Strathmore
UNIVERSITY

The interest rate pass-through from the Central Bank Rate to Microfinance Banks' lending rates in Kenya

Njoroge Dorcas Mumbi
071129

Submitted in partial fulfillment of the requirements for the Degree of Bachelor of Business Science in Finance at Strathmore University

School of Finance and Applied Economics
Strathmore University
Nairobi, Kenya

November 2015

Abstract

This paper investigates the significance of the interest rate pass-through from monetary policy rates to microfinance lending rates in Kenya. This methodology makes use of the Vector Auto regression Model, using annual data from a sample of 6 microfinance institutions from the year 2000 to 2015. This study finds that the degree of interest rate pass-through is insignificant and that it takes a considerable period of time before the policy rates can be fully reflected in the long term microfinance lending rates. The Impulse response and Variance Decomposition models also indicate that the relationship between the Central Bank Rate and the Microfinance Bank lending rates was insignificant. This study is novel as it is one of the first attempts to consider the effectiveness of monetary policy in the Kenyan microfinance sector, hence providing policy makers with additional insights to the effectiveness of monetary policy in the microfinance sector.

List of Abbreviations

ADL	Autoregressive Distributed Lag Model
BRICS	Brazil, Russia, India, China and South Africa
CAEMC	Central African Economic and Monetary Community
CBR	Central Bank Rate
CGAP	Consultative Group to Assist the Poor
ECM	Error Correction Model
KBRR	Kenya Banks Reference Rate
K-REP	Kenya Rural Enterprise Programme
KWFT	Kenya Women Finance Trust
MAL	Mean Adjustment Lag Model
MPC	Monetary policy Committee
SMEs	Small and Medium Size Enterprises
VAR	Vector Auto Regressive Model
VAR(X)	Vector Auto Regressive Model with exogenous variables

The CBR is closely linked to the Kenya Bank Reference Rate[2]. In July 2014, the Kenya Bank Reference Rate (KBRR) was introduced in a bid to improve the supply of private sector credit and mortgage finance in Kenya. The KBRR required transparency and fairness in the financial sector and banks are expected to disclose the KBRR and any additional premium to their customers (Central Bank of Kenya, 2014).

On the other hand, lending rates to the public are at the discretion of the financial institution, since they should be sufficient to cover operating costs and earn a mark-up. Lending rates are different from the interbank rates, which is the interest rate that commercial banks lend and borrow from each other.

Microfinance banks have contributed significantly in achieving financial inclusion in Kenya. Financial inclusion is the delivery of financial services in a reliable, convenient, affordable, continuous and flexible manner to the low-income segments of the society. For microfinance to be successful, it needs to address the socio-economic issues faced by the public. Microfinance banks are therefore seen as part of the solution towards eradicating poverty, with a spillover effect on the economy (Senanayake & Premaratne, 2006). As a result, they have become very successful because they improve the welfare of their customers and unleash the productivity of cash starved entrepreneurs (Chavan & Ramakumar, 2002), (Cull, Demirgüç-Kunt, & Morduch, 2009). Microfinance has also caused a positive and radical change in culture, gender roles and perceptions about money in rural Ghana although microfinance is not the sufficient condition in improving the socio economic conditions of the rural families (Arku & Arku, 2009). Microfinance needs to complement other efforts geared towards improving the welfare of the poor and marginalized members of the public.

Kenya has seen some growth of Microfinance Institutions with an increasing number being regulated by the Central Bank of Kenya. This trend is expected to persist into the foreseeable future.

[2] Kenya Bank Reference Rate is a benchmark rate prescribed by the Central Bank of Kenya for determining the lending rate for commercial and microfinance banks as well as pricing mortgage products. This was to prevent banks from setting their own rates and ensure transparency in credit lending and enhance the transmission between the CBR and the banks' lending rates.

research hopes to find out how monetary policy, through the CBR, affects Microfinance lending rates to the Kenyan public.

