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RESEARCH ARTICLE

NEXUS BETWEEN LIQUIDITY MANAGEMENT AND LOAN REPAYMENT AMONG MICROFINANCE BANKS IN EMERGING MARKETS: A PANEL ANALYSIS

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Abstract

Loan repayment remains the chief source of internally-generated liquidity reserves in the microfinance banks operating in the emerging markets in developing countries. Globally, reports indicate that of the loans disbursed in the United States of America, 45% of borrowers default on repayment, 60% of whom eventually end up as non-performing. A similar trend is reported in Nigeria with statistics indicating growth in overall default rate from USD1.612B in 2017 to USD 2.694B in 2021. Uganda recorded about USD.1.215B worth of non-performing loans in its MFI sector in 2018, from USD 324M in 2017. Microfinance banks (MFBs), as one of the institutions at the center of financial inclusion in Africa target to serve low-end borrowers who are prone to fall in default of honouring their arising loan repayment obligations. In Kenya, MFBs have recorded a steady rise in non-performing loans from Kshs.328M in 2018 to Kshs.1.9B in 2021. The loan repayment trend among MFBs reflects a trajectory that calls for urgent invention measures to secure steady operations to the extent of meeting their arising financial obligations. Previous studies on loan repayment have focused on conventional banking institutions, whose operational lending dynamics are significantly distinct from those of MFB. Existing literature is skewed in favour of investigating parameters associated to profitability. The main objective of this study was to establish the relationship between liquidity management and loan repayment among MFBs in Kenya. The anticipated incometheory underpinned the study objective. Secondary balanced panel data sourced from the annual reports of 12 regulated MFBs in Kenya were used. The study covered an eight-year period from 2015 to 2022, yielding 96 data points. Moderated multiple regression was applied to realize the study objective. Regression results showed that a unit change in liquidity management results in 2.01% significant change in loan repayment (β=0.020110, p=0.0085) with R^2=82.7%. From the results, the nexus between liquidity management and loan repayment is positive and significant but weak. It is recommended that reliance on strict management of internally generated funds ought to be complemented with moderate external funding.

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Introduction:-

Microfinance is a concept that has profoundly transformed the financial access debate as it has significantly contributed to the growth of developing countries from inception (Adusei and Appiah, 2011). Microfinance refers to financial services availed to the poor and low-end financial consumers (Postelnicu and Hermes, 2018; Abebe 2019) in order to enhance liquidity access to all. Microfinance remains a key growth parameter among developing countries' economic blueprints on poverty reduction (Hermes, Lensink and Meesters, 2011; Postelnicu and Hermes, 2018) and financial inclusion. The microfinance model is an upgraded and version of informal finance structure of rotating savings and credit associations (ROSCAS) which many developing countries have introduced controls through legislation and others even placed them under supervision of their mainstream financial regulators. The essence is to streamline pooling of monetary resources which are subsequently loaned out to the targeted majority who operate outside the confines of the conventional banking financing system.

Loan portfolio refers to the different categories of financial assets advanced to borrowers by a financial entity, analyzed together (Maina et al, 2016). It is regarded the largest and most dominant source of revenue from which MFBs obtain operational cash reserves to fund their operations (Ahmed and Malik, 2015). A loan whose scheduled principal and interest payments has not been realized by the lender for a period of up to 90 days is referred to as a non-performing loan (NPL) (Beck, Jakubik and Piloiu 2015; Boussada, Hakimi and Karmani, 2020). On the other hand, loans whose instalments continue to be anticipated with payments not delayed past the 90 days' mark are referred to as performing loans (Sangwan et al, 2020).

Liquidity management involves an institution's ability to adequately provide cash and cash equivalents sufficient enough to fund increasing assets and offset arising financial obligations as and whenever they fall due (Chikoko, 2013). Past research on liquidity management and loan repayment performance have not arrived at mutual consensus. A section of researchers proclaim that even though liquidity is a prime component for operations of financial institutions, its adequacy cannot be achieved uniformly across all lenders given the varying degrees of need (Bassey et al. 2016; Kitere et al. 2019; Sandino, 2019; Sathyamoorthi et al 2020). Those in favour of this limb of argument opine that the phrase 'adequate liquid assets' is abstract and open to abuse by those charged with financial management affairs of lending entities. They advocate for diversified investment and argue that holding liquid assets regarded as sufficient leads to wastage and imprudent appropriation of idle cash. On the other hand, there is a set of researchers that push for availability of liquid assets in proportions enough to respond to arising monetary obligations. They are proponents of the phrase 'cash is king', the euphemism adopted to put up a case for maintaining cash enough to inspire confidence among borrowers. This school of thought frowns at the adoption of aggressive investment of available resources as it drains liquid assets to the extent that negatively exposes the image of financial entities. Outside the context of the illustrated divided opinion, there is a missing link in literature connecting the relationship between liquidity management among institutions whose cashflow rely on collection of disbursed loans.

Problem Statement

There is evidence that the loans issued by microfinance banks have not been performing to the optimum level, enough to sustain their operational requirements. Loans repayment is regarded optimal when recovered funds favourably compare with disbursed loans such that the net outcome provides adequate funds to sustainably cater for arising financial obligations as and whenever needed. MFBs have in the recent past recorded a fluctuating trend in the performance of their loan portfolio, posting a growing NPL profile of Kshs.328M in 2018 and Kshs.1.9B in 2021. Existing empirical investigations revolve around liquidity risk management and either financial performance or profitability. The focus of liquidity risk is limited to the adverse outcomes of potential illiquidity, while financial performance and even profitability, is preceded by loan repayment trends. Similarly, profitability is the net outcome of trading events, that is, the excess of interest income over operating expenses. Studies that have attempted to address these variables have confined their attention to conventional commercial banks. Their operating fundamentals are extensively distinct from those in MFBs. There is missing empirical knowledge specifically addressing the relationship between liquidity management and loan repayment among microfinance banks.

Objective:-

The main objective of this study was to analyse the relationship between liquidity management and loan repayment among microfinance banks in Kenya.

