African development finance journal http://journals.uonbi.ac.ke/index.php/adfj

October Vol1 No.1, 2017 PP 28-43 ISSN 2522-3186

Effect of Monetary Policy on Credit Supply in Kenya

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Abstract

Purpose- This paper sought to establish the effect of monetary policy on credit supply in Kenya.

Methodology- This study adopted a descriptive research design. Descriptive statistics such as mean, median, minimum, maximum and standard deviation were used to describe the trend of the variables. Breusch Godfrey serial correlation LM test was used to test correlation of the study variables. Stationarity tests on time series data was conducted using augmented dickey fuller test statistic. Regression analysis was used to establish the influence of monetary policy on credit supply.

Findings- The study concluded that CRR, OMO and Inflation are significant and have a negative effect on credit supply. The model was also fit to explain the relationship as 76% (R^2= 0.761160) variation of the dependent variable (Credit supply) was explained by the independent variables (OMO, CRR, CBR and Inflation) in the long run. Adjusted R- square which provides adjustment to the R Square was73% (Adjusted R^2= 0.736664) indicating 73% variation in credit supply was explained by independent variables (OMO, CRR, CBR and Inflation). *F*- Statistic 31.07233 was significant at 1% level *P*=0.0000.

Implications – The study recommends that the Central Bank of Kenya should come up with monitoring and evaluation programmes of monitoring how credit supply is influenced by various monetary policy instruments and should streamline the economic environment in which banks operate by ensuring CRR, OMO and Inflation are maintained at a constant.

Value –The study narrowed in scope to commercial banks and excluded the non-banking organizations. Additionally a study should be done on the impact of monetary policy on money supply to capture both banking and non-banking institutions. The research had a presumption that the relationship of the variables was linear therefore more studies should be carried out explore nonlinear relationship on the variables of study,

Key Words*: Credit Supply, Monetary policy*

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Introduction

Monetary Policy and Credit Supply analyzes the effect instruments of monetary policy have on the bank credit supply. Instruments of monetary policy influence both loan supply and demand. Poorer economic conditions and tighter monetary policy extensively distress loan granting Jimenez, Ongena, Peydro and Saurina, 2012).When monetary policy tighten and economic conditions degenerate, credit supply decrease and agency problems between lowly capitalized banks and investors are intensified leading to an even harsher reduction in bank credit (Holmstrom & Tirole, 1997).The monetary Policy is an instrument of macroeconomics used by governments to manage the country's economy. It is used to manage the availability of credit in a country's economy. The CBK has the mandate of implementing monetary policy.When monetary policy contracts the interest rate raises thus reducing the availability of credit to credit dependent borrowers. Generally economists and policy makers say that monetary policy mostly implemented through interest rates. (Morris & Selleon1995).Monetary policy instruments remain essential in the demand and supply reserves held by banking institutions and subsequently on accessibility of credit. (Ayodele, 2014)

When monetary policy contracts unfavorable economic situations may increase agency costs for both banks and firms. Financial factors may influence the impact of monetary policy in two contemporary ways. One is the result theories of finance on business cycle that stresses the role of the obligor's balance sheet. These theories emphasize the impression that imperfections in capital market create spending of certain debtors be contingent on their balance sheet positions. Monetary policies come into representation both directly and indirectly. When interest rates increase balance sheet weakens, cash flows net of interest lower and net worth of the collaterizable assets also lowers. This has a tendency to amplify the total influence of monetary policy on debtors'

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expenditure. Incidentally tight money shrinks expenditure; reductions in cash flows and assets values related to this drop in expenditure also lead to deterioration of the balance sheet (Gertler & Gilchrist, 1994).