1.2. Problem Statement

Background to the problem:

In the 1960-70s, the monetary policy was inactive, with the Kenyan government determining the minimum interest rate to be charged by the financial sector. In 1981, the government switched from setting minimum interest rates to setting maximum interest rates. However, the 1970s were characterized by negative real interest rates. Liberalization of the financial sector became imperative to satisfy the requirements of the Structural Adjustment Programmes. In 1991, the Kenyan financial sector became fully deregulated, and this was justified under the McKinnon Shaw hypothesis (Kariuki, 1995). However, this did not translate to the inclusion of the poor and the marginalized members of the society, which were considered too risky by commercial banks. The monetary policies have previously ignored the informal sector and the microfinance banks were not regulated by the Central Bank until the early 21st century.

Problem statement:

Several studies have tackled the effects of a change in the monetary policy rate on commercial bank interest rates. These studies include the research carried out by (Aziakpono & Wilson, 2010), (Betancourt, Vargas, & Rodríguez, 2008), (Fadiran, 2014) and (Hofmann & Mizen, 2004). The results from these studies concluded an incomplete interest rate pass-through to policy rates. Using Kenyan commercial banks' data, the effect of the CBR on deposit rates (Njiru, 2014) and lending rates (Makambi, Wawire, & Omolo, 2013) were examined. These researchers found that lending and deposit rates respectively had a slow degree of adjustment and a rigid interest rate pass-through from the CBR. The research undertaken by (Amidu, 2006) found that the prime rate and the inflation rate (as a proxy of monetary policy) in Ghana insignificantly affected bank lending rates. In Zambia, the monetary policy rate had a moderate impact on medium sized banks with no effect on small banks (Simpasa, Nandwa, & Nabasanga, 2014). Additionally, some studies have tackled the pass-through of interest rates to small banks (Nehls, 2006) & (Frappa, Murez,

1.6. Scope of Study

This research is confined to the Kenyan Microfinance sector, where the degree of pass-through is considered in depth.

Collusive Pricing Arrangements theory states that banks are less likely to decrease lending rates because they wish to avoid interfering with the collusive arrangement equilibrium. Lending rates will be unwillingly reduced by banks when the policy rate is reduced thus exhibiting downward rigidity. In South Africa, deposit rates show an upward rigidity in response to an increase in policy rates and therefore have the lowest speed of adjustment (Aziakpono & Wilson, 2010).

The Customer Reaction hypothesis links the behavior of borrowers to changes in policy rates. Banks operating in imperfectly competitive markets will be reluctant to increase the lending rate for fear of customer reprisals and because switching costs are low. Hence, for example, in the Euro area, lending rates will show a rigidly upward speed of adjustment when the monetary policy rate is increased (De Bondt, 2005).

According to Customer behavior (Adverse Selection) hypothesis, highly sophisticated customers and well-informed users of financial services are likely to influence the bank's ability to raise or lower interest rates. Considering low switching costs and higher bargaining power of customers, lending rates will reflect rigid upward adjustment to monetary policy rates while there is a downward rigid adjustment in deposit rates. At the same time, banks are wary of attracting riskier borrowers in the event that lending rates increase, thus reflecting an upward rigidity in interest rates (Stiglitz & Weiss, 1981).

These theories are of the opinion that Monetary Policy Rates directly affect Microfinance interest rates charged to their customers.

In the BRICS (Brazil, Russia, India, China and South Africa), Customer Reaction theory was present in Brazil, India, China and South Africa's deposit rate adjustment, while Collusive Pricing Theory persisted in Russia. With regard to lending rate adjustments, Collusive Pricing Theory was prevalent in Brazil, China and South Africa while Customer Reaction Theory persisted in India and Russia (Fadiran, 2014).

exposure to Credit Default Swaps[8] and the Subprime loans[9] and was also seriously affected by the recession in the Baltic States. Liquidity risk was low due to the low degree of money market volatility. Therefore, in order to have an efficient transmission of monetary policy, a stable relationship between monetary policy rates and banks' interest rates is paramount. This also reflects the effectiveness of the authorities to keep monetary policies under control in event of such shocks (Harbo & Welz, 2011). The impact on the pass-through rates on the United Kingdom's retail rates was statistically significant but temporary (Ahmad, Aziz, & Rummun, 2013).

