Empirical analysis on the impact of market share and capital adequacy ratio on the bankruptcy rate of community banks in Tanzania: an application of Altman’s Z-Score model

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ABSTRACT

This paper examines the impact of market share and capital adequacy on the bankruptcy rate of community banks in Tanzania, for the period spanned for 16 years from 2006 to 2021. For instance, recently in Tanzania, seven community banks were closed by the Regulator while others were being merged to increase their going concern and operational efficiency. This study has employed a quantitative approach based on secondary data collected from the Bank of Tanzania as a Regulator and some of them were gathered from community banks. The sample size is 11 community banks, with a total of 176 observations. The panel data analysis has been conducted using statistical software, namely, STATA version 17 with the random effect model being used to generate regression results ready for interpretation. The research findings depicted significant positive correlations between bankruptcy rates as computed using Altman’s Z-score model and the independent variables, namely, market share and capital adequacy ratio. In that regard, the study recommends adequate capital levels and market share to reduce the bankruptcy rates of community banks in Tanzania.

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Introduction

The global financial crisis, which took place in 2007 and 2008 revealed how banks are inextricably connected to the global economy (Buthiena, 2019). The identified causes for the crisis included, among others, poor market share and inadequate capital levels to absorb internal and external shocks (Veitch, 2019). Some researchers globally and in Africa have identified some challenges facing community banks in many countries with diverse financial systems. For instance, in Kenya, Kipkirui (2018) indicated that the low performance of microfinance banks was mainly attributed to poor market share and low capital levels that eventually reduced the bankruptcy rates. In the same perspective, Mugo (2018) pointed out that non-performing loans resulted from low market share and increased levels of watch loans, which finally affected the bankruptcy rate of microfinance banks.

Further, Nigeria also experienced rise in banks’ distress and bankruptcy rates, which raised unanswered questions, which justifies the necessity to investigate factors behind the bankruptcy of banks and reduce the contagion effect on good operating banks (Akani & Uzah, 2018). In Tanzania, for the period ranging from 2018 to 2020, some community banks went insolvent and therefore liquidated while other banks were being merged to increase their operational efficiency. Further, it can be noted that the Tanzania banking sector is dominated by few large banks compared with small banks such as community banks (BOT, 2021). This leads to the failure of community banks to compete and thus exit the market. It is further important to note that the high levels of market shares and capital adequacy increase the ability of banks to withstand shocks that may emanate from internal and external environments (BOT, 2021; Asima, 2021; Nyagol & Otieno, 2016).
In addition, the banking sector is characterized by having different banks with unique physiologies in terms of capital adequacy, where some of them have adequate capital levels while others have weak capital positions, which causes inefficiency in creating market share (BOT, 2021).

However, some studies in the related field ended with inconclusive results. For instance, Asima (2021) and Josephat (2019) indicated a negative relationship between capital adequacy and bank failure while Antwi (2019) portrayed a positive correlation between capital adequacy and bankruptcy rate or probability of bank failure. Further, Peter (2018) and Ruslan (2019) depicted a negative correlation between market share and the bankruptcy rate of banks while Roberto et al. (2017) revealed a positive correlation between market share and the probability of bank failure.

Additionally, some of the referenced studies such as Jing (2020) did not focus on the community banks sub-sector, thus creating a contextual gap while no any researcher computed the proxy of the bankruptcy rate of community banks as a dependent variable, hence creating a methodological gap. Furthermore, some studies such as Jing (2020) used a case study strategy, key informant interviews and questionnaires as methods of primary data collection from the purposively selected respondents, therefore creating a methodological gap. A theoretical gap exists as constructed with facts from contagion theory. The theory states that a good bank may fail due to the failure of another bank caused by a massive deposit withdrawal (bank run) as the effect of a public panic (Murithi, 2017). However, this theory is being challenged by not taking into consideration other factors that may influence the bankruptcy rate of banks rather than focusing only on the failure of a bank due to the spillover effect of bank runs.

In that regard, the ultimate intention of this study is also to justify other factors that may affect the bankruptcy rate by establishing correlations between explanatory and dependent variables of community banks in Tanzania. The primary objective is to assess the impact of explanatory factors, namely, market share and capital adequacy ratio on the bankruptcy rates of community banks in Tanzania’s banking sector. In that regard, the study has disintegrated the general objective into specific objectives for effective assessment of correlations between the dependent and independent variables. The first objective is to determine the effect of market share on the bankruptcy rate (Altmann’s Z-Score) of community banks in Tanzania’s banking sector; while the second objective is to determine the effect of capital adequacy ratio on the bankruptcy rate (Altmann’s Z-Score) of community banks in Tanzania banking sector. In addition, the study has used some assumptions as a combination of the underlying study variables for effective and successful completion and interpretation of the study findings. The first assumption is the presence of financial intermediation among community banks as the main activity of banks in Tanzania as evidenced by the financial intermediation theory of banking (Josephat, 2019). The second assumption is that there is a significant level of interconnectedness among banks, which may expose them to bankruptcy vulnerabilities through contagion and systemic risks (BOT, 2021).