In Kenya Monetary Policy are the actions and decisions that the central government takes to ensure money supply is in line with the economic growth and the price objectives that the government wants to achieve. Comparing the CPI of a particular month with CPI of the same month in the previous period is used in the determination of month on month inflation rate. In this study we shall seek to establish the interaction of monetary policy and credit supply in Kenya by analyzing the fluctuations in the monetary policy instruments and the banks loans from the statement of financial position data. The following are monetary policy instruments used to implement monetary policy in Kenya. They include: CRR- This is the minimum percentage of the customers deposit that a deposit taking institution should hold with the central bank, OMO-This is the buying and selling of securities from the government so as to control the amount of money available in the banking system and Lending by CBK-This where the central bank lends to banks that are experiencing financial difficulty. By manipulating these instruments, CBK influence money supply, government security Prices, credit availability and creation of liquidity in commercial banks (central bank of Kenya statement, 2016).

Research Objective

The research pursued to establish the effects of monetary policy on credit supply in Kenya.

Methodology

This study took a descriptive case study approach in collecting data, this is useful because it uses both quantitative and qualitative elements research methodology and it determines the cause and effect. The main focus of this study is quantitative however there are some qualitative aspects that

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will be used in order to gain better understanding of the causal effect. The main objective of the study was to determine the effect of monetary policy on credit supply in Kenya

Analytical Model

The data was analyzed using descriptive measurements such as standard deviation, mean, Median, minimum and maximum were used to study the data. The quantitative data on credit supply measured in real values. Results were presented in tables and graphs for further analysis and to assist in evaluation. The descriptive statistical tools were used to describe the data.

The research used regression method for its capability to assess the nature of variation of the independent variable on the dependent variable. Regression is able approximate the coefficients of a linear equation, comprising of more than one independent variables

The study used inferential analysis; an error correlation model will be used to determine accurate predictions. The following model was stated in effort to examine the effectiveness of monetary policy on credit supply in Kenya.

The study used the following regression model

$Y= \alpha + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \varepsilon$

Where;

Y= credit supply

α = Constant Term.

$\beta 1$, $\beta 2$, $\beta 3$ and $\beta 4$ = beta coefficients

ε = Error Term

Table 1 Operationalization of the study variables

Symbol	Definition	Measurement

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Y	Credit supply	Total loans advances by commercial banks for the year
CBR	Central Bank Rate	Weighted average CBR for the year
CRR	Cash Reserve Ratio	Weighted average CRR for the Year
OMO	Open Market Operations	Average 364 T-Bill rates for the Year
CPI	Inflation(Consumer Price Index)	Quarterly Variables for the year

Results and Discussions

Table 2 below presents the descriptive statistics for all the variables. It shows the numbers of observation for all the variables, their average values and their standard deviation. It also shows the minimum and maximum values

Table 2: Descriptive Analysis

	Credit Supply	Open Market Operations	Cash Reserve Ratio	Central Bank Rate	Inflation
Mean	6.756443	1.035985	-2.933820	-2.319953	1.992463
Median	6.727945	1.272600	-2.946942	-2.465104	1.945195
Maximum	7.749322	1.924103	-2.813411	1.9108283	2.953868
Minimum	5.681537	1.482805	-3.101093	-2.813411	0.966984
Std Dev	0.607381	0.708460	0.102684	0.699983	0.537232
Skewness	-0.017220	-1.343676	-0.222235	5.192369	0.246684
Kurtosis	1.756783	5.087562	1.927739	31.81033	2.153099
Jarque-Bera	2.835751	21.22960	2.470045	1719.442	1.761197
Probability	0.242228	0.000025	0.290828	0.00000	0.414535
Observations	44	44	44	44	44

Source: Research Findings (2016).

