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FIRM SPECIFIC FACTORS AND FINANCIAL DISTRESS OF DEPOSIT TAKING SAVING AND CREDIT COOPERATIVE SOCIETIES IN KENYA

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ABSTRACT

Financial distress remains a major concern among Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya, threatening their financial stability and sustainability. This study examined the influence of asset tangibility and asset quality on the financial distress of DT-SACCOs in Kenya. The study was anchored on the Trade-Off Theory and the Wrecker Theory of Financial Distress. A descriptive research design was adopted, targeting all 176 DT-SACCOs licensed by the Sacco Societies Regulatory Authority (SASRA) as at 31st December 2024. A census approach was employed, and secondary data were collected from audited financial statements covering the period 2015 to 2024. Financial distress was measured using the Altman Z-Score model, while asset tangibility was measured using the tangibility ratio and asset quality using the ratio of non-performing loans to gross loans. Data were analyzed using panel data regression with the aid of STATA software. The findings revealed that asset tangibility had a negative and statistically significant effect on financial distress (β = -424.456, $p < 0.001$), indicating that DT-SACCOs with higher levels of tangible assets experience lower levels of financial distress. The study further established that asset quality had a positive and statistically significant effect on financial distress ($\beta = 324.480$, $p < 0.001$), implying that deterioration in asset quality, reflected through increased non-performing loans, increases the likelihood of financial distress. The model explained 55.1% of the variation in financial distress ($R^2 = 0.551$) and was statistically significant ($F = 78.245$, $p < 0.001$). The study concludes that asset tangibility and asset quality are critical determinants of financial distress among DT-SACCOs in Kenya. The study recommends that SACCOs strengthen asset management practices and enhance credit risk management systems to minimize non-performing loans and improve financial stability.

Keywords: Asset Tangibility, Asset Quality, Financial Distress, Deposit-Taking SACCOs, Altman Z-Score, Non-Performing Loans, Kenya.

INTRODUCTION

The prudent and competent management of financial resources is essential to preserving the stability and longevity of financial organizations in the highly regulated and dynamic banking sector (Rawal & Gopalkrishnank, 2024). DT SACCOs play a significant role in promoting national economic development by allocating enough capital and resources (Srivastava, 2021). They advance financial inclusion by providing crucial financial services to individuals and communities lacking access to conventional banking (Fundi & Wamugo, 2023). This has enabled numerous Kenyans to save, invest, and acquire credit (Akuku, Nyang'au & Maobe, 2023).

DT SACCOs can face distress due to economic uncertainty, internal challenges, and external factors. Altavill *et al*., 2021 alludes that Liquidity problems, deteriorating asset quality, and inadequate capitalization are only a few indicators of financial difficulty within banks. Financial distress can warn creditors and investors of potential losses since it signals impending insolvency (Zhou et al., 2022). Theoretical and empirical literature indicates that firm-specific factors play a major role in determining the financing distress of any institution (Kimutai, 2019). Profitability, liquidity, capital adequacy, and Asset quality plays major role as alluded by (, Azam, Chsani, & Nuryartono, 2010; Altman & Ozili ; Sporta, 2018; Githinji,2016, Kosikoh, 2014). The study will be supported by several theories.

Statement of the Problem

Financial distress is one of the most common issues faced by organizations in their daily operations. Competitive financial services in the financial sector will be achieved only if financial distress is well managed (Sporta,2018). According to Altman (2000), financial distress varies among firms based on liquidity, leverage, profitability, market value, and efficiency.

Taking deposits, SACCOs are vital to the economy since they promote saving and offer loans to its members. Over 80% of Kenya's population makes their living either directly or indirectly from the cooperative sector, which is crucial to the country's economy (Kagiri, 2023). However, the financial crisis has caused the failure of several financial institutions, including SACCOs in Kenya. Financially troubled enterprises experience significant decreases in market value and stock prices (Warner, 1977). Large DT SACCOs may not always have a strong financial condition. In Kenya, more than half of Kenyan SACCOs are financially distressed (SASRA, 2022). Cash flow issues, nonpayment of statutory deductions for employees, such as Pay as you earn and failure to meet statutory requirements by SASRA. The rate of nonperforming loans has been increasing from 2015 to 2024, negatively impacting the financial operations of SACCOs (SASRA, 2024). Some SACCOs have been delisted or issued restricted licenses due to their failure to meet statutory minimum capital requirements (SASRA, 2019). (Appendix II). Given the important role of the SACCO sector in Kenya's economy, it is essential to identify the factors that lead to financial difficulties in SACCOs to better forecast their future performance.