This paper is organized into four parts as follows: Following section explains conceptual framework and study hypotheses while Section 3 provides a brief description of the study methodology in terms of all procedures and strategy employed by in this study, which includes sample size, data collection, different regression diagnostic tests and type of model employed in this study. Further, section 4 displays regression results and their correlation coefficients while section 5 provides an explanation and discussion of regression results against the empirical evidence. Lastly, section 6 provides the conclusion and implication of the study.

**Literature Review**

**Theoretical and Conceptual Background**

The study is based on four theories, namely, the contagion theory, the theory of lemons, the theory of market structure and the financial intermediation theory of banking. The contagion theory states that if one bank fails due to internal factors that are only in that one bank such as frauds or financial reported losses then other banks could be adversely affected in the long run (Diamond & Dybvig, 1983). The theory further states that banks are interconnected to each other by their linked and heterogeneous financial assets (Murithi, 2017). Therefore, in the banking context, the theory concluded that a good bank may fail due to the failure of another bank caused by a bank run as the effect of public panic. However, the theory is being challenged by not taking into consideration other factors that may influence the bankruptcy rate of banks rather than focusing only on the failure of a bank due to the spillover effect of bank runs emanating from other failed banks (Mohamed & Magdy, 2020). Sutton (2006) and Ezenekwe (2019) in their study about market structure, explained the main variables in the theory of market structure, which include market concentration (market share), competition and economies of scale (barrier to entry). It is further believed that the bank with a high market share than other banks tends to dominate the market and increase its going concern (Ezenekwe, 2019, Basharat, 2020, Mohamed & Magdy, 2020). The financial intermediation theory of banking reveals that commercial and community banks typically generate liquidity by borrowing short and lending long (Asima, 2021). This implies that banks borrow from depositors with short maturities and lend to borrowers with longer maturities, which is backed with adequate core capital level (Josephat, 2019). While the theory of lemons explains that once one bank fails, the depositors even in the good banks tend to withdraw their cash as well due to public panic. Consequently, this may drive the good banks out of business due to other failed banks (lemons) resulting from bad service offered (Akerlof, 1970).

Different theoretical reviews on the failure of community banks indicated a significant linkage between bankruptcy rate and the explanatory variables, namely, market share and capital adequacy ratio. Some of this review pointed out that low market shares and inadequate capital levels affect positively the level of bankruptcy rate of community banks (Lucas, 2019; Ahmet & Harun, 2019). This is due to the fact that when there is low market share and inadequate capital levels, the respective bank fails to expand business.
and compete with others in terms of lending portfolio and deposits mobilization, thus exposing to the potential vulnerability of bankruptcy (Alzoubi, 2021). In that regard, community bank’s management is responsible for creating fundamental centricity for increasing performance through increasing market share, thus assisting to raise strength to withstand external shocks emanating from the macroeconomic environment (Leonard et al. 2017, Ahmet & Harun, 2019).

In the current banking sector with high network intensity among commercial and community banks, banks tend to increase the level of market share and capital levels to strengthen their survival rate and therefore reduce their bankruptcy rate (Peter, 2018 & Ghislain, 2018). In the same perspective, good market share has a 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 due to deterioration of power and price in the market (Josephat, 2019 & Faqera, 2019).

In the case of capital adequacy, when the level of capital increases, the bankruptcy rate decreases accordingly (BOT, 2021). This stance is based on further reasons that adequate capital levels normally help a bank to raise its loan portfolio, which eventually increases earning interests, thus up-surging the market share of the respective bank (Hidayati et al. 2019). For instance, some literature reviews such as Faqera, (2019) argued that capital adequacy seemed to have a positive relationship with the bankruptcy rate, implying that when the level of capital level rises, it escalates upward performance of community banks, which then decreases the possibility of bankruptcy of community banks (BOT, 2021).

