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Effect of Profitability Ratio on Bankruptcy Prediction of Dairy Cooperative Societies in Meru County, Kenya

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*Profitability Ratio,
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Return on Equity,
Dairy Cooperative
Societies*

Many sectors of the economy across the globe are concerned with the avoidance of bankruptcy in order to operate as going concerns. The purpose of this study was to analyse the influence of financial analysis on bankruptcy prediction for dairy cooperative societies in Meru County, Kenya. The objective of the study was to determine the influence of profitability ratio on the bankruptcy prediction of dairy cooperative societies in Meru County, Kenya. The hypothesis was derived from the objective of the study. The research was anchored on value maximisation theory. Descriptive and correlational research designs were used. The target population of the study was 13 dairy cooperative societies in Meru County that were in operation and had audited financial statements for the period of study (2017-2021). A census survey of all 13 dairy cooperative societies was conducted. A checklist was used to collect the secondary data, which was analysed using descriptive statistics and a bivariate model. The significance of the predictor variable on bankruptcy prediction was tested using the t-statistic, and the overall significance of the model was tested using the f-statistic at a 5% level of significance. The research findings were presented in the form of tables and graphs. The study established a statistically significant positive relationship between profitability ratio and bankruptcy prediction (coefficients=12.415, $p=0.017<0.05$) at a 5% level of significance. The management of dairy cooperative societies is encouraged to closely monitor the financial indicators of profitability. The findings of this study would be important to policymakers, such as the management of dairy cooperative societies and farmers who are key stakeholders in dairy cooperative societies. Scholars and researchers would find this study being of great interest since the gap for further research has been provided.

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INTRODUCTION

Bankruptcy prediction within an organisation is essential in the current economic era. Firms encounter bankruptcy when they face difficulties in meeting their financial liabilities. Past studies and theoretical studies indicate that profitability is the key determinant of the bankruptcy of firms (Altman and Hotchkiss, 2019). Further bankruptcy can also arise due to inadequate cash flows, reduced revenue, inability to adhere to payment deadlines and failure to comply with legal and contractual agreements (Efuntade & Akinola, 2020). The highest chances of bankruptcy possibility are shown by insolvency, which is an expensive exercise as it comprises legal costs and may lead an organisation to sell its assets at a very low price (Range et al., 2018).

The Altman Z-score is the most common statistical model used to predict the chances of bankruptcy. This study focused on the effect of profitability ratio on predicting the bankruptcy possibilities of dairy cooperative societies in Meru County, Kenya. The findings of this study are likely to provide information that will enable the various stakeholders of dairy cooperative societies to take early corrective action, which will include salvaging those dairy cooperatives which can be salvaged and

liquidating those that cannot be salvaged (Roni et al., 2018). It is worth noting that despite the role of the dairy sector plays in the Kenyan economy such as the provision of employment opportunities, production of milk for domestic and commercial consumption, generation of government revenue through taxes and boosting exports, the financial performance of the sector is wanting. A study carried out by Kangogo (2019) on the challenges faced by dairy cooperative societies showed that some cooperative dairy societies faced chances of closure due to accumulated debts.

The profitability ratio indicates the firm's general efficiency. Mostly it is used as a measure of income that a company generates within the duration of time in regard to the level of sales, capital employed, assets, earnings per share and net worth. Profitability ratios also measure the income ability of the firm, and it is seen as a symbol of growth and success (Jahur & Quidir, 2012). Naz et al. (2010) provide that return on assets, return on investment and return on equity contribute highly to the performance of firms. Profitability ratios can be measured by; gross profit margin, net profit margin, return on assets, return on equity, return on capital invested and return on capital employed (Senan et

al., 2021). However, this study adopted return on equity to assess the influence that profitability has on bankruptcy prediction since it represents the percentage of net income by the organisation to ordinary shareholders. A favourable increase in the return on equity ratio reveals a reason to purchase a company stock (Enekwe & Eziedo, 2014).

Statement of the Problem

The strategic objective of every firm is to have positive financial health and sustainability that ensure it meets its financial obligations as and when they fall due. Dairy cooperatives have the responsibility of supporting the country's economy through the mobilisation of savings and provision of credits to its members hence enhancing economic growth. The dairy sector in Kenya contributes 14% of the agricultural GDP with a growth rate of 4.1% annually compared to the 1.2% overall growth of the agricultural sector (Odero-waitituh, 2017). With sound financial indicators like profitability ratio, dairy cooperative societies can operate smoothly without any risk of bankruptcy hence positively contributing to the growth of the agricultural sector in the country. Bankruptcy hinders the attainment of such goals and portrays a poor overall performance of any sector of the economy. A study carried out by Kangogo (2019) on the challenges faced by the dairy sector revealed that some dairy cooperative societies faced chances of closure due to accumulated debt. On the other hand, Meru Central Dairy Cooperative Union waived a loan of 449 million by the state to be able to pay farmers their dividends (Wambugu, Kirimi & Opiyo, 2011). A financial ratio that determines bankruptcy includes the profitability ratio. It is therefore important to investigate how this ratio influences bankruptcy prediction of dairy cooperative societies in Meru County. The existing literature on predicting bankruptcy that has been done in another sector has revealed a contextual gap. Research has been done in other countries; for example, Ali (2020) and Aziidah (2017), who conducted research in the service sector in Pakistan and energy in Nigeria,

