

Empirical Analysis on the Impact of Management Efficiency and Watch Loans on the Bankruptcy Rate of Community Banks in Tanzania: A Random Effect Model Approach

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ABSTRACT

This paper analyses the impact of management efficiency and watch loans on the bankruptcy rate of community banks in Tanzania, for the period ranging from 2006 to 2021. In Tanzania, for the period starting from 2017 to 2019, seven community banks were closed by the Regulator while others were being merged to increase their operational efficiency and going concern. The failure of these banks raised a lot of concerns among banks' stakeholders including private sector, the government and the general public. The study used archival reviews as one of the tools for secondary data collection in quantitative research where panel data were collected from community banks and the Bank of Tanzania publications. The employed sample size was 11 community banks, with a total of 176 observations. The panel data analysis has been conducted using statistical software (Stata) with the random effect model being used to generate regression results as one of the statistical models for panel data analysis. The research findings indicated significant negative correlations between the explanatory variables, namely, management efficiency and watch loan ratios with bankruptcy rates as computed using the Altman's model approach specific for developing countries. This paper contributes to the contagion theory by arguing that not only bank runs that causes bank failure, but also there are other factors such as; management inefficiency and high level of watch loans as justified by the theory of market structure and asymmetric information theory. Further, for the purpose of diminishing bankruptcy rate of community banks, the study recommends adequate credit management policy in terms of proper credit appraisal systems and strong corporate governance policy, which reduce level of watch loans and operational costs.

Keywords: Management Efficiency, Watch Loans, Community Banks, Bankruptcy Rate and Altman's Model

INTRODUCTION

The magnitude of the global financial crisis in 2007 and 2008 demonstrated how banks are inextricably linked to the global economy. The crisis identified some of the causes as supported by Buthiena (2019) and Veitch (2019), which include poor management, weak bank stability, and a high level of non-performing loans as escalated by high level of watch loans. Researchers in Africa had identified some challenges facing community banks in many countries with diverse financial systems. In Kenya, Kipkirui (2018) indicated that effective risk management increases the performance of microfinance banks due to fact that good management enhance efficiency in terms of low operational cost and watch loans that eventually reduce the bankruptcy rate. In the same perspective, Mugo (2018) pointed out non-performing loans resulting from increased level of watch loans as a major determinants of credit risk upturns that finally affects the bankruptcy rate of microfinance banks. Further, Akani and Uzah (2018) indicated that Nigeria has also experienced rises of banks' distress and bankruptcy rate, which elevated unanswered questions, which justifies the necessity to investigate factors behind the bankruptcy of banks and reduce contagion effect on good operating banks.

In Tanzania, for the period from 2017 to 2019, seven (7) community banks went bankrupt, and some of them merged to increase their operational efficiency. The Tanzania banking sector is characterized by an anomalous increase in the level of watch loans, which are termed as a signal for bad loans at an average rate of above 5.5 percent. In same perspective, BOT (2021), Asima (2021), Nyagol and Otieno (2016) pointed out that high level of watch loans affects other loan categories, which include substandard, doubtful, and loss. Further, the banking sector in Tanzania is characterized by having different banks with unique physiologies in terms of management efficiency, that is why some of community banks fail in their operations due to this challenge.

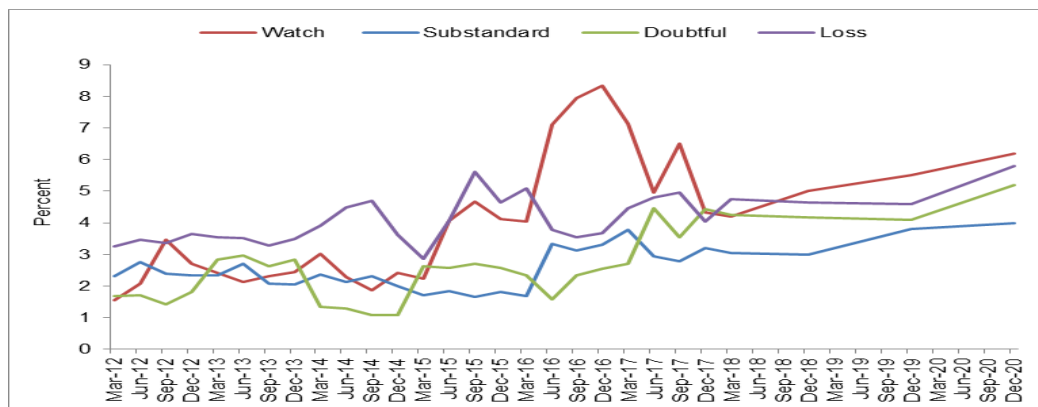


Figure 1.0: Trends of Watch Loan Ratios in Tanzania Banking Sector
Source: BOT, (2021)

However, some studies ended with inconclusive results. For instance, BOT (2021), IMF (2019), Lucas (2019), Amr (2019), Josephat (2019), Asongu & Odhiambo (2019). pointed out negative relationship between watch loans and banks’ failure implying that when watch loans increases, the bankruptcy rate decreases while other reports such as that produced by National Bank of Rwanda (2018) explained positive relationship, which means that when watch loans increases, the bank failure also rises. In different thought, Kartika, Sulistyowati, Septiawan and Indriastuti (2022) portrayed no impact of watch loans and management efficiency against bank failure due to reason that watch loans are just indicator of non-performing loans, thus not directly related with bankruptcy rate.

