Determinants of Interest Rate Spread among Commercial Banks in Kenya

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Abstract:-The study intended to find out the determinants of interest rate spread among commercial banks in Kenya; to establish the effect of statutory reserve requirements oninterest rate spread among commercial banks in Kenya; to determine the effect of inflation rate on interest rate spread among commercial banks in Kenya; to examine the effect of exchange rate volatility on interest rate spread among commercial banks in Kenya; and to determine the effect of Treasury Bill Rate on interest rate spread among commercial banks in Kenya.The study used quarterly time series data for the period 2005 to 2014 which was obtained from the Central Bank of Kenya's published economic reviews.It was revealed that exchange rate volatility and inflation rate is statistically significant in explaining interest rate spreads implying that volatility of the exchange rate does have a significant impact on the banking sector interest rate spreads in Kenya. The Treasury bill rate, the reserves and gross domestic product were also found to significantly affect interest rate spread in the Kenya's banking sector. It is thus recommended that there is need for policies to deal with reserve requirements as well as putting in place measures to stabilize the exchange rate volatility in Kenya.

I. BACKGROUND OF THE STUDY

An efficient and vibrant financial system is essential ingredients for the growth of an economy (Kohli, 2012). Financial institutions in general and commercial banks in particular, mobilize savings by offering various types of deposit products to savers and channel such savings as loans and advances to borrowers and investors (Sologoub, 2006). The difference between the rates at which banks lend money to borrowers and the rate they are paying to depositors are generally known as interest rate spread (IRS). The efficiency of the banking system is reflected by a series of financial indicators and more importantly by interest rate spread (IRS) and net interest margin (NIM) as was observed by among other key variables (Sologoub, 2006; Kohil, 2012).

According to Crowley (2007) interest rate spread is the difference between the weighted average lending rate (WALR) and the weighted average deposit rate (WADR). Wider spreads are always a proxy for an underdeveloped financial system characterized by inefficiency, lack of competition and higher concentration of the banking sector; among others and the reverse is also perceived to be true (Demirguc Kunt and Huizinga, 1999; Mlachila and Chirwa, 2002).

Financial system in developing countries have been shown to exhibit significantly and persistently large intermediation spreads on average than those in developed countries. The spread or margin between lending and deposit interest rates is a key variable in the financial system. It reflects the additional cost of borrowing related to intermediation activities performed by banks in linking borrowers with the ultimate fund lenders. When it is too large, it can contribute to financial disintermediation as it discourages potential savers with too low returns on deposits and limits financing for potential borrowers, thus reducing feasible investment opportunities and therefore the growth potential of the economy.

The magnitude of interest rate spread, however, varies across the world. For instance, Jayaraman and Sharma (2003), noted that it is inverse to the degree of efficiency of the financial sector, which is an offshoot of a competitive environment. The nature and efficiency of the financial sectors have been found to be the major reasons behind differences in spread in countries across the world. In economies with weak financial sectors, the intermediation costs which are involved in deposit mobilization and channeling them into productive uses are much larger.

1.1 Statement of the Problem

As financial intermediaries, banks face substantial uncertainty which can add to spreads due to uncertainty, banksrequire a risk premium to compensate for the added volatility. Higher inflation or higher interest rates would be sources of uncertainty, and several studies confirms this relationship. Demirguc-Kunt and Huizinga (1999) found a relationship between inflation and uncertainty. Therefore, changes in inflation or interest rates would seem more directly related to uncertainty. Ho and Saunders (1981) found that interest rate volatility leads to larger spreads. Variability of the exchange rate could also be a source of uncertainty.

Despite the ongoing financial sector reforms, which are aimed at enhancing competition, the interest rate spread in Kenya, has been either stagnant or growing instead of narrowing down. This paper attempts to fill this gap in the Kenyan case by undertaking a comprehensive study on the factors behind the high interest rate spread in Kenya's commercial banks.

