

Effect of Mobile-Based Lending Process on Non-Performing Loans in Commercial Banks in Nakuru Town, Kenya

¹Murunga, DavidLuucho, ²Kibati, Patrick

¹School of Human Resource Development, Jomo Kenyatta University of Agriculture and Technology, Kenya

²School of Business, Kabarak University, Kenya

Corresponding Author: ¹Murunga, DavidLuucho

Abstract: This study sought to determine the effect of mobile-based lending platform on non-performing loans in commercial banks in Nakuru town, Kenya. Precisely, the study assessed how loan appraisal process using the mobile platform affected NPLs in commercial banks. The study adopted a descriptive survey research design. The 172 credit officers working with 37 branches of commercial banks based in Nakuru town when the study was done, comprised the study population. A sample of 64 credit officers was obtained from the study population using stratified random sampling method. A structured questionnaire was used to collect data. A pilot study was carried out prior to the main study with the aim of determining both the reliability and validity of the research instrument. The Statistical Package for Social Sciences software was used to facilitate data analysis. Descriptive statistics and inferential statistics were used in the analysis. The results of the analyses were presented in tables. The hypotheses were tested at 95% confidence level. The study observed that loan appraisal process was a very important element of mobile-based loans in respect of NPLs. The null hypothesis was rejected. The study also found that, the more commercial banks emphasized on lending through the mobile platform, the more they were likely to record NPLs. It was also concluded that the loan appraisal process had a significant relationship with NPLs. The study recommends that commercial banks should have a comprehensive process of appraising loans advanced via mobile platform in order to enhance the mechanisms of assessing creditworthiness of prospective borrowers.

Keywords: Commercial banks, loan appraisal process, mobile-based lending platform, Nakuru town, non-performing loans

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I. Introduction

Lending is one of the most important functions of commercial banks [1]. Lending by financial institutions is premised on various terms including amount of credit facility, lending rates, collateral requirements, purpose of credit, form of credit (secured or unsecured) among others. Every loan disbursed is associated with a certain degree of risk which is referred to as credit risk. Credit risk is describes as the probability of decrease in economic benefit occasioned by a monetary loss or an unexpected expense or loss resulting from a given transaction. This form of risk is measured by the percentage of non-performing loans against the total loans [2]. The risk management procedures and policies in Pakistani banking sector are still in their infancy [3]. In view of this, the industry is advised to have a better understanding of risk management in order to effectively address the problem of loan recovery and also tighten their credit assessment scrutiny policy. Moreover, the banking sector in this country is advised to have appropriate monitoring procedure so that they are able to keep check of non-performing loans (NPLs). In the event that credit risk is not addressed, lending institutions are likely to be more prone to NPLs. Credit risk is described as the proportion of NPLs to total loans advanced to borrowers [2].

In Nigeria, lending is stated to be one of the primary functions of commercial banks [2]. This is in spite of lending being associated with risk of default. Commercial banks always make provisions for both bad and doubtful debts every financial year. The foregoing sends bad message to current and prospective investors. The surest way for financial institutions to avoid bad debts and hence NPLs is failing to lend out any credit at all. But then, this is an unassailable challenge since the chief source of revenue for commercial banks is credit. This implies that, lending institutions have no alternative to advancing credit to their customers. However, this ought to be effected within sound credit management strategies in order to mitigate bad debts [2].

There are very interesting statistics regarding mobile lending in Kenya. This is attributed to the fact that Kenya is the pioneer of mobile money transfer in the world. The advent of the mobile money transfer popularly known as "M-Pesa" by the leading telecommunication firm in the country, Safaricom Limited, changed drastically financial transactions including mobile lending. Other telecommunication giants have followed the

footsteps of Safaricom Limited and are now running their own mobile money transfer platforms. Lending institutions particularly commercial banks have been providing mobile services on the platforms of these telecommunication firms. Since the inception of mobile lending, commercial banks in Kenya have recorded tremendous growth in loan uptake. A case in point is the Kenya Commercial Bank (KCB) which recorded about 4 million new loans in 2015 compared to approximately 200,000 new loans it used to make per year there before. Majority of these borrowers at 94% applied for loans using their mobile phones [4].