Deposit-Taking SACCOs (DT-SACCOs) in Kenya have continued to expand, with sector assets reaching about KSh 832.9 billion in 2023 and loans growing faster than deposits (11.5% vs. 9.95%), creating funding gaps (SASRA, 2024). However, signs of financial distress are emerging. Non-performing loans rose to 8.45% in 2023 (DT-SACCOs: 8.66%), with "loss" category loans increasing to KSh 36.35 billion, partly due to non-remittance of payroll deductions (SASRA, 2024).

Research on financial distress has mostly focused on commercial banks. Ndinda (2023) asserts that the financial performance of Kenyan commercial banks is not significantly affected by firm-specific factors. Credit size and profitability greatly influence the financial performance of Kenya's commercial banks. By examining the financial distress of DT-SACCOs, this study addresses a research gap. According to Kuria, Kiboi, and Macheru (2024), the financial stability of the banking industry declines as NPLs increase. This study filled a research gap by adopting an approach that considers several independent factors of DT-SACCOs.

Objectives of the study

General objective

The study sought to establish the influence of selected firm-specific factors on the financial distress of deposit taking saving and credit cooperative societies in Kenya

Specific objectives

i. To examine the effect of asset tangibility on the financial distress of deposit taking saving and credit cooperative societies in Kenya.
ii. To determine the effect of asset quality on financial distress of deposit taking saving and credit cooperative societies in Kenya.

Research Hypothesis

The following null hypotheses were tested

H_{01}: Asset Tangibility has got no significant effect on the financial deposit taking saving and credit cooperative societies in Kenya

H_{02}: Asset quality has got no significant effect on financial distress of eposit taking saving and credit cooperative societies in Kenya.

LITERATURE REVIEW

Theoretical Framework Review

Trade-off Theory

According to the Trade-off theory, a company will borrow until the additional tax advantage from an additional dollar of debt is precisely equal to the cost, with a greater chance of financial crisis (Xuezhou *et al.,* 2024). The Trade-off theory assumes that the firm's assets and operations are static and simply accounts for variations in the debt–equity ratio. Using the trade-off theory, each company weighs the advantages of debt, such asa tax shield, against the disadvantages, such as distress costs (İltaş & Demirgüneş, 2020). When the marginal benefit of debt equals the marginal cost of debt, leverage is considered optimal. The trade-off theory highlights the need of considering the benefits and drawbacks of debt versus equity financing when determining financial leverage (Umobong, 2023). As a corporation incurs more debt, the marginal gain decreases and the marginal cost increases. Managers must find the optimal balance between minimizing costs and maximizing benefits. The theory is critiqued for its assumptions that capital markets are perfect, with no transaction costs, symmetric information, and rational investors. In reality, markets are complex, and information asymmetry and investor behavior can significantly influence financing decisions (Igbru & Onuora, 2022). This study used Trade-off Theory to assess the effect of asset tangibility on the financial distress of DT SACCOs under SASRA in Kenya

Wrecker Theory

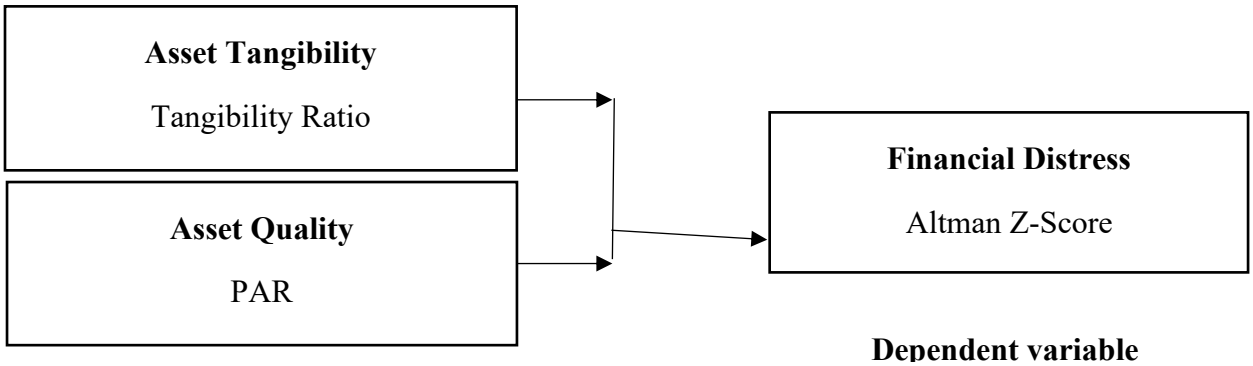
The wreckers theory was developed initially by Campbell, Hilscher and Szilagy (2005) suggested that stocks of distressed firms perform in a manner which is vastly inferior to stocks of financially healthy firms. The wreckers' theory of financial distress seeks to explain the benefits that may step out of financial distress to stakeholders (Kalckreuth, 2005). This theory contributes to an efficient-market interpretation of an important stock market and normally it links work on private benefits to the literature on the empirics of asset pricing and that the financial structure and the probability of default may be important for determining the size of private benefits of control (Kalckreuth, 2005). Kalckreuth (2005) argued that with an increasing probability of default, there is a greater incentive to withdraw resources from the firm as private and non-dividend benefits. Shareholders will feel the full opportunity costs only in states where default does not occur. If default is certain, withdrawing resources is a free lunch. In this theory, this is termed "wrecking".