Terms and conditions on lending rates to non-bank financial institutions also play a role in the effectiveness of monetary policy transmission. The speed of adjustment is affected by the size of credit institutions, refinancing conditions and extent of business with non-banks. Since smaller banks are less exposed to capital markets, they adjust slowly to changes in monetary policy. Overdependence on savings deposits slows down the speed of adjustment to policy rates and having large relationships with non banks increases the speed of adjustment, hence increasing the significance of 'relationship banking' (Weth, 2002).

Generally, the interest rate pass-through is mostly heterogeneous as it depends on the region or country being studied. For example, composition of financial markets varies widely across regions and between countries (Montagnoli, Napolitano, & Siliverstovs, 2015).

If the lending rates and the central bank rate are related, this may manifest an interest rate pass-through. The closer the relationship between lending and central bank rate, the higher the interest rate pass-through. This is important because the interest rate pass-through reflects the effectiveness of monetary policy in controlling inflation and stabilizing the economy (Matemilola, Bany-Ariffin, & Muhtar, 2015).

[8] Credit Default Swaps are financial derivatives where the buyer makes periodic payments to the seller in exchange for an agreement to compensate the buyer in the event that credit risks occur such as the default of a loan by the borrower.

[9] Subprime loans are loans that are offered at higher rates to risky borrowers who fail to qualify for prime loans possibly because they have poor credit history and such loans have a higher risk of default

Central African Economic and Monetary Community (CAEMC)[10]. The results indicated that there was a low and incomplete pass-through from the policy rate to deposit rates. There was an overshooting effect on lending rates, which led to interest rate asymmetry (Samba & Yan, 2010).

Sheefeni (2013) carried out a two-phase analysis on the effect of monetary policy on commercial bank interest rates and retail rates in Namibia using an ADL Model, an ECM and MAL Model. The interest rate pass-through was found to be incomplete, while short run lending rates had a higher pass-through than long run lending rates. The deposit rate stickiness was found to be higher in the short-run than in the long run.

In South Africa, Aziakpono and Wilson (2010) applied symmetric and asymmetric ECM and found out that speed of adjustment from the monetary policy rate was highest in lending rates, followed by the treasury bill rate, the money market rate, deposit rates and bond yield rates, which had the lowest speed of adjustment. A similar study was carried out in Rwanda where it was found that policy rates affected commercial bank retail rates with a time lag, an evidence of a slow and sluggish interest rate pass-through (Rutayisire, 2014).

Likewise, research on interest rate pass-through in Kenya was carried out by Makambi et al., (2013) and Misati et al., (2011) where they studied the degree of interest rate pass-through and the speed of adjustment of commercial bank lending and deposit rates from the CBR respectively. Both studies agree that there was an incomplete interest rate pass-through of policy rates in the short and long run to commercial bank deposit rates in Misati et al., (2011) and lending rates in Makambi et al., (2013). However, the speed of adjustment differs in both studies, with Makambi et al., (2013) finding a full speed of adjustment to take effect at 11-22 months, whereas Misati et al., (2011) found a full speed of adjustment after 18-24 months. Both Misati et al., (2011) and Makambi et al., (2013) used the profit maximization model and the ECM to estimate the degree of pass-through and the

[10] The Central African Economic and Monetary Community (CAEMC) is a regional trading bloc involving countries in the central part of the African continent. Member states include: Chad, Equatorial Guinea, Gabon, The Republic of Congo, Cameroon and the Central Africa Republic.

Table 1 below summarizes the methodologies used and findings from research that have been carried out on the speed of adjustment and interest rate pass-through from policy rates.