The banking sector is one of the most important financial sectors in the country. It is governed by both the Banking Act and Companies Act as stipulated in the Constitution. It plays a leading role in the socio-economic development of the nation. The sector is important since it executes monetary policies in addition to providing means for effecting payments for various goods and services [5]. The main players in this sector are commercial banks which are financial entities that offer financial and other related services to their customers. The services provided by these institutions include savings, credit facilities, processing of cheques, insurance services (bancassurance), processing of salaries and other payments, among other services. In Kenya, there are 42 licensed commercial banks. These banks fall under three tiers based on their capitalization. All commercial banks are regulated by the Central Bank of Kenya. The requirements for lending are stipulated by the CBK. A total of 28 commercial banks had branches in Nakuru town by the time this study was conducted.

II. Statement Of The Problem

Non-performing loans are a monumental challenge to the banking sector. According to the International Monetary Fund (IMF) statistics, the ratio of bank NPLs to total gross loans was 5.989% in 2015. Since 2003 when the aforesaid ratio stood at an all-time high of 34.9% the NPLs have consistently declined to an all-time low of 4.429% in 2011. However, the NPLs have been increasing ever since to 4.594% in 2012, 5.046% in 2013, 5.455% in 2014, and to 5.989% in 2015. The foregoing implies that there are challenges that commercial banks have been experiencing since 2011 in their loan recovery plans and in addressing NPLs. This is further justified by the Central Bank of Kenya (CBK) bank supervision report for 2015, where it was indicated that the banking sector in Kenya recorded a decline in asset quality as a result of NPLs ratio increasing from 5.6% in December 2014 to 6.8% in December, 2015 [6].

Coincidentally, mobile-based lending in Kenya was incepted in 2012 with the introduction of the now-popular 'M-Shwari' concept. M-Shwari enables customers to have access to savings and credit products using their mobile phones. It is imperative to examine the nexus between increased NPLs and mobile lending given that the latter has hitherto hit billions of Kenya shillings. It is important to put in check the NPLs in order to ensure that the financial performance of commercial banks is not hugely affected particularly in the wake of the interest rate ceiling that was recently introduced by the Central Bank of Kenya. The present study, therefore, purposed to examine the effect of mobile-based lending platform on non-performing loans among commercial banks.

1. General Objective

To determine the effect of mobile-based lending process on non-performing loans in commercial banks in Nakuru town, Kenya

3.1 Specific Objective

To examine the effect of loan appraisal process on non-performing loans in commercial banks in Nakuru town

2. Research Hypotheses

H₀₁: There is no significant effect of loan appraisal process on non-performing loans in commercial banks in Nakuru town.

3. Theoretical Framework

The study was guided by the asymmetric information theory.

5.1 Asymmetric information theory

The theory of asymmetric information was put forward by Akerlof and Spence in 1970s [7]. The theory states that there is often an imbalance of information between sellers and buyers (between lenders and borrowers). In this perspective, one party has more or better information than the other. The foregoing results in an imbalance of power in transactions. Information asymmetry can lead to moral hazard, adverse selection and information monopoly. It is asserted that information asymmetry can lead to misinforming and is also essential in every communication process.

In the context of mobile lending by commercial banks, it is very likely that the borrowers have greater and better information regarding commercial banks than the latter. This is a case of information asymmetry which is potentially detrimental to banks since they may fail to accurately appraise the creditworthiness of prospective borrowers on mobile platform. It is thus possible for commercial banks to lend out loans to customers on mobile platform with high degree of defaulting.

III. Empirical Review

Empirical studies on lending and especially mobile-based lending process are reviewed. In particular, the review focuses on loan appraisal process in line with non-performing loans.

6.1 Loan appraisal process and non-performing loans

A past empirical study examined appraisal of a rural co-operative with the thrust on rural development [8]. The study relied on both primary and secondary data on loan appraisal. However, the study did not divulge much information relative to loan appraisal system. In the same vein, a previous study evaluated credit risk grading model and loan performance of commercial banks in Bangladesh [10]. The study noted that as a result of rising number of non-performing loans and competition in the banking sector, majority of commercial banks have strongly focused on credit risk assessment, the initial stage is the loan appraisal process. It was acknowledged that indeed bankers preferred sophisticated financial techniques in credit appraisal process with the object of assessing the both the borrower's business and financial position.

In Pakistani, a study on credit risk management (CRM) and loan performance was conducted [11]. The study was interested in microfinance banks (MFBs) in the country. The primary aim of the study was to investigate how credit risk management practices influence performance of loans. The dimensions of CRM practices considered in the study included credit terms and policy (CTP), client appraisal, collection policy (CP), and also credit risk control (CRC). The results of the study revealed that both credit terms and client appraisal impacted significantly on the loan performance (LP). This implies that credit appraisal is one of the major aspects that lending institutions ought to factor in order to enhance the performance of loans.