Wrecker's theory of financial distress paints an illusion of a firm being hit by a series of negative shocks, making losses and approaching a state of financial distress. Since shareholders expect withdrawal from the firm in form of dividend payments, loans, advances, and bank-runs, thus affecting the asset quality since there will be low deposits and high non-performing loan and advances resulting from high withdrawals.

According to Wrecker's theory therefore, asset quality is a significant factor of financial distress. With higher leverage, volatility of share prices increases with respect to private information; the ultimate fate of the firm depends on issues unknown to the general public (Nyamboga et al., 2014). Since investors or shareholders will start demanding for returns on their investments, there will be frequent withdrawals in terms of loans, advances and bank runs; consequently, the firm will be financially distressed, as it will be required to make huge payments to the shareholders. This hypothesis served as the foundation for the statistical testing of the independent variable of the research, asset quality.

Conceptual Framework

According to Myers (2013), a conceptual framework involves using graphs or diagrams to depict the relationships between variables in study. According to Miles and Huberman (2019), a conceptual framework identifies key characteristics, variables, and their relationships. A conceptual framework is a collection of concepts and principles relevant to investigation and presentation. A conceptual framework aims to categorize and describe relevant ideas, as well as identify their associations.



Source: Author 2025

Figure 2.1: Conceptual Framework

Table 1: Operationalization of variables

Variable	Measurements
Asset Tangibility	Tangibility Ratio
Asset Quality	PAR
Financial distress	Altman Z score

(Source: Research 2025)

Asset Tangibility

Asset tangibility refers to the proportion of a firm's total assets that are physical or measurable in nature assets that have a clear, observable market value and can be used as collateral in financial transactions. These include properties such as land, buildings, machinery, equipment, vehicles, and inventory, all of which can be physically touched, seen, and valued with relative certainty (Xuezhou *et al.,* 2024). Tangible assets are contrasted with intangible assets like goodwill, patents, trademarks, and software, which lack physical form and are harder to liquidate or use as security. In financial analysis and lending decisions, asset tangibility is crucial because it affects a firm's borrowing capacity, risk profile, and financial stability. High tangibility generally signals to lenders and investors that a firm has valuable, recoverable assets in case of default, which reduces credit risk and improves access to external financing (İltaş & Demirgüneş, 2020). In the context of Deposit-Taking SACCOs, asset tangibility is also important for compliance and prudential standards, as regulators often consider the composition of assets when assessing an institution's solvency and resilience against financial distress (Umobong, 2023).

Asset tangibility, often expressed through the tangibility ratio, refers to the extent to which a firm's assets are made up of tangible, physical items as opposed to intangible assets. The tangibility ratio is typically calculated by dividing tangible assets (such as property, plant, equipment, and inventory) by total assets (Igbru & Onuora, 2022). This ratio provides insight into how much of a company's asset base can be used as collateral for securing debt or can be liquidated in the event of financial distress. A higher tangibility ratio indicates that the firm holds a greater portion of tangible assets, which are more reliable in terms of valuation and financing potential. This is particularly important in capital-intensive industries and in regulated financial institutions where the asset structure influences creditworthiness and regulatory compliance (Oganda, Mogwambo & Museve, 2023).

Asset Quality

Loans and advances made to clients make up the majority of a SACCO's assets. In order to maintain the entity's profitability, these are intended to provide returns for shareholders through a variety of investments, mostly through interest from loans to clients (Love, Matthews, Simpson, Hill, & Olatunji, 2019). According to Salina, Zhang, and Hassan (2021), asset quality is the process of assessing the credit risk connected to a certain financial asset, such as a bond or stock; the higher the credit risk, the lower the financial asset quality.

The capital and financial performance of banks are impacted by low asset quality, which makes them unstable financially (Boachie, Aawaar, & Domehar, 2021). The financial institution may become unstable as a result of increased non-performing loans and revenue losses brought on by improper accounting practices and inadequate management of declining asset quality (Klein, Schardin, & Baily, 2017). Identification, analysis, assessment, monitoring, and control of credit can all improve asset quality through credit risk management. This can directly affect the quantity of loans and advances given to clients as well as the percentage of non-performing loans (Trad, Trabelsi, & Goux, 2017). In this study, asset quality will be measured by the ratio of non-

performing to gross loans. A higher NPL ratio is an indication of a higher credit risk which can be a cause of financial crises (Kuria, Kiboi & Macheru,2024). Jepkorir, (2022) posits that NPL in loan portfolios affects operational efficiency which in turn affects profitability, liquidity, and solvency position of SACCOs.