This was achieved through testing the following null hypothesis;

H_{01}: There is no significant relationship between liquidity management and loan repayment among microfinance banks in Kenya

Theoretical Literature

The Anticipated Income Theory, propounded by H.V. Prochanow in 1944anchored the study objective. The theory states that irrespective of the borrower's business, a financial lender organizes the liquidation of the term loan from the anticipated income of the borrower. It provides a platform for financial entities to regard long term loans as avenues for raising the much-needed liquidity for purposes of onward lending.

Empirical Literature

Beck, Jakubik and Piloiu (2015) initiated a study focused on highlighting empirical determinants of non-performing loan (NPL) ratios with a view to address bank asset quality, which had sharply deteriorated. The dependent variable was measured by the ratio of NPLs to total (gross) loans while loan loss provisions and loss given default were among other variables operationalizing the dependent variable. The study used panel data drawn from different countries. Fixed effect estimations were used in analysis to address time-constant unobserved heterogeneity that was present in the different countries involved in the study. Lending rates were used as a liquidity management mechanism to detect their influence on default. It was reported that lending rates were positively correlated with non-performing loans (R^2 = 0.434, p = 0.018). The results indicated that decline in the liquidity management mechanisms significantly contributed to increase in NPLs.

Sangwan, Nayak and Samanta (2020) soughtto establish the repayment behaviour among MFB borrowers in India. The study was undertaken at a period that had reported growing loan non-repayment trends that threatened the sustainability of the MFB sector in India. The study approach was focused on assessing household trends, comparing liquidity control initiatives and non-performing loans. The study based on primary data and concluded that MFBs are sustained by a continuous flow of financial resources generated by the pool of saved funds. Weak liquidity control was recorded as a major contributor to non-performing loans.

In yet another study conducted in Nigeria, Muhammad, Ibrahim and Sulaiman (2020) undertook a study on loan characteristics, loan repayment and performance of small and medium enterprises in Kano Metropolitan. The study was motivated by a sustained loss-making trajectory among microfinance institutions, which was perceived to be on account of non-repayment of loans by borrowers. The study used simple random sampling to collect primary data using structured questionnaires from respondents. Data analysis was achieved using correlation andmultiple regression. Loan characteristics were measured by loan size and loan tenure. The findings disclosed that loan size was positively correlated with loan repayment (adjusted R^2 = 0.676, p = 0.000). Similarly, loan tenure and loan repayment were positively and significantly correlated (adjusted R^2 = 0.561, p = 0.000). Based on the findings of the study, the researchers recommended that whenever financial institutions consider disbursing loans to borrowers from among small and medium enterprises, they should prioritize their level of income so as to enhance prospects of loan repayment.

Chinweoda, Onuora, Ikechukwu, Ikechukwu and Ngozika (2020) conducted a study on the effect of liquidity management on the performance of deposit money banks in Nigeria. The study period covered 2011 to 2017, involving 18 banks listed at the Nigerian Stock Exchange. Judgmental sampling technique was used to settle for the 18 banks from a possible 21. The study used ex post facto design and proxied liquidity management by capital adequacy ratio, liquidity ratio and asset quality ratio while performance was measured by return on assets and equity. The study reported a positive and significant relationship between liquidity ratio and performance. Correlation results between capital adequacy, asset quality and liquidity ratios respectively against ROA revealed a weak positive but significant relationship between the study variables (β = 0.184, p = 0.048; β = 0.014, p = 0.015; β = 0.590, p = 0.041). On the basis of the findings, the study recommended implementation of strong liquidity management measures so as to minimize on potential default risk.

Dzapasi (2020) carried out a study to assess the impact of liquidity management on bank financial performance in Zimbabwe. The setting of the study was to analyze the dynamics of liquidity management in a subdued economic environment. The study was grounded on the positivism research philosophy and adopted a mixed research methodology, by combining the use of qualitative and quantitative data. Purposive sampling technique was used to collect data from five dominant financial institutions in the banking sector. Questionnaires containing both open and closed ended questions were employed to collect primary data while secondary data was obtained from the published financial statements of the target financial institutions. The adopted measure of liquidity management was the current ratio while return on equity proxied financial performance. Linear regression was used to evaluate the relationship between the study variables. Panel data, yielding 25 observations, comprising of a cross section of five banks focused for a period of five years between 2014 to 2018, was also used to evaluate study variables. Results indicated that current ratio explains 78% of changes in return of equity ($R^2 = 0.781019$, $p = 0.0000$).

Sathyamoorthi, Mapharing and Dzimiri (2020) investigated liquidity management and financial performance as evidencedby commercial banks in Botswana. The study was designed to respond to the dilemma as to whether prudential measures emphasizing liquidity management automatically yielded a stream of profitability to banks. This was a census study which targeted all the nine commercial banks from which secondary data was collected from published financial statements from the country's Central Bank for a period of nine years from which a panel data set was derived. They surrogated liquidity management using six different financial ratios of total loans to total assets ratio, liquid assets to deposits ratio, cash and cash equivalents to total assets ratio, loans to deposits ratio, cash to deposits ratio and liquid assets to total assets ratio. The results showed that the relationship of loan to deposits ratio was negative, though significant with both return on assets and return on equity ($r = -0.530$, $p = 0.000$; $r = -0.641$, $p = 0.000$) while loan to total assets ratio similarly reports a significant inverse relationship with the dependent variable ($r = -0.451$, $p = 0.000$; $r = -0.573$, $p = 0.000$). This means when the bank liquidity management increases by a single unit, its profitability drops significantly between 53% to 64%. The significant proportion of banks' profitability emanate largely from interest on loans. The reported findings would have provided a more comprehensive outlook had loans repayment formed part of the study objectives. This perspective though, was outside the scope of this study.