1.2 Specific Objectives

i. To determine the effect of gross domestic production on interest rate spread among commercial banks in Kenya

ii. To establish the effect of statutory reserve requirements oninterest rate spread among commercial banks in Kenya
iii. To determine the effect of inflation rate on interest rate spread among commercial banks in Kenya
iv. To examine the effect of exchange rate volatility on interest rate spread among commercial banks in Kenya
v. To determine the effect of treasury bill rate on interest rate spread among commercial banks in Kenya

1.3 Research Hypotheses

The study was guided by the following objective

H_{01}: To determine the effect of gross domestic production on interest rate spread among commercial banks in Kenya

H_{02}: To establish the effect of statutory reserve requirements oninterest rate spread among commercial banks in Kenya

H_{03}: To determine the effect of inflation rate on interest rate spread among commercial banks in Kenya

H_{04}: To examine the effect of exchange rate volatility on interest rate spread among commercial banks in Kenya

H_{05}: To determine the effect of treasury bill rate on interest rate spread among commercial banks in Kenya

The study adds to the body of knowledge, specifically in regard to interest rate spreads in Kenya in light of the fast changing banking environment and hopefully ignites the need for further research especially looking into competition and risks arising in the sector.

1.5 Research Design

Cooper and Schindler (2006) stated that research design is the manner in which data is collected, measured and analyzed in order to achieve certain research objectives. The design for this study was explanatory. As explained by Mugenda and Mugenda (2003), an explanatory research design is an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables.

1.6 Data Type and Data Collection

This study used quarterly time series data for the period 2005 to 2014. The period was chosen and this was necessitated by the availability of data. Data was collected from the Central Bank of Kenya's published economic reviews.Data was supplemented from the Kenya National Bureau of Statistics (KNBS) as well as published data from the respective banks.

1.7 Model Specification

Based on the background, literature reviewed and the conceptual framework, determinants of banking sector interest rate spreads in Kenya are analyzed by the model developed by Tennant and Folawewo (2007) with modifications suit the current study:

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Determinants of banking sector interest rate spreads in Kenya are analyzed by the model developed by Tennant and Folawewo (2007) with modifications suit the current study. The model for this study was specified;

$IRS_t = \alpha_0 + \beta_1 GDP_t + RES_t + INF_t + ERV_t + TBR_t + \varepsilon_t$…….....3.1

Where;

IRS_t - Interest Rate Spread

GDP_t - Annual Real per capita GDP

RES_t - Statutory reserve requirements measured in terms

INF_t - Inflation in percentage

ERV_t - Exchange Rate Volatility in percentage

TBR_t - Treasury Bill Rate in percentage

ε_t is white noise

1.9 Descriptive Statistics

The descriptive statistics were carried out to check for outliers and describe the characteristics of the sample in terms of mean, standard deviation, minimum and maximum.

Table 1.1: Descriptive Statistics

Variables	Mean	Std.Deviation	Minimum	Maximum	Skewness	Kurtosis
IRS	0.0800	0.0430	0.0000	0.0000	0.7690	0.4280
GDP	1.62E10	1.031E10	7127350265	44101114724	1.4650	5.4130
RES	3.08E8	1.980E8	133167412	882022295	1.3680	1.9230
INF	0.1000	0.0760	0.0000	0.0000	2.1700	4.4120
ERV	0.0200	0.0170	0.0000	0.0000	2.4650	5.4550
TBR	0.162 E8	0.0900	0.0000	0.0000	1.6830	2.4170

Source: Author's compilation from Survey Data, 2015

As indicated in table 4.2, the mean interest rate spread was 0.08 percent, Annual Real per capita GDP recorded annual average of 110. on the other hand, Statutory reserve requirements registered of KShs308 million. Inflation had a mean of 10 percent. The mean rate for exchange rate volatility was 0.02%. From the findings of skewness and kurtosis, the study found that interest rate spreads inflation, reserve, Treasury bills rate, exchange rate volatility and annual real per capita GDP, the study found that the distribution is also positively skewed and leptokurtic showing that most of the sample data was close its mean.

1.10 Diagnostic Checks

1.10.1 Multicollinearity

Multicollinearity is how regressors are related to each other and how this affects the stability and variance of the regression estimates in an estimated model.The existence of Multicollinearity is a poses a serious problem in applying time series regression model. Multicollinearity inflates the variances of the parameter estimates and hence this may weaken the statistical power of the regression model and makes it difficult to interpret the coefficients.To detect for Multicollinearity, the study used variance inflation factor (VIF) as shown in Table below 1.2. The Variance VIF quantifies the severity of Multicollinearity in an ordinary least- squares regression analysis. VIF's greater than 5 are a sign of highMulticollinearity, a VIF of between 1 and 5 shows that the regressors are moderately correlated while a VIF of 1 indicates that the variables are not correlated; the higher the value of VIF's, the more severe the problem (Liu, 2007). The study results showed that all the six variables had a variance inflation factors (VIF) of below 5. This implies that there was no multicollinearity between the variables and thus all the variables were maintained in the regression model.

