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Interest Rates and Commercial Banks credit: Evidence from selected emerging African Economies 1991-2018

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ABSTRACT

This study examined the relationship between interest rate components and commercial banks credit to the domestic economy in selected developing Sub Saharan African economies from 1991 to 2018. The specific objectives of this study were to analyse the relationship between lending interest rate (LIR), real interest rate (RIR), interest rate spread (IRS), deposit interest rate (DIR), risk-premium on lending rate (PLR), and credit ratio of commercial banks to the domestic economy (CBDS) in selected developing Sub Saharan African economies. The study sourced data from World Bank Data base and Knoema for Nigeria, South Africa, Egypt and

Kenya its sample countries and anchored on Portfolio theory. The study used the Co-integration and Panel Data Analysis techniques to test the relationship between independent variables namely between LIR, DIR, IRS, PLR, RIR and dependent variable-CBDS at the 5% level of significance. The findings in the selected developing Sub Saharan African economies' pooled panel result indicated that interest rate components used had both positive and negative significant relationship thus moderating and influencing credit ratio of commercial banks to the domestic economy. The study concluded that interest rate variables have significant relationship with credit ratio of commercial banks to the domestic economy in the selected developing Sub Saharan African economies combined. Hence, the study recommends the enforcement of reduced lending interest rate of commercial banks to encourage improved credit capacity of banks since it has an inverse implication on the domestic economies of selected developing Sub Saharan African economies.

Keyword: Interest rate, bank credit ratio, lending rate, deposit rate & risk premium to lending rate

1. INTRODUCTION

The African economy is characterized as virtually untapped continent of the world. The region has huge landmass and unlimited resources that runs into trillions of dollars in minerals. However, an efficient financial system with credible interest rates will enhance continuous re-investment of resources into harnessing this mineral resources and economic growth of the region. Efficient financial system enables financial institutions to archive their objectives of credit facilities to key segment of the economy and the overall performance or profitability of the commercial banks in the continents. However, the lending rates in African economies affects the overall performance of commercial banks in the continent. For instance, the lending rates in African countries are high as shown in Gambia 30.6%, Ghana 29.3%, Mozambique 27%, Malawi 26.9%, Guinea 21.5%, Kenya 17%, Nigeria 17.5% official while non-official is more than 30%, Egypt 19.5% and South Africa 10.4%. The rate of lending in Africa is quite high compared to developed economies of the world in USA, China and Great Britain with 4.3% lending rate as at December 2017 (World factbook, 2019).

Commercial banks are engine room of every industrious economy and their functionalities also prove that a thriving economy must have a vibrant and robust banking system which will improve and sponsor viable investment projects (Alper & Anbar, 2011). They are also vital segment of the financial system via financial intermediation that play a major role in the economy (Hara, 1983). Commercial banks are financial intermediaries that mobilize savings from surplus economic units to deficit economic units. They are also special financial intermediaries that mobilize funds between depositors and borrowers within an economy.

When an economy is at boom, the commercial banks are assumed to also be at boom since they are vital tools of economic growth via investment and financial transmission mechanism across the economy to varying sectors of the economy (Ragonmal, 2015). When the economy however goes into recession, the first point of call is also at the commercial banks which will have difficulty recouping already loaned out funds and releasing further funds when requested (Umanhonlen & Lawani, 2015). Thus, commercial banks' lending also defines the direction of an economy. The general health of the financial institution determines the well-being of Africa economy thus, banks are dominant factor (Suffian, 2009). Therefore, to stabilize the African economy, the knowledge of factors influencing commercial banks' profitability essential.Commercial Banks are an important channel for transmission of Central Banks' interest rate policy. Commercial banks pay interest on deposits on one hand and on the other hand they charge interest on loans and advances lent to borrowers. The difference between these two interest rates defines the interest spread which constitutes a significant proportion of the profits of commercial banks in African economies. Thus, interest rates unavoidably are an important factor in the survival of commercial banks credit ratio especially as it concerns their profitability. As interest rates keeps on changing as can be seen from the unstable interest rate regime in Nigeria, Kenya, South Africa and Egypt such frequent changes could affect commercial banks' credit ratio and overall, its profitability which, in turn, could impact on the general economy of African countries.