Shakatreh (2021) analyzed the effect of liquidity management ratios on the profitability of listed industrial companies in Amman Stock Exchange. It was reported that of the three ratios used to measure liquidity management (trading ratio, quick liquidity ratio and cash ratio), there was a negative correlation ($R=-0.568$, $p=0.0000$) between trading ratios and return on assets (ROA), which was used to measure profitability. Cash ratio and quick liquidity ratios returned a positive correlation with profitability, at $R = 0.774$; $p = 0.0000$ and $R = 0.779$; $p=0.0000$ respectively. The study focus was on establishing how the dependent variable, profitability, is influenced by liquidity management. Profitability is a consideration of the performance of an entity at the end of a defined trading period and whose behaviour is determined by several other variables. This thesis held the theoretical view that non-repayment of loans is negatively correlated with profitability and should be given adequate premium attention.

Research Design and Study area

The research was undertaken by way of correlational research design. It adopted census as all the regulated microfinance banks (CBK, 2023) were included in the study.

The study was based at the Central Bank of Kenya whose headquarters are located at the country's capital city of Nairobi.

Data Source

The research used secondary data that was obtained from annual financial reports of the regulated MFBs from 2015 to 2022, yielding 96 data points. Data was collected from audited published annual financial statements available at the Central Bank of Kenya (CBK) handbooks available from its library and website. Secondary data from annual financial reports was used because, being statutory documents, they facilitate easy comparisons given they are produced on an annual basis by all regulated MFBs.

Data Collection Procedure

Secondary data was collected by recording quantitative information from audited financial statements in data sheets for purposes of computing ratios to be used during the analysis. Information obtained from the CBK is regarded as

not only authentic but authoritative since it undergoes comprehensive verification and scrutiny so as to meet specified established standards.

Data Analysis and Presentation

Panel data estimation methods were employed in this study because the observations have two dimensions; cross-section and time-series. Hsiao (2005) points out that panel data estimation methodology contains more degrees of freedom and less multicollinearity leading to estimates that are more efficient. Moreover, it allows for greater flexibility in modelling differences in behaviour across entities that enables the control for unobserved heterogeneity (Wooldridge, 2002). The analysis was carried out using EViews-12 Statistical Package. Descriptive statistics were calculated to determine the characteristics of the data, such as means, standard deviations and frequencies (Field, 2018).

Variables Specification

All the variables of the study were measured using financial ratios. The dependent variable, loan repayment was measured by net non-performing loans to total assets which signifies the rate of loan repayment (Boussaada, Hakimi and Karmani., 2020). The lower the ratio, the higher the loan repayment and vice versa. The independent variable, liquidity management was measured using net loans to customer deposits (Shrestha, 2018; Osei, 2019; Sandino, 2019; Mishra and Pradhan, 2019; Sathyamoorthi et al. 2020). Alownet loans to customer deposits ratio indicates that the MFBmaintainssufficient funds to meet arising obligations and other contingencies. Credit risk management and operating leverage were adopted as independent and moderating variables respectively. Management efficiency which was the control variable in this study measures the extent to which firms control recurrent costs from exceeding prevailing set limits. It was measured in this study as a ratio of staff costs plus directors' emoluments divided by total costs.

Model Specification

Data used comprised time series and cross-sectional, which were then pooled into a panel data set and estimated using panel data regression. The data set was tested for stationarity at levels. The reason to stationarize data was to obtain a meaningful sample mean and variance. Non-stationary data gives rise to mean underestimation (Jaroslava & Martin, 2005).

The panel regression model that was used to test the relationship between the independent and dependent variables;

$$\mathbf{LRP_{it} = \beta_0 + \beta_1 MLDM_{it} + \beta_2 MCRK_{it} + \beta_3 ME_{it} + \mu_{it}}$$

Where;

β_0: The intercept,

LRP = Loan repayment; measured by the ratio of net non-performing loans to total assets

MLDM = Liquidity Management; measured by the ratio of net loans to customer deposits

MCRK = Credit Risk Management; measured by the ratio of total cash and cash equivalents divided by customer deposits

ME = Management efficiency; measured by the ratio of staff expenses and directors' emoluments to total assets, being the control variable.

β_1, β_2 and β_3 = Regression coefficients

μ_{it} = The error term

i = cross-section, representing MFBs in the study

t = time-series, representing annual data per MFB in the study

Diagnostic Tests

Diagnostic statistics are methods used to establish existing challenges inherent in the data set to be used or the model adopted for the study (Eyduran, Ozdemir and Alarslan (2005). This step was critical ahead of subjecting data to regression so as eliminate the likelihood of violation of the established classical linear regression models' (CLRM) assumptions. Besides, the procedure provides the opportunity for corrective intervention measures to be undertaken so as to arrive at valid results capable of generalization. It was also to assert that the tests were an appropriate model chosen for analysis in the event that CLRM assumption were not compromised. Estimating the regression models when the CLRM assumptions are violated result in inefficient, inconsistent parameters estimates. The common tests to ascertain conformity to the requirements of linear regression, according to Field (2000), include; Unit Root test of stationarity, normality, model specification, heteroskedasticity and multicollinearity.

Results and Discussion:-

The output of the diagnostic tests were as follows;

Unit Root Test

Time series data is said to be stationary if its mean and variance are established as being constant over time and that the value of covariance is dependent not on the actual time of its computation but the lag or period of variation (Gujarati, 1995). Testing for stationarity of the individual time series is important because if a time series is non-stationary, we could then study its behaviour only for the time period under consideration and as a consequence, it is not possible to generalize it to other time periods. Moreover, regression of a nonstationary time series on another nonstationary time series may produce spurious regression.

The null hypothesis under unit root tests indicates that the time series used in the study has a unit root, meaning, it is non stationary. The alternative hypothesis is that the time series is stationary, implying that it has no unit root. The significance level was at 5%, meaning any variable with a probability of below 0.05 would result in rejecting the null hypothesis. In this study, unit root tests were conducted on the variables using Levin, Lin, Chu (LLC) common root test. The results were as indicated in Table 1.

Table 1:- Levin, Lin, Chu Common Root Test Results on the Study Variables.