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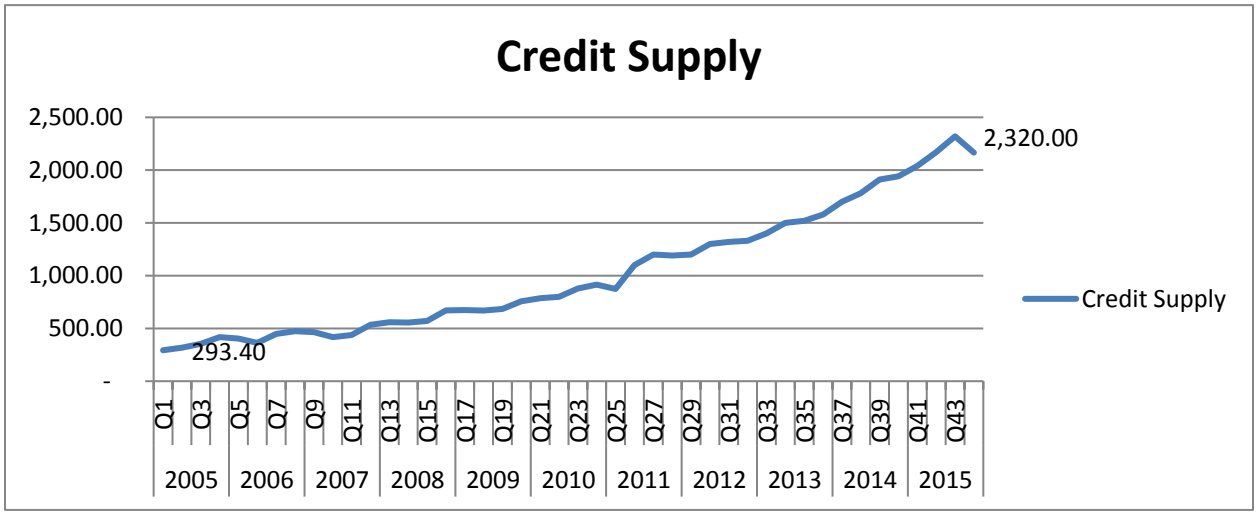
Credit supply had a mean of 6.756443 with a standard deviation of 0.607381, Inflation had a mean of 1.992463 with a standard deviation of 0.537232, Central Bank Rate had mean of 2.319953 with a standard deviation of 0.6999983, Cash Reserve Ratio had a mean of - 2.933820 and a standard deviation of 0.102684 while Open Market Operations had a mean of 1.035985 and a standard deviation of 0.708460.

Credit Supply was measured using gross loans advanced by commercial banks. The study findings revealed that credit supply had been on a steady growth over the study period (2005-2015). The end of Quarter 1, 2005 recorded the lowest credit supply of Kes. 293.4 billion while the highest credit supply of Kes. 2,320.00 billion was recorded in quarter 3 2015. The standard deviations indicated fluctuations in credit supply over the study period. The trend of the credit supply over the study period is as depicted on Figure 1 below.

Figure 1: Credit Supply



Source: Research Findings (2016).

Open Market Operations, Central Bank Rate, Cash Reserve Ratio and Inflation had been fluctuating over the study period. Open Market Operations recorded a high of 0.06849 in 2008

