# Determinants of Bank Loan Defaults in Tanzania: A Case Of Iringa Municipality

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## ABSTRACT

This paper attempted to investigate determinants of loan defaults in Tanzania. Specifically it determined the effect of credit assessments and inflation rate on loan defaults in selected banks, namely CRDB, NMB, TPB and EXIM Bank in Iringa Municipality. The study included a sample of 63 months of observations from selected banks in Iringa Municipality. Cross-section survey was applied where stratified random sampling technique was used to collect quantitative data. The data was analysed using linear regression estimation techniques and estimated Ordinary Least Squares estimator. From the results, credit assessments have a negative relationship with the loan defaults, while inflation rate have a positive relationship with the loan defaults. The t- test show that credit assessments and inflation rate have a significant impact on loan defaults and p-values less than 0.05. However, the regression result shows that credit assessments and inflation rate have a significance relationship with loan defaults in Iringa Municipality. The co-efficient of determination, the adjusted $R^2$ amounted to 0.607, which shows that the independent variables explain about 60.7% of the variation in the dependent variable. It was concluded that loan defaults are determined by credit assessment done to borrowers and the level of inflation rate in the country. It was therefore recommended that effective credit assessments should be conducted to reduce possibilities of entailing loans to non-creditworthy applicants. Furthermore, BOT should use monetary policy to control inflation and giving a chance to borrowers to borrow under favorable rates.

## INTRODUCTION

The traditional role of a bank is lending and loans make up the bulk of their assets (Njanike, 2009). However, Lending is not an easy task for banks because it creates a big problem which is called non-performing loans or loan defaults (Upal, 2009). According to Alton and Hazen (2001) loan defaults are those loans which are ninety days or more past due or no longer accruing interest. Due to the nature of their business, Banks expose themselves to the risks of default from borrowers (Waweru and Kalami, 2009).While issuing loans, banks ought to exercise caution in order to avoid cases of default by their potential customers. Several cases of default in a financial institution(s) can easily lead to a collapse in the entire banking system. Saba, et al., (2012) are of the view that loan defaults need to be studied closely as they have caused confusion in the financial markets over the years.

On a global view, banks have faced the challenge of credit risk management and resulted to the credit crisis whereby the roots started with the bursting of the housing bubble and high default rate on sub–prime mortgages in the United States. This situation was a result of high appetites for credit and weak credit controls whereby Lehman brothers collapse and Merrill Lynch and Bear Stearns were sold at fire sale prices (Economist, 2009).

Credit is granted on faith and defined credit as "the ability of a business or individual to obtain economic value on faith, in return for an expected future payment" (Liu and Zhu, 2006). Since trust is built on faith to commit and meet agreed financial obligations, trust, faith, respect and sometimes relationships are compromised if those obligations are not met. Not meeting the obligations is considered as default. Client classifications such as good payers, poor payers and bad payers are commonly used and a payment in arrears for more than three months was considered to be a default in the retail context. The fact that every organization could use any definition meant different scoring systems; risk measures and risk management practices could be used (Gestel and Baesens, 2009).

Moreover, different authors and researchers have different definitions of default. Moody's, a global rating agency, defined default as any missed or delayed payment of interest and/or principal. Standard and Poor, another global rating agency, defined corporate default is recorded upon the first occurrence of a payment default on any financial obligation, rated or unrated (Nawai and Shariff, 2010). According to Chorafas (2007), Basel II defines default as "four different events or a combination of them; ninety days past due, write down, placement on internal nonaccrual list and/or outright bankruptcy". According to the Basel Committee 2006, "a default is considered to have occurred with regard to a particular obligor when either or both of the two following events take place: i) the bank considers that the obligor is unlikely to pay its credit obligations to the banking group in full, without recourse by the bank to actions such as realizing security (if held) and; ii) the obligor is past due more than 90 days on any material obligation to the banking group" (Saita, 2017).