Table : Summary of methodology and findings

Author	Methodology used	Interest rate pass-through		Country studied
		Lending	Deposit	
(Alam & Waheed, 2006)	VAR	N/A	Incomplete	Pakistan
(Aziakpono & Wilson, 2010)	ECM	Sluggish and rigid		South Africa
Betancourt et al., (2008)	ECM, VAR(X)	N/A	Incomplete (short run) Complete (long run)	Colombia
(Fadiran, 2014)	MAL, ECM	Complete (short-run in SA & Brazil)	Incomplete (short run in SA & Brazil)	BRICS
		Incomplete (short run in India)	Over complete (short run in India)	
(Rutayisire, 2014)	ECM	Almost complete	Incomplete	Rwanda
Makambi et al., (2013)	ADL reparameterized as ECM	Sluggish and incomplete		Kenya
Misati et al., (2011)	ADL reparameterized as ECM	Incomplete both in short run and in long run		Kenya
Qayyum et al., (2005)	ADL	Incomplete		Pakistan
(Samba & Yan, 2010)	ADL	Overshooting	Incomplete	CAEMC
(Sheefeni, 2013)	ADL, ECM, MAL	Incomplete and lower pass-through in long run		Namibia

financial sector since it is believed that the changes in policy rates will have an effect on the commercial and microfinance lending rates, such that financial institutions are unwilling to reduce the interest rates when the monetary policy rate is reduced. However, it is likely that these financial institutions are more willing to raise the interest rates when the monetary policy rate is increased.

This paper focuses on lending rates by Microfinance banks and the Central Bank Rate. The research will use a sample from the population of twelve[11] Microfinance Banks in Kenya.

3.4. Data collection process

Sample data for the Central Bank Rate and the Microfinance lending rates will be obtained from the Central Bank of Kenya and the Microfinance Information Exchange website. Annual data ranges from 2000 up to 2015 since it reflects the evolution of the lending rates of Microfinance banks since 2000 as well as the extent of financial liberalization in Kenya's informal sector.

Microfinance rates are used since they reflect the needs of the informal sector. The informal sector makes a significant contribution to Kenya's Gross Domestic Product. It is therefore expected that changes in monetary policy will have implications on Microfinance bank lending rates.

3.5. Data analysis

In order to observe the relationship between Microfinance lending rates and Central Bank Rate, the following steps will be carried out:

- Unit Root tests
- Tests for Co-integration
- Vector Auto-regression Model
- Granger causality/ Block Exogeneity test
- Impulse response function
- Variance Decomposition

3.5.1. Unit root tests

It is necessary to conduct unit root tests in order to find out if the data is stationary or not. If the data follows some kind of a random walk, it is imperative that unit roots be

[11] See Appendix one

Suppose our AR(1) model (without a constant and trend) has an error term that looks like this:

$\varepsilon_t = y_t - bx_t$ .....(2)

Which is derived from this equation:

$\varepsilon_t - \varepsilon_{t-1} = \gamma\varepsilon_{t-1} + v_t$ .....(3)

The null and alternative hypothesis are as follows:

Ho:$\varepsilon_{i1}=\varepsilon_{i2}=0$

Ha: $\varepsilon_{i1}\neq\varepsilon_{i2}\neq0$

If the null is rejected at a given level of significance, it means that the series are co-integrated. Two time series variables $\boldsymbol{aX_1 + bX_2}$ are said to be co-integrated if their behavior is affected when one of the variables changes over time. The linear combination is stationary in that it has a constant mean, standard deviation and autocorrelation function for both a and b.

3.5.3. Vector Auto-Regression Model

Suppose we have a data set that follows a random walk such that the first equation is as follows:

$Y_t = \alpha_{10} + \alpha_{11}Y_{t-1} + \alpha_{12}X_{t-1} + U_{(y)t}$ .....(4)

This means that the variable (Y_t) is a function of its own lag (Y_{t-1}) and the other variable's lag (X_{t-1}).

The other equation is as follows:

$X_t = \alpha_{20} + \alpha_{21}Y_{t-1} + \alpha_{22}X_{t-1} + U_{(x)t}$ .....(5)

This means that the variable (X_t) is a function of its own lag (X_{t-1}) and the other variable's lag (Y_{t-1}).

The two equations are combined to form what is called a VAR (1) model, since it has only one lag. Therefore, the VAR model is a framework used to describe the dynamic relationship between two variables which have to be stationary.

The Granger Causality/ Block Exogeneity Wald test is also used to test whether the endogenous variables can be treated as exogenous variables.

This test is necessary so that we avoid making an erroneous judgment as to whether a variable has an effect on the behavior of another variable. It also makes empirical analysis more accurate and precise.