Further, other referenced studies such as; Lotto (2019) did not focus on community banks sub-sector but mainly focused on all commercial banks, the individual bank, whole banking sector and based on certain region, thus creating a contextual gap. In addition, there is no any researcher who has computed the proxy of the bankruptcy rate of community banks as a dependent variable in Tanzania, hence creating a methodological gap. In addition, some studies such as; Asongu & Odhiambo (2019). used a case study strategy, key informant interviews and questionnaires as methods to collect primary data from the purposively selected respondents while Lucas (2019) used to bit regression and triangulation methods to analyze the collected secondary data, thus creating a methodological gap. Theoretical gap exists as constructed with facts from contagion theory. Muriithi (2017) supports the theory by explaining that good banks may fail due to fail of another bank

caused by bank run (massive deposits withdrawal) as the effect of public panic. This theory is also supported by the view of the theory of lemons that evidenced a massive deposits withdrawal by customers (bank runs) when one bank fails in the market as a result of public panic (Sutton, 2006 & Ezenekwe, 2019). However, the theory is being challenged by not taking into consideration of other individual specific factors that absorb shocks exerted from the failed banks or have great influence on bank's failure rather than focusing only on the failure of a bank due to spillover effect of bank runs. In that regard, the ultimate intention of the study is also to address the key identified gaps. The primary objective is to assess the impact of explanatory factors, specifically management efficiency and watch loans ratio, which affecting the bankruptcy rates of community banks in Tanzania banking sector. In that manner, this study has decomposed the general objective into specific objectives for effective assessment of correlations between the variables. The first objective was to analyze the effect of management efficiency on the bankruptcy rate (Altman's Z-Score) of community banks in Tanzania banking sector while the second objective was to analyze the effect of watch loan ratio on the bankruptcy rate (Altman's Z-Score) of community banks in Tanzania's banking sector.

The study used some assumptions as a combination of the underlying study variables for effective and successful completion of the study. The first assumption is that the financial intermediation is the main activity of community banks in Tanzania, which gather deposits and lend to deficit borrowers as evidenced by the financial intermediation theory of banking. The Second assumption was that an information gap exists between lenders and borrowers that leads to adverse borrower selection and, thus, results in increase of non-performing loans that may further increase the bankruptcy rate for community banks. Lastly, the third assumption is that there is a significant level of interconnectedness among banks, which may expose the sector into bankruptcy vulnerabilities via contagion and systemic risks. The study was based on four theories, namely; contagion theory, theory of market structure, asymmetric information theory and financial intermediation theory of banking. According to Schoenmaker (1996) and Diamond & Dybvig (1983), the contagion theory explained that if one bank fails due to the internal factors that are only in that one bank such as fraud and reported losses then other banks could be adversely affected in the long run. The theory further stated that banks are interconnected to each other by virtue of their linked and

heterogeneity assets (Muriithi, 2017). Thus, in banking context, the theory concluded that good banks may fail due to fail of another bank caused by bank run as the effect of public panic. However, the theory is being challenged by other studies such as; Muriithi (2017), Mohamed and Magdy (2020) by not take into consideration individual specific factors that may absorb shocks exerted from the failed banks or have great influence on bank's failure rather than focusing only on the failure of a bank due to spillover effect of bank runs emanated from other failed banks. Sutton (2006) and Ezenekwe (2019) in their study about Market Structure, explained main variables in the theory of market structure, which include competition, market concentration (market share) and economies of scale (barrier to entry) as a result of good management. This implying that the bank with good management than other banks, tends to dominate the market (Ezenekwe, 2019; Basharat, 2020) and increase its going concern.

However, the theory of market structure is being challenged by not considering other factors that may increase barriers for a new entrant firm such as political influence and poor management of the respective firm (Basharat, 2020). The asymmetric information theory was first introduced by Arkelof (1970), which deals with the study of decisions in transactions where one party has more or better information than the others. Asymmetry of information occurs when lenders have little information about borrowers, which increases the level of non-performing loans via watch loans and therefore intensifies the bankruptcy rates (Michael, 2021). This asymmetry happens through creation of an imbalance of power in transactions, which can sometimes cause the transaction to go away or a kind of market failure in the worst case. He first introduced the concept of asymmetric information in the paper "The Market for Lemons." Asima (2021), Buthiena (2019) and Werner (2016) supported the view of the study, which normally explains that information gap leads to adverse selection of the borrower, thus increase level of watch loans, which subsequently rise bankruptcy rates of community banks. Different theoretical review on failure of community banks indicated significant linkage between bankruptcy rate and the explanatory variables, namely, management efficiency and watch loans generated as a result of information gap. Some of these review such as; Ahmet and Harun (2019), Buthiena (2019) and Lucas (2019) pointed out that poor management efficiency and a high level of watch loans, negatively contribute abundantly to the upsurges in the bankruptcy rate of