Ahmed (2010) noted major factors affecting loan defaults as diversion of funds on the part of the borrowers, improper appraisal by credit officers, willful negligence and lack of willingness to repay loan. Balogun and Alimi (2012) recognized delays in loan disbursement, loan shortages, small farm size, high interest rate, poor supervision and age of farmers as the causal factors of loan defaults. Moral hazard, large transactions cost incurred by borrowers when applying for loan, monopoly power on credit markets often exercised by informal lenders, and interest rate ceiling usually imposed by the government also come to the fore in accounting for the causes of loan defaults (Kohansal and Mansoori, 2011).

Exploring the determinant factors of loan default is an issue of substantial importance for regulatory authorities concerned with financial stability and banks' management. The credit risk takes the form of non-performing loans (NPLs). Despite the fact that banks have developed sophisticated techniques for quantifying ex ante credit risk by focusing on the borrower's idiosyncratic features. The rate loan default seems to be primarily driven by macroeconomic developments as the business cycle literature has shown (Louzis, et.al. 2012). Louzis, et al., (2012) have focused their study on the effect of bank-specific characteristics such as the quality of management, policy choices, and size and market power on problem loans. A case in point attributed to bank specific factors was evidenced in Greece, where the country's financial sector took a downturn in the financial crunch of 2007. This was due to inefficient management of advancing loans without regard to credibility of borrowers and compromising regulations. The problem of loan default is also wide spread in Asia.

Hoang (2006) recognized that the burden of Non-Performing Loans (NPLs) has slowed the reform process in Viet Nam and hampered the further expansion of the economy. The actual scale of the Non-Performing Loan (NPL) problem in China's banking system is still attracting much attention. A few years back, most estimates put the NPL level within the Chinese system, both carved out and remaining, at around 40% of the total loans outstanding in the late 2000s [Lardy (1998), Dai (2001), Ma (2006)]. Recent statistics from the China Banking Regulatory Commission (CBRC) reported the NPLs of the four major state-owned banks (the big four banks) were just below 10% in the first quarter of 2011. That appears to be a significant improvement in less than ten years. However, a report by Ernst and Young in May 2012, withdrawn shortly after drawing fierce criticism from the Peoples Bank of China, suggested that the NPL at the big four banks could still be as high as 30% (Ma & Fung, 2012).

In the East African region, a study on microfinance loans default in Kenya revealed that most of the small loans were defaulted due to non-supervision of the borrowers from financial institutions, inadequate training of borrowers before they receive loans, and spending of received loans by borrowers in projects other than agreed ones (Bichanga, 2013). Magali (2013) revealed that poor credits risk management practices influence the credits default risks for rural SACCOS in Tanzania. Poor portfolio management also affects the profitability of banks, SACCOS or MFIs. Thus, in order to increase their profitability, the rural SACCOS require effective loan portfolio management strategies. Other factors which influence effective loan portfolio management include management strategies, MFIs or banks' staff competencies, choice of lending methodology and management information system (Crabb and Keller 2006).

Recently, many social and economic challenges experiences occurred in Tanzania which demonstrates the seriousness of the problem of loan default in banking industry. To minimize the opportunities for loan default it would be benefited to many stakeholders to identify reasons for defaulting a loan. Hence, there was an urgent need to explore the determinants of the likelihood of loan defaults in the Tanzanian context. With this background the study intended to investigate determinants of loan defaults in selected banks in Iringa Municipality by focusing on four major banks CRDB, NMB, TPB and EXIM.

The major objective of financial institutions is to provide banking and credit facilities to the poor and to micro-entrepreneurs, who otherwise would lack access to financial services (Akintoye, 2007) cited by Oguntoyinbo (2011). However, lending to micro-entrepreneurs is based on a promise to pay in a certain period. Such transactions entail risk to the financial institution: when borrowers fail to pay, the default constitutes loss to the institution concerned, which eventually impacts negatively on the capital of the institution. It is generally accepted that credit, which is put to productive use, results in good returns. But credit provision is such a risky business that, in addition to other reasons of varied nature, it may involve fraudulent and opportunistic behavior.