Table 1.2: Collinearity Statistics

Variables	Tolerance	VIF
Inflation Rate	0.273	3.661
Gross Domestic Product	0.072	4.855
Exchange Rate Volatility	0.243	3.117
Treasury Bill	0.216	3.109
Reserves	0.219	2.117

Source: Authors Compilation from Survey Data, (2015)

Table 1.3: Unit Root Test using ADF Statistic

Variable		ADF Test statistics	Critical Values		P-Values	Order of integration
			1%	5%		
IRS	Level	- 0.05	- 3.49	-2.89	0.21	Unit root
	1st Diff	- 14.42	- 3.49	-2.89	0.00	Stationary
Inflation rate	Level	- 1.26	- 3.49	-2.89	0.24	Unit root
	1st Diff	- 5.83	- 3.49	-2.89	0.00	Stationary
Real Gross Domestic Product	Level	- 2.25	- 3.49	-2.89	0.41	Unit root
	1st Diff	- 8.19	- 3.49	-2.89	0.00	Stationary
Exchange rate	Level	- 0.38	- 3.50	-2.89	0.25	Unit root
	1st Diff	- 7.60	- 3.50	-2.89	0.00	Stationary
Treasury Bills	Level	- 2.41	- 3.51	-2.89	0.19	Unit root
	1st Diff	- 6.73	- 3.51	-2.89	0.00	Stationary
Reserve requirement	Level	- 2.25	- 3.49	- 2.89	0.42	Unit root
	1st Diff	- 6.11	- 3.49	-2.89	0.00	Stationary

The computed ADF test-statistic for commercial banks' interest rate spreading (-0.05) is greater than the critical values (- 3.49 - 2.89) at 1% and 5% significant level, respectively). This means the series is a non-stationary series. For inflation rate the ADF test-statistic shows a co-efficient of - 1.26 which is greater than the critical values (- 3.49 and - 2.89) at 1% and 5% significant level which also means the series is a non-stationary series. This is also the case for gross domestic product, exchange rate volatility, treasury bill and reserve where the ADF test-statistic co-efficient aregreater than the critical values at 1% and 5% significant level thus the series is a non-stationary series.

1.10.2 Johansen Co-Integration Test

A multivariate Johansen testing was carried out to test for cointegration of the variables. The results are presented in the table below.

Table 1.4 : Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob.**
None*	0.037244	101.5351	95.75366	0.0188
At most 1	0.029471	63.77002	69.81889	0.1381
At most 2	0.014172	34.00517	47.85613	0.5016
At most 3	0.010016	19.80340	29.70707	0.4363
At most 4	0.007161	9.787241	15.49471	0.2975
At most 5	0.002646	2.636294	3.841466	0.1044

** CEs-denotes the number of cointegrating equations*
** denotes rejection of hypothesis at the 0.05 level*
*** P-values*

The Trace tests in the table above shows that one cointegration equation at the 0.05 level as shown by the co-efficient 0.0188 (p - value <0.05). It indicates the existence of 1 cointegration equation at the 5% significance level. This cointegration equation means that one linear combination exists between the variables and thus along term relationship among the variables. Maximum Eigenvalue Test was also performed as shown in the table below to reinforce Johansen's Trace.

Table 1.5: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.037244	37.76507	40.07757	0.0891
At most 1	0.029471	29.76485	33.87687	0.1433
At most 2	0.014172	14.20177	27.58434	0.8085
At most 3	0.010016	10.01616	21.13162	0.7432
At most 4	0.007161	7.150946	14.26460	0.4714
At most 5	0.002646	2.636294	3.841466	0.1044

Source: Authors' compilation, 2019
* denotes rejection of hypothesis at the 0.05 level
** P-values

Results in Table 4.8 above shows that the Maximum Eigenvalue Test shows no cointegration equations at the 0.05 (5%) level

II. REGRESSION ANALYSIS

In this study, a multiple regression analysis was conducted to test the effect of the independent variables on the dependent variable. The first sub-section provides results on adjusted R-squared before presenting the model results.