Profitability

The ability of lenders to make more money is essential for absorbing losses, increasing their capital base for mitigating any shock that may arise from their day-to-day operations, and ultimately guaranteeing their stability. The management's capacity to generate income and cut expenses, including unusual costs, loan losses, and legal fees, is demonstrated by profitability (Hassan, Zhang, and Salina, 2020).

Sustaining high income, according to Wanjagi, Nasieku, and Fatoki (2024), offers benefits that extend far beyond profitability: it increases shareholder value, builds resilience to economic volatility, and cultivates customer trust. Wanjagi, Nasieku, and Fatoki (2024) further states that a bank's long-term survival is significantly reliant on its capacity to produce quality profitability, which subsequently safeguard and augment capital reserves and shareholder returns. High profits assures sustainability and growth (Mulianga, Simiyu, & Makokha, 2024). A company's capacity to maximize earnings from its capital and assets is gauged by profitability ratios (Kasmir, 2016).

Empirical Review

Asset Tangibility and Financial Distress

Xuezhou *et al.,* (2024) examined the interaction of asset tangibility on the relationship between leverage structure and financial distress in agriculture-linked non-financial firms in China. A panel data logit regression model used to estimate the relationship between capital structure, debt maturity structure, and financial distress while controlling the effects of acclaimed variables like firm size, taxes, and profitability. The data set consists of 187 agriculture linked non-financial firms listed on the Pakistan Stock Exchange (PSX) over five years (2013-2017). The results reveal that asset tangibility negatively moderates the relationship between debt maturity structure and the probability of financial distress, but no such evidence found for the relationship between capital structure and financial fragility. The study concluded that asset tangibility negatively moderates the relationship between debt maturity structure and the probability of financial distress.

İltaş and Demirgüneş (2020) researched asset tangibility and financial performance in Turkey: A time series evidence. The researchers analyze the effect of asset tangibility on financial performance of Turkish manufacturing sector covering 1990.Q3-2016.Q4. The stationarity of series and the co-integration relationship among them are tested by ADF (1979; 1981), KPSS (1992), and Zivot and Andrews (1992) unit root tests, and one-break Gregory and Hansen (1996) co-integration test. Long-run coefficients estimated by Stock and Watson (1993)'s DOLS methodology posit that asset tangibility, financial leverage, liquidity and operating efficiency have significant and positive effects on financial performance till (and including) the break date. However, from this break date on, they affect financial performance negatively. The study concluded that asset tangibility has a significant and positive influence on financial performance.

Umobong (2023) conducted a study on asset tangibility, efficiency and firm value: evidence from Ghana. The study examined the relationship between Asset tangibility, efficiency and firm value of manufacturing firms listed on Nigeria Stock Exchange between 2018 and 2023. Census sampling technique covering food and beverages, cement and pharmaceutical subsector was used to determine sample size of 22 firms from a population of Sixty-five manufacturing firms with

complete data listed on the Exchange. Descriptive statistics and Multiple Regression technique was used for analysis of data while Hausamann test for selection of model was adopted. The study found positive significant relationship of asset tangibility with price earnings ratio. The study found negative co-efficient indicating a positive insignificant relationship of asset tangibility with price earnings ratio. Result also showed efficiency has positive co-efficient indicating a negative significant relationship of asset tangibility with enterprise value. From the result, the study found reverse directional relationship between efficiency and asset tangibility on firm value measured by enterprise value and Tobin Q. The study concluded increased asset tangibility dampens efficiency and vice versa thereby indicating a trade-off of the two firm characteristics.

Igbru and Onuora (2022) researched on the determinants of assets tangibility: evidence from small cap firms in Nigeria. Ex-post facto design was adopted and data for the study were obtained from the Nigerian Stock Exchange Factbook and published annual financial reports of the twenty three manufacturing. The finding indicated that leverage financing and firm age has negative significant impact on assets tangibility evidence from small CAP firms in Nigeria. While firm performance has positive insignificant impact on assets tangibility evidence from small CAP firms in Nigeria quoted on NSE with data spanning from 2014-2018. Based on this, the study concluded that asset tangibility has information content as investor look at the investment pattern of firm in tangible assets to determine the long run survival of such firm.

Oganda, Mogwambo and Museve (2023) examined asset tangibility and financial performance: the moderating role of economic growth and earnings volatility in Kenya. This study applied Dynamic Unbalanced Panel analysis techniques using Secondary data for 10-year period (2010 - 2019) with the study population comprising of 9 listed firms. A census of the firms was done and resulted to 86 observations. Focus was on asset tangibility moderated by economic growth rate and earnings volatility on firm value which was proxied by Tobin's Q and EVA. Pecking order guided the study. The study found that asset tangibility is imperative as it directly determines the financial burden firms face in their operations and concluded that the managers of manufacturing firms need to consider project financing to limit exposure to credit risk.

