 19:16
Sample (adjusted): 1984 2019
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-320.7500	306.7742	-1.045557	0.3062
D(INTR)	43.45482	70.74747	0.614224	0.5448
D(MS)	0.200547	0.291817	0.687234	0.4985
D(PRIME(-1))	-5237.223	1362.256	-3.844521	0.0008
D(INTR(-1))	5282.007	1359.180	3.886172	0.0007
D(EXR(-1))	43.75557	16.77834	2.607861	0.0154
D(INF(-1))	-15.00828	16.24490	-0.923876	0.3647
D(MS(-1))	0.218672	0.419255	0.521572	0.6067
D(PRIME(-2))	-8408.227	1564.498	-5.374393	0.0000
D(INTR(-2))	8384.515	1556.740	5.385943	0.0000
D(EXR(-2))	50.06817	17.28103	2.897292	0.0079
ECM(-1)	-0.593323	0.273129	-2.172319	0.0399

R-squared	0.817812	Mean dependent var	1027.837
Adjusted R-squared	0.734309	S.D. dependent var	2542.908
S.E. of regression	1310.749	Akaike info criterion	17.45579
Sum squared resid	41233490	Schwarz criterion	17.98363
Log likelihood	-302.2042	Hannan-Quinn criter.	17.64002
F-statistic	9.793798	Durbin-Watson stat	1.452529
Prob(F-statistic)	0.000002		

SOURCE: Computer analysis using EViews 9

In the parsimonious model as shown in table 7, the error correction term ECM (-1) is correctly specified. It is negative and statistically significant. This means that it will be effective to correct any deviations from the long run equilibrium. The speed of adjustment which is the coefficient of ECM (-1) is -0.593323. This shows that about 59.3 percent of short run disequilibrium adjusts back to equilibrium in the long run. This indicates that present value of the dependent variable adjusts slower to changes in the independent variables than what is obtained in the over-parameterized model. The coefficient of determination (R^2) in the parsimonious model is 0.817812. This means that about 81.8 percent of the variations in the dependent variable (GCF) are explained jointly by the explanatory variables in the model. The F- statistic of 9.793798 with probability of 0.000002 is highly significant. The Durbin Watson statistic of 1.452529 means the presence of positive autocorrelation. The result of the parsimonious model showed that the coefficients of the current INTR is 43.45482 and is statistically insignificant. This value of the coefficient showed that on the average, one unit increase in the INTR will lead to 43.45482 units increase in on the current GCF. The result also revealed that the coefficient of current MS is 0.200547 and is statistically insignificant. The value of the coefficient showed that on the average, one unit increase in current MS of will on the average leads to 0.200547 units increase on the current GCF. The result equally revealed that the coefficient of PRIME in the one period

lag is -5237.223 and is statistically significant. The value of the coefficient of PRIME in the one period lag showed that on the average one unit increase in the one period lag of PRIME will lead to a fall of 5237.223 units on the current GCF. The result also showed that the value of the coefficient of EXR in the one period lag is 43.75557 and is statistically significant. The value of the coefficient showed that on the average one unit increase in one period lag EXR will lead to an in increase in the current GCF by 43.75557 units. The result also showed that the coefficient of INF in the one period lag is -15.00828 and is statistically insignificant. The value of the coefficient of INF in the one period lag showed that on the average one unit increase in the one period lag of INF will on the average lead to a fall in current GCF by 15.00828 units. The result equally showed that the coefficient of MS in the one period lag is 0,218672 and is statistically insignificant. The coefficient of MS in the one period lag showed that on the average one unit increase in the one period lag of MS will on the average lead to 0.218672 increase on current GCF. The result showed that coefficient of PRIME in the two periods lag is -8408.227. The value of the coefficient of PRIME in the two periods lag showed that on the average one unit increase in the two periods lag of PRIME will on the average lead to a fall of 8408.227 units on the current GCF. The result also showed that the value of the coefficient of INTR in the two periods lag is 8384.515 and is statistically significant. The value of the coefficient showed that on the average one unit increase in two periods lag of INTR will on the average lead to an in increase in the current GCF by 8384.515 units. The result also showed that the coefficient of EXR in the two periods lag is 50.06817 and is statistically significant. The value of the coefficient of EXR in the two periods lag showed that on the average one unit increase in the two periods lag of EXR will on the average leads to an increase in the current GCF by 50.06817 units.

4.1 Summary:

The study examined the impact of interest rate on investment (using gross capital formation for formation as proxy for investment) in Nigeria for the period 1981–2019. The short run regression result showed that all the explanatory variables: prime rate (PRIME) and exchange rate (EXR) have a negative and insignificant effect on investment while interest rate (INTR) and inflation (INF) have a positive and insignificant effect on investment. The result also showed that money supply has a positive and significant effect on investment. The joint effect of the explanatory variables on the dependent variable was statistically significant implying that these variables were considered important variables in explaining changes in investment proxied by gross capital formation in Nigeria within the period of study. The modeled and operationalized framework of analysis exhibited a very high explanatory power, thereby providing supporting evidence that the explanatory variables included in the model were relevant in explaining changes in investment in Nigeria within the period of study. The coefficient of the error correction indicates that the speed of adjustment to long run equilibrium is 59.3 percent when any past deviation must be corrected in the present period.

4.2 conclusion: Given that the joint effect of the explanatory variables on the dependent variable were statistically significant the study concludes that the explanatory variables considered in this study were important variables in explaining investment in Nigeria within the period of study.

4.3 Recommendations:

The result of the study showed that there is a negative and insignificant relationship between prime lending rate and investment, the government through the monetary authority should come up with monetary policies that will affect interest rate in such a way that investment will be stimulated.

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