**Empirical Review and Hypothesis Development**

Most reviews indicate positive relationships between market share and bank failure based on the same ground that when market share increases, the bankruptcy rates also decrease implying upturns in the performance of community banks (NBR, 2018). In Tanzania’s banking sector, many literature reviews have evidenced the presence of adequate capital levels and market share for a few big banks while small banks have inadequate capital levels and low market shares, which lead to failure to compete in the market, thus exit the market (Ramadhanti & Hidayati, 2019; BOT, 2021 & IMF, 2019). Through various experiences in the world, high market shares and adequate capital levels have been observed as major contributors to the good performance of any bank or financial institution, thus increasing its going concern and reducing the bankruptcy rate (Jing, 2020; Lucas, 2019; Nyagol & Otieno, 2016). In the same manner, it has been stated that the 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 undercapitalization and low market share of some community banks in terms of deposits, assets and loan portfolio (Simplice & Odhiambo, 2019). According to Alzoubi (2021), Ahmet and Harun (2019) detailed that the capital adequacy of banks is very important for efficient bank operations based on the ground that total capital levels, normally grow at a high rate depending on the profitability level of the respective bank. Further, according to various literature reviews such as Awadzie (2021) indicated that the capital adequacy ratio has a significant positive relationship with community bank financial performance; thus, when the bank has a low capital position, it may frequently experience a high bankruptcy rate. It is therefore believed that strong capital adequacy appears to contribute positively to the operational efficiency of community banks, thus reducing vulnerability to bankruptcy (Joseph, 2019). Furthermore, other scholars have argued that there is a negative relationship between capital adequacy and the default rate of community banks, which can lead to bankruptcy (Asima, 2021). In addition, several concepts from prior literature had distinguished between two kinds of factors that may influence the bankruptcy rate of community banks, which are the ones related to the bank’s specific variables, such as internal factors such as bank size and capital adequacy ratio (Hidayati, 2019).

Several empirical reviews have evidenced the presence of a significant relationship between market share and the bankruptcy rate of banks. For instance, Peter (2018) conducted a study titled “Model Specification for Bank Failure,” using data set controls from the bank’s balance sheet, correspondent network, charters and memberships, country characteristics and market share. The study examined banks in Missouri during the great depression to find the correct model specification for bank failure during economic downturns. Using the probit model, it was concluded that an increase in the market network led to higher rates of bank survival and thus reduced the bankruptcy rate. In a different field, Genchev (2012) conducted a study titled Effects of Market Share on the Bank’s Profitability. The study explained that the relationship between market share and profitability was perhaps the most studied single phenomenon in business policy. The objective of this study was to explore the impact of various factors (such as market share and concentration ratio) on the profitability measurements of banks in Bulgaria. The analysis was based on balanced panel data of 22 banks over the period ranging from 2006 to 2010. The main research hypothesis was that the leading banks (on market share) should achieve better profitability. The survey results indicated that the relationship between market share and profitability of banks was positive and statistically significant, implying a negative relationship between market share and bankruptcy rate of banks. Further, Mathina and Jagongo (2022) conducted a study on the Moderating Effect of Market Share on the Relationship Between Supervisory Review, Market Discipline and Financial Performance of Commercial Banks in Kenya. The target population for this study was comprised of 43 commercial banks from which a sample of 38 commercial banks was selected using purposive sampling. The study employed descriptive statistics and inferential analysis in data analysis. Furthermore, the study used a 5% significance level to test the research hypotheses. The final results for panel data regression showed that Market share had a positive and insignificant effect on the financial performance of commercial banks in Kenya, implying a negative relationship with bankruptcy rates of commercial banks.
In addition, Asima (2021) conducted a study titled “Effect of Credit Risk Management and Bank-Specific Factors on the Financial Performance of South Asian Commercial Banks”. The research approach was based on secondary data collection from 19 commercial banks (10 commercial banks from Pakistan and 9 commercial banks from India) in the country for a period of 10 years, for the period ranging from 2009 to 2018. The generalized method of moments (GMM) was used for the coefficient estimation to overcome the effects of some endogenous variables. The results indicated that NPLs, CER, and LR have significantly negative relationships with FP (ROA and ROE), while CAR and ALR have significantly positive relationships with the FP of the Asian commercial banks (Asima, 2021). In the same perspective, Josephat (2019) in his study, examined factors affecting the operating efficiency of 36 commercial banks in Tanzania for the period between 2000 and 2017. The study used a robust random-effect regression model, which revealed that adequate capital levels have a positive effect on bank efficiency and thus, negatively correlated with bankruptcy rate. In different thoughts, the study conducted by Lucas (2019) on Microeconomic and Macroeconomic Drivers of Inefficiencies in Community Banks in Tanzania stated that over years, efficiency in Tanzanian Community Banks (CBs) has been low due to specific and macroeconomic drivers (Lucas, 2019). Using tobit regression and triangulation methods, the study analyzed the drivers of inefficiency and found that the capital adequacy ratio (Car1) was statistically significant and negatively related to most bank inefficiency measures. In different approaches and contexts, other empirical reviews also indicate a significant relationship between capital adequacy and the probability of bank failure. For instance, Malimi (2017) conducted a study titled “The Influence of Capital Adequacy, Profitability, and Loan Growth on Non-Performing Loans: A Case of the Tanzanian Banking Sector,” the study had two central objectives: compliance with capital adequacy and non-performing loan ratios as prudential requirements and analysis of the influence posed by capital adequacy, profitability, and loan growth on non-performing loans. In his study, it was observed that capital adequacy and profitability posed an insignificant influence on non-performing loans, thus posing a great influence on the bankruptcy of community banks in Tanzania’s banking sector. In addition, Alzoubi (2021) conducted a study titled Bank Capital Adequacy: The Impact of Fundamental and Regulatory Factors in a Developing Country in Jordan. The dependent variable was capital adequacy while the independent variables were risk and credit risk, bank size, performance and liquidity. The study employed a random effect model in establishing regression results. The study concluded that systematically important banks hold less capital, which may be a sign of moral hazard. Generally, the conclusion was that capital adequacy was negatively related to the possibility of bank failure and vice-versa.