Irungu *et al*., (2022) assessed the effect of asset tangibility on financial performance of listed firms in the Nairobi securities exchange. The study employed panel research design that is non-experimental in nature. This study targeted all the 64 firms listed on the Nairobi Securities Exchange. A census of all the 64 firms listed in Nairobi Securities Exchange was used as a unit of analysis. Secondary data extracted from the financial statements was used to compute the relevant ratios and encompassed panel data. The study employed a dynamic panel data regression model while ANOVA was used to test the relationship between the variables across the sectors. The study found out that there was a positive and significant relationship between asset tangibility and financial performance of financial and nonfinancial firms. The study concluded that asset tangibility has a positive and significant effect on financial performance of Listed Firms in the Nairobi Securities Exchange.

Mohamed (2023) assessed the relationship between asset tangibility and financial leverage among commercial and services firms listed at NSE, Kenya. Descriptive survey research design was adopted targeting 11 NSE listed entities and census was adopted. Auxiliary information on the time frame 2018-2022 was obtained. The analysis of the gathered information was supported by SPSS version 25 and presented through tables. From the results, it was apparent that profitability had the largest positive and significant effect on financial leverage then asset tangibility although its effect was negative then lastly firm size respectively. It was concluded that asset tangibility is a predictor of financial leverage when firm size and profitability are controlled.

Asset Quality and Financial Distress

Vigneswara (2015) investigated the factors influencing bank asset quality and profitability in India. The study used panel data methodologies from 1997 to 2009, and the results indicated an inference that contradicted the accepted and expected outcome. It was discovered that non-performing assets had little effect on the profitability of commercial banks, and the research also concluded that asset size has no substantial impact on commercial bank profitability. The study was conducted in India's commercial banks over an eleven-year period from 1997 to 2009.

Akhtar and Hayati (2016) conducted an empirical study on the Islamic banking system of Pakistan, analyzing the effect of asset quality, income structure, and macroeconomic factors on insolvency risk from 2007 to 2015. To quantify the insolvency risk in Pakistani Islamic banks, a number of bank-specific and macroeconomic indicators were used. The results were acquired by OLS estimation. The findings show that the Islamic banking system's asset quality has no substantial impact on insolvency, however the interaction with the capital asset ratio does.

Ahmed et al. (2021) studied the macroeconomic and bank-specific factors of commercial bank stability in Pakistan from 2008 to 2018, utilizing nonperforming loans (NPLs). The findings of the analysis revealed that loan loss provision, net interest margin, credit growth, and bank diversification all increase NPLs significantly, whereas operating efficiency reduces NPLs and hence financial distress. Furthermore, exchange rates, increased interest rates, and political risk all contribute to an increase in NPLs, but GDP growth reduces them.

Udofia and Okhae (2024) applied the discriminant (Z-score) technique and regression analysis to evaluate the effect of Capital Adequacy, Asset Quality, Management Quality, Profitability Quality, and Liquidity Efficiency (CAMEL) variables on the financial health conditions of selected banks in Nigeria, using data from 2012 to 2021. The study reveals that capital adequacy and liquidity sufficiency are insignificant predictors of a bank’s financial health, while, assets quality, management quality, and profitability quality significantly predict the banks financial health in Nigeria.

Kuria, Kiboi & Macheru, (2024), evaluated the role of asset quality on the financial soundness of commercial banks in Kenya. Asset quality was assessed using non-performing loans (NPLs), while financial distress was measured using Z-scores. Utilizing panel data estimation methods, the findings indicate a negative relationship between asset quality and financial distress, emphasizing that an increase in NPLs leads to a decrease in financial distress within the banking sector

METHODOLOGY

Research Philosophy

The study adopted the positivist research philosophy. Positivism emphasizes objective measurement, empirical observation, hypothesis testing, and the use of quantitative techniques in establishing relationships among variables (Saunders, Lewis, & Thornhill, 2019). The philosophy was considered appropriate because the study relied on observable financial data obtained from audited financial statements of DT-SACCOs and sought to establish the effect of asset tangibility and asset quality on financial distress.

Research Design

The study employed a descriptive research design. Descriptive research design enables researchers to systematically describe phenomena and establish relationships among variables using quantitative data (Cooper & Schindler, 2014). The design was suitable for examining the

relationship between asset tangibility, asset quality, and financial distress among DT-SACCOs in Kenya using historical financial data.

Population of the Study

The target population comprised all the 176 Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) licensed by the Sacco Societies Regulatory Authority (SASRA) in Kenya as at 31st December 2024. A census approach was adopted because the population was manageable and allowed the inclusion of all licensed DT-SACCOs, thereby eliminating sampling error and enhancing the comprehensiveness of the study (Roche, 2022).