Thus, the level of interest rates and its onward high fluctuations determine the rate of banking credit facilities and its overall performance within the African economy. The growing rate of interest within the African investment environment has hindered thorough usage of all possible loan facilities of the commercial banks thus affecting its credit facilities. However, the level of increasing rate within the African economy has not outrightly eliminated the usage of credit capacity of banks by investors. Rather, the growing concern in the literature is to what extent has interest rate influence credit facilities in African developing economies. This thus necessitated this study, to ascertain how interest rates components has affected credit capacity of commercial banks in African economies.

Test of Hypothesis

Ho_1: There is no significant relationship between interest rate components in real interest rate, risk premium on lending rate, Interest rate spread, Deposit interest rate, lending interest rate and credit ratio of commercial banks to the domestic economy in the selected developing Sub Saharan African economies.

2. LITERATURE REVIEW

Conceptual Framework

Bank is an institution that create credit from deposit received from the public (Ekezie, 1997). Borrowing money attract cost measured as interest rate which can be annually, semi-annually, quarterly, bi-monthly, monthly and daily. Interest rate is the amount of interest paid per unit of time expressed as a percentage of the amount borrowed. Interest rates are determined by maturity, liquidity and many different financial instruments (Anyanwu, 1997).

The variation in interest rate computation ascertain whether it is either nominal or real terms. If there is no adjustment for the changes in the price level, then the interest rate is expressed in nominal terms but if there is then it will be real term.

The credit facilities of banks ascertain the position of profitability. The credit ratio of banks is the product of the interest rates fluctuations, as increase in interest rates reduces the credit ratio of banks and verse versa. This signify that credit ratio or capacity of commercial banks are end reaction of interest rates that determine their profitability. Costs associated with transactions from agent to agent and information failure leads to rise of intermediation in finance. The intermediaries assist in solving the challenges created from transaction related costs and information asymmetry. They make diversification, deposit mobilization, allocation of resources and risks associated with borrowing and lending of money smooth (Ngugi, 2001). The flow of receipt of deposit and granting of loans are not at the same level and also the different service expenses made. A charge is then levied for the mediation extended without certainty, and the levels of interest for deposits received and credit extended are set.

Interest Rate Reform in Africa

African economies have witnessed different monetary reform over the years and their reform has gone a significant way to improve the financial system. The different reforms are discussed looking at the selected sub Saharan African economies for the study.

Nigerian Interest Rate Regime

Interest rate in Nigeria has evolved over the years in consonance with the economic situation of the country. The countryhas undergone two different interest rate regimes till date. These are the controlled or fixed regime and deregulated or liberalized regimes.

Controlled Regime	**Aim**
Fixed interest rate by monetary authority before 1986 financial liberalization. **Tools** • Credit ceilings and controls; • Administration of interest and exchange rates; • Special deposits and • Cash reserve requirements **Cosequences** Fixed interest rates trailed inflation rate, resulting in • Negative real interest rate • Financial disintermediation proven by low level of investment	• Optimum resource allocation; • Systematic development of financial sector; • Inflation and internal debt servicing of government's burden reduction. • Price stability maintainnace • Resource allocation to key sectors of the economy e.g. Manufacturing and agriculture.

• Savings and growth coupled with misallocation of resources.	
Deregulated Regime	**Aim**
Structural Adjustment Program (SAP) CBN uses the minimum rediscount rate (MRR) in line with market conditions In December 2006, the CBN re-anchore interest rate on monetary policy rate (MPR)	To allowed banks to determine their deposit and lending rates according to market conditions through negotiations with their customers. Maintainnace of stable domestic currency value via short-term interest rates and price stability, and efficient inter-bank money market transactions as well as stability of other DMBs interest rates

Researcher Compilation, 2020

Interest Rate in Kenya

The banking sector in Kenya play significant role in the finance sector, especially when it comes to the service of deposit taking and collection and provision of funds for borrowers. Analyising the banking spreads of interest rates is thereby at the center of understanding the process of finance intermediation and the macroeconomic environment in which operations of banks take place (Were & Wambua, 2014).