respectively, presented findings which cannot be applicable to the dairy sector in Kenya because of differences in governance and economic conditions. Other studies done in Kenya were in another sector; for example, the sugar sector (Kungu, 2015) and Range (2019) in the banking sector (Sporta, 2018) and Kariuki (2013) findings cannot be applied to the dairy sector due to regulatory system differences.

Objective of the Study

To determine the effect of profitability ratio on bankruptcy prediction of Dairy Cooperative Societies in Meru County, Kenya.

Research Hypothesis

H₀₁: Profitability ratio has no statistically significant relationship on bankruptcy prediction of Dairy Cooperative societies in Meru County, Kenya.

Significance of the Study

This research work will provide useful information to the management of cooperative societies that would be helpful in evaluating their financial performance and financial position. The study would also be useful to the management in making informed decisions on how they can fund their capital structure to the optimal level. The financial institutions, on the other hand, are likely to find the findings of the study useful in analysing and evaluating the financial strength of the enterprise to determine the ability of the enterprise to pay back the borrowed funds and the interest. Any decision to accept credit should be supported by the assets base, increased profitability, adequate liquidity, and low gearing level. The research findings will be beneficial to the government in finding the facts that are crucial for the dairy sector and the economy as a whole in policy and strategy formulation.

LITERATURE REVIEW

Theoretical Framework

Value Maximization Theory

This theory was formulated by Professor Michael Jensen in 1970. The theory states that the main objective of why a firm would exist is to maximise profits in the short run and maximise shareholders' wealth in the long run. The theory further provided even when the activities of an organisation seem to be many, profit making is the key. The value of the organisation can only be maximised when the management invests in projects which after evaluation show a positive net present value result. Profitability is the key determinant for the firm's ability to attain its objectives and, specifically, utilisation of scarce resources and achieve a competitive advantage (Yazdanfar, 2013). The theory assumes that; the objective of the firm is to maximise profits where profits are the difference between firms' revenue and cost, tastes and habits of consumers are given as constant and the own firm demand and cost are known with certainty.

The main objective of dairy cooperative societies is to maximise profits. Therefore, profit maximisation theory was used in this study to show how profitability affects the financial performance of the dairy, thereby leading to bankruptcy. This theory also can be used in explaining the process the dairy cooperatives undergo to determine the best output and price level in order to maximise their returns.

Profitability Ratio and Bankruptcy Prediction

A study by Szlagy et al. (2010) sought to examine factors that determine the individual and corporate financial problems of public companies listed on the Kamakura Risk Information Service. The study adopted a logit model. The finding indicated a negative relationship between financial ratios and the financial problems of public companies. The results were similar to that of Taliani (2012) who studied the relevance of financial ratios in predicting the financial distress of 28 commercial

banks in Kenya. Secondary data was collected from the financial statement of the commercial banks. The study adopted a descriptive research design. The independent ratios used were; turnover ratios: activities ratios, and profitability ratios (ROA and ROE). The study revealed the inability of financial ratios to determine the firm going concerned. The study relied on the secondary data obtained from the financial statements. Further, the study adopted a discriminant model and incorporated all the above ratios. The study showed that none of the activity ratios and turnover ratios were critical in predicting financial distress in Kenya. The study context is however different from the current study and did not incorporate a moderator; however, the current study adopted firm size as a moderator.

A study by Samira (2012) sought to investigate the listed companies on Nairobi Stock Exchange from 1996-2012 in Kenya. This study adopted Multivalent Discriminant Analysis (MDA) in bankruptcy prediction on the listed companies. The study adopted profitability ratios to determine bankruptcy levels. The study used a descriptive research design and data was from secondary sources. The study revealed that Z-score multi-discriminant financial analysis in the bankruptcy prediction of non-manufacturing firms. This study was only limited to profitability ratios; however, the current study will incorporate profitability ratios, liquidity ratios and capital gearing ratios. However, descriptive research design cannot be used to show relationship variables, unlike correlational research design. Further, the finding cannot be generalised in the dairy sector because of regulatory differences, thereby revealing a contextual gap that the current study sought to address.

