

Financial Liberalization and Some Selected Macroeconomic Variables in Nigeria: 1986 – 2016

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ABSTRACT

The aim of the study was to determine the impact of financial liberalization on some selected macroeconomic variables in the Nigerian economy. The specific objectives were to: examine the impact of interest rate and exchange rate liberalization on investment in Nigeria, assess the impact of interest rate and exchange rate liberalization on savings in Nigeria, analyze the impact of interest rate and exchange rate liberalization on inflation in Nigeria, evaluate the impact of interest rate and exchange rate liberalization on financial depth in Nigeria and determine the impact of interest rate and exchange rate liberalization on Gross Domestic Product (GDP) in Nigeria. The ex-post facto research design was adopted to enable the researcher make use of secondary data to determine the cause-effect relationship of financial liberalization on the selected macroeconomic variables. The data were sourced from the Central Bank of Nigeria Statistical Bulletin and Federal Bureau of Statistics. The study covered a period of thirty-one years, 1986 to 2016. The study conducted the stationarity test to guarantee a non-spurious result, the co-integration test to capture the equilibrium long-run relationship between the variables and employed the error correction mechanism to reconcile the short-run behaviour of the chosen variables with its long-run behaviour. Tests were conducted to clearly ascertain the causality between financial liberalization and the selected macroeconomic variables. The data were tested and analyzed at 5% level of significance. The study found that Interest rate liberalization had negative and significant impact on investment while exchange rate liberalization had positive and significant impact on investment in Nigeria, Interest rate and exchange rate liberalization had negative and significant impact on savings in Nigeria, Interest rate liberalization had negative and significant impact on inflation while exchange rate liberalization had positive and significant impact on inflation in Nigeria, Lending Rate liberalization had negative and significant impact on financial depth while Deposit Rate and Exchange Rate liberalization had positive but non-significant impact on financial depth and Lending rate and exchange rate liberalization had positive and significant impact on GDP while deposit rate liberalization had negative and significant impact on GDP. The study therefore recommended that; implementation of financial liberalization measures should be gradual, interest rate policy should be made such that savings and investment are stimulated and stability of exchange rate.

KEYWORDS: Financial Liberalization, Macroeconomics, Variables

1.0 INTRODUCTION

Financial liberalization is the elimination of restrictions on financial markets and financial institutions. The concept of financial liberalization is believed to have been popularized by the works of McKinnon (1973) and Shaw (1973). Originally, the financial repression model included the adverse effects of high reserve ratios and government directed credit policy, which altogether led to low savings, low investment and credit rationing (Gemech & Struthers, 2003). Financial liberalization according to McKinnon (1973) and Shaw (1973) is aimed at improving and sustaining the economic performance of a country through increased efficient and effective competition within the financial markets, hence invariably benefiting the non-financial sectors of the economy. After the prescription of financial liberalization in Nigeria, the domestic economy has failed to experience an impressive performance such as significantly attracting foreign investment and stopping capital flight. Evidence in Nigeria suggests that neither the domestic investments nor savings have significantly increased since the introduction of the reform programme (Akpan, 2004).

"With the introduction of SAP, financial liberalization measures were adopted which included interest rate liberalization and exchange rate liberalization" (Ogwuma, 1993 and Ojo, 1993) among others. Financial liberalization generally, involves the elimination of credit controls, deregulating interest rates, removal of entry barriers into the financial services industry, development of capital markets, increased prudential regulation and supervision and liberalization of international capital flows. These reforms are expected to increase competitive efficiency within the financial market in at least three ways: improved allocation, higher operational and dynamic efficiency as the reform measures generate an improved range of financial products and services adaptable to changing consumer needs.

The McKinnon-Shaw thesis systematically details the inefficiency and output costs associated with state intervention in the financial system, defined as financial repression. It was argued that the existence of comprehensive regulation on financial intermediaries as well as markets, including regulations on deposit and loans rate, selective credit policies, restrictions of entry into the financial sector, high reserve requirements, ceilings on credit expansion, restrictions on assets and liabilities, as well as pervasive government ownership/regulation of financial intermediaries makes it difficult for financial development and impedes the contribution of the financial sector to growth and development. Therefore the study sought to investigate the impact of financial liberalization on some selected macroeconomic variables in the Nigerian economy. The main objective of this study was to examine the impact of financial liberalization on some selected macroeconomic variables in Nigeria. However, the specific objectives were:

1. To examine the impact of interest rate and exchange rate liberalization on investment in Nigeria.
2. To assess the impact of interest rate and exchange rate liberalization on savings in Nigeria.
3. To analyze the impact of interest rate and exchange rate liberalization on inflation in Nigeria.
4. To evaluate the impact of interest rate and exchange rate liberalization on financial depth in Nigeria.
5. To determine the impact of interest rate and exchange rate liberalization on GDP in

Nigeria.

2.0 METHODOLOGY

This study focused on the impact of financial liberalization policy package on some selected macroeconomic variables of the Nigerian economy from 1986 to 2016. The choice of 1986 as the starting point is owing to the fact that, financial liberalization was part of the Structural Adjustment Programme (SAP) policy package introduced into Nigeria in 1986. The macroeconomic variables used include: investment, savings, inflation, financial depth and Gross Domestic Product while financial liberalization were proxied by interest rate liberalization and exchange rate liberalization.

The *ex-post facto* research design, being a design used to measure the cause-effect relationship a specific change will have on existing norms and assumptions; was adopted in this study. The dependent and independent variables were observed over the period, 1986 to 2016. The same data were analyzed and tested using econometric analytical technique to determine the impact of the independent variable - financial liberalization, on the dependent variables - investment, savings, Inflation, financial depth and GDP. The nature of data was secondary, sourced from the Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics.