Data Collection Procedures

The study utilized secondary data extracted from audited financial statements of DT-SACCOs for the period 2015 to 2024. Secondary data are advantageous because they are objective, reliable, cost-effective, and suitable for longitudinal financial analysis (Johnston, 2014). The ten-year period was considered sufficient for capturing trends and variations in financial distress and firm-specific factors over time (Kosikoh, 2014).

Measurement of Variables

Financial distress was measured using the Altman Z-Score model, which has been widely applied in predicting financial distress and insolvency among financial institutions (Altman, 2000). Asset tangibility was measured using the tangibility ratio, while asset quality was measured using the ratio of non-performing loans to gross loans, a commonly used indicator of credit risk and loan portfolio quality (Kuria, Kiboi, & Macheru, 2024).

Data Analysis

The collected data were analyzed using STATA Version 15.0. Descriptive statistics, including means, standard deviations, minimum values, and maximum values, were used to summarize the characteristics of the variables. Panel data regression analysis was employed to examine the influence of asset tangibility and asset quality on financial distress. Panel data analysis is preferred because it combines cross-sectional and time-series observations, controls for heterogeneity, improves efficiency, and provides more informative data than either cross-sectional or time-series analysis alone (Baltagi, 2021; Gujarati & Porter, 2022).

Empirical Model

The study estimated the following panel regression model:

$$FDit = \beta 0 + \beta 1ATit + \beta 2AQit + \varepsilon it$$

Where:

FDit = Financial distress of DT-SACCO i at time t;

ATit = Asset Tangibility of DT-SACCO i at time t;

AQit = Asset Quality of DT-SACCO i at time t;

$\beta 0$ = Constant term;

$\beta 1$, $\beta 2$ = Regression coefficients;

εit = Error term.

Diagnostic Tests

Diagnostic tests were conducted before estimating the regression model to ensure compliance with panel data assumptions. Autocorrelation was tested using the Breusch-Godfrey LM test (Verbeek, 2017), heteroscedasticity was examined using the Breusch-Pagan test (Breusch & Pagan, 1979), multicollinearity was assessed using the Variance Inflation Factor (Gujarati & Porter, 2022), stationarity was evaluated using the Levin-Lin-Chu unit root test (Levin, Lin, & Chu, 2002), while the Hausman specification test was used to determine the appropriate panel estimation model between fixed and random effects (Hausman, 1978).

RESULTS AND FINDINGS

Descriptive Statistics

The descriptive statistics to determine the descriptive statistics for financial distress measured by Altman Z-score, Asset tangibility measured by ratio of Fixed assets / Total assets, and Liquidity (Current ratio; ((Marketable Securities + Cash and Cash equivalents /Total Assets))) Asset quality (NPLs / Gross loans) and Profitability measured by Return of Asset. The mean Altman Z-score for financial distress was 70.221 (SD = 67.589), with a minimum of 21.670 and a maximum of 263.640. The substantial standard deviation relative to the mean indicates pronounced dispersion in financial health across SACCOs, suggesting heterogeneity in stability levels. The between variation (SD = 41.662) further confirms significant differences across SACCOs, while the within variation (SD = 53.305) indicates considerable fluctuations over time within individual SACCOs. This wide spread implies that although some SACCOs are financially stable, others face elevated distress risk, reinforcing the importance of continuous financial monitoring. In a similar vein, Dumitrescu (2025) discovered that digitalised Z-score assessment improves forecast accuracy, especially when governance elements are added.

Asset tangibility had a mean of 0.065 (SD = 0.057), ranging between 0.002 and 0.477. The relatively low mean suggests that SACCOs generally hold a small proportion of fixed tangible assets compared to total assets, implying a stronger reliance on liquid or intangible asset structures. The between variation (SD = 0.022) is lower than the within variation (SD = 0.052), indicating that changes in asset composition over time within SACCOs are more pronounced than differences across SACCOs. This pattern suggests that asset structure decisions are dynamic and may respond to operational or regulatory conditions., This was consistent with El Mokadem's (2024) observation that asset tangibility favourably improves firm profitability.

Asset quality, measured by the non-performing loan ratio, had a mean of 0.074 (SD = 0.070), with values ranging from 0.003 to 0.620. This implies that, on average, 7.4% of loans were non-performing, indicating moderate credit risk exposure across SACCOs. However, the high maximum value points to instances of severe loan default problems in certain SACCOs. The within variation (SD = 0.062) exceeds the between variation (SD = 0.031), suggesting that asset quality tends to fluctuate more over time within SACCOs than across them. This reflects the sensitivity of loan performance to changing economic conditions and credit risk management practices. Kittur (2019) highlighted that increases in non-performing assets significantly weaken firms' financial health, and the Altman Z-score effectively captures such deterioration. This underscores the close link between asset quality and financial distress risk.