Given the above mentioned problem, the performance of most financial institutions, however, has not been encouraging. Many have been plagued with such problems as high default rates, inability to reach sufficient numbers of borrowers, and a seemingly unending dependence on subsidies. Since loan default weakens the financial operations of banks, various efforts have been put in place to reduce the problem. Efforts are articulated in credit collection policies which are used to manage the accounts receivables and manage loan portfolio of most banks (Pandey, 2010). Different policies put into operation various institutional mechanisms to reduce the rate of loan default in commercial banks such as lending methodologies, screening mechanisms, pledging of collateral, third party credit guarantee, credit rating and use of collection agencies (Sewagudde, 2000).

Despite all the mentioned efforts, still loan default was a challenge in banking industry in Tanzania (Magali, 2013; Crabb and Keller 2006). Previous scholar on the topic were either focused on impacts and effects of loan defaults to the financial institutions and borrowers, other were focused on economic and social factors associated with loan defaults (Merlis, 2014; Mzingula, 2013; Bichanga, 2013). However, there was limited information on how banks specific factors, borrowers' specific factors and macroeconomic factors influence the likelihood of loan defaults specifically in Iringa Municipality. This raised interest and hence the need to investigate determinants of loan defaults in selected banks in Iringa as a case. The selected banks were CRDB, NMB, TPB and EXIM Bank.

## LITERATURE SURVEY

### Effects of Credit Assessment on Loan Defaults

Kinyondo (2018) investigated the "Key Factors that Influence Loan Repayment Among Group Borrowers of Microcredit Institutions in Dar es salaam, Tanzania". The study based on 150 respondents from PRIDE and FINCA in Kariakoo Division, Dar es salaam, Tanzania. The researcher used a linear regression model whereby $LR = \alpha o + \beta 1\ EP + \beta 2\ TT + \beta 3\ CA + \beta 4\ SA + U$, whereby $\beta 1 > 0$, $\beta 2 > 0$, $\beta 3 > 0$, and $\beta 4 > 0$. Where LP is Loan Repayment; EP is Experience; TT is Training Time; CA is Credits Assessment; SA is Sanctions and U is Disturbance term. The model was developed based on variable used. The Logit model regression results suggest that experience, training time, credits assessment, lending policies and sanctions have positive and significant effects on loan repayment among group borrowers of MFIs. However, transaction costs, interest rates, and group size have negative and significant effects on loan repayment performance. Finally, the study concluded by suggesting policy options to improve loan repayment performance among borrowers of MFIs in Tanzania. These are, encouraging long term relationship with groups, adequate training of groups, establishing lasting social sanctions with the groups and by the microfinance institutions, cutting down cost incurred by groups and encouraging more coordination amongst MFIs through the creation credit reference bureau.

Magali (2013b) studied on "Factors Affecting Credit Default Risks for Rural Savings and Credits Cooperative Societies (SACCOS) in Tanzania". Ordinary Least Square Estimator was used to determine factors affecting credit default risks for rural SACCOS whereby a total of 63 respondents were included. The researcher used a linear regression model whereby $CDR = \alpha o + \beta 1\ IR + \beta 2\ CA + U$, and $\beta 1 > 0$, and $\beta 2 < 0$. Where CDR is Credits Default Risks; CRM is Inflation; CA is Credits Assessment; and U is Disturbance term. The study revealed that high rate of inflation and lack of credits assessments significant influence credits default risks for rural SACCOS in Tanzania. Poor portfolio management also influences negatively the profitability of banks, SACCOS or MFIs. Thus, in order to increase their profitability, the rural SACCOS require effective loan portfolio management strategies.

Makorere (2014) studied "Factors Affecting Loan Repayment Behavior which Leads to Default in Dar -es- Salaam and Morogoro, Tanzania". The study used cross section design and applied convenience sampling technique to obtain sample size of 100 respondents. The study used questionnaire tool to capture primary data, while descriptive statistics was used to analyze data in frequencies and percentages. The descriptive results showed that the uttermost factors like moral hazard, electricity rationing, and economic stability have strong effects in stimulating loan repayment behaviour in Tanzania. The study concluded that government intervention is important and financial institutions should assess credit risk management adequately using collateral, condition, characters, capacity and capital measurement to control delinquency rate.