Study Variable	Statistic	Prob.
LRP	1.80567	0.0355*
MLDM	7.02793	0.0000*
MCRK	3.46507	0.0003*
ME	11.0877	0.0000*

* Represent significance at the 0.05 level

Legend: LRP= Loan repayment; MLDM = Liquidity Management; MCRK = Credit Risk Management; ME = Management Efficiency

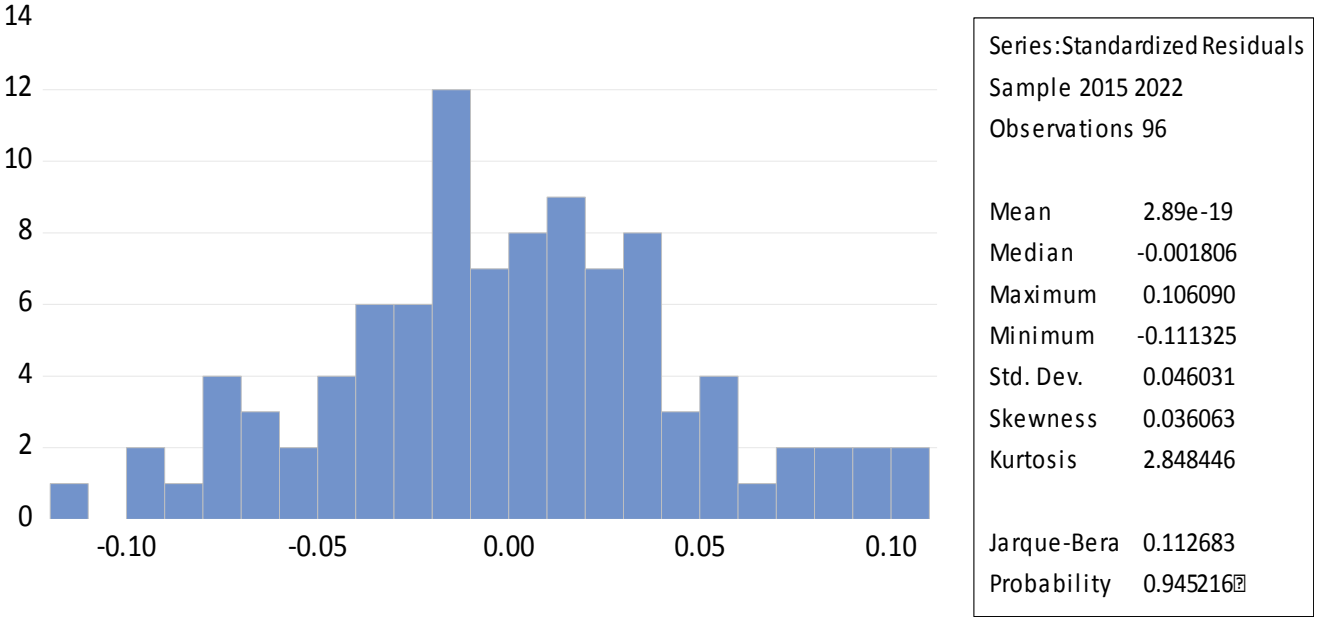
Source: Field Data, 2023

Testing for Normality

According to Gujarati (1995), the assumption of normality of residuals makes it possible to generalize findings. In this thesis, a histogram of regression-standardized residuals alongside their summary statistics was used to diagnose normality. In this study, the measures of kurtosis, skewness and Jarque-Bera tests of normality were adopted to test for normality. Kurtosis is a measure of relative peakedness or flatness of a given sample distribution while skewness measures the degree of asymmetry of such distribution. Tabachnick and Fidell (2007) provides that data whose kurtosis value for the residuals is 3.0 or close to 3.0 and skewness value is 0 or close to 0, is regarded to be normally distributed. For Jarque-Bera tests, Gujarati (1995) posits the rule of thumb as being that the residuals are normally distributed. Normal distributions under Jarque-Bera tests return a zero value and in case the distribution is not normal, the statistic assumes increasingly large values. The preference for Jarque-Bera test was informed by the recommendation of Gujarati (1995) who asserts that it is more comprehensive in testing normality than to the graphical alternative.

The results of the normality test are shown in Figures 1.

Figure 1:- Results on the Test of Normality of Study Model.



In Figure 1, the skewness value is 0.036063 which is close to zero while kurtosis is 2.848446, which is close to 3. Jarque-Bera statistic is 0.112683 which is close to 0. The overall analysis indicates that the parameters as suggested in Tabachnick and Fidell (2007) are satisfied and therefore the assumption for data normality is met.

Model Specification Test

Before determining the best regression method to use, it was critical to establish whether the predictor variables are endogenous, meaning, whether there exists correlation between the predictor variables and the error term. Since this thesis adopted panel data analysis, the Hausman specification test was adopted to detect endogenous regressors and determine the best model to be used, as between fixed effect and random effect model. Under Hausman testing, the null hypothesis suggests adoption of random effect while the alternative hypothesis indicates that the fixed effect model is preferred for analysis.

So as to determine whether to use Random or Fixed Effects approach in analysing the model of this study, a Hausman test was undertaken. The results were as presented in Table 2.

Table 2:- Summary Results on Hausman Test.

Test Cross-Section Random Effects			
Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random	9.294250	3	0.0256

* Represent significance at the 0.05 level

Source: Field Data, 2023

Table 2 reported a significant chi-square statistic of 9.294250, p = 0.0256. The results suggest that the null hypothesis failed to be accepted and the alternative hypothesis failed to be rejected. Therefore, the Fixed Effect model was used to analyse the model of this studying.

Heteroskedasticity Test

The moderated regression analysis was done using the Generalized Least Square (GLS) cross-section weighted method with the cross-section coefficient covariance method. According to Gujarati (1995), GLS yields best linear unbiased estimators (BLUE) and thus obviates the need of testing heteroskedasticity as the standard errors of the regression results reported took care of the heteroskedasticity problem.