Further, Antwi (2019) conducted a study titled Capital Adequacy, Cost Income Ratio and Performance of Banks in Ghana. The study intended to examine the relationship between Capital adequacy, Cost Income ratio and performance of banks in Ghana. The study used a sample of banks listed on the Ghana Stock Exchange and data for the period ranging from 2013 to 2018, which were gathered from annual reports and regression analysis was carried out using Statistical Software Package, STATA version 15. The study findings revealed that capital adequacy was negatively related to performance as measured by return on assets (ROA) and return on equity (ROE). Generally, the study concluded that the capital adequacy ratio has negative correlations with performance and a positive relationship with the possibility of bank failure (bankruptcy rates) of community banks. Further, Ramadhanti, Marliana and Hidayati (2019) conducted a study titled the Effect of Capital Adequacy, Liquidity and Credit Risk to Profitability of Commercial Banks. The study objective was to determine the effect of Capital Adequacy, which was proxied with Capital Adequacy Ratio (CAR) toward Profitability as proxied by Return on Asset (ROA).

The sample and population for this study were banking companies listed on the Indonesia Stock Exchange (IDX) 2015-2017. The technique used for sample selection was purposive sampling and obtained 27 commercial banks with a research period of three years to obtain 81 units of samples. Data analysis was done using Microsoft Excel 2010 and hypothesis testing in this research using Data Panel Regression Analysis with the E-Views 9.0 program and a significance level of 5%. The results of the research show that capital adequacy (CAR) has a significant positive effect on profitability (ROA), which implies a negative relationship with the bankruptcy rate of commercial banks. To provide a structural understanding of the concepts and relationship between the identified independent and the dependent variables, the conceptual framework has been formulated, which is centered on the interpretation of study findings against research hypotheses (Jeremiah, 2016; Buthiena, 2019; Kingu & Macha, 2018).

The framework is based on classical positivism where the researcher collects data, conduct analysis and test results against the initial formulated hypotheses. The referenced variables and concepts have been linked with key theories, namely, the contagion theory, the theory of market structure, the theory of lemons and the financial intermediation theory of banking to assist in the construction of the conceptual framework. In that regard, this framework indicates how the referenced explanatory variables affect the level of bankruptcy rates of community banks under the worst-case scenario.
According to the research objectives (ROs) and the conceptual framework, the following two hypotheses have been framed and tested:

Ha1: There is a positive effect of market share on the bankruptcy rate (Altman’s Z-score) of community banks in Tanzania’s banking sector (RO1); and

Ha2: There is a positive effect of capital adequacy ratio on the bankruptcy rate (Altman’s Z-score) of community banks in Tanzania’s banking sector (RO2).