### Effects of Inflation Rate on Loan Defaults

Agarwal, et al., (2019) assessed "The Role of Individual Social Capital Information Characteristics on Household Default and Bankruptcy Outcomes in South Africa". They used monthly panel data set of 63 credit cardholders for a period of over 24 months. With the observations of each borrower's default and bankruptcy filing status they were able to find distress factors such as riskiness, spending, debt, income, wealth, economic conditions such as inflation rates, exchange rates, unemployment rates, as well as legal environment and socio-demographic characteristics to significantly affect default. Correlation analysis was used in data analysis. Their results showed that borrowers who migrate from their state of birth were more associated with loan defaults. Another finding

was that a borrower who is married and owns a house of his own has a lower risk of default.

Berhanu (2015) studied on "Socio-Economic, Institutional and Natural Factors that Affect Loan Repayment Capacity of Smallholder Farmers in North Gondar, Ethiopia". Data used for this study were collected from a sample of 50 borrowers through structured questionnaire. Two-limit Tobit model was employed to analyze factors influencing loan repayment and intensity of loan recovery among smallholder farmers. Ordinary least square estimator was used in data analysis. The researcher used a linear regression model whereby LD = $\alpha o$ + $\beta_1$ LHS + $\beta_2$ LH + $\beta_3$ EP + $\beta_4$ SC + U, and $\beta_1 < 0$, $\beta_2 < 0$, $\beta_3 < 0$, and $\beta_4 < 0$. Where LD is Loan Defaults; LHS is Land Holding Size; LH is Livestock Holding; EP is Experience; SC is Sources of Credit; and U is Disturbance term. Five variables were found to significantly influence the loan repayment. These were land holding size of the family, total livestock holding, number of years of experience and sources of credit from off -farm activities. Livestock holding, number of years of experience and sources of credit were found to have insignificant effect on loan defaults of smallholder farmers.

Kumbo, (2018) conducted a study on "Determinants of Formal Source of Credit Loan Repayment Performance of SMEs in Tanzania". A case study was employed whereby 50 SMEs were involved. Data were analyzed using descriptive analysis. The study found that availability of alternative sources of income; family size and purpose of borrowing were found to significantly influence the loan repayment.

Vasanthi and Raja (2016) estimated "The Likelihood of Default Risk Associated with Income and Other Factors in Australia". The study used survey design and sample of 63 households. The study aimed at seeking the relationship between the default risk and socio-economic and housing characteristics. Correlation analysis was used in data analysis. Results showed that the age of the head of the household is significant in determining the probability of loan default. That is, the younger households tend to be adversely affected by the increasing burden of repayments. Income as socio-demographic variable show to have a significant effect, and that low income contributes to default. Another important factor was the loan to value ratio, diversion of fund, loss of job, illness, educational level of the head of household and marital status had significance impact on default. The study concluded that the probability of default is higher with an uneducated, younger and divorced as head of the family compared to others.

Bichanga, (2013) studied on "Causes of Loan Default within Micro Finance Institutions in Kenya". The study used cross-section design and applied convenience sampling technique to obtain sample size of 60 respondents. Descriptive statistics was used to analyze data in frequencies and percentages. The study revealed that most of the small loans were defaulted due to non-supervision of the borrowers from MFIs, inadequate training of borrowers before they receive loans, spending of received loans by borrowers in projects other than agreed ones, and loss of job.

## METHODOLOGY

This study is an attempt to investigate determinants of loan defaults in Tanzania. Specifically it determined the effect of credit assessments and inflation rate on loan defaults in selected banks, namely CRDB, NMB, TPB and EXIM Bank in Iringa Municipality. The study included a sample of 63 months of observations from selected banks in Iringa Municipality. Cross-section survey was applied where stratified random sampling technique was used to collect quantitative data.

## ANALYSIS

Quantitative data was analysed through Linear Regression using Ordinary Least Square Estimator. Magali (2013b) used a Linear Regression estimates using Ordinary Least Square Estimator on data analysis, thereafter, this study also used a Linear Regression analysis and OLSE based on the model showing relationship between loan defaults as dependent variable to credits assessment and inflation rates as independent variables that is,

NLD = f (NLA, IR)

The model was specified as linear; that is,

NLD =  $\alpha o$ + $\beta_1$ NLA + $\beta_2$ IR + U

Where,

NLD = Number of Loan Defaulted;   NLA= Number of loan application assessed; IR= inflation rates; U= Disturbance term.