The models for the study were specified as a System Generalized Method of Moments (SGMM) function as follows:

MODEL 1: This model tests the impact of financial liberalization on investment in Nigeria. It is stated as follows:

$$INV_t = f(INV(-1), LR, DR, EXR, \dots) \quad -6$$

The econometric form of equation (6) can be expressed as:

$$INV_t = \alpha_0 + \alpha_1 INV_t(-1) + \alpha_2 LR_t + \alpha_3 DR_t + \alpha_4 EXR_t + \mu_t \quad 7$$

MODEL 2: This model tests the impact of financial liberalization on Savings in Nigeria. It is stated as follows;

$$SAV_t = f(SAV(-1), LR, DR, EXR, \dots) \quad 8$$

The econometric form of equation (8) can be expressed as:

$$SAV_t = b_0 + b_1 SAV_t(-1) + b_2 LR_t + b_3 DR_t + b_4 EXR_t + \mu_t \quad 9$$

MODEL 3: This model shall test the impact of financial liberalization on inflation in Nigeria. The model is stated as follows;

$$INF_t = f(INF(-1), LR, DR, EXR, \dots) \quad 10$$

The econometric form of equation (10) can be expressed as:

$$INF_t = c_0 + c_1 INF_t(-1) + c_2 LR_t + c_3 DR_t + c_4 EXR_t + \mu_t \quad 11$$

MODEL 4: The model tests the impact of financial liberalization on financial depth in Nigeria. It is stated thus;

$$FD_t = f(FD(-1), LR, DR, EXR) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 12$$

The econometric form of equation (12) can be expressed as:

$$FD_t = d_0 + d_1FD_t(-1) + d_2LR_t + d_3DR_t + d_4EXR_t + \mu_t \quad - \quad - \quad - \quad 13$$

MODEL 5: This model tests the impact of financial liberalization on GDP in Nigeria. It is stated as follows;

$$GDP_t = f(GDP(-1), LR, DR, EXR) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 14$$

The econometric form of equation (14) can be expressed as:

$$SAV_t = e_0 + e_1SAV_t(-1) + e_2LR_t + e_3DR_t + e_4EXR_t + \mu_t \quad - \quad - \quad - \quad - \quad 15$$

where:

INV = Total Investment

LR = Lending Rate

DR = Deposit Rate

EXR = Exchange Rate (₦/US\$1)

SAV = Domestic Savings

INF = Inflation Rate

FD = Financial Depth

GDP = Gross Domestic Product at Current Basic Prices

a, b, c, d and e = the coefficient of the independent variable

t = Time Observation

μ = Random error term.

In achieving the objectives of the study, the data were tested using the E-view statistical software adopting the Ordinary Least Square (OLS) method on the regression models adopted. The signs and significance of the regression coefficients will be relied upon in explaining the nature and influence of the independent variable on the dependent variable as to determine both magnitude

and direction of impact. In the analysis we relied on the following statistical tools; Correlation Coefficient (R), Coefficient of Determination (R^2), probability and the student (t) test. It will be hypothesized that financial liberalization has no positive significant impact on macroeconomic variables of the Nigerian economy. The hypotheses were tested at 0.05 (5%) level of significance.

3.0 ANALYSIS OF DATA

3.1 Unit Root Test Result

In order not to run a spurious regression, the variables of the adopted models were subjected to unit root test. The tests were carried out to know whether the mean value and variances of the variables were time invariant, that is, constant over time. The unit root test for stationarity was applied using the Augmented Dickey Fuller (ADF) Test.

Table 1: Unit Root Test Result

Variables	ADF test statistic	critical value 5% (Level form)	Stationarity
INV	-4.367852	-3.632896	I(1)
LR	-4.507037	-2.963972	I(0)
DR	-6.201756	-2.967767	I(1)
EXR	-3.480327	-2.967767	I(1)
SAV	4.367852	-3.644963	I(1)
INF	-4.170237	-2.998064	I(1)
FD	-4.582372	-2.971853	I(1)
GDP	-9.321112	-3.580623	I(1)

Source: Researcher's computation

From table 1 above, it is observed that all the variables are stationary after taking their first difference. From the Augmented Dickey Fuller (ADF) test results, intercept is not included in EXR. However, intercepts are included for INV, DR, SAV, INF, FD and GDP are statistically significant as shown in the graph, implying that all the variables are integrated of order one I(1). It is only LR that is integrated of order zero (level form).

3.2 Test of Co-integration

Economically, two (or more) variables will be co-integrated if they have a long-term, or equilibrium relationship between (or among) them (Gujarati, 2003). Individual time-series in a model may be spurious but their linear combination may not. This is the purpose of co-integration test. The augmented Engle-Granger (AEG) is employed to validate this hypothesis. If δ is statistically significant at the chosen level, then the variables of the model is co-integrated.

Decision rule: Reject H_0 if the absolute value of the ADF test statistic is greater than the absolute critical value at the chosen level of significance for the generated residual series; otherwise, do not reject H_0 .

Table 2: Co-integration test result

Variable	t-ADF	Critical values		
		1%	5%)	10%
μ_{t-1}	-6.174988	-3.689194	-2.971853	-2.625121

Source: Researcher's computation

From table 2 above, since the absolute value of t-ADF > the critical values, at 5% level, that is $|-6.174988| > |-2.971853|$, we therefore do not reject H_0 and conclude that there exist co-integration among the variables i.e. there is a long run relationship among the variables of the model at the chosen critical level, hence are co-integrated. For detailed result of the co-integration test. This result is consistent with Ikeora, Igbodika and Jessie, (2016). They found that long run relationship exists among the variables as indicated by the likelihood ratio that is greater than the critical values both at 1 percent and 5 percent level of significance.