A study conducted in Nigeria empirically investigated effects of credit risk on profitability of commercial banks [12]. The study involved a total of 8 commercial banks where data for the period between 2011 and 2014 was employed. While citing the results of an earlier study [13] on banking reform and their impact on the Nigerian economy, the study noted that the increased number of commercial banks has overstretched their existing workforce capacity. The foregoing has resulted in numerous challenges including poor credit appraisal system, financial crimes among others; factors that have increased the number of banks in financial distress.

A study conducted locally indicated that loan appraisal is conducted for different reasons [14]. These include the use of appraisal as a selection tool, to quantify risk, to assist in decision making, and also to ensure that there is good quality business with excellent credit worthiness. The foregoing underpins the importance of credit appraisal process among lending institutions which include commercial banks. The process was found to be also important in addressing non-performing loans which are occasioned by lengthy litigation process, unprofessional credit risk evaluation, moral hazard on the part of management, poor and unprofessional credit risk assessment, lack of sufficient supervisions of activities and projects, and also intentional default, and also valuation of credit appraisal model.

Moreover, another local study investigated the effectiveness of credit management system on loan performance [14]. The study was delimited to microfinance sector in Kenya. The study revealed that the ability to intelligently and efficiently manage customer credit lines is a crucial requirement for effective credit management. It was further found that the existence of an ineffective and inefficient loan appraisal process is one of the primary causes of NPLs among lending institutions. A lending institution is supposed to address the challenges presented by NPLs by having greater insight into borrowers' financial strength, credit score history and changing payment patterns [14].

IV. Conceptual Framework

A conceptual framework is an illustration that shows how constructs of a study are perceived to relate to each other as shown in Figure 1. The framework depicts two major sets of variables. These are independent variable which is represented by loan appraisal process, and the dependent variable which is non-performing loans. Each of the aforesaid variables is characterized by various indicators. It was held that the loan appraisal process presumptively influenced non-performing loans. It is on the foregoing hypothesis that this study was conducted.

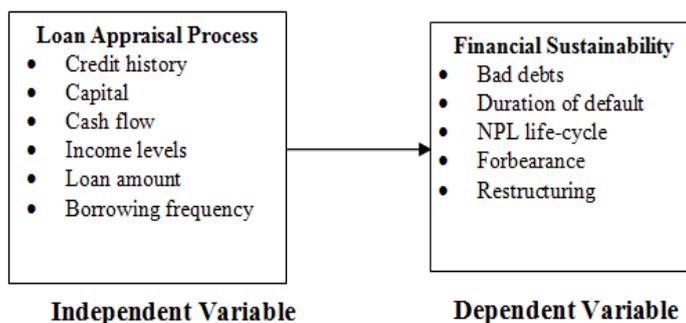


Figure 1: Conceptual Framework

V. Methodology

The methodology covers the research design, population, sampling procedure, research instrument, pilot testing, data collection procedure and data processing and analysis. It also states how the results of the analysis were presented.

8.1 Research Design

A research design is defined as the blueprint of conducting a research study. In other words, it is the conceptual structure within which a research is carried out [15]. A research design refers to the plan that is employed to generate answers to a research problem. This study adopted a descriptive survey research design. Descriptive survey is described as a method of collecting information by interviewing or administering a questionnaire to a sample of individuals [16].

8.2 Target Population

The target population describes subjects or individuals who share similar character traits. It is the population to which the study findings are generalized [17]. In the context of the present study the credit officers working with commercial banks in Kenya constituted the target population. The study population is a subset of the target population and refers to the population that the researcher can reasonably access. The 172 credit officers who were working with 28 commercial banks in Nakuru town by the time the study was being conducted comprised the accessible (study) population. The sampling frame which outlines the distribution of the credit officers across the commercial banks in Nakuru town

8.3 Sample Size and Sampling Technique

A sample refers to a subset of the accessible population. On the other hand, sampling is defined as the procedure employed to gather people, places or things to study [17]. It is the process of selecting a number of individuals from a population such that the selected group contains elements representative of the characteristics found in the entire group [18]. The Nassiuma's formula [19] was used to calculate the size of the sample as shown.

$$n = \frac{NC^2}{C^2 + (N - 1)e^2}$$

Where:

n	represents	Sample Size
N	represents	Study Population
C	represents	Coefficient of Variation ($21\% \leq C \leq 30\%$),
e	represents	Precision Level ($2\% \leq e \leq 5\%$)

Therefore;

$$n = \frac{172 \times 0.25^2}{0.25^2 + (172 - 1) 0.025^2}$$

$$n = 63.47$$

$$n = 64 \text{ credit officers}$$

Stratified random sampling method was employed to obtain the sampled respondents from the study population. This sampling method was chosen due to the fact that it reduces bias by ensuring that there is fair and equitable distribution of respondents [20] across all strata (35 bank branches in Nakuru town).