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Table 1: Descriptive Statistics

Variable	Level	Mean	Std. Dev.	Min	Max	Observations
Financial distress	Overall	70.221	67.589	21.670	263.640	N = 1760
	Between		41.662	34.212	192.700	n = 176
	Within		53.305	-24.460	272.240	T = 10
Asset tangibility	Overall	0.065	0.057	0.002	0.477	N = 1760
	Between		0.022	0.037	0.158	n = 176
	Within		0.052	-0.084	0.437	T = 10
Asset quality	Overall	0.074	0.070	0.003	0.620	N = 1760
	Between		0.031	0.035	0.168	n = 176
	Within		0.062	-0.072	0.545	T = 10

(Source: Stata 2025)

Trend Plots

The trend plots were analyzed into visual plots for the periods between 2015 and 2024

Asset Tangibility

The trend plot in Figure 1 for mean asset tangibility among Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya from 2015 to 2024 shows a generally stable yet mildly fluctuating pattern, with a notable dip followed by a recovery. Between 2015 and 2019, the ratio shows modest oscillations around an upward trajectory, suggesting a gradual strengthening in the proportion of tangible assets relative to total assets. This stability implies that SACCOs maintained a balanced asset structure during this period, likely reflecting prudent investment in fixed assets such as property and equipment alongside financial assets. However, a marked decline is observed in 2020 and reaches its lowest point in 2021, which may be associated with the economic disruptions caused by the COVID-19 pandemic, leading to asset restructuring and increased allocation toward liquid or short-term financial instruments. Similar findings indicate that financial cooperatives adjusted their asset compositions during the pandemic to enhance liquidity and resilience (Kinyua & Muturi, 2021; WOCCU, 2022).

From 2022 onwards, the trend shows a sharp recovery and consistent increase through 2024, indicating a renewed emphasis on tangible asset accumulation. This rebound may reflect post-pandemic stabilization, improved financial performance, and strategic reinvestment in long-term assets as SACCOs regained operational confidence. The upward movement also suggests strengthened capital bases and compliance with regulatory frameworks emphasizing asset quality and institutional sustainability. Empirical evidence shows that higher asset tangibility can enhance collateral value, reduce credit risk exposure, and improve financial stability in cooperative institutions (Mugo, Wanjau, & Ayodo, 2023; SASRA, 2024). Overall, the trend indicates that while SACCOs experienced temporary structural adjustments in response to external shocks, they demonstrated resilience by re-aligning their asset portfolios toward more stable and tangible asset holdings in the recovery period.