community banks. This is due to fact that when there is poor management of banks, the respective bank fails to expand business and compete with others in terms of lending portfolio and deposits, thus exposed to the vulnerability of bankruptcy. In that regard, community banks' management is responsible for creating fundamental centricity for increasing performance, thus helping to raise strength to withstand external shocks emanating from the macroeconomic environment (Ahmet & Harun, 2019). In the current banking sector with high network intensity among commercial and community banks, banks tend to increase the efficiency of management in order to strengthen their survival rate (Peter, 2018 & Ghislain, 2018) and therefore reduce their bankruptcy rate. In same argument, Josephat (2019) and Faqera (2019) argued that the effect of organization's management efficiency has great influence on the trends of bankruptcy rates when this pillar moves adversely because different stakeholders will be less interested in investing their funds, such as deposits. For the case of watch loans, Bank of Tanzania(BOT) (2021) justified that when these loans category increases, the possibility of bankruptcy rate also rises accordingly. This stance is based on further reasons that some of these loans normally migrate to other loan categories like substandard, doubtful and loss.

For instance, some literature reviews have argued that watch loans seemed to have a negative relationship with the bankruptcy rate, implying that when the level of watch loans is higher, it affects non-performing loans and therefore escalates credit risk for the respective bank, which then rise possibility of bankruptcy of community banks. In the same perspective, most reviews such as NBR (2018) indicates negative relationships between watch loans and bank failure based on same ground that when watch loans increases, the bankruptcy rates also decrease implying upturns of bankruptcy of community banks. Other studies such as Peter (2018) and IMF (2019) shown that Tanzania's banking sector, has high level of watch loans, as evidenced by the high level of credit risk in the sector. In other context, watch loans are considered as non-performing loan indicators as being experienced by even big countries with different banking systems and economies like Italy and Greece. Therefore, some reviews explained watch loans as non-performing loans indicators rather than being a straight factor that may cause bankruptcy of community banks. Through various experience in the world, a lot of non-performing loans have been observed as a result of high level of non-performing loans. For instance,

in Russian economy experienced a similar trend when the average level of watch loans impacted the non-performing loan ratio in the 1990s, which was about 15% but decreased significantly to about 3% in the early to mid-2000s before going back up (Nyagol & Otieno, 2016). In same manner, it has been stated that Regulator has the role to intervene when the banks indicate signals of bankruptcy. However, this risk remains high, as evidenced by the continuation of increases in the level of non-performing loans caused by an excessive level of watch loans. The review of empirical literature indicated presence of significant relationships between the explanatory variables, namely, management efficiency and watch loans against the bankruptcy rates of community banks. For instance, Faqera et al. (2019) he investigated the influence of management efficiency in banks' bankruptcy through a study titled "Bankruptcy and Corporate Governance: the Impact of Firm Performance and Macroeconomic Factors".

The study employed Z-Score bankruptcy model and management efficiency i.e., return on assets and return on equity as explanatory variables against banks' performance as dependent variable for the period of five years ranging from 2006 to 2010. The data analysis was conducted using the SPSS program while the selected sample consists of the Northern rock's bank. Based on the statistical results, the descriptive statistics illustrated that management efficiency of the company (the bank) has a negative correlation with a score of -17 percent. On the other hand, it was also observed that there is a significant positive influence between Altman Z score and performance in terms of return on equity. Generally, it was concluded that the lower the score, the higher the risk of bankruptcy for firms, including other financial institutions such as banks. For instance, the study suggested that if a Z-Score is above 0.001 shows financial soundness while underneath 0.10 recommends a high probability of failure. In different perspective, Lucas (2019) in the study of micro and macro-economic drivers of inefficiencies in community banks in Tanzania, stated that over a span of years, efficiency in Tanzanian Community Banks (CBs) had been at a low level. The study covered the period from 2002 to 2017. The dependent variable was inefficiency scores, while the explanatory variables used were management efficiency (net interest margin), gross loan to total deposit (Gltd) ratio, return on average assets (RoaA), capital adequacy ratio (Car1), bank size (logAssts), gross domestic product (loggdp) and market lending rates (lrates). Using tobit regression and triangulation

methods, the study analysed the drivers of inefficiency at community banks. The results indicated that management efficiency is statistically significant and positively related to bank inefficiency operations. Faqera et al. (2019) ended with negative correlation while Lucas (2019) ended with positive correlation between Management efficiency with banks' performance (survival of banks). Further, the study conducted by Lotto (2019) titled "Evaluation of Factors Influencing Bank Operating Efficiency in Tanzania's Banking Sector," using 36 commercial banks for the period between 2000 and 2017. The included variables were liquidity and capital adequacy as explanatory variables while management efficiency (operating efficiency) was used as dependent variable. The paper employed a robust random-effects regression model to estimate the relationship between bank's management efficiency and its determinants. The results shown that bank liquidity and capital adequacy have a positive relationship with bank management efficiency, implying that when management efficiency increases, level of liquidity and capital adequacy also increases, thus reduce bankruptcy rate of the respective bank. In addition, Dzomira (2014) in the study titled "Analysis of Bank Failures During Financial Tumult in Africa-Zimbabwe. A Historical Review". The paper described analysis of the bank failures phenomenon in Africa with major consideration in Zimbabwe banking sector, based on historical research design. The explanatory variables were management efficiency i.e. flawed corporate governance standards, liquidity and capital position while dependent variable was bank failure. From this study, it was discovered that the failing of banks was attributed to poor management efficiency, which caused drainage of liquidity and capital position of banks. In same perspective, Ariemba et al. (2016) in the study titled "The Effect of Bank Specific Factors on Financial Performance of Commercial Banks in Kenya. The main purpose of this study was to determine the effects of bank specific factors on the financial performance of commercial banks in Kenya for a period of 5 years, starting from the year 2011 to 2015. The dependent variable under investigation was return on assets (ROA). The independent variables were capital adequacy, asset quality, management efficiency, earnings ability and liquidity. The specific objectives of this research were to determine the effects of capital adequacy, asset quality, management efficiency, earnings ability on the financial performance of commercial banks in Kenya. In this research, the scope was all the 11 banks listed in the Nairobi securities exchange. This study adopted an explanatory approach by using panel data research design to fulfil