The Central Bank of Kenya (CBK) records show that in 2010, interest rates were between a high of 14.98% and a low of 13.85%. In 2011, there was a sharp rise to between 20.34% and 17.78% indicating an increase in the lowest rates offered between 2011 and 2012 of 3.9%. In 2013, rates were at their highest in January at 18.13% and fell to 16.86% in September (lowest). According CBK records, the average interest rate for lending in Kenya has been 16.5% for the period between January 2010 and December 2015. During this same period the lending rate oscillated between a low of 13.85% to a high of 20.34% (Mugabi, 2017).

Regulation of commercial banks credit via imposition of interest rate was instituted in August 2016 by Banking (Amendment) Bill 2015. The bill imposed interest rate charges on loans and deposit account of commercial banks.

Interest Rate in South Africa

The South African Reserve Bank (the Bank) determine the level of short-term interest rates by lending to private-sector banks. South Africa has a fast-growing economy that require moderated interest rates to boost the open economic policy. Interest rate is key to developments in both developed and emerging financial markets which form the reason behind the direct control by South African Reserve Bank. Thus, low saving culture made the Bank to provide high interest rates on savings which was also facilitated by high inflation. The rate of interest in South Africa cannot be compared with other emerging economies in the world (Reserve Bank, 2018).

Egypt'sInterest Rate

Interest rate in Egypt was last recorded at 8.75 percent as reported by the Central Bank of Egypt. For over 14 years the Egyptian interest rate was 11.6% with an all-time high of 21.4% in October of 1991 and a record low of 8.3 Percent in September of 2009. Interest rate decision rely on the Central Bank of Egypt (CBE) and the interest rate is same as deposit rate. Theyplan to achieve medium term goals and low inflation rate which are essential for maintaining confidence and for sustaining high rates of investment and economic growth. In Egypt, interest rates and Treasury bill rate have been increasing rapidly since 2008, in the aftermath of the global financial crisis (Abdelmonem & Mohamed, 2018).

Several interest rates serve as alternative indicators of the monetary policy stance. For instance, 3-month treasury bill rate is considered as a short-term policy rate given that the securities were issued in coordination with the CBE in order to sterilize capital inflows, with the amount issued substantially exceeding the financing needs of the government (El-Refai, 2001).

Theoretical Framework

The portfolio theory approach is the most relevant and plays an important role in interest rates and bank credit facilities (performance). Asset Portfolio balance model in an optimum asset holding is a function of policy decisions determined by vector of rates of return, risk and size on all assets held in the portfolio, groups of risks associated with financial assets and the size of the portfolio. Portfolio diversification and portfolio composition of commercial banks credits are key to decisions of bank management. Further, the ability to obtain maximum profits depends on the feasible set of assets and interest rate fluctuations. Hence, the theory

upon which this study is anchored is Portfolio theory which largely assume that bank credit capacity cum performance is influence by internal efficiencies and managerial decisions of monetary policy (interest rate components).

Empirical Review

The empirical work on the interest rates and deposit money banks profitability have been discussed by different scholars and empirically, most researchers have identified with key interest rates variables. Interest rates have conspicuously been reviewed in the literature and the study of Ahmed, Ehman, Supro, & Ahmed (2018) evaluate the impact of interest rate fluctuations on the profitability of banks. The result of their study shows that deposits with other banks and interest rate have negative impact on banks profitability, while also showing positive influence of advances, loans and investment on banks' profitability.

Nguyen, Tripe and Ngo (2018) examining a causal relationship between bank loans and deposits in Vietnam covering 2008–2015; using three staged least square revealed that bank deposits have a positively significant impact on bank loans without a reverse significant impact.

Wallen (2017) examined the effect of bank capital requirements on bank loans rates. The study discovered that increase in bank capital raised the cost of borrowing by 20 basis points.

Beutler, Bichsel, Bruhin and Danton (2017) analyze the transmission of realized interest rate risk on bank lending. Using panel data analysis, the study yields that interest rate risk determines the significant impact of interest rate on bank lending.

Claessens, Coleman and Donnelly (2017)using sample of 3,385 banks from 47 countries from 2005 to 2013examine Low-Long Interest Rates and Banks' Interest Margins (Profitability) in a cross-country evidence and discovered that a one percentage fall in interest rate leads to an 8 points lower net interest margin. Thus, low rates adversely affect bank profitability.

