

Moderation Effect of Interest Rates on the Nexus between Firm Characteristics and Financial Stability of Microfinance Banks in Kenya

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Abstract

Microfinance institutions provide financial services in small scale to the unbanked who are unable to receive credit from the formal banking sector and as well as other standard financial systems. However, over the years, the financial stability of microfinance banks in Kenya has attracted key consideration from policy makers. The study sought to assess the moderating effect of interest rates on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya. The study is guided by Financial Intermediation Theory. The study targeted the 13 microfinance banks in Kenya, hence a census study. The study concluded that interest rates had significant moderating effect ($\beta=34.223$, $p=0.000$) on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya. The study also presented a workable empirical model on firm characteristics, interest rates and financial stability as it statistically established significance on the nexus between these variables. The study recommends that the setting of interest rates should be guided by the underlying economic conditions of the country

Keywords: Interest Rates, Firm Characteristics, Financial Stability and Microfinance Banks

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I. Introduction and Background of the Study

In addressing the ever-increasing demand for financial services in Africa, a number of microfinance institutions over time have been established (Bengi & Njenje, 2016). With some of them providing credit, while others both credit and deposit services and others only involved in the collection of deposit. In Sub-Saharan Africa, the sector encompasses a combination of geographically dispersed and diverse institutions which give financial services to the low-income earning customers and thus contribute to poverty alleviation. These roles, however, can only be performed by stable microfinance banks. Kenya's financial sector has over the years been under distress as a result of the Central Bank's tightening operational rules (Wangila, 2017). Banks' financial stability may be influenced by both internal processes and as well as external shocks thereby bringing about the presence of weak spots (Laeven, Ratnovski & Tong, 2014).

Interest rates influence the linkages in the difference emanating from interest earning assets and liabilities (Otambo, 2016; Huseynov, 2018). In 2016, the Central Bank of Kenya, on its drive to boost the banking industry, licensed another deposit-taking microfinance institution. The Central Bank of Kenya notably has the key role of solvency, liquidity, and financial system stabilization (Central Bank of Kenya, 2018). Interest rates refer to the charges imposed on borrowing money (Ngaira & Miroga, 2018). Interest rate is also regarded as the amount of interest charged in a given time period per unit of time, usually one year (annually). Varying rates of interest depict borrowers' enthusiasm and capability of meeting their obligations and the degree to which the promissory note or bond, debenture, mortgage or other indebtedness indication can be converted into money (Kiganda, 2014). Interest rates therefore reflect the quality of the money which a borrower's indebtedness is denominated.

Interest rates are regarded as the earnings which a lender anticipates by parting ways with liquidity for a specified period. It is based on two notions in that those with (owners of) surplus funds will have higher future returns part with some of it (Al-Qudah & Jaradat, 2013). Higher interest rates on the other hand discourage customers from borrowing. However, at equilibrium, interest rates are equal to demand, investment, supply and as well as savings in the market. Interest rates influence the banks' financial stability. The underlying influences of interest rates on the linkages between firm characteristics (internal decisions and operations) and banks' financial stability is, therefore, key to bank management.

Monetary policy activities aimed at controlling the amount of money in circulation influence the lending behavior of banks. Increased lending by banks implies higher credit risks which are associated with the potential effect of bankruptcy (Podder *et al.*, 2012). The association between interest rates and banks' financial stability is, therefore, apparent as during the period of recession, interest rates bring about decreased growth loans of banks while increasing the levels of non-performing loans simultaneously. As such, smaller banks may encounter challenges in ensuring financial stability in periods of decreasing interest rates in the market (Ngaira & Miroga, 2018). Interest rates are inherent in the banks' operating environment, therefore, impacting on the efficient and effective handling of portfolios which include assets and liabilities (Akims, Omagwa & Mungai, 2020). Financial stability of Microfinance banks in Kenya was assessed based on insolvency risk while the Central Bank rate was used as a proxy for interest rates.