the objectives. The researcher collected data on published financial statements of the 11 commercial banks listed in the Nairobi securities exchange for five years from 2011 to 2015. The collected data was analysed using multiple linear regression models to show the effect of bank specific factors on financial performance of commercial banks. The results indicated that there was positive and significant association between ROA and all the independent factors. This imply that management efficiency has negative relationship with bankruptcy rate of banks while watch loans (as main indicator of non-performing loans) also has negative relationship with bankruptcy rate of banks. Further, the study explained that the asset quality of banks has been deteriorated due to high level of watch loans and low efficient of management of those banks, thus recommended mitigation for watch loans levels and having in place strong management in order to ensure that banks do not become insolvent.

Furthermore, the study conducted by Catherine (2020) with research title “Credit Risk Management and Financial Performance: A case of Bank of Africa (U) Limited” explained that adequate strategies to minimize watch loans (as the main indicator of non-performing loans) and high management efficiency play major role in improving credit risk management, which then reduce bankruptcy rates of a specific bank. In different view, Dzomira (2014) in his study titled “Analysis of Bank Failures During Financial Tumult in Africa-Zimbabwe: A Historical Review” described analysis of the bank failures phenomenon in Africa with major consideration in Zimbabwe banking sector, based on historical research design (qualitative design), which used analytical and comparative research approaches to study the bank failures phenomenon. From the study, Dzomira (2014) discovered that the failing of banks was attributed, among others, to high level of watch loans (non-performing loans), which caused drainage of liquidity and capital position of banks. Also, Munangi (2020) in his study titled “An Empirical Analysis of the Impact of Credit Risk on the Financial Performance of South African Banks” concluded that watch loans were negatively related with financial performance and positively related with bankruptcy rate of banks. This implies that the higher the incidence of watch loans (non-performing loans), the lower the profitability of the bank, thus increases bankruptcy rate of a specific bank. In addition, Emenike et al. (2014) in the study titled “Poor Management and Failed Banks: A Study of Banks with State Governments Participation in

Nigeria” explained that banks fail when they become unable to meet demands from depositors and shareholders’ funds being eroded due to poor management characterized by creation of bad loans (watch loans), insider abuses, and bad corporate governance culture among others. Other regulatory reports such as the financial stability report published by the Bank of Tanzania in 2020 and 2021 indicated that the level of watch loans in banks impacts the level of non-performing loans, which then drive the bank into bankruptcy if not well monitored. The reasons being that some proportion of these watch loans normally migrate into the substandard, doubtful, and loss loan categories, which constitute level of non-performing loans, thus increasing bankruptcy rate. For instance, International Monetary Fund (IMF) in its financial assessment report of 2019, indicated that the classification of watch loans includes currently up-to-date loans accompanied by factors that could in the future affect borrowers’ ability to service accounts or impair collateral, thus escalates bankruptcy rate of banks.

The National Bank of Rwanda through its published Stability Report of 2018, it indicated that the classification and descriptions of watch loans included currently up-to-date loans accompanied by factors that could in the future affect borrowers’ ability to service their accounts or impair collateral. Both cited reports, explains watch loans as being having negative relations with bankruptcy rate. Indriastuti et al. (2022) conducted a study titled “Corporate governance and non-performing loans: the mediating role of financial performance”. The research data were processed by structural equation modeling based on partial least squares. The results of this study indicated that the management efficiency as represented by audit committee, CEO duality and independent commissioners do not affect banks failure through high level of non-performing loans while financial performance positively affects non-performing loans and bank failure. They said that management efficiency i.e. audit committee, CEO duality, and independent commissioners is required to stabilize and minimize level of watch loans (non-performing loans) in banks. Further, the study explained that high level of watch loans as indicator of non-performing loans indicated a bank’s failure to manage its banking business, thus increase probability of failure for the respective bank. They added that the increasingly uncontrollable non-performing loans with a net position of above 5% will make the bank a patient regulator in the category of banks under intensive or special supervision. In that regard, they concluded that

management efficiency has nothing to do with bank failure while watch loans have positive impact on the bankruptcy rate of banks. Gwahula et al. (2018) examined the impact of watch loans as indicator of non-performing loans on commercial bank profitability in Tanzania using asymmetry theory and bad management hypothesis. The study adopted causality research design using panel data (2007 – 2015) of 16 commercial banks in Tanzania. The study employed method of descriptive statistics and multiple regression analysis estimation, likewise ordinary least squares (OLS) regression techniques also used and then considered fixed effects and random effects assumption. The study found that occurrences of high level of watch loans is negatively associated with the level of profitability in commercial banks in Tanzania while liquidity and growth domestic product is also negative and statistically insignificant with the return on assets. Further, the study concepts indicated that watch loans or bad loans are just an indicator of non-performing loans, thus, may have no impact on bankruptcy rate.