Wambari and Mwangi (2017) study the effects of rates of interest on financial performance of Kenyan financial institutions and concluded that the ratio of lending rate influences the financial performance of commercial banks positively. The study came to the conclusion that there is a significant positive relationship between financial performance of commercial banks and the ratio of the lending rate.

Ghazali, Said and Faisal (2017) using multiple regression technique found that profitability of regional banks is affected by the prime lending rate. Thus, mortgage and non-mortgage loans determines the profitability of banks in Indonesia.

Mugabe (2017) investigated the effect of interest rates on commercial banks profitability and performance in Kenya between 2011 and 2015. The study using correlation and regression analysis showed that interest rates had a positive correlation with bank performance in Kenya. Thus, the higher the interest rates the better the financial performance of commercial banks in Kenya.

Oladele, Amos and Adedeji (2017) examine the effect of interest rate on profitability of deposit money banks in Nigeria; looking at 21 deposit money banks between the period of 2005- 2014. The study using OLS regression analysis showed that there was a positive significant relationship between lending rate and banks profitability. There was a significant positive relationship between inter-banks rate (interest rates) and banks profitability.

Makinde (2016) examined the effect of interest rate on commercial bank deposits between 2000 and 2013 in Nigeria. The study sourced data from the Central Bank of Nigeria statistical bulletin and the National Bureau of Statistics between 2000 and 2013; and its model of study has as its dependent variable as Commercial Bank Deposits (CBD) while its explanatory variables were the interest rates and the Gross Domestic Product (GDP). Using the Ordinary Least Square (OLS) multiple regression techniques; the study revealed that there is a negative relationship between the interest rates and the commercial bank deposits suggesting that interest rates have not been responsible for customers' deposits in commercial banks in Nigeria.

Eke, Eke and Inyang (2015) studied interest rate deregulation and lending operations of Nigerian commercial banks (1970-2013). The study was arranged into regulated and deregulated periods of 1970-1986 and 1987-2013. Using the Chow test to ascertain the relationship between interest rate and commercial banks' lending for the two periods, the study revealed that interest rate spread and statutory liquidity ratio had negatively significant effect on the volume of commercial banks' loans, fixed exchange rate had negatively insignificant impact on banks' loans and advances and monetary policy rate (MPR) and inflation rate exert a positively significant impact on banks' loans for the period.

Simiyu and Ngile (2015) employed Panel data analysis using Fixed Effects model. This was applied on the data to examine the effects of three major macroeconomic variables which included: (GDP), Exchange rates, and interest rates on profitability of the listed commercial banks. The study found that real interest rates had a significant negative influence on profitability of listed commercial banks in Kenya.

Borio, Gambacorta and Hofmann (2015) using recent data and analysing a sample of 108 relatively large international banks, many from Europe and Japan, and 16 from the United States, find non-linear relationships between the interest rate level and the slope of the yield curve and bank NIMs and profitability, i.e., ROA. They find that the effects on NIMs are much stronger at lower

levels of interest rates. Also, a positive relationship with the slope of the yield curve is found, which corresponds to the findings of Albertazzi and Gambacorta (2009).

Alessandri and Nelson (2015)evaluate the effect of market interest rates on bank profitability. The net interest margin increases with the short-term interest rate. In response to higher interest rates, banks raise their lending rates and reduce their lending volume, potentially by strengthening their lending standards (this will be addressed in the following subsection), and *vice versa*. Regarding the yield curve, it is found that a steep yield curve boosts bank income margins, evidently as banks borrow short and lend long.

Onuonga (2014) investigated the effects of internal determinants of profitability on Kenya`s top six commercial banks over the period 2008 to 2013. The study used secondary panel data obtained from the Central Bank of Kenya publications, the Kenya Economic Surveys and World Bank development indicators. Using Generalized Least Squares method bank size, capital strength, bank operation expenses, ownership, and the ratio of loans to assets significantly influence profitability of top six Kenyan commercial banks.

Khan and Sattar (2014) examined interest rate changes on commercial banks' profitability in Pakistan and discovered that there is strongly positive correlation between interest rate and commercial banks' profitability.

Ogunbiyi and Ihejirika (2014) studied how interest rates affect the profitability of deposit money banks in Nigeria between 1999 to 2012. The study using multivariate regression analysis show that savings deposit rate has negatively significant effects on the profitability of Nigerian deposit money banks.