3.3 The Error Correction Model (ECM)

The existence of co-integration among the variable of the model which we verified above necessitates the need for the postulation of the Error Correction Model (ECM). This model aims to link the short run dynamics with the long run equilibrium. The result of the ECM is presented below:

Table 3: The Error Correction Model result

Variables	Coefficient	Std Error	t- Statistic	Prob.
C	1.53E+09	1.93E+09	0.792649	0.4364
D(DR)	5.71E+08	6.35E+08	0.899348	0.3782
D(LR)	-1.01E+08	2.80E+08	-0.361986	0.7208
DEXR	-1.04E+08	32726345	-3.189363	0.0042
D(FDI)	-6.889207	3.490476	-1.973716	0.0611
ECM(-1)	-0.161844	0.064809	-2.497236	0.0205
D(GDP)	3166342.	627088.3	5.049276	0.0000
	$R^2 = 0.618706$	Adjusted $R^2=0.514716$		

Source: Researcher's computation

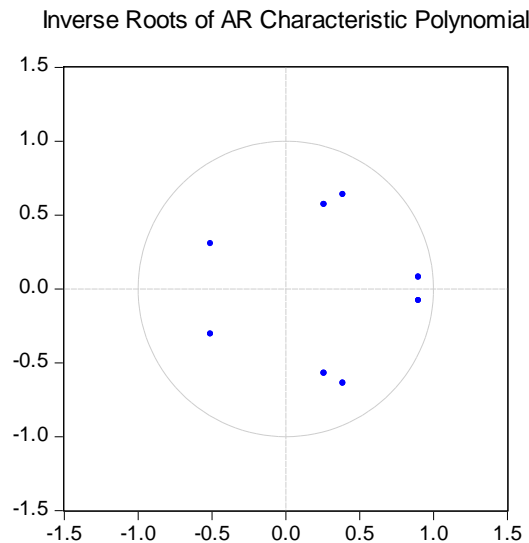
From the result in Table 3, error correction model (ECM) showed that financial liberalization in Nigeria had significant impact on macroeconomic variables in the long run. However, the ECM revealed that LR, FDI and EXR have negative impact on the macroeconomic variables in the short run, while DR have positive impact on the macroeconomic variables in the short run. This is consistent with Sulaiman, Oke, and Azeez (2012) that revealed that the coefficient of ECM in

the parsimonious model indicates that the speed of adjustment of any past deviation to long run equilibrium is 12.6%. This shows that present value of the dependent variable adjust more slowly to changes in the independent variables than what was obtained in the over-parameterized model.

3.4 Reliability of the Models and its Results

The stability of these macroeconomic variables is examined through the dynamic effect of a Cholesky non-factorized one standard deviation innovation from the financial liberalization. Stability test is usually conducted to ascertain whether the specification of the model satisfies the condition of stability or not. In essence, the stability test is used to verify the overall stationarity of the VAR model. It therefore means that if the stability conditions are violated, the specifications of model are therefore not stable and as such not suitable for further analysis which implies that there is non-stability of the VAR specifications. Therefore, VAR Stability Condition Check was adopted Using the Inverse Roots of Autoregressive Characteristics Polynomial. See figure 1 below;

Figure 1: Inverse Roots of AR characteristic



Source: Researcher's computation

From figure 1, it is obvious that all the roots lie inside the circle thereby fulfilling the condition of stability. Given this result, it can be concluded that the VAR specifications are stable. This means that the mean, variance and auto covariance of each series are constant over time after difference at the chosen critical level. This is supported by VAR stability condition shown in figure 1, which shows that eigenvalues of the model lie inside the unit circle. Hence, the model is not a spurious regression.

3.5 Test of Hypothesis One

The hypothesis is restated in both Null and Alternate forms as follows:

H₀: Interest rate and exchange rate liberalization did not have positive and significant impact on

investment in Nigeria.

H_a: Interest rate and exchange rate liberalization have positive and significant impact on investment in Nigeria.

TABLE 4: REGRESSION RESULT OF THE IMPACT OF INTEREST RATE AND EXCHANGE RATE LIBERALIZATION ON INVESTMENT IN NIGERIA

Variables	Coefficients	Std error	t-values
C	3.48E+09	(1.2E+10)	[0.28184]
INV(-1)	0.885698	(0.24667)	[3.59069]
INV(-2)	0.071570	(0.27369)	[2.26150]
LR	-3.3825692	(6.7E+08)	[-2.05034]
DR	-2.54E+08	(8.2E+08)	[-3.30883]
EXR	2.6871100	(7.6E+07)	[3.35513]
R ² = 0.910401	Adjusted R ² =0.890037		

Source: Researcher's computation

From the regression result in table 4 above, the sign of each variable in the model conforms to its a priori expectation. The coefficient of the first lag of investment (INV-1) is about 0.885698, meaning that holding other variables constant, a unit increase in INV(-1) leads to an increase in investment with about 88%. The result suggests a significant positive impact of the first lag of investment on investment.

The coefficient of the second lag of investment (INV-2) is about 0.071570, meaning that holding other variables constant, a unit increase in the INV(-2) leads to an increase in the level of investment by about 7 percent. In sum, it is not only the first lag of investment that impact on investment, but that the value of investment at time *t* depends on its value in the previous two time periods, holding other variables constant. This is because the values of the previous two lagged periods of investment are statistically significant.

The coefficient of lending rate (LR) is about -3.3825692, meaning that given other variables, a unit increase in lending rate (LR) leads to about 14% decrease in the level of investment. Similarly, the result shows that given other variables, 1 percent increase in deposit rate (DR) leads to about 25% percent decrease in investment in Nigeria.

The coefficient of exchange rate (EXR) is about 2.6871100, meaning that holding other variables constant, a unit increase in the EXR leads to an increase in the level of investment. In summary, investment in Nigeria depends on two lagged periods of investment, lending rate, deposit rate and exchange rate within the period under review.