Kingu and Macha (2018), Jeremiah (2016) and Buthiena (2019) pointed out that the designed conceptual framework aims at providing structure understanding on concepts and relationships of the identified explanatory and the dependent variables as centered on the interpretation of research findings against research hypotheses. The framework is based on classical positivist where the researcher collects data, conduct analysis and test results against the formulated hypotheses. The framework has used watch loan ratios and management efficiency as explanatory variables and the bankruptcy rate, which has been computed using the Altman's Z-score as a dependent variable. These variables' concepts are being linked with key theories, namely, theory of market structure, contagion theory, asymmetric information theory and financial intermediation theory of banking have been assisted in the construction of the conceptual framework. Therefore, this framework indicates how the mentioned explanatory variables impact level of bankruptcy rates of community banks under the case of worse scenario (unfavorable movement).

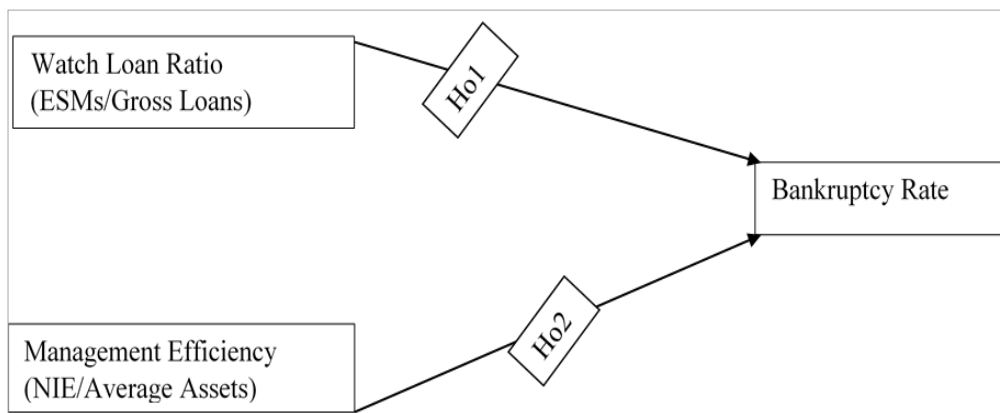


Figure 1: Conceptual Framework

Source: Authors (2023)

Therefore, research hypotheses have been developed from the formulated research objectives (ROs) explained above and the conceptual framework as identified in figure 1.0. The two formulated hypotheses are:

Ho1: There is positive relationship between watch loans ratio and bankruptcy rate (Altman's Z-score) of community banks in Tanzania banking sector (RO1); and

Ho2: There is positive relationship between management efficiency and bankruptcy rate (Altman's Z-score) of community banks in Tanzania banking sector (RO2).

This paper is organized in four parts as follows: - Section 1 explains an introductory part specifically on the background of the study, objectives, research gaps, conceptual framework and study hypotheses. Accordingly, section 2 provides a brief description of the study methodology in terms of all procedures and strategy employed by in this study, which includes sample size and data collection. Further, section 3 displays data analysis, which includes different regression diagnostic tests, type of model employed and results while section 4 provides explanation and discussion of regression results against the empirical evidence. Lastly, section 5 provides study implications, limitations and conclusion.

Methodology

The study used non-probability sampling approach based on purposive sampling, whereby all four (4) existing and seven (7) closed community banks were being considered as a sample for this research. In that regard, the study used a sample size of 11 community banks, which comprised of 100 percent of the intended population with 176 total observations. The secondary data were collected from financial statements of community banks and the database of the Bank of Tanzania for a period of 16-years, which range from 2006 to 2021. The study employed a random effect model rather than a fixed effect model due to naturalist of the employed panel data, based on the abilities and limitations of each model. Baum (2006) expressed the regression model for Random Effect panel data as follows: $y_{it}=x_{it}\beta_k+z_i\delta+(u_i+\epsilon_{it})$

Where

$y_{i,t}$ = dependent variable and represents the bankruptcy rate of bank i at the time t ,

x_{it} = variables that vary over individual unit and time,

β = coefficients of explanatory variables,

z_i = time-invariant variables that vary for individual banks,

δ = is the coefficient of variables for time-invariant variables,

u_i = is the individual effect; and

$(u_i+\epsilon_{it})$ = is the composite error term.

For the random effect model to yield consistent results, a critical assumption of this model was that u_i was uncorrelated with the regressors, namely, x_{it} and z_i (Baum, 2006). The data variables used in this study were as identified in Table 2.1 and 2.2.