Ia Statement of the Problem

The Microfinance Sector of Kenya had growth in total assets at 21.6% in 2012 translating to KShs. 298.4bn (Central Bank of Kenya, 2018). Through Microfinance (Deposit Taking Microfinance Banks) 2008 Regulations, the Microfinance Act 2006, the CBK was given the responsibility of developing an efficient, vibrant, sound and stable microfinance sector through the supervision and regulation of microfinance banks (Central Bank of Kenya, 2016). The legislation on microfinance was enforced in 2008, for providing a platform that will broaden and deepen access to financial services across the country (Kenya), with more focus on the population with low income and Small and Medium Enterprises (SMEs) spanning from urban to rural areas (Central Bank of Kenya, 2018).

In Kenya, the microfinance sector is characterized by financial instability (King'ori, Kioko & Shikumo, 2017). Insolvency risk assesses stability by showing the distance of banks from insolvency through the combination of accounting measures which include volatility, leverage, and profitability. Financial instability brings about heavy costs to banks which in turn can have a snowball effect on an economy as the volatility in the financial systems increases economic shocks which may lead to the bankruptcy or collapse of banks (Vlahović, 2014). The objective of the study is to assess the moderating effect of interest rates on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya.

Ib Objective of the Study

The objective of the study is to assess the moderating effect of interest rates on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya.

Ic Research Hypothesis

H₀: Interest rates have no significant moderating effect on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya.

II. Literature Review

IIa Theoretical Review

Financial Intermediation Theory was introduced by Diamond (1984). The theory rests on the assertion that intermediary financial function in decreasing costs associated with transactions as well as asymmetric information. Financial intermediation entails depositing funds by surplus units with financial institutions that, in turn, transform such funds into loans to the deficit units. In line with Scholtens & van Wensveen (2003), financial intermediaries carry out essential roles that create specialized financial commodities. These come to fruition whenever intermediaries viable to sell them for prices above costs of production and operations, both direct and opportunity costs. Financial intermediaries come into existence because of the underlying imperfections existing in the market (Andries, 2009). Therefore, financial intermediaries would not exist in a perfect market, which is a market without information or transaction. Financial Intermediation Theory remains key to the proposed study as it provides more insight into banks' financial stability. Due to the desire to generate profit amidst a limited capital base, financial intermediaries are often engaged in excessive lending activities. Lending above their capacity, thereby triggering liquidity and insolvency challenges, which ultimately lead to financial distress. For banks to carry out effective roles of financial intermediation, such banks must be financially stable. Banks during intermediation activities develop various financial products to keep their operations towards optimal intermediation. Therefore, the financial intermediation roles played by banks are interrelated with the banks' financial stability.

IIb Empirical Review

Ekweny (2014) assessed interest rates volatility effect on nonperforming loans portfolio of commercial banks listed in Kenya. The study sought to assess the effect of 91-Day Treasury Bill Rate and volatility in interest rates on NPLs. The longitudinal research design was adopted in the research, and 11 listed banks in Kenya formed the study population. Secondary data for the period 2002 to 2013 was used. Based on regression analyses, it was documented that interest rate volatility and 91-Day Treasury Bill Rate had positive effects on

NPLs of listed commercial banks in Kenya. The recommendation was that the country should appropriately handle the macroeconomic environment by putting in place proper macroeconomic policies to achieve banking sector's stability. Commercial banks were notably the study focus, and these banks are larger in size and operations compared to MFBs. Additionally, insolvency risk (Z score) was used to measure financial stability.

Githinji (2016) explored the determinants of the financial stability of commercial banks in Kenya. The research population comprised of the 43 commercial banks in Kenya, where a census approach was used. Primary data sources were used based on questionnaires administered to two (2) top bank managers of each firm. A sample size of 82 respondents was used. The study used correlation, descriptive and multiple regression analyses. It was found that interest rates had a negative and insignificant effect on the financial stability of commercial banks in Kenya, as measured by NPL. The study was of the recommendation that the government (CBK) should develop sound policies towards proper regulation of interest rates and interest rates spread as this will ensure banks' financial stability. The study notably employed NPL in assessing financial stability, whereas this study focused on insolvency risk which is more robust measure of financial stability.