3.5.6. Impulse response tests

'They show the effect of shocks on the adjustment path of the variables' (Hill, Griffiths, & Lim, 2008, p. 352). For example, recall equation 1:

$$y_t = \rho y_{t-1} + v_t \quad \text{.....(1)}$$

The impulse response function, when plotted on a graph, shows what happens to y_t after it is subjected to a shock, so it tells us how rapidly y_t reacts to the shock (in this research, it can be understood as the degree of pass-through).

3.5.7. Variance decomposition tests

This separates the effects of the various shocks on the behavior of the variables (Hill, Griffiths, & Lim, 2008, p. 355). It considers the independent contribution of each type of shock on the behavior of the variables. This helps in understanding the evolutionary patterns of the variables and help in determining which shocks have a greater impact on the variable's performance than others.

The following table summarizes the list of microfinance banks under study:

Table : List of selected microfinance Banks and their characteristics

Name of MFB/Ch	Age	Legal status	Level of Interme	Outreach	Profit status
BIMAS **	Mature	NGO	High	Small/Medium	Non Profit
Equity Bank KEN*	Mature	Bank	High	Large	Profit
Faulu MFB	Mature	NBFI	High	Large	Non Profit
K-Rep*	Mature	Bank	High	Large	Profit
KWFT MFB	Mature	NBFI	High	Large	Profit
SMEP MFB	Mature	NBFI	High	Medium/Large	Non Profit

NBFI-Non Bank Financial Institution
NGO-Non Govermental Organisation
* they are now operating as commercial banks
** means that they are not regulated by the Central Bank of Kenya
Level of intermediation-degree to which the institution links the savers (debtors) and the borrowers (creditors) in the financial system
Outreach-reflects the presence of the institution in different parts of the country

One of the challenges faced during data analysis is the fact that there were missing data values. Although there was data from 2000 up to 2015, there were some gaps, which required simulation using the largest and smallest values of the real gross portfolio yield. This is one of the limitations of this study.

The variables used in the analysis are the Central Bank Rate and the real gross portfolio yields of the individual microfinance banks, which is a proxy for the lending rates.

Panel data was used in the analysis, such that all the lending rates for the Microfinance Bank was jointly analyzed against the CBR, with the MFBank rates being the dependent variable and CBR was the independent variable.

4.2. Findings on the unit root tests and co-integration tests

In order to use the VAR, the variables have to be I (0). It means that variables used have to be non-linearly integrated at the level. The Augmented Dickey Fuller Tests and Phillips Perron tests are used because of their simplicity and ease of use. The following hypothesis is used, with a 5% level of significance and a maximum lag of seven:

If the null is rejected at a given level of significance, it means that the series are not co-integrated.

From the unit root analysis, the data on MFBank Lending Rates and the CBR show that the data is stationary, so the Johansen Co-integration test is not relevant. The co-integrating relationship implies that the linear combination of CBR and MFBank Lending rates are stationary, whereas co-integration tests only apply to data that are non-stationary.

4.4. Number of lags to be used in the model

The optimal number of lags selected will be the one that is given a lower penalty. The penalty will be indicated by the asterisk * which shows the significance of the lag selection.

The following show the different lags used in the VAR model estimation, assuming a lag length of 7 (this means 7 years):

Table : Selection of the number of lags

Lag	LogL	LR	FPE	AIC	SC	HQ
0	216.2018	NA	1.23E-06	-7.933401	-7.859735	-7.904991
1	216.4017	0.377597	1.42E-06	-7.792657	-7.571659	-7.707427
2	223.5358	12.94693	1.26E-06	-7.908732	-7.540402	-7.766681
3	225.4807	3.385656	1.36E-06	-7.832619	-7.316956	-7.633748
4	245.2055	32.8746	7.64E-07	-8.415017	-7.752023	-8.159326
5	253.5584	13.30275	6.54E-07	-8.576236	-7.765909	-8.263724
6	306.68	80.66615	1.07E-07	-10.39555	-9.437896	-10.02622
7	324.1984	**25.30434***	**6.54e-08***	**-10.89624***	**-9.791245***	**-10.47008***