Table 2.1: Descriptions of Dependent and Independent Variables

Variable	Types of Variable	Authors
Bankruptcy Rate	Dependent	(BOLAT, 2017)
Watch Loans Ratio	Independent	(NBR, 2018 and BOT, 2021)
Management Efficiency	Independent	(Lucas, 2019 and Buthiena, 2019)

Source: Literature review and Authors, (2023)

Table 2.2: Expected Signs of the Explanatory Variables

Variables	Symbol	Descriptions	Expected Sign
Watch Loans Ratio	Wlr	WLs/Gross Loans	–
Management Efficiency	Me	NIE/Average Assets	–

Source: Literature Review and Authors, (2023)

Data Analysis and Results

Various regression models produce unique specifications and diagnostic tests. These tests allow researchers to determine whether the regressions are appropriate to serve as information regarding the determinants of the dependent variable, namely, the bankruptcy rate of community banks, for the purpose of this study. Therefore, different diagnostic tests and estimated results are discussed as part of research procedures. The study included a constant term in the regression equation (Brooks, 2008), thus the error zero mean ($E(e) = 0$) assumption is not violated. In order to test the data stationarity, the assumption was tested using the Levin-Lin-Chu unit-root test, and the summary of the results is shown in Table 2.3. The null hypothesis (H_0) was that, all the panels contained a unit root, while the alternative hypothesis was that the panels were stationary. Because all p-values for all independent variables were less than 0.05, H_0 was rejected, indicating that the stationarity assumption holds for all independent variables.

Table 2.3: Stationary Test based on the Levin-Lin-Chu Unit-Root Test

Variables	brt	Wlr	me
Unadjusted t	-7.0144	-7.7254	-7.2908
Adjusted t*	-3.1674	-3.8963	-2.9003
P-value	0.0000	0.0000	0.0019
Average Lags	8.0000	8.0000	8.0000

Source: STATA, (2023)

Further, the study conducted test for data normality where skewness and kurtosis tests were employed. According to Brooks (2008), the Skewness and kurtosis values should be within the range of 2 and 7, respectively, to test the assumption of normal distribution for residuals. Normality means that the distribution of the test is normally distributed (or bell-shaped) with a zero (0) mean, one (1) standard deviation, and a symmetric bell-shaped curve. Table 2.4's Skewness and Kurtosis values indicate that the normality assumption is valid.

Table 2.4: Skewness and Kurtosis Tests for Normality: Test for Univariate Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	Adj chi2(2)	Prob>chi2
brt	176	0.0000	0.0000	-	0.0000
wlr	176	0.0000	0.0000	-	0.0000
me	176	0.0000	0.0000	35.32	0.0000

Source: STATA, (2023)

The test for heteroscedasticity was also conducted using Breusch-Pagan Test. The null hypothesis (Ho) was constant variance (homoscedasticity), while the alternative hypothesis (Ha) was no constant variance (heteroscedasticity). Reject the null hypothesis when the p-value was less than 0.05 and otherwise accept it. The study used Breusch-Pagan to test for heteroscedasticity, and the results summary is shown in Table 2.5, which indicates that the p-value was 0.000, which was less than 0.05. Thus, the null hypothesis was rejected, implying heteroscedasticity across entities.

Table 2.5: Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Ho: Constant variance	Variables: fitted values of brt
chi2(1) = 242.03	
Prob > chi2 = 0.0000	

Source: STATA, (2023)

Further, the presence of serial correlation between the variables was being tested using FGLS-based Autocorrelation Test. The null hypothesis (Ho) is the presence of serial correlation up to order p, while the alternative hypothesis is no serial correlation up to order p. Reject Ho when Prob>F is less than 0.05; otherwise, accept it. The identified summary of results in table 2.6 indicates a P-value of 0.000, which is less than 0.05, so the null hypothesis is rejected, thus implying no serial correlation.

Table 2.6: FGLS-based Autocorrelation Test

brt	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
wlr	4.737114	6.856417	0.69	0.490	-8.701216	18.17544
me	-15.76325	2.455029	-6.42	0.000	-20.57501	-10.95148
cons	182.0108	40.46341	4.50	0.000	102.704	261.3177

Source: STATA, (2023)

Multicollinearity means that the variables of interest are highly correlated, and high correlations should not be present among variables of interest. The study used the variance inflation factor (VIF) to test the multicollinearity of the explanatory variables. If VIF is greater than 10, it indicates that there is a multicollinearity problem (Shrestha, 2020 and Gujarati, 2007). The summary results in Table 2.7 indicates that VIF is less than 10. Hence, there is no presence of a multicollinearity problem; no explanatory variable was found that is higher than 10 in the analysis.

Table 2.7: Multicollinearity (VIF) Results

Variable	VIF	1/VIF
ME	1.35	0.742972
WLR	1.35	0.742972
Mean VIF	1.35	

Source: STATA, (2023)

In addition, Hausman specification test (Baltagi, 2005) was conducted to determine the appropriate model to employ for unbalanced panel data between the random effect model and the fixed effect model (Brooks, 2008). The null hypothesis (Ho) was that differences in coefficients were not systematic, while the alternative hypothesis was the presence of systematic differences across variables' coefficients. The results were indicated in Table 2.8 with the following parameters: Prob>chi2, or a P-value of 0.0033, which was lower than 0.05, and the differences were negative 11.63 and positive 18.71, respectively. In addition, the p-value for RE was 0.00, while the p-value for FE is 0.213, so the random effect model is recommended as it yields a low p-value. Further, prob>chi2 = 0.0033 and chi2 (2) = 11.44, indicated that the coefficients of independent variables were different and therefore significant to the study.