8.4 Research Instrument

A structured questionnaire was used to collect data from the sampled respondents. It is stated that questionnaires are the most appropriate tools for collecting data in survey studies [21]. The questionnaire was

structured in such a way that it facilitated collection of data pertinent to the study objectives. More so, the questionnaire enabled collection of data on a 5-point Likert scale.

8.5 Pilot Testing

A pilot study was carried out prior to the main study with the aim of determining both the reliability and validity of the research instrument. The piloting was done amongst randomly selected credit officers working with commercial bank branches in Naivasha town. The choice of banks in Naivasha town was in order to ensure that the participants of the pilot study were not going to take part in the main study. Reliability is a measure of the internal consistency of a research instrument [20]. This implies that a reliable instrument can be administered on different populations with similar characteristics and return similar results. The study adopted the Cronbach alpha coefficient to test the reliability of the research questionnaire. The reliability threshold was alpha values equal to or greater than 0.7 ($\alpha \geq 0.7$). As shown in Table 1, the predictor variable and the dependent variable returned alpha coefficients greater than 0.7 which implied that they were found to be reliable.

Variables	Test Items	α
Loan appraisal process	6	0.81
Non-performing loans	5	0.80
Average reliability	26	0.81

8.6 Validity Testing

It is asserted that the definition of validity has indeed undergone a number of changes. The test of validity falls under three categories according to Creswell (2005). These include criterion-related, content, and construct validity. The present research determined content validity. Given that this validity cannot statistically be determined [22]. The researcher consulted with the university supervisors in order to assess how well the questions contained in the instrument could address the study objectives.

8.7 Data Collection Procedure

The researcher obtained the requisite permits and consents before collecting data. First, an official letter of introduction was obtained from the university. This was followed by obtaining the consent of the management of the commercial banks in Nakuru town. The research questionnaire was then issued to the sampled respondents through the heads of credit department of the respective bank branches. The respondents were allowed approximately five working days to fill in the questionnaires after which they were collected.

8.8 Data Processing and Analysis

The researcher first verified the completeness of the filled questionnaires to ensure that only the appropriately filled ones were going to be considered in the analysis. The Statistical Package for Social Sciences (SPSS) Version 24 software was used to facilitate data analysis. Descriptive statistics and inferential statistics were used in the analysis. Descriptive statistics encompassed measures of distribution (frequencies and percentages) measure of central tendencies (means) and measures of variation (standard deviations). Inferential statistics took the form of Pearson's correlation coefficient and linear regression analysis. The null hypothesis was tested at 95% confidence level. The results of the analyses were presented in tables. The following multiple regression model was adopted.

$$Y = \beta_0 + \beta_1 X_1 + \epsilon$$

Where:

Y	represents	NPLs
β_0	represents	Constant
X_1	represents	Loan appraisal process
β_1	represent	Regression Coefficient

VI. Results, Interpretations And Discussions

This section presents the results of data analyses and associated interpretations and discussions. The first part outlines the response rate. The second part addresses the descriptive and inferential statistical findings in respect of the study variables.

9.1 Response Rate

Response rate is also called questionnaire return rate in that it describes the proportion of the questionnaires that are returned having been filled accordingly in comparison to the total number of questionnaires issued to the respondents. In this study, the researcher issued 64 questionnaires to the sampled credit officers. After collection, it was found that a total of 58 questionnaires had been appropriately filled. This figure represented 90.63% response rate. This was way above the 75% recommended threshold in survey studies

[23]. The relatively high response rate was attributed to the fact that the questionnaires were issued to the respondents by the researcher in person who explained the rationale of maximum participation in the study by the credit officers and also giving factual information.