Yimer (2016) investigated the liquidity determinants of private Ethiopian commercial banks. The study was based on secondary data for the time scope of 2000 to 2015, which was collected from six private Ethiopian commercial banks, which formed the study sample. The study was based on balanced panel data, where the fixed effect model was used for estimation. The ratios: liquid assets/ total assets, liquid assets/deposit and loan/deposit, were used in measuring liquidity. The study outcome based on the analyses indicates that short term interest rates and interest rates on loans have an insignificant effect on the liquidity of private Ethiopian commercial banks. Private Ethiopian commercial banks were the study focus, and only liquidity was considered. In addressing the contextual and conceptual gaps, the current study focused on MFBs where insolvency risk was considered.

Ngaira and Miroga (2018) assessed the determinants of the financial stability of commercial banks listed in Kenya. The descriptive survey research design was adopted in the study. The study population comprised three hundred and fifty-six (356) employees of the commercial banks where the 11 NSE listed commercial banks were covered. Data was based on primary sources. Correlation, descriptive and multiple regression analyses were applied in the study. The regression output indicated that interest rates had a significant positive influence on the NSE listed commercial banks' financial stability. The study recommendation was that cross-checking liquidity flows and liquidity ratios should be done by banks as this is useful in designing and ensuring robust prudential approach towards liquidity as it translates to banks' financial stability. The study, however, applied primary data sources, which are characterized by biasness, unlike secondary, which is more objective as the case in this study. Financial stability was assessed using a return on equity, return on assets and return on investment (ROI). This study applied insolvency risk in measuring financial stability.

III. Research Methodology

The study adopted explanatory research design, which is applied when examining a less researched problem and providing a better-researched model. Explanatory research design is focused on carrying out an in-depth inquiry and explaining the aspects of a phenomenon in a detailed manner (Blumberg, Cooper & Schindler, 2014). The target population comprised of the thirteen Microfinance Banks in Kenya. Therefore, the census approach was adopted in this study since the licensed microfinance banks in Kenya are only thirteen (13) in number (Central Bank of Kenya, 2018). The empirical model of the study was based on two main models, that is the step one and step two of the moderation effect model shown in the subsections below. The Whisman and McChelland (2005) technique was applied in testing for moderation effect.

IIIa Step One

$$FS_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 CA_{it} + \beta_3 ME_{it} + \beta_4 EA_{it} + \beta_5 IR_{it} + \varepsilon \dots \dots \dots 1$$

IIIb Step Two

$$FS_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 CA_{it} + \beta_3 ME_{it} + \beta_4 EA_{it} + \beta_5 IR_{it} + \beta_6 IR * FC_{it} + \varepsilon \dots \dots \dots 2$$

Where:

- FS_{it}** = Financial Stability of the bank at a given time
- BS_{it}** = Bank Size of the bank at a given time
- EA_{it}** = Earnings Ability of the bank at a given time
- CA_{it}** = Capital Adequacy of the bank at a given time
- ME_{it}** = Management Efficiency of the bank at a given time
- IR** = Interest rates
- FC** = Composite of firm characteristics
- i** = Bank
- t** = Time period

* = Interaction term
 β_1 to β_6 = Coefficients
 ϵ = Error term

Table 3.1 Decision Criteria for Moderation Tests

Table 3.1 contains the various decision criteria for the moderation effect tests.

Scenario	Model One	Model Two	Conclusion
One (1)	β_5 is found to be significant	β_6 is not significant	Interest rates are not moderators
Two (2)	β_5 is found not to be significant	β_6 is significant	Interest rates are moderators

Whisman and MacClelland (2005)

IV. Research Findings and Discussion

The moderation effect of interest rates on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya was examined using the moderation effect (Step one and step two) models.