Table 2.8: Coefficients for Hausman Test

	(b) Fixed	(B) Random	(b)-(B) Difference	sqrt(diag(v_b-v_B)) S.E
wlr	-24.42901	-12.7987	-11.63031	13.6862
me	-6.006503	-24.71962	18.71312	5.793808

Source: STATA, (2023)

The regression model employed was the random effect model, as it seemed to be superior over the fixed effect model and yields better results as tested using Hausman specification test. The test indicated results of p-value being lower for random effect model compared to fixed effect, thus selected. Table 2.9 indicates descriptions of the regression results with correlational coefficients of the explanatory variables against the dependent variable.

Table 2.9: Descriptive Statistics Using a Random Effect Model

brt	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
wlr	-12.7987	7.318242	-1.75	0.080	-27.14219	1.544787
me	-24.71962	3.315504	-7.46	0.000	-31.21789	-18.22136
cons	483.5869	76.31113	6.34	0.000	334.0198	633.1539

Source: STATA, 2023

The regression equation after the results is written as follows: -

$$(brt)it = 483.5869 - 12.7987 (wlr)it - 24.71962 (me)it.$$

where brt = bankruptcy rate, wlr = watch loans, and me = management efficiency.

The results indicated significant negative relationship between watch loans ratio and bankruptcy rate of community banks. This implied that a unit increase in the watch loan ratio leads to a decrease in the variance of the bankruptcy rate by 12.7987 percent. Further, the results showed negative correlations between management efficiency and bankruptcy rate, which means that a unit increase in management efficiency of a respective community bank leads to a decrease in trends of bankruptcy rate of community banks by 24.71962 percent. In addition, the results negate the referenced hypotheses, which were depicted as follows: Ho1: There was positive effect of watch loans ratio on the bankruptcy rate (Altman's Z-score) of community banks in Tanzania's banking sector (RO1); and Ho2: There was positive effect of management efficiency on the bankruptcy rate (Altman's Z-score) of community banks in Tanzania's banking sector (RO2).

Empirical Analysis and Discussion of Results

This section provides explanations that links results obtained in this study against other empirical findings conducted in same field however using different sample, period, methodology and population. The first objective was to analyse the effect of management efficiency on bankruptcy rates of community banks. Therefore, the conclusion regarding this objective was reached by referring the regression results, which indicated negative coefficient of 24.71962 percent. The result implied significant negative influence of management efficiency on bankruptcy rates of community banks.

Further, the result means that a unit increase in management efficiency of a respective community bank leads to a decrease in trends of bankruptcy rate for community banks by 24.71962 basis points. This result conforms to the finding of Ariemba et al. (2016) who explained that the increase in bank failure through asset quality deterioration was mainly influenced by low efficient and effective management of those banks in Kenya, thus recommended effective and strong management in order to ensure that banks do not become insolvent. Mathematically, they justified that management efficiency was negatively correlated with banks' bankruptcy rates, which was in line with the research findings portrayed in this study. Further, Faqera et al. (2019) also provides concepts that indicating negative correlations between management efficiency and bank failure. The same stance was also observed by other studies such as Lotto (2019), Catherine (2020) and Emenike (2014) who also explained negative relationship between management efficiency and bankruptcy rate of banks, in line with the study findings of this paper.

However, this study contradicted with some of other research findings as follows: - Indriastuti et al. (2022) explained presence of no correlations between management efficiency and the bankruptcy rate of banks on ground that management of banks has nothing to do when the respective bank possesses low competitive advantage and poor asset quality. In same perspective, the study finding also contradict with the finding produced by Lucas (2019), who explained that net interest margin as a proxy for management efficiency was positively related to the bank inefficiency operations and bank failure. Further, the result disputes the finding explained by Dzumira (2014) who justified that the failing of banks in Zimbabwe was attributed to poor management efficiency, which caused drainage of liquidity and capital position of banks. Mathematically, Dzumira (2014) specified positive correlations between management efficiency and bankruptcy rates of banks.

The second objective was to determine the effect of watch loans on bankruptcy rate of community banks. In that regard, the conclusion regarding this objective were reached by referring the regression results, which indicated negative coefficient of 12.7987 percent. The result implied significant negative influence of watch loan ratio on bankruptcy rates of community banks. The result implied that a unit increase in the watch loan ratio led to a decrease in the variance of the bankruptcy rate by 12.7987 percent. This resulted supports

the findings explained by Dzomira (2014) who argued that bank failures in Zimbabwe was mainly attributed by watch loans, which caused drainage of liquidity and capital position of banks. In same perspective, the finding also conformed with finding produced by Munangi (2020) who explained negative effect of watch loans on the financial performance and bank failure. This implied that the higher the incidence of watch loans, the lower the profitability of the bank, thus increases bankruptcy rate of a specific bank. In addition, Emenike (2014) also revealed negative relationship between watch loans and bank failure, thus conforms with the finding of this paper. However, this study finding contradicts with some of the empirical studies as follows: Indriastuti et al. (2022) explained presence of no correlations between watch loans and the bankruptcy rate of banks, which contradicted with the result of this paper. Further, this result was not line with the financial stability report published by the Bank of Tanzania in 2021, which explained that when watch loans moved unfavorably, increases banks' bankruptcy rate due to its effect on non-performing loans.