Malik, Khan, Khan and Khan (2014) examine the market interest rate effect on the bank's profitability in public and private sectors of Pakistan. The results show that the interest rate (represented by bank lending rates) has more effects on both ROA and ROE in private banks as compared to the public sector banks.

While studying the impact of a low interest rate environment on bank profitability, Podjasek and Genay (2014) stated that their analysis suggests that low short-term interest rates and a flat yield curve can compress bank earnings.

Paul and Omosefe (2014) investigated the effect of interest rates on customer savings behavior in the Nigerian banking sector. Using quantile regression method, a non-parametric estimation process, the study concluded that interest rates increased bank deposits while income was also found to affect bank deposits.

Looking at bank lending rate and performance of Nigerian Deposit Money Banks between 2000 and 2010, Okoye and Eze, (2013) discovered that lending rate and monetary policy rate has significantly positive impact on Nigerian deposit money banks performance.

Kanwal and Nadeem (2013) examining macroeconomic variables on profitability of commercial banks in Pakistan between 2001-2011. Using pooled ordinary least square (POLS) method for inflation rate, real gross domestic product (GDP) and real interest rate on profitability indicators; return on assets (ROA), return on equity (ROE) and equity multiplier (EM). The findings show a strong positive relationship between real interest rate with ROA, ROE and EM. Therefore, interest rate affects commercial banks profitability in Pakistan.

Bolt, De Haan, Hoeberichts, Van Oordt and Swank (2012) is closely related to Borio et al. (2015). They discovered that short-term interest rate negatively affects net interest income while showing that long-term interest rate proved a positive effect. For the non-interest income an insignificant effect of short-term interest rate is found.

Akabom-Ita, (2012) evaluated relationship between interest rate and net assets of multinational companies in Nigeria between 1995-2010. The result thus revealed that an increase in interest rate results in reduction in net assets.

Enyioko (2012) examined the role of interest rates policies on banks performances in Nigeria. The study analyzed audited accounts (published) of twenty (20) banks that emerged from the consolidation exercise and data were sourced from the Central Banks of Nigeria (CBN). Applying regression and error correction model to analyze the relationship between interest rates and bank performance the study found that interest rate policies have not improved the overall performances of banks significantly.

Rasheed (2010) investigated interest rates determinants in Nigeria. The study using error correction model (ECM) found that Nigerian financial sector integration into the global market, improve the returns on foreign assets which is determined by domestic interest rates.

However, Aburime (2008) investigate the macroeconomic determinants of bank profitability in Nigeria using a sample of 1255 observations in an unbalanced panel data over the period 1980-2006 showed how inflation, monetary policy, real interest rate, and foreign exchange positively determined banks' return on assets.

According to Idrees and Musleh (2007), increase in the interest rate depresses the borrowers and depositors, like investment and saving. Banks charging of high interest rate improves returns from borrowers and discouraging the depositors by giving low return to them thus leading to inclusive spreads.

Davis and Zhu (2005) evaluate commercial property prices and bank performance within 1989-2002 period. This seeks to fill the gap by undertaking an extensive analysis of a sample of 904 banks worldwide in 15 industrialized economies. The study discovered that commercial property price positively influences bank lending and profitability, while also negatively influencing banks" net interest margin and bad loan ratios.

Laurenceson (2004) panel data study of 101 countries between 1994 and 2001 examined the relationship between bank franchise values and deposit mobilization; the study revealed negative relationship between franchise value and a decrease in deposits; suggesting that increased competition leads to improvements in service quality which tempts households to raise their holdings of savings deposits.

Ramful (2001) came to the conclusion that indeed interest rates do affect profitability of commercial banks and that they also play the role of generating finances for the operations of banks and also cover risks associated with loans that have been given out.

Uchendu (1995) investigating monetary policies and performance of Nigerian commercial banks. He observes banks' profitability rely on interest rates, exchange rate, bank reserves, banking structure and unit labour costs. He therefore concluded that stable and realistic monetary and banking policies are important for the profitability of commercial banking business in Nigeria. Studying the determinants of bank profitability in 18 European countries covering 1986-1989, Molyneux and Thornton (1992) showed that return on equity have positively significant impact on the level of interest rates, bank concentration and government ownership.