Table 1: Summary of Empirical Literature Review

<table>
<thead>
<tr>
<th>Author (Date)</th>
<th>Subject</th>
<th>Variables</th>
<th>Methods</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genchev (2012)</td>
<td>Effects of Market Share on the Bank’s Profitability</td>
<td>Market share and profitability</td>
<td>Balanced panel data-regression model</td>
<td>Market share and profitability were negatively related with bankruptcy rate.</td>
</tr>
<tr>
<td>Lucas (2019)</td>
<td>Microeconomic and Macroeconomic Drivers of Inefficiencies in Community Banks</td>
<td>Capital adequacy and bank inefficiency</td>
<td>Tobit regression and triangulation methods</td>
<td>Capital adequacy ratio is statistically negatively related to inefficiency.</td>
</tr>
<tr>
<td>Malimi (2017)</td>
<td>Influence of Capital Adequacy, Profitability, and Loan Growth on Non-Performing Loans</td>
<td>Capital Adequacy, Profitability, and Non-Performing Loans (credit risk)</td>
<td>Regression model analysis</td>
<td>Capital adequacy and profitability posed an insignificant influence on credit risk (proxy for bank failure)</td>
</tr>
<tr>
<td>Ramadhanti et al., (2019)</td>
<td>Effect of Capital Adequacy, Liquidity and Credit Risk to Profitability</td>
<td>Capital Adequacy, Liquidity, NPLs and Profitability</td>
<td>Data panel regression analysis with the E-Views 9.0 program</td>
<td>Capital adequacy is negatively related with the bankruptcy rate.</td>
</tr>
</tbody>
</table>

Source: Authors, 2023

Research and Methodology

The study has used a sample size of 11 community banks with 176 total observations. The data were collected from secondary sources, which include the financial statements of community banks and the database of the Bank of Tanzania as a regulator. The
study period is 16 years spanned from 2006 to 2021. The study employed a random effect model rather than a fixed effect model and other regression models due to the naturalist of the employed panel data and the abilities and limitations of each model. Baum (2006) expressed the regression model for Random Effect panel data as follows:

\[ y_{i,t} = x_i \beta + z_i \delta + (u_i + \epsilon_{i,t}) \]

Where \( y_{i,t} \) = dependent variable and represents the bankruptcy rate of bank \( i \) at the time \( t \), \( x_i \) = variables that vary over individual units and time, \( \beta \) = coefficients of explanatory variables, \( z_i \) = time-invariant variables that vary for individual banks, \( \delta \) = is the coefficient of variables for time-invariant variables, \( u_i \) = is the individual effect, and \( (u_i + \epsilon_{i,t}) \) = is the composite error term.

For the random effect model to yield consistent results, a critical assumption of this model is that \( u_i \) is uncorrelated with the regressors, namely, \( x_i \) and \( z_i \) (Baum, 2006). The data variables that have been used in this study are as identified in Tables 2 and 3

Table 2: Descriptions of the Dependent and Independent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type of Variables</th>
<th>Literature Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankruptcy Rate</td>
<td>Dependent</td>
<td>Altman’s Model (Altman, 1995)</td>
</tr>
<tr>
<td>Market Share</td>
<td>Independent</td>
<td>(Buthiena, 2019)</td>
</tr>
</tbody>
</table>

Source: Literature review & Authors, 2023

Table 3: Expected Signs of the Explanatory Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Symbol</th>
<th>Descriptions</th>
<th>Expected Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Share</td>
<td>ms</td>
<td>Bank’s Loans/Total</td>
<td>+</td>
</tr>
<tr>
<td>Capital Adequacy Ratio</td>
<td>car</td>
<td>Core Capital/(RWA + OBIs)</td>
<td>+</td>
</tr>
</tbody>
</table>

Source: Literature Review & Authors, 2023

To test the reliability of the collected panel data, various regression models apply unique specifications and diagnostic tests to assess whether there is any error for correction. In that regard, different diagnostic tests and estimated results have been discussed as part of research procedures. For instance, the study included a constant term in the regression equation, thus the error zero mean (E(\( e \)) = 0) assumption has not been violated (Brooks, 2008).

The assumption of data stationarity was tested using the Levin-Lin-Chu unit-root test, and the summary of the results is shown in Table 4. The null hypothesis (Ho) is that all the panels contain a unit root, while the alternative hypothesis is that the panels are stationary. Because all p-values for all independent variables are less than 0.05, Ho is rejected, indicating that the stationarity assumption holds for all independent variables.