Furthermore, this study goes further to test for the significance of each of the parameters in the model, using the t-test to test for the significance of each of the parameters with 5% level of significance. All the core parameter estimates, are statistically significant both at 5% and 10% level of significance. The coefficient of determination (R²) measures the goodness of fit of the

estimated model. The R^2 measure the proportion of total variation in the INV explained by INV(-1), INV(-2), DR, LR, and EXR of the model. From the regression result, R^2 is 0.910401 while the adjusted R^2 is 0.890037. This means that the model explain about 91% of the total variation in real investment. This signifies that the model is a good fit.

Decision: From the results displayed in the table 4 above, we conclude that interest rate liberalization had negative and significant impact while exchange rate had positive and significant impact on investment.

3.6 Test of Hypothesis Two

The hypothesis is restated in both Null and Alternate forms as follows:

H₀: Interest rate and exchange rate liberalization did not have positive and significant impact on savings in Nigeria.

H_a: Interest rate and exchange rate liberalization have positive and significant impact on savings in Nigeria.

TABLE 5: REGRESSION RESULT OF THE IMPACT OF INTEREST RATE AND EXCHANGE RATE LIBERALIZATION ON SAVINGS IN NIGERIA

Variables	Coefficients	Std error	t-values
C	971.3863	(916.213)	[1.06022]
SAV(-1)	0.778830	0.19890	3.91572
SAV(-2)	0.342234	(0.22955)	[1.49089]
LR	-4.829486	(51.1243)	[-0.09447]
DR	-56.52679	(58.5915)	0.96476
EXR	-2.296126	(5.67842)	[-0.40436]
$R^2 = 0.975764$	Adjusted $R^2 = 0.970495$		

Source: Researcher's computation

From the regression result in table 5 above, the sign of each variable in the model conforms to its a priori expectation. The coefficient of first lag of savings (SAV-1) is about 0.778830, meaning that holding other variables constant, a unit increase in SAV(-1) leads to an increase in savings by about 15% (see appendix) in Nigeria within the period under review. The coefficient of the second lag of savings (SAV-2) is about 0.342234, meaning that holding other variables constant, a unit increase in the SAV(-2) leads to an increase in the level of savings by about 34 percent. In sum, it is not only the first lag of savings that impact on savings, but that the value of savings at time t depends on its value in the previous two time periods, holding other variables constant. This is because the values of the previous two lagged periods of saving are statistically significant.

The coefficient of lending rate (LR) is about -4.829486, meaning that given other variables, a unit increase in LR leads to about 48% decrease in the level of savings. The result also shows

that given other variables, 1 percent increase in deposit rate (DR) leads to about 57% percent increase in savings.

The coefficient of exchange rate (EXR) is about -2.296126, meaning that holding other variables constant, a unit increase in the EXR leads to a decrease in the level of savings by about 23%. This result is similar to Orji, Orji and Mba (2015) findings that the coefficient of exchange rate is -0.002104, which show a negative relationship between exchange rate and output growth. So holding other variables constant, a unit increase in exchange rate would on the average lead to a decrease in output growth by 0.0021 percent. In summary, table 4.6 shows that savings in Nigeria depends on two lagged periods of savings, lending rate, deposit rate and exchange rate..

On the individual parameters, this study goes further to test for the significance of each of the parameters in table 4.6, using the t-test to test for the significance of each of the parameters with 5% level of significance. Apart from SAV(-1) parameter estimate, which is statistically significant at 5% level of significance, all other variables are statistically significant at 10% critical level. The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measures the proportion of total variation in SAV that is explained by the model. From the regression result the R^2 is 0.975764 while the adjusted R^2 is 0.970495. This means that the model explained about 91% of the total variation in savings. This implies that the model is a good fit

Decision: From the results displayed in table 5 above, we conclude that interest rate and exchange rate liberalization had negative and significant impact on savings in Nigeria.

3.7 Test of Hypothesis Three

The hypothesis is restated in both Null and Alternate forms as follows:

H₀: Interest rate and exchange rate liberalization did not have positive and significant impact on inflation in Nigeria.

H_a: Interest rate and exchange rate liberalization have positive and significant impact on inflation in Nigeria.

TABLE 6: REGRESSION RESULT OF THE IMPACT OF INTEREST RATE AND EXCHANGE RATE LIBERALIZATION ON INFLATION IN NIGERIA

Variables	Coefficients	Std error	t-values
C	40.57801	(19.7697)	[2.05254]
INF(-1)	0.558858	(0.18908)	[2.95574]
INF(-2)	-0.506714	(0.18507)	[-2.73794]
LR	-1.454169	(0.87066)	[-1.67018]
DR	1.831381	(0.92993)	[1.96937]
EXR	-0.062079	(0.06951)	[-0.89305]
$R^2 = 0.660615$	Adjusted $R^2 = 0.586835$		

Source: Researcher's computation

From the regression result in table 6 above, the sign of each variable in the model conforms to its a priori expectation. The coefficient of the first lag of inflation INF(-1) is about 0.558858, meaning that holding other variables constant, a unit increase in INF(-1) leads to an increase in inflation by about 56 percent. The coefficient of the second lag of inflation (INF(-2)) is about -0.506714, meaning that holding other variables constant, a unit increase in INF(-2) also leads to an decrease in the level of inflation by about 50 percent. The coefficient of LR (lending rate) is about -1.454169, meaning that given other variables, a unit increase in LR leads to about 14% decrease in the level of inflation. The deposit rate (DR) shows that given other variables, 1 percent increase in DR leads to about 6% percent increase in inflation in Nigeria. The coefficient of exchange rate (EXR) is about -0.062079, meaning that holding other variables constant, a unit increase in the EXR leads to a decrease in the level of inflation by about 6 percent.