3. METHODOLOGY

The study used *ex-post facto* research design and data were derived from World Bank Data base, and Knoema. The study covers the period of 29 years from 1991 to 2018. The study adopts Beutler, Bichsel, Bruhin and Danton (2017) study on interest rates and bank lending. Their equation is stated thus;

$LGR = \beta 0 + \beta_1 NIR + \beta_2 LTR + \beta_3 STR + \beta_4 LR + \beta_5 CPI + et$ .....(i) (Beutler, Bichsel, Bruhin & Danton, 2017)

Where; LGR = Loan Growth Rate, NIR = Nominal Interest Rate, LTR = Long term rate, STR = Short Term Rate, LR = Liquidity Ratio, CPI = inflation rate.

However, our study is not country specific as thus the study adopts variables that specifically identify the ratio of commercial banks credit to the domestic economy (RBCD) and interest rate variables acceptable to the world bank standards in lending rate, interest rate spread, real interest rate, deposit interest rate and lending interest rate. There are four countries namely Nigeria, Kenya, Egypt and South Africa are considered as the sample components of the selected developing African economies

The modified model is stated thus;

RBCD = f(RPL, IRS, RIR, DIR, LIR) ..... (1)

The mathematical form is stated thus;

$RBCD = b_o + b_1 RPL + b_2 IRS + b_3 RIR + b_4 DIR + b_5 LIR + U$ ..... Equation 1

Where; RBCD = Rate of Bank Credit to the Domestic economy, RPL = Risk Premium on Lending Rate, IRS = Interest Rate Spread, RIR = Real Interest Rate, DIR= Deposit Interest Rate, LIR = Lending Interest Rate, b_0 = Constant, b_0 = Intercept and U = Error Term.

4. PRESENTATION AND ANALYSIS OF RESULTS

This section is divided into three subsections. The unit root test is presented first, followed by cointegration tests. This leads to the presentation of the Panel Co-integration and Granger analysis for the countries.

The table 1 shows the stationarity tests for the panel data series following the Levin, Lin and Chu (LLC) statistics. All the panel variables were found to be stationery at first difference level (1) except for IRS which was stationary at level. At level and first difference levels as reported, the variable p-value were all less than the 5% chosen significance level and thus we reject the Null hypothesis of the presence of unit root and accept the alternative that there is no unit root and stationarity as attained by all the variables at both level and the first difference levels.

Table 1: LL and C Unit Root Result (Panel)

Variables	Order of Integration	P-value (5%)	LL and C Test Statistics	Decision
LIR	**I(I)**	0.0000	-6.83685	Stationary
IRS	**I(0)**	0.0187	-2.08175	Stationary
DIR	**I(1)**	0.0000	-5.11867	Stationary
RIR	**I(I)**	0.0000	-4.48787	Stationary
RPL	**1(1)**	0.0000	-7.30667	Stationary
DCBS	**1(1)**	0.0000	-5.06242	Stationary

Source: Researcher computation using E-view 10.0 Output

Tests for Cointegration

Cointegration method has been used in several established research to test for long-run equilibrium relationship (Levine & Zervos, 1998; Soumare & Tchana, 2015). This forms the basis for our adoption of cointegration method to test for the existence of long-run equilibrium relationship before we can proceed with our regression analysis.

Table 2: Residual Panel Cointegration Test @ 5% level

Pedroni Residual Cointegration Test
Series: DCBS DIR IRS LIR RIR RPL
Sample: 1991 2018
Included observations: 112
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-1.286060	0.9008	-1.212393	0.8873
Panel rho-Statistic	1.936862	0.9736	2.026217	0.9786
Panel PP-Statistic	1.665072	0.9521	1.843154	0.9673
Panel ADF-Statistic	1.327495	0.9078	1.443874	0.9256

Source: E-view 10.0 Output

Table 3: Johansen Fisher Panel Cointegration Tests

Johansen Fisher Panel Cointegration Test
Series: DCBS DIR IRS LIR RIR RPL
Sample: 1991 2018
Included observations: 112
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	79.89	0.0000	43.32	0.0000
At most 1	42.58	0.0000	39.42	0.0000
At most 2	14.33	0.0736	11.58	0.1709
At most 3	7.306	0.5040	4.563	0.8031
At most 4	6.374	0.6054	4.111	0.8469
At most 5	8.292	0.4055	8.292	0.4055