where:
* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

	Endogenous variable	
** Standard errors in ( ) & t-statistics in [ ]	MFBANK_LENDING_RATE	CBR
CBR(-3)	0.160661 (2.489620) **[0.06453]**	-0.451107 (0.317680) **[-1.41999]**
CBR(-4)	3.214279 (3.160470) **[1.01703]**	-3.182591 (0.403280) **[-7.89169]**
CBR(-5)	-0.763805 (6.507420) **[-0.11737]**	-2.093118 (0.830360) **[-2.52072]**
CBR(-6)	6.726462 (3.356980) **[2.00372]**	6.923038 (0.428360) **[16.1617]**
CBR(-7)	7.688869 (10.596200) **[0.72563]**	6.028259 (1.352100) **[4.45844]**
C	-1.338744 (0.905160) **[-1.47901]**	-0.184661 (0.115500) **[-1.59878]**

R-squared	0.397788	0.969214
Adj. R-squared	0.181609	0.958162
Sum sq. resids	0.061567	0.001002
S.E. equation	0.039732	0.00507
F-statistic	1.840088	87.70001
Log likelihood	106.3459	217.5229
Akaike AIC	-3.38318	-7.500848
Schwarz SC	-2.830684	-6.948353
Mean dependent	0.208759	0.091491
S.D. dependent	0.04392	0.024787

The VAR model looks like this:

$$Y_t = c_1Y_{t-1} + c_2Y_{t-2} + c_3Y_{t-3} + c_4Y_{t-4} + c_5Y_{t-5} + c_6Y_{t-6} + c_7Y_{t-7} + c_8X_{t-1} + c_9X_{t-2} + c_{10}X_{t-3} + c_{11}X_{t-4} + c_{12}X_{t-5} + c_{13}X_{t-6} + c_{14}X_{t-7} + c_{15}$$

Where: Y is the MFBank Lending rates

X is the CBR

And $X_t = c_{16}Y_{t-1} + c_{17}Y_{t-2} + c_{18}Y_{t-3} + c_{19}Y_{t-4} + c_{20}Y_{t-5} + c_{21}Y_{t-6} + c_{22}Y_{t-7} + c_{23}X_{t-1} + c_{24}X_{t-2} + c_{25}X_{t-3} + c_{26}X_{t-4} + c_{27}X_{t-5} + c_{28}X_{t-6} + c_{29}X_{t-7} + c_{30}$

contradicts what is expected. It is believed that the CBR has some directional influence on the MFBank Lending rates but the VAR model tells us otherwise.

This may be understandable from the perspective of the government as the price taker, where the government simply accepts what it gets from the market, possibly in a bid to increase the financial inclusion or pursue a more liberalized monetary policy stance.

4.5.1. Granger causality test

The Granger Causality/ Block Exogeneity Wald test is used to test whether the endogenous variables can be treated as an exogenous variable. In this analysis, we test whether CBR 'granger' causes Microfinance Lending rates and vice versa in the short run.

The following are the results at the 5% significance level:

Table : Granger Causality test results

Dependent variable: MFBANK_LENDING_RATE			
Excluded	Chi-sq	df*	Prob.
CBR	8.710934	7**	0.2741
All	8.710934	7**	0.2741
Dependent variable: CBR			
Excluded	Chi-sq	df	Prob.
MFBANK_LENDING_RATE	39.93912	7**	**0.0000**
All	39.93912	7**	**0.0000**

* degree of freedom

**number of lags determined by the lag selection criteria

When the dependent variable is MFBank Lending rate, the null hypothesis is that the CBR does not granger cause the MFBank lending rate. Alternatively, when the dependent variable is the CBR, the null hypothesis is that the MFBank Lending rates do not granger cause the CBR.

From the table above, the null hypothesis that MFBank Lending rates granger causes the CBR is rejected at the 5% level of significance , so lending rates will granger

4.7. Variance Decomposition test

The variance decomposition separates the variation in the endogenous variable into its various components in the VAR model. It thus attempts to explain the importance of each innovation or shock in influencing the variables in the VAR model. The variables are the CBR and the MFBank Lending rates.

The variance decomposition results are presented in the following table with the graphical representation in appendix 2.

