



Cooperative financial evaluation using altman z-score to identifying financial distress

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ABSTRACT

Cooperatives have become an essential form of economic organization throughout the world, providing their members with a vast array of services and benefits. Nonetheless, economic fluctuations and business insecurity can place many cooperatives in a financial bind. Therefore, a thorough financial evaluation is required to identify potential issues and implement preventative measures. This research examines Karya Mandiri Cooperative as an illustration of an at-risk savings and loan cooperative. This study employs the Modified Altman Z-Score model to identify cooperatives experiencing financial distress. Using financial statements from 2020 to 2022, the Modified Altman Z-Score Method on cooperative financial statements yields safe prediction results. The predicted Z value between 2020 and 2022 has increased from 6.76 in 2020 to 8.33 in 2022. The assessment of the cooperative's health level demonstrates a significant shift from 2020, resulting in a cut-off value of 6.76 and a classification as "quite healthy" in terms of cooperative health, to 2021, resulting in a cut-off value of 7.79 and a classification as "quite healthy" in terms of cooperative health, and to 2022, resulting in a cut-off value of 8.33 and a classification as "healthy" in terms of cooperative health.

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1. INTRODUCTION

Cooperatives have emerged as a prominent mode of economic organization on a global scale, offering a diverse array of services and advantages to their members. Cooperatives function as an alternative business model that prioritizes the values of open membership and democratic involvement, with the objective of enhancing the well-being of members through shared ownership and communal administration (Ajija et al., 2018; Maryani &

Adiprasetio, 2018; Werdiningsih et al., 2023). In addition to experiencing fluctuating economic growth and encountering an unstable business climate, numerous cooperatives are currently confronted with financial challenges that have the potential to jeopardize their continued existence. In order to address these obstacles, it is imperative for cooperatives to do a meticulous financial assessment to detect possible issues and proactively intervene prior to the situation escalating (Herawaty et al., 2023; Sadikin, Naim, et al., 2023). Cooperatives possess considerable potential in facilitating inclusive economic growth; yet, they are also confronted with financial issues and hazards that necessitate meticulous attention and resolution.

Financial distress refers to a state in which a company's financial status experiences a deterioration. Under these circumstances, the corporation exhibits indications of insolvency as a result of the deterioration in its financial state. According to scholarly research, it has been elucidated that financial distress not only diminishes the worth of a company, but also has adverse consequences on the relationships among suppliers, consumers, workers, and creditors, leading to disruptions (Paputungan, 2022; Wiguna et al., 2022; Wijaya, 2022; Zuhriyah et al., 2022). A savings and loan cooperative is an example of a corporation that is susceptible to experiencing financial difficulties. There exists a subset of cooperatives that are unable to fulfill their responsibilities, specifically in regards to the restitution of deposited member monies (Arsyad et al., 2022; Mokoagow, 2018).

Based on the explanation above, the Karya Mandiri Cooperative is one of the savings and loan cooperatives that needs to be aware of experiencing financial distress. Even though the assessment of the current financial health of the Karya Mandiri Cooperative is always stable from year to year, it does not mean that the company is unlikely to experience problems in its financial condition one day. What's more, the Karya Mandiri Cooperative has experienced fluctuating asset conditions, even for profit in certain months it has experienced minus or loss conditions (Boari, Ilindamon, Mikir, et al., 2022; Ramadhan et al., 2023; Sadikin, 2020a; Sudipa & Suidiani, 2019). Another problem that occurred was the Covid-19 pandemic, which made it difficult for people to carry out their obligations, such as paying credit. This made the Karya Mandiri Cooperative's income decrease drastically from the previous year. Meanwhile, the Karya Mandiri Cooperative continues to provide concessions or excuses for customers who are unable to carry out their obligations due to the pandemic. If this condition continues and there is no vigilance, it is not impossible that the Karya Mandiri Cooperative will also experience financial distress and it will also be difficult for the cooperative to fulfill its obligations to other customers.

Some research by (Manaseer & Al-Oshaibat, 2018; Mokoginta, 2022; Olimsar, 2021; Sadikin, Yodiansyah, et al., 2023; Toly et al., 2019) have predicted the financial distress of a company, there are several methods that can be used and one of them is the Altman Z-Score model. The Altman model itself has undergone several changes, and this modified model is considered the most user friendly. This is because the financial ratios used can be applied by many types of companies (Boari, Ilindamon, & Rumaropen, 2022; Natsir & Mokoginta, 2020; Ningsih & Permatasari, 2018; Revini Pranata et al., 2023; Sadikin, 2020b). Various studies explain that this modified Altman model has also been widely used to measure financial distress in financial service companies such as banking (Goh et al., 2022; Wu et al., 2022).