Source: E-view 10.0 Output, NB * Probabilities are computed using asymptotic Chi-square distribution

From table 2, Panel V-statistics confirm a negative and insignificant long-run relationship having a statistic of -1.286060 and a p-value of 0.9008 while Panel rho statistics (statistic of 1.936862 and p-value 0.9736) and Philip Peron (statistic of 1.665072 and p-value of 0.9521) both confirm a positive but insignificant long-run relationship (co-integration) between interest rate components (LIR, DIR, IRS, RIR, RPL) and ratio banks credit to the domestic economy (DCBS) in the Sub Saharan selected African economies.

The Panel Cointegration Trace and Maximum Eigenvalue Tests reveal the existence of two (2) co-integrating vectors (with p-values of 0.0000, 0.0000 respectively and also Fisher statistic of 79.89 and 42.58 respectively) between DCBS and DIR, IRS, LIR, RIR, RPL. This confirms only two co-integration result of the residual co-integration tests of the existence of co-integration between DIR, IRS and DCBS.

Decision rule: We accept null hypothesis of no co-integration relationship. We thus, conclude that the interest rates instruments/components in DIR, IRS, LIR, RIR, RPL have no long-run equilibrium effect on DCBS in the Sub Saharan African economies.

Test of Hypotheses – Pooled Effect Output

The data for the selected study areas were pooled together to enable the researchers determine the optimum overall result for the developing African region, adopting the following procedures;

Table 4: POOLED EFFECT PANEL EGLS

Dependent Variable: DCBS			
Variable	t-Statistic		Prob.
DIR	3.865662	0.0002	
IRS	-1.942284	0.0549	
LIR	-5.296165	0.0000	
RIR	2.931077	0.0042	
RPL	-0.678855	0.4988	
ECM(-1)	26.55276	0.0000	
C	29.12102	0.0000	
	Weighted Statistics		
R-squared	0.934108	F-statistic	238.6367
Adjusted R-squared	0.930194	Prob(F-statistic)	0.000000
Durbin-Watson stat	1.824111		
	Unweighted Statistics		
R-squared	0.860866	Durbin-Watson stat	1.888513

Source: Researcher's E-view 10.0 Computation

The pooled effect model results in table 4, was carried out using Generalized Least square period weightings and the R^2 and Adjusted R^2 both showed 93.41% and 93.02% respectively. Thus, the chosen regression model best fits the data. Hence, the goodness of fit panel regression model is 93.41% and implies that chosen explanatory variables explain variations in the dependent variable to the tune of 93.41%. The square of the correlation between the value of the dependent variable and the corresponding fitted values from the model. A correlation coefficient must be between -1 and +1 by definition. A correlation of 93.41% implies that the model fits the data well and thus provides a very good fit to the data. Also, with a high Adjusted R^2 (93.02%) implies that the model can take on more variables conveniently without the R^2 falling beyond 93.02%, which is very commendable. F-statistics of 238.6367 is very good being positive and significantly large enough and it shows that there is significant positive relationship between the dependent and explanatory variables. The overall probability (F-statistics) of 0.0000 is rightly signed and very significant. The Durbin-Watson of 1.824111 is considered to be very good and lends credence to the reliability of the outcome of this research work.

Lending Interest Rate (LIR)

LIR, has a t-statistic value of -5.296165 and a p-value of 0.0000, was found to have a negatively significant impact on domestic credit provided by the banking sector (DCBS) and this impact is statistically significant at 5% level since its p-value is well less than

0.05%.This result is very instructive as past levels of LIR shows negative and significant relational impact on domestic credit provided by the banking sector (DCBS)within the selected developing Sub Saharan African economies at the 5% level of significance and indicates that a 1% increase in past levels of LIR will result to a -7.222922% decline in domestic credit provided by the banking sector (DCBS). Therefore, we reject the null hypothesis to accept the alternative.