Table 4: Stationary Test Based on the Levin-Lin-Chu Unit-Root Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>brt</th>
<th>ms</th>
<th>car</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted t</td>
<td>-7.0144</td>
<td>-5.0746</td>
<td>-7.8223</td>
</tr>
<tr>
<td>Adjusted t*</td>
<td>-3.1674</td>
<td>-2.1846</td>
<td>-1.8530</td>
</tr>
<tr>
<td>P-value</td>
<td>0.0000</td>
<td>0.0145</td>
<td>0.0319</td>
</tr>
<tr>
<td>Average Lags</td>
<td>8.0000</td>
<td>8.0000</td>
<td>8.0000</td>
</tr>
</tbody>
</table>

Source: STATA, 2023

Further, the study conducted a test for the normality of data using skewness and kurtosis tests. For data reliability and results, the skewness and kurtosis values should be within the range of 2 and 7, respectively. This test is applied to test whether 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 5’s Skewness and Kurtosis values indicate that the normality assumption is valid (Brooks, 2008).

Table 5: Skewness and Kurtosis Tests for Normality: Test for Univariate Normality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Pr(Skewness)</th>
<th>Pr(Kurtosis)</th>
<th>Adj chi2(2)</th>
<th>Prob&gt;chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>brt</td>
<td>176</td>
<td>0.0000</td>
<td>0.0000</td>
<td>-</td>
<td>0.0000</td>
</tr>
<tr>
<td>ms</td>
<td>176</td>
<td>0.0000</td>
<td>0.0000</td>
<td>-</td>
<td>0.0000</td>
</tr>
<tr>
<td>car</td>
<td>176</td>
<td>0.0000</td>
<td>0.0000</td>
<td>-</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Source: STATA, 2023
In addition, the test for heteroscedasticity was also conducted using the Breusch-Pagan Test. The null hypothesis (Ho) is constant variance (homoscedasticity), while the alternative hypothesis (Ha) is no constant variance (heteroscedasticity). The decision rule is to reject the null hypothesis when the p-value is 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 6, which indicates that the p-value is 0.000 less than 0.05. Thus, the null hypothesis was rejected, implying heteroscedasticity across entities.

**Table 6: Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity**

<table>
<thead>
<tr>
<th>Ho: Constant variance</th>
<th>Variables: fitted values of brt</th>
</tr>
</thead>
<tbody>
<tr>
<td>chi2(1) = 40.88</td>
<td></td>
</tr>
<tr>
<td>Prob &gt; chi2 = 0.0000</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** STATA, 2023

In addition, the test of whether there is a serial correlation between the variables was conducted using the 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. The decision rule is that reject Ho when Prob>F is less than 0.05; otherwise, accept it. The identified summary of results in Table 7 indicates a P-value of 0.000, which is less than 0.05, in that regard, the null hypothesis is rejected, thus implying no presence of serial correlation.

**Table 7: FGLS-Based Autocorrelation Test**

| bret | Coef.  | Std. Err. | z   | P>|z|    | [95% Conf. Interval] |
|------|--------|-----------|-----|--------|---------------------|
| ms   | 731.7886 | 305.3017  | 2.40| 0.017  | 133.4081 - 1330.169 |
| car  | 5.799182 | .2827611  | 20.51| 0.000  | 5.244981 - 6.353384 |
| cons | -21.32077| 20.25856  | -1.05| 0.293  | -61.02683 - 18.38529|

**Source:** STATA, 2023

Further, to test whether there is a high correlation between variables of interest, the test for multicollinearity was conducted using the variance inflation factor (VIF) to test the multicollinearity of the explanatory variables. The decision rule is that when the value of VIF is greater than 10, it indicates that there is a multicollinearity problem (Gujarati, 2007). The summary results in Table 8 indicate that VIF is less than 10. Therefore, no presence of a multicollinearity problem among the explanatory variables.

**Table 8: Multicollinearity (VIF) Results**

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>1/VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>ms</td>
<td>1.01</td>
<td>0.989553</td>
</tr>
<tr>
<td>car</td>
<td>1.01</td>
<td>0.989553</td>
</tr>
<tr>
<td>Mean VIF</td>
<td>1.01</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** STATA, 2023

To select which regression model fits the employed data, the Hausman specification test (Baltagi, 2005) was conducted to determine the appropriate model for the employed unbalanced panel data between the random effect model and the fixed effect model (Brooks, 2008). The null hypothesis (Ho) is that differences in coefficients are not systematic while the alternative hypothesis is the presence of systematic differences across variables’ coefficients. The results are indicated in Table 9 with the following parameters: Prob>chi2, or a P-value of 0.0033, which is lower than 0.05, and the differences are positive numbers 56.33 and 0.113, respectively. In addition, the overall R-square for RE is 0.8300, while the overall R-square for FE is 0.7168, therefore, the random effect model was recommended as it explains more of the explanatory variables than the fixed effect model. Further, prob>chi2 = 0.0033 and chi2 (2) = 1.30, indicating that the coefficients of independent variables are different and therefore significant to the study.