IVa Moderation Effect, Step One

In line with the approach by Whisman and McChelland (2005), step one of the moderation effect test entails the inclusion of the moderating variable as an explanatory variable in order to determine its significance which in turn determined whether to proceed to step two or not. The step one of the moderation effect test results are contained in Table 4.1 below.

Table 4.1 Moderation Effect, Step One Results

Financial Stability	Coef.	Std. Err.	Z	P> z	[95% Conf.	Interval]
Bank Size	167.6412	97.84083	1.71	0.087	-24.12327	389.4058
Capital Adequacy	143.7936	54.66816	2.63	0.009	36.64602	250.9413
Management Efficiency	9.713528	1.574645	6.17	0.000	6.627281	12.79978
Earnings Ability	138.8141	133.9124	1.04	0.300	-123.6493	401.2775
Interest rates	2.921706	13.05501	0.22	0.823	-22.66564	28.50905
_cons	-134.1676	127.7462	-1.05	0.294	-384.5456	116.2104
R ²	=0.4140					
Wald chi2 (5)	=46.63					
Prob> chi2	=0.0000					

Source: Study Data (2020)

In view of the findings obtained in Table 4.1 above, the following regression formula was developed:

$$FS_{it} = \beta_0 + 167.6412BS_{it} + 143.7936CA_{it} + 9.7135ME_{it} + 138.8141EA_{it} + 2.9217IR_t + \epsilon$$

Where:

FS_{it} = Financial Stability of the bank at a given time
 BS_{it} = Bank Size of the bank at a given time
 EA_{it} = Earnings Ability of the bank at a given time
 CA_{it} = Capital Adequacy of the bank at a given time
 ME_{it} = Management Efficiency of the bank at a given time
 IR = Interest rate
 i = Bank
 t = Time period
 $*$ = Interaction term
 ϵ = Error term

The findings in Table 4.1 above indicate an R squared of 0.4140. This therefore holds the implication that the various included in the model, that is, firm characteristics (bank size, capital adequacy, management efficiency and earnings ability) and interest rates collectively had high explanatory powers as they predicted 41.40% of the variations in financial stability of Microfinance Banks in Kenya. Additionally, an F statistics value of 46.63 and p-value of 0.0000 were obtained, thereby revealing significance. Firm characteristics and interest rates collectively had significant effects on financial stability of Microfinance Banks in Kenya.

With the inclusion of interest rates as an explanatory variable, bank size, capital adequacy, management efficiency and earnings ability had positive effects on financial stability of Microfinance Banks in

Kenya as indicated by coefficients of 167.6412, 143.7936, 9.7135 and 138.8141 respectively. Notably, interest rates a coefficient of 2.921706 and corresponding p-value of 0.823 which indicates non significance. This therefore implies that based on the moderation effect test, step one, interest rate is not an explanatory variable which is a requirement for proceeding to the second step of the moderation test.

IVb Moderation Effect, Step Two

Upon establishing the interest rate is not an explanatory variable, the second step of the moderation test was carried out. The second step of the moderation test entails the interaction of the moderator (interest rates) with the independent variables (firm characteristics) for purposes of determining the significance of the moderation effect of interest rates. The moderation effect, step two results are contained in Table 4.2.

Table 4.2 Moderation Effect, Step Two Results

Financial Stability	Coef.	Std. Err.	z	P> z 	[95% Conf. Interval]	
Bank Size	56.99467	83.67841	0.68	0.496	-107.012 221.0013	
Capital Adequacy	20.65402	50.55339	0.41	0.683	-78.42881 119.7368	
Management Efficiency	-78.19626	15.92405	-4.91	0.000	-109.4068 -46.98571	
Earnings Ability	112.1406	111.3219	1.01	0.314	-106.0462 330.3275	
Interest rates	-14.39643	11.28427	-1.28	0.202	-36.5132 7.720329	
Interest rates*Firm Characteristics	34.22306	6.178249	5.54	0.000	22.11391 46.3322	
_cons	80.99731	112.9836	0.72	0.473	-140.4465 302.4411	
R ²	=0.6019					
Wald chi2 (6)	=98.29					
Prob> chi2	=0.0000					