Deposit Interest Rate (DIR)

DIR, has a t-statistic value of 3.865662 and a p-value of 0.0002, was found to have a positively significant impact on domestic credit provided by the banking sector (DCBS) and this impact is statistically significant at 5% level since its p-value is well less than 0.05%.This result is very instructive as past levels of DIR shows positive and significant relational impact on domestic credit provided by the banking sector (DCBS) within the selected developing Sub Saharan African economies at the 5% level of significance and indicates that a 1% increase in past levels of DIR will result to a 5.973979% increase in domestic credit provided by the banking sector (DCBS). Therefore, we reject the null hypothesis to accept the alternative.

Interest Rate Spread (IRS)

IRS, has a t-statistic value of -1.942284 and a p-value of 0.0549, was found to have a negatively significant impact on domestic credit provided by the banking sector (DCBS) and this impact is statistically significant at 5% level since its p-value is well less than 0.05%. This result is very instructive as past levels of IRS shows negative and significant relational impact on domestic credit provided by the banking sector (DCBS) within the selected developing Sub Saharan African economies at the 5% level of significance and indicates that a 1% increase in past levels of IRS will result to a -3.211025% decline in domestic credit provided by the banking sector (DCBS). Therefore, we reject the null hypothesis to accept the alternative.

Risk Premium to Lending Rate (RPL)

RPL, has a t-statistic value of -0.678855 and a p-value of 0.4988, was found to have a negatively insignificant impact on domestic credit provided by the banking sector (DCBS) and this impact is statistically insignificant at 5% level since its p-value is well more than 0.05%. This result is very instructive as past levels of RPL shows negative and insignificant relational impact on domestic credit provided by the banking sector (DCBS) within the selected developing Sub Saharan African economies at the 5% level of significance and indicates that a 1% increase in past levels of RPL will result to a -0.406241% decline in domestic credit provided by the banking sector (DCBS). Therefore, we accept the null hypothesis to reject the alternative.

Real Interest Rate (RIR)

RIR, has a t-statistic value of 2.931077 and a p-value of 0.0042, was found to have a positively significant impact on domestic credit provided by the banking sector (DCBS) and this impact is statistically significant at 5% level since its p-value is well less than 0.05%. This result is very instructive as past levels of RIR shows positive and significant relational impact on domestic credit provided by the banking sector (DCBS) within the selected developing Sub Saharan African economies at the 5% level of significance and indicates that a 1% increase in past levels of RIR will result to a 0.870271% increase in domestic credit provided by the banking sector (DCBS). Therefore, we reject the null hypothesis to accept the alternative.

5. DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATION

This study examined the relationship between interest rates and commercial banks credits, evidence from selected developing sub Saharan African economies from 1991 to 2018 with a view to affirming or refuting the nexus of interest rates components on commercial banks credit ratio to the domestic economy in selected developing Sub Saharan African economies using empirical evidence from Nigeria, South Africa, Egypt and Kenya.

The result of the panel data regression analysis revealed that lending interest rates (LIR) and interest rate spread (IRS) has a negative but significant relational impact on domestic credit provided by the banking sector (DCBS). While both deposit interest rate (DIR) and real interest rate (RIR) had both positive and significant relationship impact on domestic credit provided by the banking sector (DCBS). However, only risk premium to lending rate showed both negative and insignificant impact on domestic credit provided by the banking sector (DCBS) in selected developing Sub Saharan African economies.

A plausible direct interpretation of this result is that the lending interest rate and interest rate spread in the selected developing Sub Saharan African economies have overtime had negatively impacted on the direction of domestic credit provided by the banking sector (DCBS) while deposit interest rate (DIR) and real interest rate (RIR) had positively impacted on the direction of domestic credit

provided by the banking sector (DCBS). Except for risk premium to lending rate which does not determine the direction of domestic credit provided by the banking sector (DCBS).

The results emanating from our panel study proved that interest rate components had significant relationship with domestic credit provided by the banking sector in the selected developing sub Saharan African economies. Thus, the study affirm that interest rate components had significant relational impact on domestic credit provided by the banking sector in the selected developing sub Saharan African economies.

Hence, the Central Banking Authorities of the different countries considered should enforce a reduced interest rate component of commercial banks to encourage improved credit capacity of banks since it has an inverse implication on the domestic economy.

Conflicts of Interest

None

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