9.2 Descriptive Results, Interpretations and Discussions

This section presents the results of descriptive analysis and pertinent interpretations and discussions. The results are in tandem with the objective of the study. In addition, the results are on a 5 point Likert scale where integers 1 to 5 stand for strongly disagree to strongly agree. The results are presented in form of measures of distribution (frequencies), measures of central tendencies (means), and measures of dispersion (standard deviations).

9.2.1 Loan appraisal process

The study put into perspective the views of credit officers working with commercial banks in Nakuru town regarding loan appraisal process when employing mobile banking. The results to this effect are as shown in Table 2. As indicated, it is clear that it was largely strongly concurred (62.1%) that commercial banks verified credit history of prospective borrowers before lending them money on mobile platform (mean = 4.55; std dev = 0.680). The sampled credit officers, however, held divergent opinion regarding the proposition that capital of the borrower on the mobile platform was verified by the lending bank (mean = 3.22; std dev = 0.879). While only 37.9% at least agreed, 22.4% disagreed and 39.7% others were not sure of the same. It was further revealed that at least 88.0% of the credit officers admitted that cash flows of mobile-based borrowers were examined by the bank. In addition, a total of 84.25 of the sampled officers at least admitted that income levels of mobile-based borrowers were verified by the bank. Moreover, the study found that majority of the respondents strongly agreed (62.1%) that the bank determined the loan amount to advance to mobile-based borrowers (mean = 4.50; std dev = 0.778). In the same vein, it was found that 70.7% of the sampled credit officers concurred that the borrowing frequency of mobile-based borrowers was factored in before advancing credit facility to them.

Table 2: Descriptive statistics for loan appraisal process

	SD	D	NS	A	SA	Mean	Std. Dev
Commercial banks verify credit history of prospective borrowers before lending money on mobile platform	0	3.4	0	34.5	62.1	4.55	0.680
The capital of borrower is verified by the bank	0	22.4	39.7	31.0	6.9	3.22	0.879
Cash flows of mobile-based borrowers are examined by the bank	0	6.9	5.2	75.9	12.1	3.93	0.672
Income levels of mobile-based borrowers are verified by the bank	0	8.6	5.2	65.5	20.7	3.98	0.783
The bank determines the loan amount to advance to mobile-based borrowers	0	5.2	1.7	31.0	62.1	4.50	0.778
The borrowing frequency of mobile-based borrowers is factored in before advancing credit facility	3.4	8.6	1.7	70.7	15.5	3.86	0.907

9.2.3 Non-performing loans

The study further examined the opinions held by credit officers in regard to non-performing loans in their respective banks and in relation to mobile-based loans as outlined in Table 3. The study revealed that 77.6% of the sampled staff strongly concurred that commercial banks had significant bad debts occasioned by mobile-based loans. It was also generally agreed (mean = 4.03; std dev = 1.092) that the duration of default in case of mobile-based loans was similar to other forms of loans. Majority of the respondents (32.8%) were found to strongly disagree that the life-cycle of NPLs for mobile-based loans was shorter than in other forms of loans. There were divergent opinion in respect to the proposition that commercial banks exhibited great degree of forbearance when dealing with mobile-based borrowers (mean = 3.33; std dev = 0.758). Most of the credit officers (48.3%) were not sure in respect to the foregoing statement. Moreover, it was agreed by the majority of the respondents (77.6%) that commercial banks kept on restructuring terms of mobile-based loans in order to address non-performing loans.

Table 3: Descriptive statistics for non-performing loans

	SD	D	NS	A	SA	Mean	Std. Dev
Banks have significant bad debts occasioned by mobile-based loans	0	0	3.4	19.0	77.6	4.74	0.515
Duration of default in case of mobile-based loans is similar to other forms of loans	6.9	3.4	5.2	48.3	36.2	4.03	1.092
Non-performance loans life-cycle for mobile-based loans is shorter than in other forms of loans	32.8	15.5	17.2	31.0	3.4	2.57	1.326

Banks exhibit great degree of forbearance when dealing with mobile-based borrowers	1.7	8.6	48.3	37.9	3.4	3.33	0.758
Banks keep on restructuring terms of mobile-based loans in order to address non-performing loans	8.6	3.4	3.4	77.6	6.9	3.71	0.973

9.3 Inferential Results, Interpretations and Discussions

The study examined the effect of mobile-based lending on non-performing loans among commercial banks in Nakuru town. To this effect, this section puts into perspective the results, interpretations and discussions in respect of correlation and linear regression analyses.