Source: Study Data (2020)

From the results documented in Table 4.2 above, the following regression function was formulated:

$$FS_{it} = \beta_0 + 56.9947BS_{it} + 20.6540CA_{it} + 78.1963ME_{it} + 112.1406EA_{it} - 14.3964IR_t + 34.2231IR_t * FC_{it} + \epsilon$$

Where:

- FS_{it} = Financial Stability of the bank at a given time
- BS_{it} = Bank Size of the bank at a given time
- EA_{it} = Earnings Ability of the bank at a given time
- CA_{it} = Capital Adequacy of the bank at a given time
- ME_{it} = Management Efficiency of the bank at a given time
- IR = Interest rate
- FC = Composite of firm characteristics
- i = Bank
- t = Time period
- * = Interaction term
- ε = Error term

The results in Table 4.2 above indicates an R squared of 0.6019 which holds the implication that characteristics (bank size, capital adequacy, management efficiency and earnings ability), interest rates and the interaction between interest rates and firm characteristics collectively had high explanatory powers. These factors collectively explained 60.19% of the fluctuations in the financial stability of Microfinance Banks in Kenya. An F statistics value of 98.29 and a corresponding p-value of 0.0000 were obtained which indicate significance. Firm characteristics, interest rates and interest rates*financial collectively had significant effects on financial stability of Microfinance Banks in Kenya.

With the inclusion of the moderator and the interaction between interest rates and firm characteristics, bank size, capital adequacy, management efficiency earnings ability had positive effect on financial stability of Microfinance Banks in Kenya. While holding other factors constant, the interaction between interest rates and firm characteristics had positive effect on financial stability of Microfinance Banks in Kenya as indicated by a coefficient of 34.2231. This therefore implies that a joint increase in interest rates and firm characteristics increases financial stability of Microfinance Banks in Kenya by 34.2231. Notably, the effect on interest rates*firm characteristics on financial stability of Microfinance Banks in Kenya had a p-value of 0.000 which indicates significance.

IVc Hypothesis Testing

H₀: Interest rates have no significant moderating effect on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya.

The study sought to examine the moderating effect of interest rates on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya. In view of this specific objective, a null hypothesis which stated that interest rates have no significant moderating effect on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya was formulated and tested at 0.05 significance level. A p-value of 0.000 was obtained, thereby implying significance at 0.05 significance level. The findings therefore indicate that interest rates have significant moderating effect on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya. As such, the study failed to reject the null hypothesis which stated that interest rates have no significant moderating effect on the relationship between firm characteristics and financial stability of Microfinance Banks in Kenya was rejected.

Interest rates as measured by Central Bank Rate are key monetary policy phenomena which influences the lending operations of banks. Bank specific interest rates are influenced by the Central Bank Rate. Increases in the rate by Central Bank leads to corresponding increases in the specific rates charged by Microfinance Banks on loans and in turn translating into higher financial stability. The study findings are in agreement with those of previous studies. Ekweny (2014) assessed interest rates volatility effect on nonperforming loans portfolio of commercial banks listed in Kenya. Based on regression analyses, it was documented that interest rate volatility and 91-Day Treasury Bill Rate had positive effects on NPLs of listed commercial banks in Kenya. Similarly, Ngaira and Miroga (2018) assessed the determinants of the financial stability of commercial banks listed in Kenya. The regression output indicated that interest rates had a significant positive influence on the NSE listed commercial banks' financial stability.

V. Conclusion and Policy Recommendations

The study findings in view of the null hypothesis concluded the nexus between firm characteristics and financial stability of Microfinance Banks in Kenya is significantly moderated by interest rates. Profitability which is a key component of financial stability increases with rising interest rates. The study recommends that setting of interest rates should be guided by the underlying economic conditions of the country. Given that this study was based on unbalanced data, additional study can be done using balanced data based on different time scope.

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