A study by Salehi and Abedini (2019) investigated the relationship between profitability and financial distress prediction of the companies listed on the Tehran Stock Exchange. The study adopted a multiple regression model. A valuation model was made using the data from the two groups. One group consisted of 30 companies which do not have any

financial difficulties, and the second group consisted of 30 companies that had financial difficulties. The study finds out that profitability has a negative relationship with financial distress. However, the study differed from that of Geng et al. (2015) who carried out a study predicting the financial distress of 107 Chinese companies that received the label “special treatment” from 2001-2008 by the Shanghai Stock Exchange and the Schenzhen Stock Exchange. The study used data mining techniques to predict financial distress warning models based on 31 financial indicators and used three different aspects of comparing these 107 firms to the control group of firms. The results showed a positive relationship between profitability and financial distress. However, the study did not adopt the moderating variable. Therefore, the current study seeks to adopt the firm size as a

moderating variable that seeks an understanding of the effect it has on the relationship between independent and dependent variables. Further, the context of the two studies is different from the current study.

Conceptual Framework

A conceptual framework is a detailed presentation of variables under study which is defined by the interest of a researcher (Gregory, 2020). Conceptually high profitability increases the cash flows, which helps a firm in meeting its operations. Thereby reducing the chances of bankruptcy; on the other hand, failure of the firm to invest their current funds in a profitable venture results in losses resulting in an inability to generate more cash to settle the financial obligations.

Figure 1: Relationship between Profitability Ratio and Bankruptcy Prediction



RESEARCH METHODS

Research Design

This study adopted a descriptive research design and a correlational research design. The descriptive research design was useful in the study as it ensured a complete description and analysis of events and transactions by ensuring there was minimum bias in the collection and analysis of data. Further descriptive research design helps the researcher in answering the questions like what is the problem under study, where the problem is and how the problem is. Correlational research design, on the other hand, was used to measure the relationship between two or more variables that could be either positive or negative. The design was appropriate for this study as it helped the researcher in assessing the

nature and strength of the relationship among the variables.

Target Population

The target population of the study comprised the financial data of the 13 dairy cooperatives societies which jointly formed Meru Central Dairy Cooperative Union and that were active, and their financial statements were audited for the period under study (2017-2021).

Sampling Procedure and Sample Size

A census was conducted on financial data from all the 13 active dairy cooperative societies in Meru County that have been in operation over the last five years under the study and the ones that were audited by the Meru County Department of Cooperatives

during this period. The census method involves an exhaustive enumeration of units comprising the target population.

Research Instrument

Data were recorded in a checklist which captured; working capital, total assets, retained earnings, earnings before interest and taxes, market value of equity and total liability.

Data Analysis

Altman Z score model, which is a multi-variant model, was used to show the relationship between financial ratios and bankruptcy prediction of the

cooperative societies. The hypothesis was tested at a 5% level of significance using T-test and F-test.

RESULTS AND DISCUSSION

Descriptive Statistics

A checklist was used to collect the data from the Department of Trade, tourism and cooperative enterprise of Meru County. After cleaning, screening and verification of data, 13 checklists were fully completed yielding a 100% response rate.

Descriptive statistics for financial analysis and Altman Z score were determined. *Table 1* presents a summary of the data.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev
Altman Z score	13	.718	7.864	3.0497	5.362
Profitability ratio	13	-1.456	1.543	.294	.541
Valid N	13				

The results presented in *Table 1* show the mean of the Altman Z score (3.0497) that falls within the safety region of above 2.6, meaning most of the dairy cooperative societies in Meru County were safe from bankruptcy. The standard deviation of the Altman Z score of 5.362 means a high variation of Altman Z score coefficients of individual dairy cooperative societies from the mean value of 3.0497. Therefore, the dairy cooperative societies in Meru County are spread in both the safe and red zone of bankruptcy in the period under study. The minimum value of the Altman Z score was 0.7182, which was less than 1.1 (bankruptcy zone), implying that some of the dairy cooperative societies were at risk of being bankrupt. The maximum value of 7.868 revealed that some dairy cooperatives were managing their funds efficiently; hence they were liquid enough to remain going concerns. The average profitability ratio (0.294) indicates the majority of the cooperative dairy societies were investing the equity of shareholders in profitable ventures to generate profits. The minimum value of the profitability ratio was -1.456.

The negative sign implies that some of the dairy cooperative society's shareholders were losing their investment, hence increasing exposure to the chances of cooperative societies becoming bankrupt. Further, the maximum value of profitability ratio was 1.543, indicating that the management in some of the dairy cooperative societies was efficiently maximising the shareholder's wealth.

Correlation analysis was carried out using Pearson product-moment correlation; the results indicated a moderate positive correlation between profitability ratio and Altman Z-score ($r = 0.648, p = 0.017 < 0.05$).