Furthermore, this study goes further to test for the significance of each of the parameters in the model, using the t-test to test for the significance of each of the parameters with 5% level of significance.

The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measures the proportion of total variation in inflation explained by the regression model. From the regression result the R^2 is 0.660615 while the adjusted R^2 is 0.586835. This means that the model explained about 66% of the total variation in inflation.

Decision: From the results displayed in the table 6 above, we conclude that all the parameter estimates, are statistically significant at 5% level of significance except for the LR and DR which are statistically significant at 10% critical level. Hence, interest rate liberalization had negative and significant impact while exchange rate liberalization had positive and significant impact on inflation in Nigeria.

3.8 Test of Hypothesis Four

The hypothesis is restated in both Null and Alternate forms as follows:

H₀: Interest rate and exchange rate liberalization did not have positive and significant impact on financial depth in Nigeria.

H_a: Interest rate and exchange rate liberalization have positive and significant impact on financial depth in Nigeria.

TABLE 7: REGRESSION RESULT OF THE IMPACT OF INTEREST RATE AND EXCHANGE RATE LIBERALIZATION ON FINANCIAL DEPTH IN NIGERIA

Variables	Coefficients	Std error	t-values
C	5.607123	(2.44061)	[2.29743]
FD(-1)	1.053360	(0.18302)	[5.75556]
FD(-2)	-0.287366	(0.19141)	[-1.50131]
LR	-0.298959	(0.12521)	[-2.38765]

DR	0.154046	(0.13512)	[1.14003]
EXR	0.020143	(0.01194)	[1.68686]
$R^2 = 0.911179$	Adjusted $R^2 = 0.891871$		

Source: Researcher's computation

From the regression result in table 7 above, the sign of each variable in the model conforms to its a priori expectation. The coefficient of the first lag of financial depth (FD-1) is about 1.053360, meaning that holding other variables constant, a unit increase in FD(-1) leads to an increase in financial depth by about 11% within the period under review. This variable actually conforms to the a priori expectation and also statistical significant.

The coefficient of the second lag of financial depth (FD-2) is about -0.287366, meaning that holding other variables constant, a unit increase in FD(-2) leads to a decrease in the level of financial deepening by about 29 percent. The coefficient of lending rate (LR) is about -0.298959, meaning that given other variables, a unit increase in LR leads to about 29% decrease in the level of financial depth. This signifies that in the short run, lending rate (LR) is inversely related to financial depth and this is in conformity with the a priori expectation. The result also shows that given other variables, 1 percent increase in DR leads to about 15% percent increase in financial depth in Nigeria. The coefficient of EXR is about 0.020143, meaning that holding other variables constant, a unit increase in the EXR leads to an increase in the level of financial dept by about 2%. In summary, financial deepening in Nigeria depends on two lagged periods of FD, LR, DR and EXR within the period under review.

Furthermore, this study goes further to test for the significance of each of the parameters in the model, using the t-test to test for the significance of each of the parameters with 5% level of significance. The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measure the proportion of total variation in the FD is explained by FD(-1), FD(-2), DR, LR, and EXR of the model. From the regression result, R^2 is 0.911179 while the adjusted R^2 is 0.891871. This means that the model explained about 91% of the total variation in financial depth. This signifies that the model is a good fit.

Decision: From the results displayed in the table 7 above, we conclude that Lending Rate was statistically significant at 5% level of significance while Deposit Rate and Exchange Rate were significant at 10% critical level. Hence, Lending Rate had negative and significant impact on financial depth while Deposit Rate and Exchange Rate had positive but non-significant impact on financial depth.

3.9 Test of Hypothesis Five

The hypothesis is restated in both Null and Alternate forms as follows:

H₀: Interest rate and exchange rate liberalization did not have positive and significant impact on GDP in Nigeria.

H_a: Interest rate and exchange rate liberalization have positive and significant impact on GDP in

Nigeria.

TABLE 8: REGRESSION RESULT OF THE IMPACT OF INTEREST RATE AND EXCHANGE RATE LIBERALIZATION ON GDP IN NIGERIA

Variables	Coefficients	Std error	t-values
C	924.0417	(2103.55)	[0.43928]
GDP(-1)	1.517857	(0.19318)	[7.85731]
GDP(-2)	-0.497119	(0.21219)	[-2.34278]
LR	21.22517	(112.345)	[2.18893]
DR	-96.53852	(129.459)	[-3.74571]
EXR	7.789065	(12.5432)	[2.62098]
$R^2 = 0.998211$	Adjusted $R^2 = 0.997821$		

Source: Researcher's computation

Table 8 above shows that Gross Domestic Product in Nigeria depends on two lagged periods of GDP, LR, DR and EXR within the period 1986-2016. From the regression result in table 7 above, the sign of each variable in the model conforms to its a priori expectation. The coefficient of the first lag of GDP (GDP-1) is about 1.517857, meaning that holding other variables constant, a unit increase in GDP(-1) leads to an increase in the GDP by about 15% (see appendix) in Nigeria within the period under review. This implies that promoting financial liberalization in Nigeria will stimulate economic growth in the long-run. This finding is similar with Orji, Orji and Mba (2015) submission that there is unidirectional causality running from economic growth (RGDP) to Financial Liberalization.

The coefficient of the second lag of GDP (GDP-2) is about -0.497119, meaning that holding other variables constant, a unit increase in the GDP(-2) leads to an decrease in the level of economic activities by about 50 percent. This variable did not conform to economic a prior expectation. This result is supported by Orji, Orji and Mba (2015) where the study revealed that coefficient of financial liberalization (FINL) is -0.268406. This implies that financial liberalization proxied by credit to private sector/GDP has a negative relationship with output growth (RGDP).