9.3.1 Relationship between loan appraisal process and non-performing loans

This section covers the results of Pearson’s correlation analysis which outlines the relationship between loan appraisal process as it characterizes mobile-based lending and NPLs as shown in Table 4. The significance of the correlation was tested at 95% confidence level which is equivalent to 0.05 level of significance. As shown in Table 4.13, the correlation between loan appraisal process and non-performing loans was established to be positive, moderately strong and significant ($r = 0.451$; $p < 0.05$). These results were interpreted to mean that enhancing the process of loan appraisal was likely to result in increased NPLs. In ordinary circumstances, the foregoing results are contrary to the norm. As such, the queer results could be attributed to the fact that it was established to be a hectic process to appraise loans on the mobile platform.

Table 4: Correlation between loan appraisal process and non-performing loans

Loan Appraisal Process		Non-performing Loans
	Pearson Correlation	.451**
	Sig. (2-tailed)	.000
	n	58

** . Correlation is significant at the 0.01 level (2-tailed).

9.3.2 Effect of mobile-based lending on non-performing loans

The study examined the extent to which mobile-based lending influenced NPLs. This was achieved through various inferential statistics including general correlation (R), coefficient of determination (R^2), analysis of variance, and regression coefficients. In addition, the null hypothesis was tested by use of the results of the T-statistics. As shown in Table 5, the general correlation between mobile-based lending and NPLs was found to be positive and strong ($R = 0.620$). This implied that the more commercial banks emphasized on lending through the mobile platform, the more they were likely to record NPLs. In addition, the study noted that the variable characterizing mobile-based lending, that is, the loan appraisal process, explained 38.4% of NPLs in commercial banks ($R^2 = 0.384$).

Table 5: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.620 ^a	.384	.350	.42480

a. Predictors: (Constant), Loan Appraisal Process

The study as shown in Table 6, further indicated that the regression model was statistically significant ($F = 8.676$; $p < 0.05$). To this effect, the study underscored the importance of mobile-based lending as exemplified by the loan appraisal process in NPLs with the emphasis being to reduce the level of lending via mobile platform.

Table 6: Analysis of variance

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	6.262	4	1.566	8.676	.000 ^a
Residual	9.564	53	.180		
Total	15.826	57			

a. Predictors: (Constant), Loan Appraisal Process,

b. Dependent Variable: Non-Performing Loans

The results indicated in Table 7 presents regression coefficients and T-statistics.

Table 7: Regression coefficients, and t-statistics

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.828	.851		2.148	.036
	Loan Appraisal Process	.524	.145	.419	3.612	.001

a. Dependent Variable: Non-Performing Loans

The regression model was interpreted as follows.

$$Y = \beta_0 + \epsilon$$

$$Y = 1.828 + 0.524X_1$$

Interpretatively, for NPLs to increase by a single unit, loan appraisal process had to be changed by 0.524 units, while holding other factors (1.828) constant. According to the findings, it is clear that loan appraisal process was a very important element of mobile-based loans in regard to non-performing loans in commercial banks. Illustratively, commercial banks are supposed to improve how they appraise the loans they lend on the mobile platform in order to arrest the escalating NPLs. The results of the T-statistics were employed to test the null hypothesis as follows.

H₀: There is no significant effect of loan appraisal process on non-performing loans in commercial banks in Nakuru town.

H_a: There is significant effect of loan appraisal process on non-performing loans in commercial banks in Nakuru town.

T-test statistics results = (t = 3.612; p < 0.05)

Interpretation: There is significant effect of loan appraisal process on non-performing loans in commercial banks in Nakuru town.

Verdict: The first null hypothesis (**H₀**) was rejected.

VII. Conclusions

The study concluded that there were several shortcomings on the part of commercial banks during the process of appraising loans advanced on the mobile platform. Though, the banks were found to verify the credit history of prospective borrowers before lending them money, the study concluded that it was not clear whether or not banks sought information regarding capital of the said borrowers. However, the study concluded that lending banks strived to examine the cash flows, income levels, and borrowing frequency of mobile-based borrowers. It was also concluded that the loan appraisal process had a significant relationship with NPLs.

VIII. Recommendations

The study recommends that commercial banks should have a comprehensive process of appraising loans advanced via mobile platform in order to enhance the mechanisms of assessing creditworthiness of prospective borrowers. The appraisal process should entail factual credit history of the borrowers, their capital, cash flows, sources and levels of income, and also the borrowing frequency. In the event that, there is lack of clarity regarding the qualification of a given applicant, the lending banks should desist forthwith from awarding any sort of credit facility to the affected applicant in order to curtail potential occurrence of NPLs.