**Table 9: Coefficients for Hausman Test**

<table>
<thead>
<tr>
<th></th>
<th>Fixed</th>
<th>Random</th>
<th>Difference</th>
<th>sqrt(diag(v_b-v_B))</th>
</tr>
</thead>
<tbody>
<tr>
<td>ms</td>
<td>789.699</td>
<td>731.786</td>
<td>57.91048</td>
<td>56.33584</td>
</tr>
<tr>
<td>car</td>
<td>5.685862</td>
<td>5.799182</td>
<td>-.1133199</td>
<td>.1136346</td>
</tr>
</tbody>
</table>

**Source:** STATA, 2023
Regression Results

The regression model selected for this study is the random effect model, as it seemed to be superior to other regression models and yields better results as tested using Hausman specification test. Table 10 indicates descriptions of the regression results with correlational coefficients of the explanatory variables against the dependent variable. The results of market share and capital adequacy ratio in relation to the bankruptcy rates are statistically significant as evidenced by the p-values in table 10, which are lower than 5.0 percent.

Table 10: Descriptive Statistics Using a Random Effect Model

|     | Coef.    | Std. Err. | z     | P>|z|  | [95% Conf. Interval] |
|-----|----------|-----------|-------|-------|---------------------|
| ms  | 731.7886 | 307.9375  | 2.38  | 0.017 | 128.2422            |
|     |          |           |       |       |                     |
|     | 5.799182 | .2852023  | 20.33 | 0.000 | 5.240196            |
|     |          |           |       |       |                     |
| cons| -21.32077| 20.43346  | -1.04 | 0.297 | -61.36962           |

Source: STATA, 2023

The study model equation after the results is therefore written as follows:

\[(brt)_{it} = -21.32077 + 731.7886 (ms)_{it} + 5.799182 (car)_{it}.\]

where \(brt\) = bankruptcy rate, \(ms\) = market share, and \(car\) = capital adequacy ratio. The graphical correlations indicate positive relationship between market share and capital adequacy ratio against the bankruptcy rate of community banks in Tanzania as shown in Figure 2 and Figure 3, respectively.

Discussion

This section links study findings, against other empirical results in related fields using different samples, periods, methodologies and populations. The first objective was to determine the effect of market share on bankruptcy rates of community banks in Tanzania’s...
banking sector. The conclusion regarding this objective has been achieved by the indicated regression results, which depict a positive coefficient of 731.7886, equivalent to 73,178.86 basis points. The result implies a significant positive influence of market share on bankruptcy rates of community banks (meaning negatively correlated with bank failure). The study finding conforms with the result obtained by Barra, Cristian and Roberto (2017) who depicted a positive effect of market shares on trends of bank failure in a concentrated market while the same study indicated a negative impact of market share on bankruptcy rate in a competitive market. Further, this result is in line with some of the regulatory reports such as the financial stability report published by the Bank of Tanzania in 2021, which indicated that market share is positively related to the trends of community banks’ bankruptcy rates. The reason is that the high market share intensifies the level of other performance categories, including the quality of the loan portfolio, and thus reduces the bankruptcy rate. However, the study finding differs from some other studies such as Liu (2021), Ruslan (2019), Duong and Huong (2016), who explained the presence of a negative relationship between market share and the bankruptcy rate of banks or any financial institutions.