In addition, this report implied that watch loans had positive correlations with bankruptcy rate in sense that when watch loans ratio rises, the bankruptcy rate also increases, inferring upsurges of potential failure of the respective bank. This result also controverted with that of Jing (2020) who explained neutrality correlations between watch loans and bank failure by arguing that watch loans are just non-performing loans indicators and not a straight factor that may cause bankruptcy of community banks. In addition, the finding also contradicts with explanations provided in the stability report of 2018 published by the National Bank of Rwanda, which indicated positive relationship between watch loans and bank failures. Mathematically, this relationship is expressed as positive correlations between watch loans and bankruptcy rates of a specific bank. In same perspective, the results with negative correlations contradicted with the explanations provided in the IMF reports (2019), which indicated positive relationship between watch loans and bankruptcy rates. In that regard, the study findings for management efficiency and watch loans against bankruptcy rate of community banks are in line with the most referenced studies despite of the fact that the result differs with the few empirical studies and reports as discussed in this paper.

Study Implication, Limitations and Conclusion

This study took its importance from the numerous bankruptcy rates of community banks in Tanzania's banking sector, which thus posed a threat to the stability of the financial system. The study examined the effect of management efficiency and watch-loan ratios on the bankruptcy rate of mentioned banks' category. The study has used a quantitative method to determine the relationship between the dependent variable, which is bankruptcy rate, and the independent variables, which are watch loan ratios and management efficiency. In order to test the research hypotheses, a random effect model was used, which indicated that both watch loans and management efficiency have significant influence on trends of bankruptcy rate of community banks. In that regard, to prevent bankruptcy rates, community banks are required to ensure adequate management and minimize level of watch loans in their lending portfolio that have proven to increase credit risk, thus upturns bankruptcy rates. The most important areas of contribution, especially for academic research is theoretical contribution. According to Eric (2020) and Lucas (2019), one of the ways to contribute to a theory is to compare the prevailing assumptions against the current situations or environment to test whether the assumptions still hold accordingly.

In addition, Eric (2020) and Peter (2018) conceptualized that papers make a theoretical contribution if they create a systematic understanding of some phenomena at an abstract level and apply existing theories to business and society. In that regard, this paper contributes to the contagion theory by arguing that not only bank runs (massive deposits withdrawal) due to public panic that causes bank failure, but also there are other factors such as management inefficiency and high level of watch loans resulting from the information gap as justified by the theory of market structure and asymmetric information theory, respectively. This stance is also justified by the following references: Munangi (2020), Dzomira (2014) and Emenike (2014), which justified the impact of watch loans on banks' bankruptcy rate. Watch loans are not related with bank runs as stated by contagion theory but these loans are concerned with poor administrative issues of a respective bank that leads to increase in defaults and therefore rises bankruptcy rates. Further, this stance is justified by Catherine (2020), Dzomira (2014), Faqera et al. (2019) and Ariemba et al. (2016) who also justified the impact of management efficiency on banks' bankruptcy rate. According to these referenced papers, management

efficiency is not related with bank runs, which is stated by Contagion theory as major causes of bank failure but concerns with bad management of a respective bank that leads to increase in defaults and therefore increases bankruptcy rates. Therefore, based on this thought, it can be concluded that apart from bank runs, there are other factors that contributes to the bankruptcy of community banks in Tanzania, which includes management inefficiency and high level of watch loans as justified by theory of market structure and asymmetric information theory. Further, the study has encountered with certain limitations, which however did not affect results and findings. The limitations include insufficient coverage in terms of periodic, geographical and population level. In fact, the study has covered only a period ranging from 2006 to 2021 using data from specific individual country (Tanzania). Therefore, it is recommended to conduct other studies by expanding coverage of periods and using different countries such as East African Community (EAC) and Southern African Development Community (SADC) member countries.

In addition, this study has focused only on one category of banks, namely, community banks, thus it is further recommended to undertake other studies based on other left categories of banks such as commercial, microfinance, development and other specialized banks. Based on the research findings, it is therefore concluded by drawing some of the policy implications as follows: *Firstly*, management of community banks are required to ensure that watch loans are mitigated through establishment of an adequate credit policy that will eventually eliminate the level of watch loans in their lending portfolio, thus, reduce the bankruptcy rate. The adequate credit policy enhances loans appraisal systems and quality review of credit before being granted to respective borrowers, thus reduce amount of watch loans. *Secondly*, community banks are required to increase management efficiency by putting in place a strong corporate governance policy to enhance their management efficiency through minimization of operational and administrative costs. The adequate corporate governance policy normally increases accountability of banks' management in terms of cost reduction and adequate credit appraisal systems that eventually reduces possibility of bank's failure and adherence to the going concern principle.

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