References

- [1]. Agu, O.C., & Basil, C.O. (2013). Credit management and bad debt in Nigeria commercial banks – Implication for development. *Journal of Humanities and Social Science*, 12(3), 47-56.
- [2]. Dolam, R.N., & Collender, J.A. (2001). Agricultural banks and the Federal home loan banks system. *Agriculture Finance Review*, 25, 57-71.
- [3]. Haneef, S., Riaz, T., Ramzan, M., Rana, M.A., Ishaq, H.M., & Karim, Y. (2012). Impact of risk management on non-performing loans and profitability of banking sector of Pakistan. *International Journal of Business and Social Science*, 3(7), 307-315.
- [4]. Hoover, R. (2016). Kenya’s KCB Bank Dials up Growth with Mobile Loans. Accessed on December 5, 2016 from: <http://investinginafrica.net/kcb-mobile-lending/>.
- [6]. Shambe, M. (2003). An Investigation into the Role of Deposit Insurance in Kenya’s Banking Sector Stability. MBA project, University of Nairobi, Nairobi, Kenya.
- [7]. Central Bank of Kenya (2015). Bank Supervision Annual Report 2015. Nairobi: CBK.
- [8]. Akerlof, G., A. (1970). The market for “lemons”: Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84(3), 488-500.
- [9]. Amit, K.C., & Krishnamay, G. (2009). Appraisal of a rural co-operative with the thrust on rural development: An empirical study. *International Journal of Social Economics*, 35(1/2), 199-211.
- [10]. Niaz, M., & Azimun, N.O. (2015). Credit risk grading model and loan performance of commercial banks in Bangladesh. *European Journal of Business and Management*, 7(13), 83-91.
- [11]. Sufi, F.A., & Qaisar, A.M. (2015). Credit risk management and loan performance: Empirical investigation of microfinance banks of Pakistan. *International Journal of Economics and Financial Issues*, 5(2), 574-579.

- [12]. Olalere, E.O., & Wan, A.W.O. (2016). The empirical effects of credit risk on profitability of commercial banks: Evidence from Nigeria. *International Journal of Science and Research*, 5(8), 1645-1650.
- [13]. Sanusi, L. S. (2012.). *Banking Reform and its Impacts on the Nigerian Economy*. Accessed on December 15, 2016 from: <http://www.bis.org/review/r120320d.pdf>.
- [14]. Mureithi, A.W. (2010). Relationship between credit appraisal process and the level of non-performing loans of the women enterprise fund loans offered through financial intermediaries in Kenya. MBA project, University of Nairobi, Kenya.
- [15]. Moti, H.O., Masinde, J.S., Mugenda, N.G., & Sindani, M.N. (2012). Effectiveness of credit management system on loan performance: Empirical evidence from microfinance sector in Kenya. *International Journal of Business, Humanities and Technology*, 2(6).
- [16]. Kothari, R. (2008). *Research methodology: Methods and techniques*. New Delhi: New Age International (P) Limited publishers.
- [17]. Orodho, A.J. (2003). *Essentials of Educational and Social Sciences Research Method*. Nairobi: Masola Publishers.
- [18]. Kombo, D.K., & Tromp, D.L.A. (2010). *Project and Thesis Writing: An Introduction*. (9th Ed.). Nairobi: Paulines Publications Africa.
- [19]. Orodho, A.J., & Kombo, D.K. (2002). *Research Methods*. Nairobi: Kenyatta University, Institute of Open Learning.
- [20]. Nassiuma, K. (2008). *Survey sampling: Theory and methods*. Nairobi, Kenya: Nairobi University Press. Kothari, C.R. (2004). *Research Methodology: Methods and Techniques*. New Delhi: New Age International (P) Limited, Publishers.
- [21]. Mugenda, O.M., & Mugenda, B.G. (2009). *Research Methods-Quantitative and Qualitative Approaches*. Nairobi: Acts Press Publishers.
- [22]. Kimberlin, C.L., & Winterstein, A.G. (2008). *Research fundamentals*. *Am J Health-Syst Pharm*, 65, Nulty, D.D. (2008). The adequacy of response rates to online and paper surveys: What can we do?
- [23]. *Assessment & Evaluation in Higher Education*, 33(3), 301-314.

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