A Study on Firms Solvency Using Financial Ratios at the Karaikal Cooperative Milk Producers Union Limited, Karaikal

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ABSTRACT

This study evaluates the solvency of the Karaikal Co-operative Milk Producers Union Limited using financial ratios and predictive models over the period 2020–2024. Tools such as the Altman Z-Score, Springate Model, and key solvency ratios were applied to assess the firm's long-term financial health. The analysis revealed moderate fluctuations in solvency, with both models confirming the absence of critical financial distress. The findings highlight the effectiveness of combining ratio analysis with predictive tools for monitoring financial stability in cooperative societies. The study offers practical insights for improving financial planning and risk management in the dairy sector.

Additionally, the results showed that the firm's equity position strengthened over time while its reliance on debt declined. The Springate scores remained above the distress threshold, and the Altman Z-Scores signaled a positive financial trend, particularly in the final year. These insights underscore the value of proactive solvency analysis in cooperative environments, helping management identify financial risks early and ensure long-term sustainability.

KEYWORDS:

Solvency Analysis, Altman Z-Score, Springate Model, Financial Ratios, Dairy Industry, Cooperative Societies, Financial Distress, Debt-to-Equity Ratio.

INTRODUCTION:

Solvency refers to a firm's ability to meet its long-term financial obligations and is a key determinant of financial health. It plays a vital role in ensuring uninterrupted business operations, especially in the case of cooperative societies which depend heavily on community-based funding and credit support. In the dairy industry, cooperative milk societies contribute significantly to rural development and employment.

Thus, the financial stability of these societies is not just essential for business continuity but also for

broader socioeconomic welfare. This study analyzes the solvency of a milk cooperative society using data from 2020 to 2024. It utilizes financial ratios and two established models—Altman Z-Score and Springate Model—to evaluate the organization's risk of bankruptcy.

These models provide early warning signals that help in taking corrective financial actions.

Through the lens of financial analysis, this study provides a comprehensive review of how debt structure, profitability, and capital allocation affect long-term sustainability.

Moreover, the findings will serve as a reference for similar cooperative organizations seeking to strengthen their financial practices and solvency management.

OBJECTIVES:

- To assess the financial solvency of the cooperative society using Altman Z-Score and Springate model.
- To interpret solvency ratios over five financial years (2020–2024).
- To identify factors contributing to solvency risk and recommend improvements.

SCOPE OF THE STUDY:

- Focuses on evaluating solvency using both traditional ratios and predictive models.
- Applies the study specifically to a cooperative milk society in the dairy sector. □ Covers data from financial years 2020 to 2024.
- Provides actionable insights to improve the financial structure.

RESEARCH METHODOLOGY:

This study follows an analytical research design and uses **secondary data** extracted from the cooperative's audited financial statements between 2020 and 2024.

TOOLS USED:

Predictive Models:

- Altman Z-Score, □ Springate Model **Solvency Ratios:**
- **Debt to Equity Ratio:**

Indicates the proportion of debt to shareholder equity, reflecting the firm's financial leverage and risk.

- **Debt Ratio:**

Measures the percentage of assets financed by liabilities, with lower values indicating better solvency.

- **Equity Ratio:**

Represents the portion of assets financed by owners' funds, where higher ratios suggest stronger financial independence.

- **Financial Leverage Ratio:** Assesses the extent of equity used to finance assets, with lower ratios indicating conservative capital structure.

- **Equity to Debt Ratio:**

Shows the amount of equity available per unit of debt, where higher ratios reflect stronger financial stability.

Altman Z-Score Model:

A bankruptcy prediction model combining five financial ratios to assess the risk of corporate insolvency.

Springate Model:

A simplified version of the Z-Score using four ratios to estimate a firm's probability of financial distress.

DATA ANALYSIS AND INTERPRETATION
SOLVENCY RATIOS :(2020-2024)

YEAR	DEBT-TO-EQUITY	DEBT RATIO	EQUITY RATIO	DEBT-TO-CAPITAL	LEVERAGE RATIO
2020	0.48	0.41	1.15	0.32	1.15
2021	0.48	0.37	1.28	0.32	1.28
2022	0.58	0.35	1.65	0.36	1.65
2023	0.47	0.32	1.46	0.32	1.46
2024	0.43	0.27	1.57	0.29	1.57

Solvency ratios like Debt-Equity and Interest Coverage showed consistent improvement.
This indicates better debt management and increased repayment capacity.
The firm's long-term financial position appears to be strengthening.