The purpose of this study is to evaluate cooperative finance using the Altman Z-Score model. This model was developed to identify potential bankruptcy in companies. In this study, the Altman Z-Score model will be adjusted for cooperatives with the aim of identifying financial distress in the financial reporting year that these cooperatives may face. (Anggraini, 2020; Mokodenseho & Puspitaningrum, 2022; Muhammadiyah & Amin, 2020; Oktaviana et al., 2022). The implications of this research have several significant benefits. First, the research results will provide valuable guidance for cooperative

managers in identifying financial risks and taking preventive steps to overcome them. Second, this research will contribute to academic knowledge about cooperative finance and the application of the Altman Z-Score model to the cooperative sector.

2. RESEARCH METHOD

The present study will employ a quantitative methodology to examine the financial data of the Cakra Mandiri Cooperative over the timeframe of 2020 to 2022. The collection of pertinent financial data will be conducted through sourcing from reputable channels, including the cooperative's financial statements and audit records. After the collection of data, the use of the Altman Z-Score model will be utilized to compute the financial score of the cooperative, thereby facilitating the evaluation of its financial risk level. The data collection techniques used in the study were:

a. Interview Process

The interview method consists of conducting direct interviews with related parties to acquire data. The interviewee is the administrator who summarizes all Cakra Mandiri cooperative transaction records. The results of the interview provided an overview of how cooperative activities have transpired thus far. At this point, the informant also explained how cooperative income can fluctuate and be unpredictable. So that it was a problem that there was no prediction of financial distress in the co-op to provide a warning due to the fluctuating income of the business.

b. Observation Process

The observation method is field data collection conducted through direct observation of the Cakra Mandiri Cooperative, particularly in the field of financial statements. Observation aims to determine how the financial situation is at the Cakra Mandiri cooperative and to observe the conditions that occur in its financial ratios.

c. Documentation Process

Documentation is a technique for accumulating data by using images as data sources. The objective of the author's documentation method is to record the Cakra Mandiri cooperative's nominal ratio, which is required for projections from 2020 to 2022.

2.1 Model Altman Z-Score

The Altman Z-Score model is a statistical technique used to evaluate the financial health of a company or business entity in order to predict future bankruptcy or financial distress. In 1968, Professor Edward I. Altman created this method (Manaseer & Al-Oshaibat, 2018; Ningsih & Permatasari, 2018). The Original Altman Z-Score model attempts to forecast the public offering of manufacturing companies. Each business has a unique financial condition. This prompted Altman to modify his prediction model so that it could be utilized by various industries. The Altman model process eliminates variable X5 (sales to total assets) [32] due to the fact that this ratio varies considerably across industries with various asset sizes. The Altman model equation (Toly et al., 2019) is as follows:

$$\text{Altman Z-Score model formula} = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4 \quad (1)$$

Information

Z = Bankruptcy Index

X1= Working Capital/Total Assets

X2= Retained Earnings/Total Assets

X3= Income Before Interest and Tax/Total Assets

X4= Equity Book Value/Debt Book Value

2.2 Z-Score Cut-off Value

Regarding cut-offs or thresholds, this usually depends on the needs of the analysis or certain rules that apply to the Z-Score. For example, in some credit or financial risk applications, the cut-off Z-Score can be used to assess a certain level of risk.

Table 1. Cut-Off Z-Score

Z < 1.1	Category
1.1 < z < 2.6	Prone
Z > 2.6	Safe

2.3 Cooperative Health Assessment

The cooperative health assessment is an academic inquiry conducted to evaluate various factors that are believed to influence the overall well-being and functioning of cooperatives. The relevant factors encompassed in this study comprise management, capital, quality of productive assets, efficiency, independence and growth (Anggraini & Khairunnisa, 2022; Arsyad et al., 2022; Sadikin et al., 2022; Safelia et al., 2022). Furthermore, it is imperative to evaluate the liquidity and cooperative identity aspects. The health indicators of savings and loan cooperatives are as follows:

Table 2. Cooperative Health Level

Score	Predicate
8 < X < 10	Healthy
6 < X < 8	Healthy Enough
4 < X < 6	Unwell
2 < X < 4	Not healthy
< 2	Very Unhealthy

3. RESULTS AND DISCUSSIONS

3.1. Financial Ratio Data Analysis

At the analysis stage there is an observation process carried out at the independent cakra cooperative to collect field data which is carried out through direct observation, especially in the field of financial reports. Observations aim to find out how the financial situation is in the Cakra Mandiri cooperative and observe the conditions that occur in financial ratios. Then carry out the documentation process by documenting the nominal financial ratios needed for predictions in 2020 to 2022. Financial ratios consist of working capital, total assets, retained earnings, SPB income, equity value and book value of debt. The following is the financial ratio of the Cakra Mandiri cooperative:

Table 3. Cooperative Financial Ratios

Ratio	Year		
	2020	2021	2022
Working capital	Rp. 1,735,863,765	Rp. 2,370,202,178	Rp. 2,700,971,846
Total Assets	Rp. 1,829,081,109	Rp. 2,542,509,276	Rp. 2,728,884,410
Retained earning	Rp. 34,467,806	Rp. 87,850,575	Rp. 98,471,647
SPB Revenue	Rp. 454,840,984	Rp. 466,544,888	Rp. 575,620,900
Equity Value	Rp. 348,792,001	Rp. 582,254,916	Rp. 668,820,180
Debt Book Value	Rp. 1,340,552,210	IDR 1,840,666,786	Rp. 2,260,760,870

3.2 Altman Z-Score Model Calculation Analysis

Calculation analysis of the Altman Z-Score model involves 6 financial ratios of cooperatives namely working capital, total assets, retained earnings, SPB income, equity

value and debt book value. Furthermore, based on the number of each ratio, the altman Z-score model calculation uses equation 1 to produce a Z score which indicates the financial risk of the cooperative.

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Based on this formula, to get the z-score there will be three calculations. Where is the first calculation to determine the value of the variables X1, X2, X3 and X4. The results of the calculation of the values X1, X2, X3 and X4 that were carried out can be seen in table 2 below.

Table 4. Calculation of the Value of Variable X

Formula	Year		
	2020	2021	2022
X1 = Working Capital / Total Assets	0.95	0.93	0.99
X2 = Retained Earnings / Total Assets	0.02	0.03	0.04
X3 = SPB Income / Total Assets	0.03	0.18	0.21
X4 = Equity Value / Debt Book Value	0.26	0.32	0.3

After getting the X value based on the table above, then multiplying all X values with the multiplier value that has been determined in equation 1. The results of calculating the Z-Score value for each ratio can be seen in the following table:

Table 5. Calculation of the value of Z

Formula	Year		
	2020	2021	2022
X1(6.56)	6.22568	6.115426	6.492901
X2(3.26)	0.06143	0.112642	0.117637
X3(6.72)	0.20148	1.233105	1.417492
X4(1.05)	0.27319	0.332145	0.31063
Σ	6.761788	7.793317	8.33866

Based on table 5 it can be explained the results of the Altman Z-score model on cooperative financial ratios for 2020-2022, in the table there is the sum of the values of each ratio so that the total value of the ratio in 2020 is 6.76, in 2021 is 7.79 and in 2022 it is 8.33. Furthermore, the results of this Z-score will be categorized into the cut-off value of the altman Z-score model according to the explanation in Table 1.

Table 6. Cut-off Z-Score

Information	Year		
	2020	2021	2022
Z-Score value	6.761788	7.793317	8.33866
Cut-Off Results	Safe	Safe	Safe

Based on table 6, it shows the results of the cut-off value category of the altman Z-score model showing the financial ratios of Cakra Mandiri cooperatives for the period 2020 to 2022 indicating a safe category, so it can be said that the prediction results from the altman z-score indicate that there is no financial distress in the finances of Cakra Mandiri cooperatives . The next process is to determine the soundness level of the cooperative to find out the category of cooperative financial soundness based on the explanation in table 2. The results of determining the soundness level of the cooperative are as follows:

Table 7. Comparison Results

Prediction Results		Cooperative Health	
Year	Information	Year	Information
2020	Safe	2020	Healthy Enough
2021	Safe	2021	Healthy Enough
2022	Safe	2022	Healthy

In accordance with the prediction calculations for 2020-2022 which state that cooperative conditions are classified as safe, as well as an assessment of the level of independent chakra cooperatives in 2020-2022 the results obtained are that in 2020 it produces a cut-off value of 6.76 so that it is categorized as "fairly healthy" in terms of Cooperative health, in 2021 it produces a cut-off value of 7.79 so that it is categorized as "fairly healthy" in terms of cooperative health, in 2022 it produces a cut-off value of 8.33 so it is categorized as "healthy" in terms of cooperative health.

4 CONCLUSION

The study's findings indicate that the implementation of the adjusted Altman Z-Score model can be beneficial for the Cakra Mandiri cooperative in evaluating financial ratios and assessing its overall financial health. Specifically, the Altman Z-Score model demonstrates an increase in financial ratios for the Cakra Mandiri cooperative, reaching a value of 8.33 from the vulnerable state observed in 2020 to the projected year of 2022. Consequently, the assessment of the cooperative's health level reveals that it falls within the "healthy" category. This study has the potential to yield significant research implications by enhancing our comprehension of the financial performance of cooperatives. Moreover, it can offer helpful recommendations to managers and stakeholders in effectively and sustainably operating cooperatives. It is recommended that future research endeavors incorporate a larger dataset from various companies to assess the efficacy of the altman z-score method through the utilization of a Hypothesis test.

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