Multicollinearity Test

A multicollinearity condition exists whenever there is high, but not perfect, correlation between two or more explanatory variables (Wooldridge, 2010). Data that has multicollinearity is regarded redundant and overlapping. Besides, increase in multicollinearity brings with it the difficulty in explaining the associations between the study variables. This phenomenon makes it difficult to explain effects of any such variables so as to make logical findings and inferences (Wonsuk et al 2014)

There is no clear empirical agreement defining the level of correlation that causes multicollinearity. Shettima (2016) reports the conflict in the position as espoused by Hair et al (2006) and Kennedy (2008). Whereas Hair et al (2006) posits that correlation coefficient below 0.9 may not cause serious multicollinearity problem, Kennedy (2008) suggests that any correlation coefficient above 0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results. Variance Inflation Factors (VIF) indicate the increase in variance that can be attributed to multicollinearity (Greene, 2003). The rule of thumb is adopted from the assertion by Gujarati (1995) that multicollinearity can be a problem if and only if one of the VIF values exceeds 10. In this thesis, multicollinearity was tested by way of VIF and the results were as indicated in Table 3.

Table 3:- Testing for Multicollinearity using VIF.

Variable	CoefficientVariance	UncenteredVIF	CenteredVIF
C	0.000101	11.93314	NA
ME	0.013354	12.00036	1.067218
MLDM	5.93E-05	1.536852	1.536852
MCRK	2.11E-05	1.549386	1.549386

Legend: LRP= Loan repayment; MLDM = Liquidity Management; MCRK = Credit Risk Management; ME = Management Efficiency

Source: Field Data, 2023

As shown in Table 3 all the centered VIF values lie below 10, suggesting the explanatory variables did not present multicollinearity challenges.

Descriptive Statistics

Table 4 presents the descriptive statistics relating to the study variables of loan repayment, liquidity management, credit risk management, operating leverage and management efficiency.

Table 4:- Descriptive Statistics on Loan Repayment, Liquidity Management, Credit Risk Management, Operating. Leverage and Management Efficiency for the MFBs

	LRP	MLDM	MCRK	ME
Mean	0.058497	2.78E-15	1.92E-15	0.083282
Median	0.033344	-0.169709	-0.185046	0.072043
Maximum	0.372642	6.781433	14.36709	0.306122
Minimum	-0.183333	-1.452363	-1.694078	0.011299
Std. Dev.	0.089479	1.118274	1.742627	0.053644
Skewness	0.768780	3.042879	6.402868	1.637485
Kurtosis	4.947896	16.94806	51.14514	6.185074
Jarque-Bera	24.63355	926.3389	9927.766	83.48050
Probability	0.000004	0.000000	0.000000	0.000000
Sum	5.615750	2.63E-13	1.71E-13	7.995032
Sum Sq. Dev.	0.760619	118.8010	288.4913	0.273379
Observations	96	96	96	96

Legend: LRP= Loan repayment; MLDM = Liquidity Management; MCRK = Credit Risk Management; ME = Management Efficiency

Source: Field Data, 2023

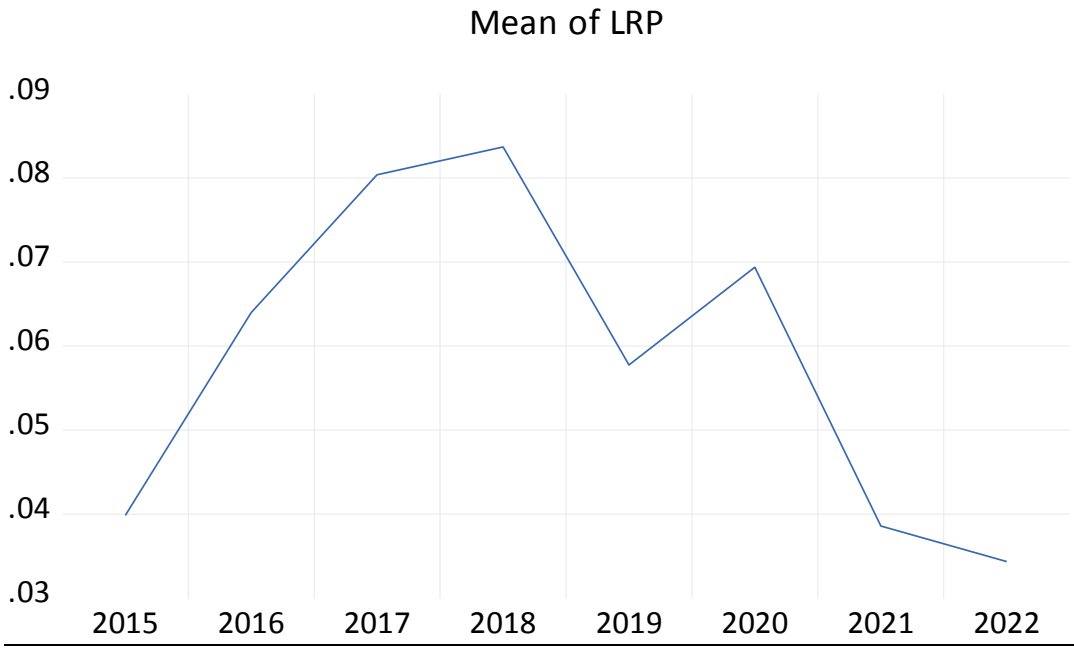
From Table 4., the loan repayment of the MFBs in Kenya, measured by net non-performing loans to total assets had a mean of 0.058497 with a maximum of 0.372642 and a minimum of -0.183333. This implies that non-performing

loans to total assets ratio has a 5.8% component of liquidity management. The reported mean compares favourably with 9.1% reported in Boussaada et al (2020) on liquidity management and loan repayment performance among Middle East-North Africa (MENA) financial institutions but unfavourably with 13% as reported by Mohammad et al (2020) on liquidity management and loan repayment for conventional banks. The differences could be as a result of the panel data lengths and respective samples used in the various studies. On the other hand, liquidity management measured by the ratio of net loans to customer deposits had a mean of 2.78E-15 with a standard deviation of 1.118274.