Table : Variance Decomposition test results

Variance Decomposition of MFBANK_LENDING_RATE:			
Period	S.E.	MFBANK_LENDING_RATE	CBR
1	0.039732	100	0
2	0.040141	99.23872	0.761279
3	0.041025	95.02442	4.97558
4	0.042104	92.1325	7.8675
5	0.044611	83.01144	16.98856
6	0.046266	80.56415	19.43585
7	**0.046611**	80.1973	**19.8027**
8	0.053063	69.98113	30.01887
9	0.064433	47.51396	52.48604
10	0.070046	47.90354	52.09646
Variance Decomposition of CBR:			
Period	S.E.	MFBANK_LENDING_RATE	CBR
1	0.00507	1.213331	98.78667
2	0.010571	1.277062	98.72294
3	0.013185	14.90077	85.09923
4	0.015662	23.20778	76.79222
5	0.040142	3.54046	96.45954
6	0.082864	4.252657	95.74734
7	**0.094172**	**21.04526**	78.95474
8	0.189374	8.708876	91.29112
9	0.44312	2.934846	97.06515
10	0.665816	10.98881	89.01119

Considering the influence of each innovation on the CBR and the MFBank Lending rates in year 7 (this is based on the lag selection criteria), it is clear that 19.08% of the shocks in MFBank Lending rates is caused by the CBR whereas 21.045% of the shocks in the CBR is caused by the MFBank Lending rates.

This result means that the effect of each shock on the CBR and the MFBank Lending rates is negligible, pointing to the insignificant pass-through relationship between the

Chapter 5: CONCLUSIONS AND RECOMMENDATIONS

The following section summarises the findings of research and presents recommendations for further study.

5.1. Conclusions

If markets are efficient, it is expected that market rates and policy rates move in together. The interest rate pass-through should be equal or close to one. However, in this case, the pass-through is minimal due to the fact that it is not significant, as shown in the results from the VAR model, impulse response and variance decomposition tests.

This has implications in the effectiveness of monetary policy and in the adaptability of the informal and formal financial sector in the implementation of monetary policy changes.

The fact that monetary policy changes have not been fully reflected in the microfinance lending rates means that it is not effective in influencing aggregate demand and investment in the microfinance sector. Just like commercial banks, microfinance banks have continued to maintain high interest rates even when the CBR was reduced by the MPC. This scenario may also imply that the MPC are not coming up with effective policies that are geared towards achieving their main goal of maintaining price stability. This poses serious challenges in the implementation of monetary policy in the microfinance sector in Kenya.

5.2. Recommendations

This study seeks to provide further insights into the relationship between policy rates and interest rates in the microfinance sector, by investigating the interest rate pass-through in the microfinance sector. This study indicates an insignificant interest rate pass-through from policy rates to microfinance lending rates. It is advisable that policy makers take into account the forward-looking models that will incorporate the

References

Ahmad, A., Aziz, N., & Rummun, S. (2013). Interest Rate Pass-Through in the UK: Has the Transmission Mechanism Changed During the Financial Crisis? *Economic Issues , 18* (Part 1), 17-38.

Akerlof, G. A. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics , 84* (3), 488-500.

Alam, T., & Waheed, M. (2006). Sectoral Effects of Monetary Policy: Evidence from Pakistan. *The Pakistan Development Review , 45* (4), 1103-1115.

Amidu, M. (2006). The Link between Monetary Policy and Banks Lending Behaviour: The Ghanaian case. *Banks and Bank Systems , 1* (4), 38-48.

Arku, C., & Arku, F. S. (2009). More Money, New Household Cultural Dynamics: Women in Micro-Finance in Ghana. *Development in Practice , 19* (2), 200-213.

Aziakpono, M. J., & Wilson, M. K. (2010). *Interest Rate Pass-Through and Monetary Policy Regimes in South Africa.*

Banerjee, A., Bystrov, V., & Mizen, P. (2012). *How do anticipated changes to short-term market rates influence banks' retail interest rates? Evidence from the four major Euro area economies.* Centre for Finance and Credit Markets.