The coefficient of LR is about -21.22517, meaning that given other variables, a unit increase in LR leads to about 21% decrease in the level of economic activities. The result also reveals that, given other variables, 1 percent increase in DR leads to about 97% percent increase in financial liberalization in Nigeria. The coefficient of EXR is about 7.789065, meaning that holding other variables constant, a unit increase in the EXR leads to an increase in the level of financial activities by about 77% in Nigeria within 1986- 2016 period. This study goes further to test for the significance of each of the parameters in model 5, using the t-test to test for the significance of each of the parameters with 5% level of significance.

The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measure the proportion of total variation in the GDP explained by the regression model. From the regression result the R^2 is 0.998211 while the adjusted R^2 is 0.997821. This means that the model explained about 91% of the total variation in GDP.

Decision: From the results displayed in the table 8 above, we conclude that all the core parameter estimates, are statistically significant both at 5% and 10% level of significance. Hence, Lending rate and exchange rate liberalization had positive and significant impact on GDP while deposit rate liberalization had negative and significant impact on GDP.

4.0 DISCUSSION OF RESULTS

The main objective of the study was to determine the impact of financial liberalization on some selected macroeconomic variables of the Nigerian economy. In order not to run a spurious regression, the variables of the adopted models were subjected to unit root test. The tests were carried out to know whether the mean value and variances of the variables were time invariant, that is, constant over time. The unit root test for stationarity was applied using the Augmented Dickey Fuller (ADF) Test. The test showed that all the variables are stationary after taking their first difference. From the Augmented Dickey Fuller (ADF) test results, intercept was not included in EXR. However, intercepts were included for INV, DR, SAV, INF, FD and GDP were statistically significant as shown in the graph, implying that all the variables are integrated of order one I(1). It is only LR that was integrated of order zero (level form).

Table 2, revealed that the absolute value of $t\text{-ADF} > \text{the critical values}$, at 5% level, that is $|-6.174988| > |-2.971853|$, we therefore do not reject H_0 and conclude that there exist co-integration among the variables i.e. there is a long run relationship among the variables of the model at the chosen critical level, hence are co-integrated. For detailed result of the co-integration test, see appendix. This result is consistent with Ikeora, Igbodika and Jessie, (2016). They found that long run relationship exists among the variables as indicated by the likelihood ratio that is greater than the critical values both at 1 percent and 5 percent level of significance.

The existence of co-integration among the variable of the model necessitated the need for the postulation of the Error Correction Model (ECM). This model aims to link the short run dynamics with the long run equilibrium. The error correction model (ECM) showed that financial liberalization in Nigeria had significant impact on macroeconomic variables in the long run. However, the ECM revealed that LR and EXR had negative impact on variables in the short run, while DR have positive impact on the macroeconomic variables in the short run. This is consistent with Sulaiman, Oke, and Azeez (2012) that revealed that the coefficient of ECM in the parsimonious model indicates that the speed of adjustment of any past deviation to long run equilibrium is 12.6%. This shows that present value of the dependent variable adjust more slowly to changes in the independent variables than what was obtained in the over-parameterized model.

The stability of the variables is examined through the dynamic effect of a Cholesky non-factorized one standard deviation innovation from the financial liberalization. Stability test is usually conducted to ascertain whether the specification of the model satisfies the condition of stability or not. In essence, the stability test is used to verify the overall stationarity of the VAR model. It therefore means that if the stability conditions are violated, the specifications of model are therefore not stable and as such not suitable for further analysis which implies that there is non-stability of the VAR specifications. Therefore, VAR Stability Condition Check was adopted Using the Inverse Roots of Autoregressive Characteristics Polynomial. The Inverse Roots of

Autoregressive Characteristics Polynomial showed that all the roots lie inside the circle thereby fulfilling the condition of stability. Given this result, it can be concluded that the VAR specifications are stable. This means that the mean, variance and auto covariance of each series are constant over time after difference at the chosen critical level. This is supported by VAR stability condition shown in figure 1, which shows that eigenvalues of the model lie inside the unit circle. Hence, the model is not a spurious regression.

Analysis of hypothesis one revealed that, the sign of each variable in the model conforms to its a priori expectation during the period under study. The coefficient of the first lag of investment (INV-1) is about 0.885698, meaning that holding other variables constant, a unit increase in INV(-1) leads to an increase in investment with about 88%. The result suggests a significant positive impact of the first lag of investment on investment. The coefficient of the second lag of investment (INV-2) is about 0.071570, meaning that holding other variables constant, a unit increase in the INV(-2) leads to an increase in the level of investment by about 7 percent. In sum, it is not only the first lag of investment that impact on investment, but that the value of investment at time t depends on its value in the previous two time periods, holding other variables constant. This is because the values of the previous two lagged periods of investment are statistically significant. The coefficient of lending rate (LR) is about -3.3825692, meaning that given other variables, a unit increase in lending rate (LR) leads to about 14% decrease in the level of investment. Similarly, the result shows that given other variables, 1 percent increase in deposit rate (DR) leads to about 25% percent decrease in investment in Nigeria. The coefficient of exchange rate (EXR) is about 2.6871100, meaning that holding other variables constant, a unit increase in the EXR leads to an increase in the level of investment. In summary, investment in Nigeria depends on two lagged periods of investment, lending rate, deposit rate and exchange rate within the period under review. Furthermore, this study goes further to test for the significance of each of the parameters in the model, using the t-test to test for the significance of each of the parameters with 5% level of significance. All the core parameter estimates, are statistically significant both at 5% and 10% level of significance. The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measure the proportion of total variation in the INV explained by INV(-1), INV(-2), DR, LR, and EXR of the model. From the regression result, R^2 is 0.910401 while the adjusted R^2 is 0.890037. This means that the model explain about 91% of the total variation in real investment. This signifies that the model is a good fit. From the results displayed in the table 4, we conclude that interest rate liberalization had negative and significant impact while exchange rate had positive and significant impact on investment within the period under study.