Trend Analysis on the Study variables

Trend analysis provides a graphical outline of the pattern taken by particular study variable elements so as to predict the direction and behaviour over a period of time. Trend analysis of the sampled microfinance banks (MFBs) was conducted on the dependent variable loan repayment and independent variable, liquidity management. The findings were as shown;

Figure 2:- Trend for Loan Repayment.

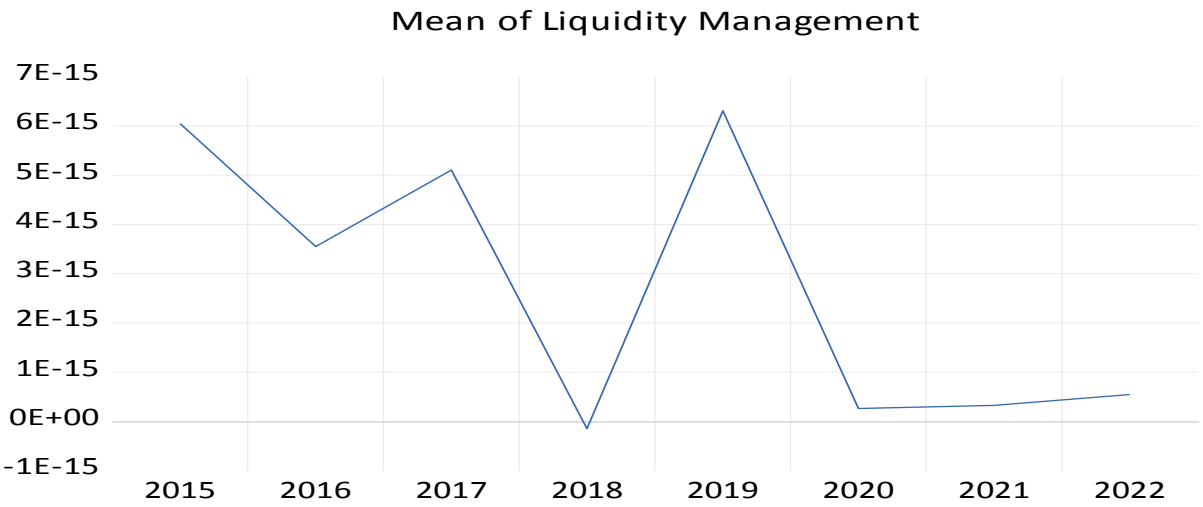


Source: Field Data, 2023

Figure 2 indicates that the mean loan repayment had a gradual increasing trend from 2015 to the year 2017 before experiencing a rising but gently decreasing trajectory for the period to 2018. Between the year 2018 and 2019, there was a sharp drop in loan repayment which slightly stabilized with marginal signs of regaining stable growth from 2019 to 2020. From 2020 to 2021, there was witnessed, for the second time, a marked sharp decline in loan repayment, similar to the trend between 2018 and 2019. This was an all-time low level ever witnessed for the period covered in the study. The trend of loan repayments was still experiencing a free-fall by the lapse of the last year of consideration in this study. This is consistent with the consistent with the recorded drop in net loans issued by MFB from Ksh.46.7 billion in 2019 to Ksh.44.2 billion in the year 2020, suggesting concentration of efforts in recovery of outstanding loans (CBK, 2020). The downward trend again from the middle of 2020 to the middle of 2021, which extended further to 2022, albeit at a lesser gradient was most probably in response to diminishing incentives in the borrowing market among MFBs where loan repayment was most depressed giving rise to the need for this study.

The behaviour of liquidity management depicted across the period of the study is presented in Figure 3.

Figure 3:- Trend of Liquidity Management.



Source: Field Data, 2023

From the graphical presentation of the trend with respect to liquidity management, Figure 3 indicated that the variable, measured using the ratio of loans to deposits has been gently decreasing from the year 2015, slightly improved between mid 2016 and 2017 before sharply dropping to zero in 2018. This implies in mid 2018, there were no funds accruing from recovered loans across the MFBs, resulting in low loan disbursements and hence significant drop in the ratio. This resonates with the findings in the regulators report that reliance on borrowed funds and member deposits were the major sources of liquid assets (CBK, 2019). in the subsequent year, there was a sudden spike in liquidity management efforts before a corresponding drop between 2019 to year 2020, from where an asymptotic-like stagnant ratio has been registered, evidence of the struggle by MFBs to regain normalcy to the end of the period covered in this study.

Fixed Effect Regression output for the Study Model

Table 5:- Dependent Variable: Loan Repayment.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.025046	0.009824	2.549565	0.0127
ME	0.401666	0.112987	3.554967	0.0006
MLDM	0.020110	0.007460	2.695535	0.0085
MCRK	-0.009874	0.004353	-2.268152	0.0260
R-squared	0.826936			
Adjusted R-squared	0.797024			
S.E. of regression	0.049850			
F-statistic	27.64544			
Prob(F-statistic)	0.000000			
Durbin-Watson	1.726765			

Key: LRP= Loan repayment; MLDM = Liquidity Management; MCRK = Credit Risk Management; ME = Management Efficiency

Source: Field Data, 2023

Table 5 reveals that the R^2 = 0.826936 while adjusted R^2 = 0.797024. Greene (2003) posits that coefficient of determination, R^2, is the measure by which total variation in the dependent variable is accounted for by the variation in the independent variables. It measures the quality of the model and its ability to be used for linear approximation. This implies that the model explained 79.7% of the variation in loan repayment as being brought about by the combined effect of liquidity management, credit risk management and the control variable of management efficiency.

Hypothesis Testing

To test the study objective, a null hypothesis, H_{01}, was formulated to the effect that there wasno significant relationship between liquidity management and loan repayment among microfinance banks (MFBs) in Kenya.Fixed

effects simple regression analysis was conducted on the study variables in the model of the study, which incorporated the interaction of all the other independent variables.