2.1 Adjusted R-Squared

Adjusted R-squared is the coefficient of determination which shows the variability in the dependent variable as explained by the independent variable(s). The results are summarized in table 4.9 below.

Table 1.6: Adjusted R-Squared

Model	R	Adjusted R Square
1	0.851	0.711

The results indiccates that square is 85.1 perecent. This implies that the ndependent variable explains upto 85 percent of the variations while the rest is attributed to errrror term. The adjusted R square- which is normally done to compensate for increasing the number of independent variableswas 71.1 percent.

2.2 Regression Results

Table 1.7: Regression Results

Variables	Coefficient	Std. error	t	p-value
GDP	1.9320	0.467	4.1400	0.0000
RES	0.3080	0.140	2.2000	0.0420
INF	-0.2760	0.020	-13.800	0.0240
ERV	-1.0440	0.105	-9.9429	0.0000
TBR	-0.14300	0.053	-2.7000	0.0090
Constant	-15.581	8.102	-1.920	0.0590

Source: Survey Data (2015)

As indicated in the table 1.7, all the independent variables were statistically significant at five percent based on the p-values implying that they have effect on interest rate spread in Kenya. In terms of signs, inflation rate, exchange rate volatility and treasury bill rate had negative signs implying they affect interest spread negatively while GDP and reserves had positive signs. This implies they that they affect interest rate spread negatively.

GDP reported the highest coefficient of all the independent variables in the model. A unit increase in GDP per capita leads to a 1.9320-units increase in interest spread in Kenya among commercial banks in Kenya while a unit increase in reserves would lead to a 0.3080 increase in interest rate spread among commercial banks.This finding disagrees with the findings of Al Shubiri & Jamil (2017) and Were (2013)who found insignificant relation between interest rate spread and GDP in Oman. An increase in country's GDP translates to an increase in individual disposable income of citizens and this forces the commercial banks to adjust interest rates upwards due to excess demand hence high interest spread.Reserves reported a positive and significant coefficient indicating a positive relationship with interest rate spread in Kenya. A unit increase in reserves leads to a 0.3080 increase in interest spread in Kenya. The reserve requirement is a significant determinant of interest rate spread. High reserve requirements act as an implicit financial tax by keeping interest rates high. Though Kenya has a deposit protection fund, Kenyan banks are still subjected to high liquidity reserve requirements even after financial liberalization. While reserve requirements may be designed with the aim of protecting depositors, the opportunity cost of holding reserves at the central bank, where they earn no interest, increases the economic cost of funds above the recorded interest expenses that banks tend to shift to customers.A one percent increase in the rate of inflation would lead to a-0.2760 decrease in the interest rate spread in Kenya.This finding Disagrees with the findings of Were (2013),Bennaceur and Goaied (2008), Chirwa and Mlachila (2004) and Ahokpossi (2013) who found an insignificant relationship between inflation and interest spread.The results agree with the findings of Gambacorta (2004),who found out that interest rate spread has a positive relationship with inflation. The significant inflation is as a result likely lead to higher risk premiums as argued by Emmanuelle (2003) that actual spread, is influenced by monetary and fiscal policy.On the other hand,the study found out that a unit increase in exchange rate volatility leads to decrease in interest rate spread among commercial banks by 1.044 and a unit increase in treasury bills results to a0.143-unit decrease in interest rate spread among commercial banks in Kenya. This negative association is due to the fact that banking sector increases its spreads to protect against the increased risk (Chirwa and Mlachila, 2004). The model predicts that treasury bill rates has a negative relationship with interest bank rates spread in Kenya (p-value 0.0090 < 0.0500) and the study concluded that there is negative significant relationship between treasury bill rates and interest spread in Kenya. These findings concur with the findings of Ngugi (2001). Treasury bills acts a diversification for assets of the bank as banks engage in diversification in order to maintain their high profit margins.

2.3Recommendations

There is therefore need to empower the deposit insurance in Kenya so as to protect depositors instead of using reserve requirements as a mechanism to protect depositors. There is need for the government to maintain a stable macro-economic environment.

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