Betancourt, R., Vargas, H., & Rodríguez, N. (2008). Interest Rate Pass-Through in Colombia: a Micro-Banking Perspective. *Journal of Economics , 45* (131), 29-58.

Campion, A., Ekka, R. K., & Wenner, M. (2010, March). Interest Rates and Implications for Microfinance in Latin America and the Caribbean. *IDB Working Paper Series* , 51.

Central Bank of Kenya. (2013). *Bank Supervision-Microfinance Banks.* Retrieved from Central Bank of Kenya website: https://www.centralbank.go.ke/index.php/banksupervision#microfinance-banks

Central Bank of Kenya. (2014). *Facts about the Kenya Banks Reference Rate.* Retrieved from CBK prepares to publish KBRR data: https://www.centralbank.go.ke/index.php/news/401-cbk-prepares-to-publish-kbrr-data

Chavan, P., & Ramakumar, R. (2002). Micro-Credit and Rural Poverty: An Analysis

Programmes in Kenya as Supported through the Dutch Co-Financing Programme: With a focus on KWFT. Steering Committee for the Evaluation of the Netherlands' Co-financing Programme.

Kar, A. K., & Swain, R. B. (2014). Interest Rates and Financial Performance of Microfinance Institutions: Recent Global Evidence. *European Journal of Development Research , 26* (1), 87–106.

Kariuki, P. W. (1995). The impact of interest rate liberalisation on financial savings: The case of Kenya. *African Review of Money Finance and Banking* (No. 1/2), 5-23.

Makambi, S. A., Wawire, D. N., & Omolo, D. J. (2013). Nature and Dynamics of Adjustments of Commercial Banks' Retail Rates to Monetary Policy Changes in Kenya. *International Journal of Business and Social Science , 4* (5), 49-75.

Matemilola, B. T., Bany-Ariffin, A. N., & Muhtar, F. E. (2015). The impact of monetary policy on bank lending rate in South Africa. *Borsa Istanbul Review , 15* (1), 53-59.

Microfinance Information Exchange. (2008, December). 2008 MIX Global 100 Composite: Rankings of Microfinance Institutions. 16.

Misati, R. N., Nyamongo, E. M., & Kamau, A. W. (2011). Interest rate pass-through in Kenya. *International Journal of Development Issues , 10* (2), 170-182.

Mohsin, H. M. (2011, January). Impact of Monetary Policy on Lending and Deposit rate in Pakistan: Panel data analysis. *Munich Personal RePEc Archive* , 18.

Montagnoli, A., Napolitano, O., & Siliverstovs, B. (2015). Regional Interest Rate Pass-Through in Italy. *Regional Studies* , 17.

Nehls, H. (2006). The Interest Rate Pass-Through in German Banking Groups. *Journal of Economics and Statistics , 226* (4), 463-479.

Njiru, J. N. (2014). *Monetary Policy and Commercial Bank Lending Rates in Kenya.* Research paper, University of Nairobi, School of Economics, Nairobi.

Palley, T. I. (2001). Endogenous money: What it is and why it matters. *Metroeconomica* , 152-180.

Qayyum, A., Khan, S., Khawaja, I., & Khalid, A. M. (2005). Interest Rate Pass-through in Pakistan: Evidence from Transfer Function Approach. *The Pakistan Development Review , 44* (4), 975-1001.

Qayyum, A., Khan, S., Khawaja, I., & Khalid, A. M. (2005). Interest Rate Pass-

Appendix One - List of Microfinance Banks in Kenya

1. Rafiki Microfinance Bank Ltd.
2. Kenya Women Microfinance Bank Ltd.
3. SMEP Microfinance Bank Ltd.
4. Faulu Microfinance Bank Ltd.
5. Remu Microfinance Bank Ltd.
6. Uwezo Microfinance Bank Ltd.
7. Century Microfinance Bank Ltd.
8. Sumac Microfinance Bank Ltd.
9. U&I Microfinance Bank Ltd.

Incorporated after June 2014:

10. Daraja Microfinance Bank Ltd.
11. Caritas Microfinance Bank Ltd.
12. Choice Microfinance Bank Ltd.

Data obtained from (Central Bank of Kenya, 2013)