This finding suggests that whenever efforts to manage liquid assets of MFBs are engaged, there is recorded minimal corresponding change in the loan repayment trajectory. The results show that as MFBs strive to secure adequate liquid assets to meet their arising obligations, they project an image of sound financial strength from the perspective of the borrowers. This impression stimulates the desire by borrowers to remain trusted by the MFBs in anticipation of future application of higher value loans. By striving to maintain a good borrowing record, loan default becomes as disincentive, leading to deliberate measures by borrowers to meet their arising obligations regularly. Since just a section of all loanees will see the value of maintaining good relations with MFBs for purposes of future mutual engagements, the increase in loan repayment could be traceable to the minority, which explains the marginal increase in response.

At the same time, the results may be interpretated to mean that disbursement of more loans may include granting credit to borrowers who, along the repayment journey, may get distressed. This would lead to repayment but not at the rate that may be projected. It would be safe to infer from the findings therefore, that growth in the loan book leads to growth in non-performing loans. This could be on account of inclusion of onboarding debtors with doubtful credit history or whose anticipated income fail due to the exigencies of the business environment. Consistent with pronouncement of the anticipated income theory, the findings of this study concur with past studies which related firm revenue to the projected earnings of borrowers. The point of departure however, is that the results of this study suggest limited reliance should be accorded to disbursed loans because the weak positive growth if extrapolated across a longer periods may result in depressed industry returns and possible liquidation of adversely affected MFBs.

The reported adjusted R^2 of 0.826936 with $p = 0.000$ indicates that liquidity management together with the combined variables of the study predict 82.69% of the changes in loan repayment among MFBs. The other variables not included in the model account for the remaining 17.31% of loan repayment performance of MFBs in Kenya. These results resonate with past empirical findings in Beck, Jakubik and Piloiu, (2015); Bassey et al.,.(2016); Khan and Kazi, (2016) and Dzapasi (2020) who reported a positive and significant relationship between liquidity management and loan repayment. However, the findings contradict those of other past studies (Muhammad et al. 2020; Sathyamoorthiet al.,2020 and Shakatreh, 2021) who reported a significant but negative relationship between liquidity management and loan repayment. The closest of the studies was that of Bassey et al (2016) who reported a high an R^2 of 0.13 and regression relationship of 0.74 ($\beta = 0.74$, $p = 0.000$). However, the context was in the conventional commercial banking environment and focused on the effect of liquidity management on financial performance.

The adjusted coefficient of determination (R^2) is a modified form of R^2which adjusts for the number of explanatory terms in a model (Benchimol, 2020). It serves to measure the model quality alongside its linear approximation. The results shown imply that at 79.7%, the model is a good predictor of the changes in loan repayment among MFBs. Based on the findings, the null hypothesis, H_{01}, that there is no significant relationship between liquidity management and loan repayment among microfinance banks (MFBs) in Kenya was rejected and the alternative accepted.

The findings of the relationship between liquidity management and loan repayment showed that, unlike other outcomes in related reviewed studies, there exists a weak relationship between liquidity management and loan repayment and therefore qualified the parameters to be tested for moderation.

Conclusion:-

The findings of this study indicates that the nexus existing between liquidity management, proxied by net loans and total assets, and loan repayment, measured by the ratio of non-performing loans divided by total assets is positive and significant, but weak. The outcome indicates that, holding other variables constant, liquidity management only yields minimal change in the rate at which loans are repaid among MFBs. From the findings, it is recommended that MFBs ought to employ ingenious ways of controlling non-performing loans and independently execute a separate strategy towards attaining sustainable liquidity levels. At the regulatory level, it is recommended that liquidity management regulations should be implemented independent of the performance of loan repayments since increase in liquidity management stimulate corresponding increase in non-performing loans, but very minimally. At the firm

level, it is recommended that reliance on strict management of internally generated funds ought to be complemented with moderate external funding since the expectation to sustain MFBs' operations from proceeds of loan recovery may expose them to illiquidity. should streamline their proclamation on acceptable liquidity controls to foster sustainability. Studies should be undertaken on investigating liquidity management in MFBs in their respective firm size categories.