Analysis of hypothesis two shows that the sign of each variable in the model conforms to its a priori expectation. The coefficient of first lag of savings (SAV-1) is about 0.778830, meaning that holding other variables constant, a unit increase in SAV(-1) leads to an increase in savings by about 15% in Nigeria within the period under review. The coefficient of the second lag of savings (SAV-2) is about 0.342234, meaning that holding other variables constant, a unit increase in the SAV(-2) leads to an increase in the level of savings by about 34 percent. In sum, it is not only the first lag of savings that impact on savings, but that the value of savings at time t depends on its value in the previous two time periods, holding other variables constant. This is because the values of the previous two lagged periods of saving are statistically significant. The

coefficient of lending rate (LR) is about -4.829486, meaning that given other variables, a unit increase in LR leads to about 48% decrease in the level of savings. The result also shows that given other variables, 1 percent increase in deposit rate (DR) leads to about 57% percent increase in savings. The coefficient of exchange rate (EXR) is about -2.296126, meaning that holding other variables constant, a unit increase in the EXR leads to a decrease in the level of savings by about 23%. This result is similar to Orji, Orji and Mba (2015) findings that the coefficient of exchange rate is -0.002104, which show a negative relationship between exchange rate and output growth. So holding other variables constant, a unit increase in exchange rate would on the average lead to a decrease in output growth by 0.0021 percent. In summary, table 4.6 shows that savings in Nigeria depends on two lagged periods of savings, lending rate, deposit rate and exchange rate. On the individual parameters, this study goes further to test for the significance of each of the parameters in table 5, using the t-test to test for the significance of each of the parameters with 5% level of significance. Apart from SAV(-1) parameter estimate, which is statistically significant at 5% level of significance, all other variables are statistically significant at 10% critical level. The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measures the proportion of total variation in SAV that is explained by the model. From the regression result the R^2 is 0.975764 while the adjusted R^2 is 0.970495. This means that the model explained about 91% of the total variation in savings. This implies that the model is a good fit. From the results displayed in table 5 above, we conclude that interest rate and exchange rate liberalization had negative and significant impact on savings in Nigeria.

Analysis of hypothesis three shows that the sign of each variable in the model conforms with its a priori expectation. The coefficient of the first lag of inflation INF(-1) is about 0.558858, meaning that holding other variables constant, a unit increase in INF(-1) leads to an increase in inflation by about 56 percent. The coefficient of the second lag of inflation (INF(-2)) is about -0.506714, meaning that holding other variables constant, a unit increase in INF(-2) also leads to an decrease in the level of inflation by about 50 percent. The coefficient of LR (lending rate) is about -1.454169, meaning that given other variables, a unit increase in LR leads to about 14% decrease in the level of inflation. The deposit rate (DR) shows that given other variables, 1 percent increase in DR leads to about 6% percent increase in inflation in Nigeria. The coefficient of exchange rate (EXR) is about -0.062079, meaning that holding other variables constant, a unit increase in the EXR leads to a decrease in the level of inflation by about 6 percent. Furthermore, this study goes further to test for the significance of each of the parameters in the model, using the t-test to test for the significance of each of the parameters with 5% level of significance. The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measures the proportion of total variation in inflation explained by the regression model. From the regression result the R^2 is 0.660615 while the adjusted R^2 is 0.586835. This means that the model explained about 66% of the total variation in inflation. However, from the results displayed in table 6, we conclude that all the parameter estimates, are statistically significant at 5% level of significance except for the LR and DR which are statistically significant at 10% critical level. Hence, interest rate liberalization had negative and significant impact while exchange rate liberalization had positive and significant impact on inflation in Nigeria within the period under study.

Analysis of hypothesis four from table 7 shows that the sign of each variable in the model

conforms to its a priori expectation. The coefficient of the first lag of financial depth (FD-1) is about 1.053360, meaning that holding other variables constant, a unit increase in FD(-1) leads to an increase in financial depth by about 11% within the period under review. This variable actually conforms to the a priori expectation and also statistical significant. The coefficient of the second lag of financial depth (FD-2) is about -0.287366, meaning that holding other variables constant, a unit increase in FD(-2) leads to a decrease in the level of financial deepening by about 29 percent. The coefficient of lending rate (LR) is about -0.298959, meaning that given other variables, a unit increase in LR leads to about 29% decrease in the level of financial depth. The result also shows that given other variables, 1 percent increase in DR leads to about 15% percent increase in financial depth in Nigeria. The coefficient of EXR is about 0.020143, meaning that holding other variables constant, a unit increase in the EXR leads to an increase in the level of financial dept by about 2%. In summary, financial deepening in Nigeria depends on two lagged periods of FD, LR, DR and EXR within the period under review. Furthermore, this study goes further to test for the significance of each of the parameters in the model, using the t-test to test for the significance of each of the parameters with 5% level of significance. The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measure the proportion of total variation in the FD is explained by FD(-1), FD(-2), DR, LR, and EXR of the model. From the regression result, R^2 is 0.911179 while the adjusted R^2 is 0.891871. This means that the model explained about 91% of the total variation in financial depth. This signifies that the model is a good fit. From the results in table 7, we conclude that Lending Rate was statistically significant at 5% level of significance while Deposit Rate and Exchange Rate were significant at 10% critical level. Hence, Lending Rate had negative and significant impact on financial depth while Deposit Rate and Exchange Rate had positive but non-significant impact on financial depth.