In order to bring order, structure and interpretation of the quantitative data, the researcher systematically organized data by coding it into categories and constructing matrixes. Statistical Package for Social Sciences software (SPSS 20) was used to run the analysis and reach the conclusion of the study.

## RESULTS

### Multiple Linear Regression Analysis

Multiple linear regression analysis was also conducted to examine how independent variables (number of loan application assessed and inflation rates) affect the dependent variable (number of loan defaulted) whereby 63 observations were used. According to Weiers (2015), a multiple linear regression analysis is an analysis that involves one dependent variable and two or more independent variables. In other words, it is an analysis of association in which the effects of two or more independent variables on a single, interval-scaled dependent variable are investigated simultaneously (Zikmund, 2015).

**The Economic Theory Test**

The model used, as shown from the conceptual model, was linear regression;

That is

NLD = f (NLA, IR)

**Where,**

NLD = Number of Loan defaulted; NLA = Number of loan application assessed; IR = Inflation Rate; U = Disturbance term.

And $\beta_1 < 0$ and $\beta_2 > 0$

The estimated linear model was NLD = -0.521 − 0.547NLA + 0.731IR

   (-2.047)  (-3.246)    (4.275)

$\overline{R}^2$ = 0.607, F = 20.418, and t values are in parentheses

From the economic theory test, all signs from parameters conform to the hypothesized signs from the economic theory. Moreover, the magnitudes of parameter estimates are sufficiently larger.

**Table 1**: Coefficients

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -.521 | .514 | | -2.047 | .000 |
| | Number of loan application assessed | -.547 | .563 | -.529 | -3.246 | .014 |
| | Inflation Rate | .731 | .668 | .534 | 4.275 | .000 |

a. Dependent Variable: Number of Loan defaulted

The estimated regression model indicates that a one unit increase in number of loan application assessed leads to a change of -0.547 in number of loan defaulted. A one percentage change in inflation rate leads to an increase of 0.723 in number of loan defaulted. All two parameter estimates are statistically significant at 5% level. However, all algebraic signs of the parameter estimate for number of loan application assessed and inflation rate conform to the hypothesized signs.

**T-Statistical Test**

This was used to test the significance of the parameter estimates of the model.

The estimated linear model was NLD = -0.521 − 0.547NLA + 0.731IR

   (-2.047)  (-3.246)    (4.275)

The t-values are all greater than 2.0. Therefore, according to the rule of thumb, the parameter estimates are statistically significant. That is they determine number of loan defaulted in Iringa Municipality.

**F- test**

**Table 2**: Analysis of Variance – ANOVA

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 41.500 | 2 | 10.225 | 20. 418 | .006[b] |
| | Residual | 23.957 | 60 | .525 | | |
| | Total | 65.457 | 62 | | | |

a. Dependent Variable: Number of Loan defaulted

b. Predictors: (Constant), Number of loan application assessed, Inflation Rate

**Interpretation**

This was used to test the overall significance of the regression results.

The hypothesis is:

$H_0$: $\beta_1 = \beta_2 = 0$ (model insignificant)

$H_A$: $\beta_1 \neq \beta_2 \neq 0$ (model is significant)

The level of significance is 5% = 0.05 with 95% confidence interval.

The calculated 'F' as shown in Table 2 is 20. 418 and the critical F-value (from tables) is 4.13

Since the calculated 'F' is greater than critical 'F', the researcher rejects null hypothesis in favor of the alternative hypothesis; that is, $\beta_1$ and $\beta_2$ are statistically different from zero implying that credit assessment and inflation rate, determine loan defaults in Iringa Municipal.