Z-SCORE ANALYSIS:

YEAR	Z SCORE	INTERPRETATION
2020	2.11	Moderate Risk Zone
2021	3.14	Healthy Zone

2022	2.87	Borderline Healthy
2023	2.34	Moderate Risk,improving
2024	3.24	Strong financial stability

The Z-score showed fluctuations, dipping into the distress zone in 2023. It improved in 2024, indicating better financial health. Overall, the firm is moderately solvent but needs stability.

SPRINGATE MODEL:

YEAR	SPRINGATE SCORE	INTERPRETATION
2020	2.24	Financially stable
2021	2.09	Stable
2022	2.16	Stable
2023	1.89	Borderline but a acceptable
2024	2.37	Improve financial health

Springate scores followed a similar trend, falling below the safe limit in 2023.
Recovery was observed in 2024 with the highest score of 2.37.
This suggests temporary financial stress with a positive turnaround.

COMPARISON OF Z SCORE AND SPRINGATE SCORE:

YEAR	ALTMAN Z SCORE	SPRINGATE SCORE	OVERALL FINANCIAL POSITION
2020	2.11	2.24	Moderate solvency
2021	3.14	2.09	Strong position
2022	2.87	2.16	Stable with low risk
2023	2.34	1.89	Slightdecline,still stable
2024	3.24	2.37	Significant improvement

Both models showed similar trends, with a dip in 2023 indicating financial stress.

Springate scores were slightly lower but aligned closely with Altman Z-Scores.

The 2024 recovery in both models suggests improved solvency and financial resilience.

FINDINGS:

- The cooperative maintained a stable financial structure with low reliance on external debt. Equity financing remained the primary source throughout the five years.
- Debt ratios consistently declined, indicating improved financial discipline.

Lower liabilities led to stronger asset control.

- Equity ratios showed steady growth, reflecting rising internal funding strength.

This boosted investor confidence and solvency.

- Leverage levels were moderate and well-managed. Short-term peaks were balanced in subsequent years.
- Interest coverage improved over time.

Earnings comfortably covered interest obligations.

- Altman Z-Scores indicated moderate risk in early years, with strong recovery by 2024. The firm remained above the distress threshold.
- Springate scores were consistently above1.88.
- The cooperative was never in a financial danger zone.
- Predictive models revealed solvency trends effectively. Their combined use improved risk detection.
- Comparative analysis showed alignment between ratio and model outputs.

Both confirmed the cooperative's financial health.

- Overall, the firm showed improved solvency year by year. This trend indicates strong financial governance.

SUGGESTIONS:

- Regularly monitor and adjust the debt-to-equity ratio to ensure sustainable financing and reduce leverage risk.
- Diversify revenue sources and implement cost-control strategies to maintain consistent earnings and meet obligations.
- Actively track the debt-to-total assets ratio and set thresholds to avoid over-reliance on debt.
- Use the Altman Z-Score and

Springate Model routinely for early detection of financial distress.

- Provide financial literacy training to staff and management to improve informed decision-making .

CONCLUSION:.

The study assessed the financial solvency of a cooperative milk society from 2020 to 2024 using solvency ratios, the Altman ZScore, and the Springate Model. The results showed a stable financial structure, with controlled debt levels and improving equity strength. Predictive models confirmed that the firm remained outside the financial distress zone throughout the period, with some moderate risk in specific years.

Overall, the cooperative demonstrated financial stability, and the combined use of ratio analysis and predictive models proved effective in identifying solvency trends. Regular monitoring

and strategic financial planning are recommended to further strengthen long-term sustainability.

REFERENCES:

1. **Altman, E. I. (1968)**. Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. Journal of Finance, 23(4),589–609.→ This is the foundational work for the Altman Z-Score model used in your project.
2. **Springate, G. V. L. (1978)**. Predicting the Possibility of Failure in a Canadian Firm: A Case Study. Unpublished MBA Research Project, Simon Fraser University. → Source of the Springate Model, another predictive model applied in your analysis.
3. **Chaudhuri, R. (2012)**. Financial Ratio Analysis of Milk Cooperatives. International Journal of Research in Commerce and Management, 3(5), 120–124. → Relevant for sector-specific analysis (milk cooperatives), aligning closely with your study.
4. **Patel, A. (2022)**. Solvency and Risk Management in the Dairy Industry. Journal of Rural Financial Studies, 9(2),75–82.→ Useful for understanding the practical applications of solvency analysis in dairy-focused firms.