References:-

1. Abebe, N.A (2019) Financial Performance Analysis of Selected Ethiopian Micro-Finance Companies- A Camel Model Approach, Global Scientific Journals, Vol.7, Issue 10 Available at: http://www.globalscientificjournal.com
2. Adusei, M. and Appiah, S. (2011) Determinants of Group Lending in the Credit Union Industry in Ghana, Journal of African Business, 12:2, 238-251, DOI: 10.1080/15228916.2011.588914
3. Ahmed, S. F. and Malik, Q. A. (2015). Credit Risk Management and Loan Performance: Empirical Investigation of Micro Finance Banks of Pakistan. International Journal of Economics and Financial Issues, 5 (2), 574-579. Retrieved from https://dergipark.org.tr/en/pub/ijefi/issue/31969/352159?publisher=http-www-cag-edu-tr-ilhan-ozturk
4. Bassey. F.A, Tobi. E. G, Bassey I.F &Ekwere. R. E. (2016). Liquidity Management and the Performance of Banks in Nigeria (2000-2010): Human Resource Management Academic Research Society, International Journal of Academic Research in Accounting, Finance and Management Sciences, vol. 6(1), pages 41-48, January
5. Beck, R., Jakubik, P and Piloiu, A. (2015) Key Determinants of Non-performing Loans: New Evidence from a Global Sample, Open Econ Rev (2015) 26:525–550, DOI 10.1007/s11079-015-9358-8
6. Boussaada, R., Hakimi, A. and Karmani, M. (2020). Is there a threshold effect in the liquidity risk and non-performing loans relationship? A scp PSTR/scp approach for scp MENA /scp banks. International Journal of Finance & Economics, (), ijfe.2248–. doi:10.1002/ijfe.2248
7. CBK (2019) Bank Supervision Annual Report, 2019 Available at: https://www.centralbank.go.ke/2020/12/15/bank-supervision-annual-report-2019
8. CBK (2020) Bank Supervision Annual Report, 2020 Available at: https://www.centralbank.go.ke/2021/05/26/bank-supervision-annual-report-2020
9. CBK (2021) Bank Supervision Annual Report, 2021 Available at: https://www.centralbank.go.ke/2022/05/27/bank-supervision-annual-2021-report
10. Chikoko, L. (2013): Zimbabwean Commercial Banks Liquidity Risk Determinants after Dollarisation, Journal of Applied Finance & Banking, vol. 3, no. 6, 2013, 97-114
11. Chinweoda, U.O., Onuora, U.R., Ikechukwu, E.M., Ikechukwu, A.C. and Ngozika, O.A. (2020)Effect of Liquidity Management on the Performance of Deposit Money Banks in Nigeria,The Journal of Social Sciences Research, Vol. 6, Issue. 3, pp: 300-308, 2020. Available at: https://doi.org/10.32861/jssr.63.300.308
12. Dzapasi, F. D. (2020). The impact of Liquidity Management on Bank Financial Performance in a subdued economic environment: A case of the Zimbabwean Banking Industry. PM World Journal, 9(1), 1-20.
13. Eyduran E, Ozdemir T, Alarslan E (2005). Importance of diagnostics in multiple regression analysis. J. Appl. Sci. 5(10): 1792-1796.
14. Field, A. (2000). Discovering statistics using SPSS for windows. Thousand Oaks, CA: Sage Publications Ltd
15. Field, A.P. (2018) Discovering Statistics Using IBM SPSS Statistics. 5th Edition, Sage, Newbury Park.
16. Greene, W. H. (2012) Econometric Analysis, New York University, 7thEditionPearson Education Limited
17. Gujarati, D. (1995) Basic Econometrics, 5th Edition McGraw Hill
18. Hair J. F, Black, W. C, Babin, B. J, Anderson, R. E, and Tatham, R. L. (2006) Multivariate Data Analysis. 6th edn. New Jersey: Pearson EducationHermes, N., Lensink, R., & Meesters, A. (2011). Outreach and efficiency of microfinance institutions. World Development, 39(6), 938 - 948.
19. Hsiao, Cheng, Why Panel Data? (September 6, 2005). IEPR Working Paper No. 05.33, Available at: http://dx.doi.org/10.2139/ssrn.820204
20. Jaroslava, H. and Martin, W. (2005) The Performance of Panel Unit Root and Stationarity Tests: Results from a Large Scale Simulation Study Available at: DOI:10.1080/07474930500545504
21. Kitere, W. A. O., Namusonge, G. S., & Makokha, E. N. (2019). Effect of Liquidity Management on Performance of Commercial Banks in Kenya. European Journal of Business and Management, 11(17), 30-41
22. Maina, J.N., Kinyariro, D. K. and Muturi, H. M. (2016). Influence of credit risk management practices on loan delinquency in savings and credit cooperative societies in Meru County, Kenya. International journal of economics, commerce and management, v. 4, n. 2, p. 763-773.

23. Mishra, S., & Pradhan, B. B. (2019). Impact of Liquidity Management on Profitability: An Empirical Analysis in Private Sector Banks of India. Revista ESPACIOS, 40(30)
24. Muhammad, I., Ibrahim, M., and Sulaiman, S. (2020) Loan Characteristics, Loan Repayment and Performance of Small and Medium Enterprises in Kano Metropolitan: A Mediating Model. Journal of Finance, Accounting and Management, 10(1), 43-56 Available at: https://www.researchgate.net/publication/339130751
25. Osei, C. (2019). Assessing the relationship between liquidity and profitability of banks listed on the Ghana Stock Exchange. Unpublished Master of Science research project, Kwame Nkrumah University of Science and Technology
26. Postelnicu, L., & Hermes, N. (2018). Microfinance Performance and Social Capital: A Cross-Country Analysis. Journal of Business Ethics, 153(2), 427–445. http://www.jstor.org/stable/45022825
27. Sandino, M. A. (2019). Liquidity Management and Bank Profitability: A Case of Listed Banks on the Ghana Stock Exchange. Doctoral dissertation, University of Ghana.
28. Sangwan, S., Nayak, N. C., Samanta, D. (2020). Loan repayment behavior among the clients of Indian microfinance institutions: A household-level investigation. Journal of Human Behavior in the Social Environment, 1–24. Available at: doi:10.1080/10911359.2019.169922
29. Sathyamoorthi, C.R, Mapharing, M.,&Dzimiri, M. (2020) Liquidity Management and Financial Performance: Evidence From Commercial Banks in Botswana, Faculty of Business, University of Botswana, Gaborone, Botswana, International Journal of Financial Research. Available at: https://doi.org/10.5430/ijfr.v11n5p399
30. Sathyamoorthi, C.R, Mapharing, M.,&Dzimiri, M.(2020) Liquidity Management and Financial Performance: Evidence From Commercial Banks in Botswana, Faculty of Business, University of Botswana, Gaborone, Botswana, International Journal of Financial Research. Available at: https://doi.org/10.5430/ijfr.v11n5p399
31. Shakatreh, M. (2021). The effect of liquidity ratios management on the profitability of industrial companies listed on the Amman Stock Exchange. Accounting, 7(5), 1131-1138.
32. Shettima, U.M.(2016) The Determinants of Microfinance Institutions' Capital Structure Around the World, Unpublished PhD Thesis,Salford Business School, University of Salford Greater Manchester, United Kingdom
33. Shrestha, B. (2018). Liquidity Management and Profitability of Commercial Banks in Nepal. International Journal of Management and Applied Science, 4(7), 98-102.
34. Tabachnick, B.G. & Fidell, L. S. (2007). Using Multiple Statistics. Harper Collins Publishers, New York, NY.
35. Wonsuk, Y, Mayberry, R., Bae, S., Singh, K., Qinghua H., &Lillard, J.W. (2014). A Study of Effects of Multicollinearity in the Multivariable Analysis. Int J ApplSci Technol. 4(5): 9–19.
36. Wooldridge, J. M. (2002) Econometric Analysis of Cross-Section and Panel Data. Massachusetts: MIT Press
37. Wooldridge, J. M. (2010) Econometric Analysis of Cross-Section and Panel Data. Cambridge Massachusetts: MIT Press.