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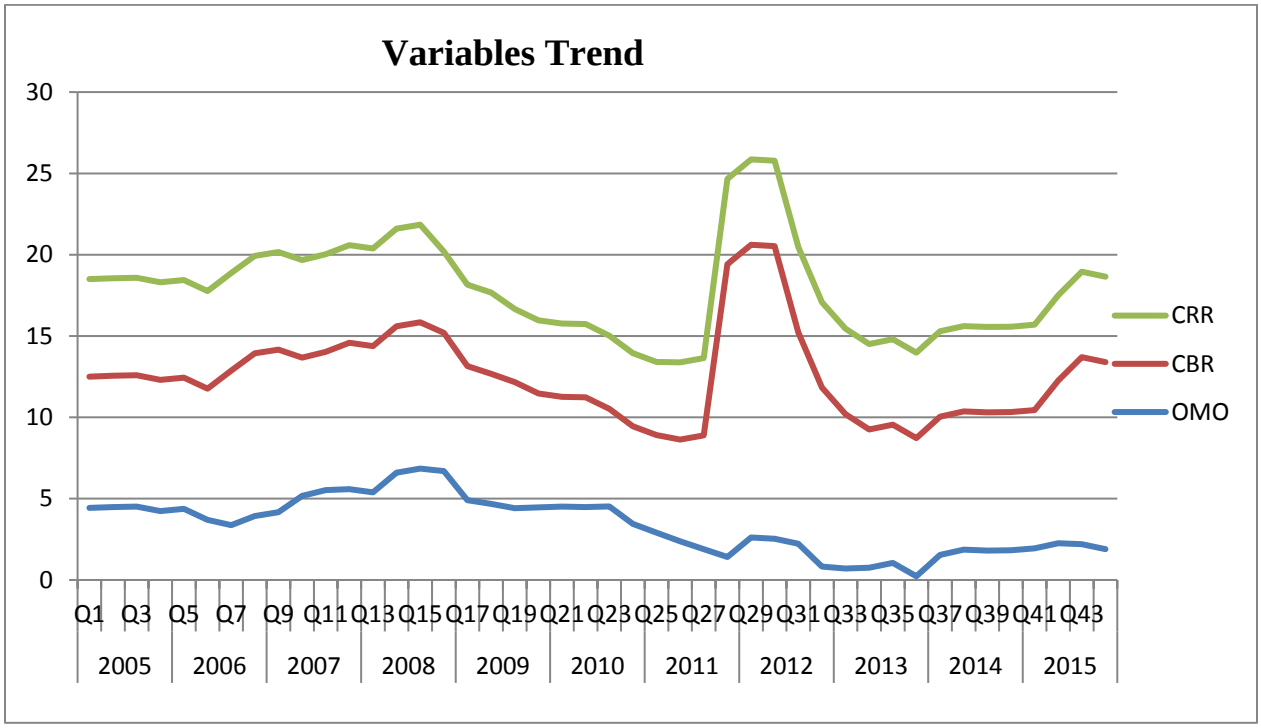
and a low of 0.00227 in 2013. Central Bank Rate also recorded a high of 0.18 in 2012 and a low of 0.06 in 2011. Cash Reserve Ratio recorded relatively stable results over the study period. While Cash Reserve Ratio recorded a low of 0.045 in 2010 & 2011 and a flat of 0.06 for the years 2005-2008. The trends of the variables over the study period are as shown in Figure 2.

Figure 2: Variables Trend



Source: Research Findings (2016).

Inflation rate recorded variations during the study period (2005–2015). The inflation rate ranged between a high inflationary pressure of 19.18 in 2011 and a low inflationary pressure of 2.63 in 2007. The trend of inflation rate for the study period is as shown in Figure 3 below

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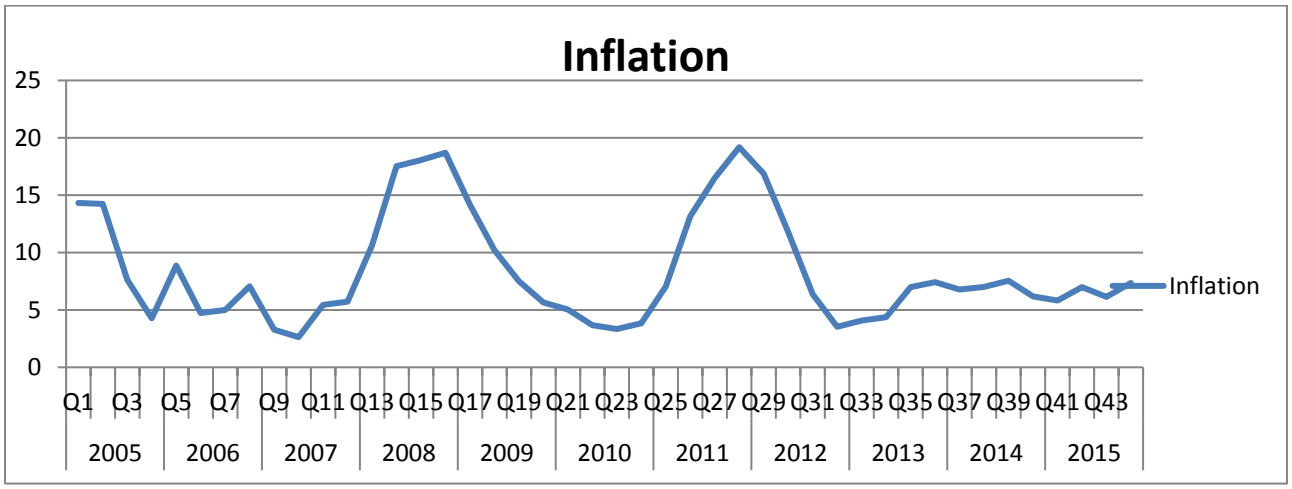
Figure 3: Inflation Rate