Test of Goodness of Fit

The results presented in *Table 2* indicate that the adjusted R^2 for the profitability ratio was 0.367. The results imply that the profitability ratio explains 36.7% of the variation in bankruptcy prediction for dairy cooperative societies in Meru County, Kenya. The remaining 63.3% was explained by other factors which were not considered in this model.

Table 2: Goodness of Fit

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.648 ^a	.420	.367	8.2438735

a. Predictors: (Constant), profitability ratio

Test of Overall Significance of the Model

The results presented in *Table 2* indicate that the fitted model linking the relationship between profitability ratio and bankruptcy prediction was

statistically significant (F statistic = 7.957, p = 0.017 < 0.05) at a 5% level of significance. This implies that the suggested model was suitable for prediction purposes.

Table 3: Overall Significance of the Model

Model		df	F	Sig.
1	Regression	1	7.957	.017 ^b
	Residual	11		
	Total	12		

a. Dependent Variable: Altman Z score

b. Predictors: (Constant), profitability ratio

Model Estimation

The regression results presented in *Table 3* indicate a statistically significant positive linear relationship between profitability ratio and bankruptcy prediction of dairy cooperative societies in Meru County, Kenya (*coefficient* = 12.415, *p* = 0.017 < 0.05) at 5% level significance. This means that one unit increase in profitability ratio will lead to an increase in the Altman Z score by a factor of

12.415. The null hypothesis that there is no statistically significant relationship between profitability ratio and bankruptcy prediction among dairy cooperative societies in Meru County, Kenya, is not supported, which means profitability ratios have a positive significant linear relationship with bankruptcy prediction (measured by Altman Z score) in dairy cooperative societies in Meru County, Kenya. This implies that an increase in profitability reduces the chances of bankruptcy.

Table 4: Individual Significance of the Model

Model	Unstandardised Coefficients		t	Sig.
	B	Std. Error		
1 (Constant)	2.401	2.627	.914	.038
profitability ratio	12.415	4.401	2.821	.017

a. Dependent Variable: Altman Z score

The regression model for the prediction of the results can be stated as follows:

$$Z'' = 2.401 + 12.145 X_1$$

Where *Z''* = Z score; 2.401 = constant; 12.145 = regression coefficient; *X*₁ = profitability ratio

DISCUSSION

The hypothesis that guided the study was as follows:

*H*₀₁: Profitability ratio has no significant relationship on bankruptcy prediction of dairy cooperative societies in Meru County, Kenya.

The regression analysis results addressed the concern of the study by showing there is a positive

significant linear relationship between profitability ratio and bankruptcy prediction. This implies that an increase in the profitability ratio will result in an increase in the Altman Z score by a factor of 12.145, meaning an increase in profitability reduces the chances of bankruptcy.

Secondly, the study is supported by the value maximisation theory, which was formulated by Michael Jensen in 1970. The theory states that the main objective of the firm's existence is to maximise profit. The theory further suggests that profitability is the key determinant for the firm ability to attain objectives and utilise the available resource. One objective of the firm is ensuring that the firm operates as a going concern. This can only be achieved by investing in profitable opportunities to yield more profit, thereby leading to reduced chances of bankruptcy.

Thirdly the findings are in agreement with a study by Samira (2012) who conducted a study on the relationship that exists between profitability ratio and bankruptcy prediction among listed companies in NSE. The findings revealed a significant positive relationship between the profitability ratio and bankruptcy prediction. However, the findings differed from a study by Taliani (2012), who conducted a study on the relevance of profitability ratio in predicting the bankruptcy of listed companies in NSE. The results revealed that there exists a negative relationship between the profitability ratio and bankruptcy prediction. The findings further contrast with the study findings by Salehi and Abedini (2019), who investigated the relationship between profitability and financial distress prediction of the companies listed on the Tehran Stock Exchange, whose findings showed a negative relationship between profitability and financial distress. The findings of this objective generally indicate that firms that are able to maximise profits survive the threat of bankruptcy.

CONCLUSION AND RECOMMENDATION

Dairy cooperative societies need to invest their funds in profitable businesses to generate returns. Therefore, the management is required to evaluate the projects under consideration and select the one with the highest positive net present value. It was further concluded that there existed a statistically significant positive linear relationship between profitability ratio and bankruptcy prediction for dairy cooperative societies in Meru County, Kenya, as measured by the Altman Z score. Therefore, the profitability ratio influences bankruptcy prediction. An increase in profitability increases the Altman Z score hence reducing the chances of bankruptcy. This implies that dairy cooperative societies in Meru County can minimise their chances of becoming bankrupt by investing their fund in profitable ventures with the aim of enhancing their profitability. Based on the findings of the current study, the researcher recommends the management of the dairy cooperative society in Meru County invest more profitably to enhance the chances of the firms remaining solvent

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