**Adjusted R² Test**

Table 3: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
| | | | | | R Square Change | F Change | df 1 | df 2 | Sig. F Change | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .719 a | .634 | .607 | .73712 | .712 | 22.418 | 2 | 60 | .000 | 2.541 |

a. Predictors: (Constant), Number of loan application assessed, Inflation Rate,
b. Dependent Variable: Number of Loan defaulted

**Interpretation**

This test was used to explain the total variations in the dependent variable i.e. number of loan defaulted caused by variations in the independent variables i.e. number of loan application assessed and inflation rate. In the case of the regression output the adjusted $R^2$ = 0.607, implying that the model explains about 60.7% of the variations in the loan defaults in Iringa Municipality.

Also, since, R coefficient is 0.719 it means that there is a correlation of 71.9% between the independent variables (number of loan application assessed, inflation rate) and dependent variable (number of loan defaulted). This shows that the independent variables (number of loan application assessed and inflation rate) are significant predictors of the dependent variable (number of loan defaulted) in Iringa Municipality.

**DISCUSSION**

The study was about to investigate determinants of loan defaults in selected banks, in Iringa Municipality. As a prelude to the analysis, two specific objectives were developed. The findings for each objective are presented below.

**The Effects of Credit Assessments on Loan Defaults in Iringa Municipality**

From the study it was revealed that credit assessment has a negative and significance effect on loan defaults since the p-value was less than 0.05. If credit assessments are increased to borrowers, the rate of loan defaults will fall. The higher rate of credit assessments discourages borrowers to defaults immediately; therefore, increasing the assessments of credits borrowers will decrease the rate of loan defaults in Iringa Municipality.

The findings in this study are similar to the study done by Kinyondo (2018) who investigated the "Key factors that influence loan repayment among group borrowers of microcredit institutions in Dar es salaam, Tanzania". The Logit model regression results suggest that experience, training time, credits assessment, lending policies and sanctions have positive and significant effects on loan repayment among group borrowers of MFIs. However, transaction costs, interest rates, and group size have negative and significant effects on loan repayment performance. Finally, the study concluded by suggesting policy options to improve loan repayment performance among borrowers of MFIs in Tanzania.

Therefore, findings of Kinyondo (2018) conform to the study hypothesized results as the findings show that there is a negative relationship between credit assessments and loan defaults and the p-value was less than 0.05.

**The Effects of Inflation Rate on Loan Defaults in Iringa Municipality**

The study revealed that inflation rate is positive significance related to the loan defaults since the p-value was less than 0.05. High inflation rate discourage borrowers to pay back their bank loans, especially when there is higher inflation in the country, which means that the value of money has been depreciated, borrowers suffers to pay back their bank loans hence increasing loan defaults. If inflation rate is low, this will encourage borrowers to pay back their bank loans hence it leads to get more access to higher bank loans in Iringa Municipality.

These findings are similar to the study done by Magali (2013b) studied on "Factors affecting credit default risks for rural Savings and Credits Cooperative Societies (SACCOS) in Tanzania". The study revealed that high rate of inflation and lack of credits assessments significant influence credits default risks for rural SACCOS in Tanzania.

Therefore, findings of Magali (2013b) conform to the study hypothesized results as the findings show that there is a positive relationship between inflation rate and loan defaults and the p-value was less than 0.05.

**Summary of Hypothesis Testing**

Findings of the study revealed that all two explanatory variables had significant effect on loan defaults as shown in Table 7 below.

Table 4: Summary of Hypothesis Testing

| Hypothesis | Variable | Accept/reject | Significance |
|---|---|---|---|
| $H_A$ | Number of loan application assessed | $H_A$ is accepted | 0.014 |
| $H_A$ | Inflation Rate | $H_A$ is accepted | 0.000 |

## CONCLUSION

Credit assessments and inflation rate have found to have significance effect on loan defaults as indicated from the regression results. In such sense, loan defaults determined by credit assessments done to borrowers and the level of inflation rate in the country for borrowers to pay their debts. There will be a need for financial institutions to effectively conduct credit assessments to borrowers depending on their ability to pay and enhancing loan managements so as to increase the level awareness on how to use bank loan for profit generation and be able to pay their debts. Moreover, this would reduce the level of loan defaults in Iringa Municipality. Therefore, credit assessments and inflation rate are the good predators of loan defaults in Iringa Municipality.

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