Source: Research Findings (2016).

Diagnostic Tests

Breusch Godfrey serial correlation analysis was done to test whether the study variables were correlated in any way. Serial correlation test was done and as per the results it is clear that there is no correlation. This ensures the OLS estimates are not biased. The diagnostic results are found on Table 3 below

Table 3: Diagnostic Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	9.774461	Prob. F(2,35)	0.0004
Obs*R-squared	15.41009	Prob. Chi-Square(2)	0.0005

Unit Root Test Results

The stationarity tests on the time series data collected was conducted using augmented dickey fuller test statistic. The null hypothesis was CBR has a unit root while the alternative hypothesis was CBR does not have a unit root. The stationary test revealed that CBR was stationary at level. On credit supply the null hypothesis was credit supply has a unit root while the alternative hypothesis was credit supply does not have a unit root, Credit supply was found to be non-

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stationary at level but stationary at first difference. CRR and OMO were found to be stationary at level while inflation was found to be non-stationary at level but stationary at first difference.

Regression Results

The research sought to establish the effects of monetary policy on credit supply in Kenya. Gross loans advanced by commercial banks were used as the proxy for credit supply and was regressed against the proxies of monetary policy (CBR, CRR, OMO and inflation).Regression analysis was conducted using Eviews data analysis software.

The general findings of the study are as shown in the Regression Results in Table 4 below

Table 4: Regression Results (Long run relationship)

Variables	Coefficients	t-statistic	Prob
Constant	9.664689	19.11270	0.0000
CBR	3.438005	1.556426	0.1277
CRR	-44.05214	-4.371199	0.0001
Inflation	-0.012895	-0.135931	0.8926
OMO	-0.785850	-7.312327	0.0000
R-squared	0.761160		
Adjusted R-squared	0.736664		
Prob(F-statistic)	0.000000		
Durbin-Watson stat	0.335663		

Source: Research Findings (2016).

The regression results show that CRR and OMO are significant variables in explaining the variation in the credit supply. A unit increase in CRR leads to 44 units decline in credit supply while a unit increase in OMO leads to 0.78 units decline in credit supply. The adjusted R-squared of 73 percent implies that 73 percent of the variation in credit supply can be explained by CBR,

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CRR, Inflation and OMO. The Prob (F-statistic) is also significant which implies that the model is fit (the variables are jointly significant in explaining the variation in credit supply).

Granger Causality tests Results

Granger causality tests was conducted on the times series data to determine if the time series was useful in forecasting another. The granger causality test results are in Table 5 below

Table 5: Granger causality test results

Pairwise Granger Causality Tests
Date: 10/20/16 Time: 20:03
Sample: 1 44
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CBR does not Granger Cause CREDS	42	0.43890	0.6481
CREDS does not Granger Cause CBR		0.47865	0.6234
CRR does not Granger Cause CREDS	42	0.14818	0.8628
CREDS does not Granger Cause CRR		0.12908	0.8793
INFLATION does not Granger Cause CREDS	42	0.13073	0.8779
CREDS does not Granger Cause INFLATION		0.59623	0.5561
OMO does not Granger Cause CREDS	42	0.17166	0.8429
CREDS does not Granger Cause OMO		2.44708	0.1004
CRR does not Granger Cause CBR	42	0.03280	0.9678
CBR does not Granger Cause CRR		0.04424	0.9568
INFLATION does not Granger Cause CBR	42	1.58297	0.2190
CBR does not Granger Cause INFLATION		1.17097	0.3213
OMO does not Granger Cause CBR	42	1.17257	0.3208
CBR does not Granger Cause OMO		8.37772	0.0010
INFLATION does not Granger Cause CRR	42	1.24366	0.3001
CRR does not Granger Cause INFLATION		0.07689	0.9261
OMO does not Granger Cause CRR	42	1.62361	0.2109
CRR does not Granger Cause OMO		4.22422	0.0223
OMO does not Granger Cause INFLATION	42	0.50263	0.6090
INFLATION does not Granger Cause OMO		0.08946	0.9146