Furthermore, Peter (2018) explained the negative effect of market share on the bankruptcy rate of banks or financial institutions, which differs from findings of this study. A different stance of finding is also provided by Andi (2019) who pointed out the negative relationship between market share and bankruptcy rate by arguing that banks with high market share are in a good position to have good performance and increase economies of scale, thus reducing level of bankruptcy rates. In addition, this result differs from that of Sutton (2006), Ezenekwe (2019), Basharat (2020), Mohamed and Magdy (2020) who pointed out statistically negative relationships between market share (gained from good competitive advantage) and failure of banks’ operations (bankruptcy). In the same perspective, other empirical studies such as Genchev (2012), Mathina and Jagongo (2022) depicted negative correlations between market share and probability of bank failure in Bulgaria and Kenya, respectively. The second objective was to determine the effect of the capital adequacy ratio on the bankruptcy rate of community banks in Tanzania’s banking sector. Therefore, the conclusion regarding this objective was reached as portrayed in the table of the regression results, which indicates positive coefficient of 5.799182, equivalent to 579.9182 basis points, implying a negative correlation between capital adequacy level and bank failure. This result supports the findings explained by Asima (2021) who evidenced that bank failures in South Asian Commercial Banks were mainly attributed to inadequacy of capital levels, thus positively related to bankruptcy rates and negatively related with bank failure. This result is in line with the financial stability report published by the Bank of Tanzania in 2021, which explained that when the capital adequacy ratio moved unfavorably, increased banks’ probability of failure. Furthermore, the result was contrary to that of Lotto (2019) and Lucas (2019) who depicted a negative relationship between the capital adequacy ratio and the probability of bank failure. In the same perspective, the finding of this study is not in line with that of Malimi (2017) who pointed out that capital adequacy does not affect the bankruptcy rate of community banks. In addition, other regulatory reports such as the financial stability report published by the Bank of Tanzania in 2021, suggest that the capital adequacy ratio is negatively related to community banks’ probability of failure. In the same perspective, the study finding was also in line with findings obtained by Antwi (2019) who pointed out a positive relationship between the capital adequacy ratio and the bankruptcy rate of banks while Alzoubi (2021), Leonard et al. (2017) and Hidayati et al. (2019) indicated a negative relationship between capital adequacy ratio and bankruptcy rate.

Conclusion

The study took its importance as a result of the subsequent numerous community banks’ failures, which posed a threat to the stability of the financial system in Tanzania. The study analyzed the effect of market share and capital adequacy ratio on the bankruptcy rate of banks based in Tanzania’s context. The study has used a quantitative method to analyze the correlations between the bankruptcy rate and the independent variables, namely, market share and capital adequacy ratios. To test the research hypotheses, a regression result using a random effect model was generated, which showed that both market share and capital adequacy ratio had a significant influence on trends in the bankruptcy rate of community banks. In that regard, to prevent bankruptcy rates, the management of community banks is required to ensure adequate capital adequacy and enhance the level of market share that will eventually increase the ability of deposit mobilization and maximize the quality of the loan portfolio, thus potentially decreasing the level of bankruptcy rate.

The study contributes to the contagion theory by arguing that not only massive deposit withdrawals (bank runs) due to public panic that causes bank failure but there are other factors such as low market shares and inadequate capital level as justified by the theory of market structure and the financial intermediation theory of banking, respectively. This stance is also justified by the following references: Alzoubi (2021), Malimi (2017), Ezenekwe (2019), Asima (2021), Basharat (2020), Mohamed and Magdy (2020), Liu (2021), Ruslan (2019), Duong and Huong (2016) who justified the presence of impact of market share and capital adequacy ratios on banks’ bankruptcy rate of banks. Further, this stance is also justified by Alzoubi (2021), Leonard et al. (2017) and Hidayati et al. (2019) who also justified the impact of capital adequacy ratio on banks’ bankruptcy rate. In that regard, it has been concluded that apart from bank runs, other factors contribute to the bankruptcy of banks including low market share and inadequate capital levels as justified by the theory of market structure and the financial intermediation theory of banking, respectively. In addition, from this study’s finding, the following policy implications have been drawn: - firstly, the management of community banks is required to put in place adequate policies to enhance capital levels and increase market shares in terms of deposits, assets and lending portfolio that will eventually reduce the bankruptcy rate. In addition, community banks are required to put in place an adequate investment policy that will enhance market share through the maximization of investment returns, thus strengthening capital levels and decreasing bankruptcy rates. Lastly, this study has certain limitations, which are elaborated as follows: - firstly, the study has used only four
theories, namely, contagion theory, theory of market structure, theory of lemons and financial intermediation theory of banking. In that regard, it is recommended to conduct the same study using different theories such as asymmetric information theory using different variables. Secondly, the study has only focused on community banks as a population for study. Therefore, it is recommended to conduct another study based on other categories of banks such as commercial, cooperative and development banks.

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Author Contributions: Conceptualization, Methodology, Data Collection, Y.L., Formal Analysis, Writing—Original Draft Preparation, Writing—Review And Editing by authors with equal participation. All authors have read and agreed to the published the final version of the manuscript.

Institutional Review Board Statement: Ethical review and approval were obtained for this study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy.

Conflicts of Interest: The authors declare no conflict of interest.

References


Duong, N. T., & Huong, T.T. (2016). The Analysis of Major Credit Risk Factors - The Case of the Vietnamese Commercial Banks. Online Published: December 8, 2016. URL: http://dx.doi.org/10.5430/ijfrr.v8n1p33.


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