Finally, analysis of hypothesis five revealed that Table 8 shows that Gross Domestic Product in Nigeria depends on two lagged periods of GDP, LR, DR and EXR within the period 1986-2016. From the regression result in table 8, the sign of each variable in the model conforms to its a priori expectation. The coefficient of the first lag of GDP (GDP-1) is about 1.517857, meaning that holding other variables constant, a unit increase in GDP(-1) leads to an increase in the GDP by about 15% in Nigeria within the period under review. This implies that promoting financial liberalization in Nigeria will stimulate economic growth in the long-run. This finding is similar with Orji, Orji and Mba (2015) submission that there is unidirectional causality running from economic growth (RGDP) to Financial Liberalization. The coefficient of the second lag of GDP (GDP-2) is about -0.497119, meaning that holding other variables constant, a unit increase in the GDP(-2) leads to an decrease in the level of economic activities by about 50 percent. This variable did not conform to economic a priori expectation. This result is supported by Orji, Orji and Mba (2015) where the study revealed that coefficient of financial liberalization (FINL) is -0.268406. This implies that financial liberalization proxied by credit to private sector/GDP has a negative relationship with output growth. The coefficient of LR is about 21.22517, meaning that given other variables, a unit increase in LR leads to about 21% increase in the level of economic activities. The result also reveals that, given other variables, 1 percent increase in DR leads to about 97% percent increase in Nigeria GDP. The coefficient of EXR is about 7.789065, meaning that holding other variables constant, a unit increase in the EXR leads to an increase in the level of financial activities by about 77% in Nigeria within 1986- 2016 period. This study goes further

to test for the significance of each of the parameters in model 5, using the t-test to test for the significance of each of the parameters with 5% level of significance. The coefficient of determination (R^2) measures the goodness of fit of the estimated model. The R^2 measure the proportion of total variation in the GDP explained by the regression model. From the regression result the R^2 is 0.998211 while the adjusted R^2 is 0.997821. This means that the model explained about 99.8% of the total variation in GDP. From the results displayed in table 8 above, we conclude that all the core parameter estimates, are statistically significant both at 5% and 10% level of significance. Hence, Lending rate and exchange rate liberalization had positive and significant impact on GDP while deposit rate liberalization had negative and significant impact on GDP.

5.0 CONCLUSION AND RECOMMENDATIONS

The aim of the study was to determine the impact of financial liberalization on some selected macroeconomic variables of the Nigerian Economy. The study observed that all the variables were stationary after taking their first difference. The co-integration test showed that there exist co-integration among the variables i.e. there is a long run relationship among the variables of the model at the chosen critical level, hence are co-integrated.

The existence of co-integration necessitated the need for error correction model. The error correction model (ECM) showed that financial liberalization in Nigeria had significant impact on macroeconomic variables in the long run. However, lending rate and exchange rate liberalization had negative impact on the macroeconomic variables in the short run, while deposit rate had positive impact on the macroeconomic variables in the short run.

The study therefore concludes that, financial liberalization in Nigeria had significant impact on macroeconomic variables in the long run, while lending rate and exchange rate liberalization had negative impact on the macroeconomic variables in the short run and deposit rate had positive impact on the macroeconomic variables in the short run.

The study therefore recommended that:

1. The stability of the economy should first be taken into consideration before implementing financial liberalization measures, which should also be a gradual process.
2. The policy towards interest rate should be made such that savings would be stimulated thereby placing more funds in the hands of banks to intermediate to investors seeking funds. Also, lending rate should be relatively low so as not to deter investors from borrowing to embark on viable investment projects.
3. Government should avoid depreciation in the value of the nation's currency (Naira) and also maintain stability in the exchange rate.
4. Government should create a conducive business environment to encourage both local and foreign participation in investment thereby engendering economic growth.
5. The monetary authority (CBN) should implement policies that increase the flow of investible funds and improve the capacity of banks to extend credit to the economy.

REFERENCES

- Akpan, D. B. (2004). Financial Liberalization and Erogenous Growth: The case of Nigeria. *African Institute for Development and Planning, Senegal*. <http://www.unidep.org>. Accessed on January 12th, 2015.
- Gemech, F. & Struthers, J. (2003). *The McKinnon-Shaw Hypothesis: Thirty Years on—a Review of Recent Development in Financial Liberalization Theory*. Paper presented at the Development Studies Association annual conference on globalization and development, Glasgow
- Gujarati, D. N. 2003. Basic Econometrics. 4th Edition. Mcgraw-Hill, International Edition. New York, U S A.
- Ikeora, J. J. E.; Igbodika, M. N. & Jessie, I. C. (2016). Financial Liberalization Economic And Growth in Nigeria (1987-2013). *IOSR Journal Of Humanities And Social Science*, 21(5): 123-132
- McKinnon, R.I.(1973). *Money and Capital in Economic Development*, Washington D.C, Brookings Institution.
- Ogwuma, P.A. (1993). *Recent Developments in the Nigerian Financial Services Industry: Problems and Challenges*. An Address at the Annual Dinner of the Chartered Institute of Bankers of Nigeria, Lagos: Nigeria.
- Ojo, M. O. (1993). *Government Borrowing, Money Supply and Monetary Policy in Nigeria*. Lagos Press.
- Orji, A.; Orji, O. A. & Mba, P. N. (2015). Financial Liberalization and Output Growth in Nigeria: Empirical Evidence from Credit Channel, *International Journal of Economics and Financial Issues*, 5(1):297-311
- Shaw, E. (1973). *Financial Deepening in Economic Development*. New York: Oxford
- Sulaiman, I.A., Oke, M.O. and Azeez, B.A. (2012) Effect of Financial Liberalization on Economic Growth in Developing countries: The Nigerian Experience. *International Journal of Economic and Management Sciences*, 1, 16-28.