Source: Research Findings (2016).

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According to the results if the p value is greater than 5 percent we accept the null hypothesis and if the P-value is less than 5 percent we reject the null hypothesis. According to the results we accept the null hypothesis that CBR does not cause credit supply cause CBR neither does credit supply cause CBR, CRR doesn't cause credit supply neither does credit supply cause CRR, Inflation does not cause credit neither does credit supply cause inflation, OMO does not cause credit supply neither does credit supply cause OMO, Inflation does not cause CBR neither does CBR cause inflation. OMO does not cause CBR however CBR do cause OMO. Inflation does not cause CRR neither does CRR cause Inflation, OMO does not cause CRR however CRR cause OMO.

There from the results CBR and CRR cause OMO. This implies that the past values of CRR and CBR can be used for the prediction of future values of OMO. Therefore CBR and CRR values can be used to predict future values of OMO.

Coefficients of Determination

Coefficient of determination R^2 is a portion of how much of the variability of one variable can be "explained by" the variation of the other. Standardized coefficients of determination are approximations resulting from regression analysis that have been standardized so that the variances of the dependent and independent variables are 1.

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Table 6: Coefficients of Determination

Variables	Coefficients		t-Statistic	Prob
	B	Standard Error		
(Constant)	9.664689	0.505668	19.11270	0.0000
Central Bank Rate	3.438005	2.208909	1.556426	0.1277
Cash Reserve Ratio	-44.05214	10.07782	-3.3074	0.0021
Open Market Operations	-0.785850	0.107469	-6.4198	0.0000
Inflation Rate	-0.012895	0.094861	1.2698	0.2122
Dependent Variable: Credit Supply				

Conclusions

The conclusion in this study is that there is a strong relationship between monetary policy and credit supply. The study also concludes that central bank rate had a positive effect on credit supply while CRR, OMO and Inflation had a negative effect. Further, the study also concludes that the monetary policy instruments used in this study collectively accounts for 73.66% of the total changes in gross loans advanced by commercial banks in Kenya.

It was found out that monetary policy is tightened by increasing the CRR and OMO.This affects credit supply by a greater extent, reserve requirements cause enhanced liquidity problems for commercial banks. While increase in the Treasury bill rates (OMO) cause banks to purchase securities thus reducing the liquidity.

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In the Long Run 76% variation in credit supply is influenced by monetary policy instruments (OMO, CBR, CRR and Inflation). The study also showed that banks are greatly involved in OMO. This influence the total liquidity available to the banks hence affects lending behavior.

Recommendations

The study found that CRR, OMO and inflation had a negative effect on the gross loans advanced by commercial banks in Kenya. The research recommends that the CBK should come up with monitoring and evaluation programmes of monitoring how credit supply is influenced by various monetary policy instruments.

Central bank should streamline the economic environment in which banks operate in by ensuring the Cash reserve ratio, Open Market Operation and Inflation are constant so as enable the borrower's access credit for economic growth, since these variables (CRR, OMO and Inflation) have a negative effect on credit supply.

The existing theory of monetary theory and policy had two conclusions that the long run monetary relationship was explained by inflation output growth and growth rates of many measures of money over a long period in many countries, this theory should be expanded to cover the effects of monetary policy instruments on money for different countries.

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