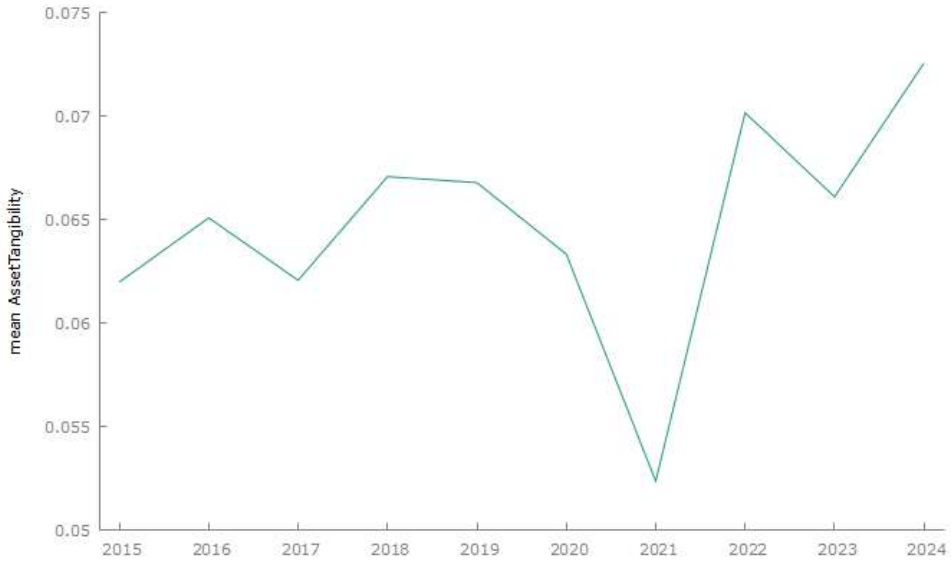

Figure 1: Asset Tangibility Trend plot

Asset Quality

The trend plot figure 2 for asset quality among the 176 Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) according to the Sacco Societies Regulatory Authority (SASRA) in Kenya from 2015 to 2024 reveals a dynamic pattern of financial health and risk management. The trend plot in Figure 4.3 for mean asset quality among the 176 Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya between 2015 and 2024 reveals a relatively stable pattern from 2015 to 2023, with mean values ranging between approximately 0.071 and 0.081, followed by a sharp decline to 0.0318 in 2024. This trajectory indicates a sustained level of asset quality likely measured as the ratio of non-performing loans to gross loans or a similar credit risk metric through most of the period, before a notable deterioration in the final year. Such a decline may signal emerging credit risk challenges, possibly driven by macroeconomic pressures, member repayment difficulties, or post-pandemic effects on household and business incomes. Recent empirical evidence confirms that asset quality remains a critical determinant of financial sustainability in SACCOs, with poor asset quality eroding earnings and capital adequacy (Mutunga & Mwangi, 2023). Moreover, studies link declining asset quality to lax credit appraisal, inadequate collateral valuation, and weak loan monitoring practices (Otieno & Oluoch, 2022). The sharp drop in 2024, as highlighted in the latest SACCO supervision reports, may reflect heightened credit defaults and calls for proactive risk-based supervision and loan restructuring frameworks (SASRA, 2024). Sustaining asset quality is therefore essential for institutional resilience and member confidence.

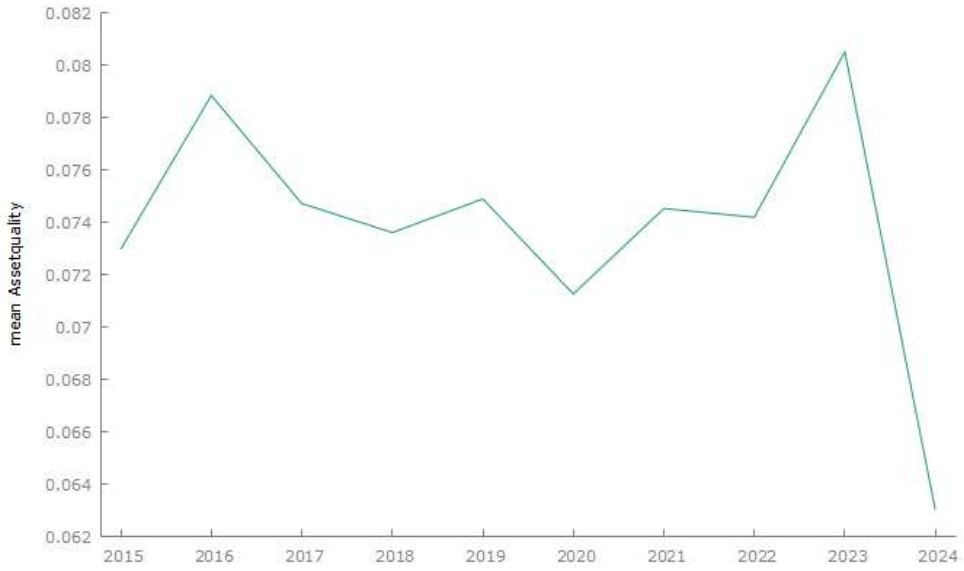

Figure 2: Asset Quality Trend plot

Financial Distress

Figure 3 shows that based on the described trend, mean financial distress (measured via an Altman Z-score–based metric) among Kenya's 176 DT-SACCOs shows a distress rising through 2017, sharply easing in 2018, recovering in 2019, dipping in 2020, climbing again in 2021, moderating in 2022, peaking in 2023, and easing slightly in 2024. (Altman et al., 2017). Sector-specific factors that typically drive these oscillations for DT-SACCOs include shifts in non-performing loans (NPLs), employer remittance delays that impair liquidity, and regulatory tightening that improves resilience but can compress short-term performance (SASRA, 2023).

The 2015–2017 rise likely reflects mounting credit risk and operational cost pressures as SACCOs expanded lending faster than internal risk controls matured, a pattern SASRA has repeatedly flagged through CAMELS/PEARLS diagnostics and targeted capital and liquidity guidelines (SASRA, 2021).

The sharp improvement in 2018 is consistent with portfolio clean-up and remediation tightening underwriting, provisioning, and collections often visible after supervisory nudges and internal control reinforcement (SASRA, 2019).

The 2019 recovery in distress suggests renewed risk-taking and macro headwinds ahead of the pandemic, followed by the 2020 dip that aligns with widespread regulatory forbearance, relief measures, and short-term liquidity support that temporarily cushioned credit stress in Kenya's financial sector (CBK, 2021; SASRA, 2021).

The 2021–2023 upswing toward a peak in 2023 is consistent with lagged pandemic effects especially elevated NPLs, member income strain, and employer non-remittances flowing through to loss classifications and provisioning. (SASRA, 2023). The slight easing in 2024 suggests gradual normalization as collections improve and cost controls and digital process efficiencies take (Altman et al., 2017; SASRA, 2023).

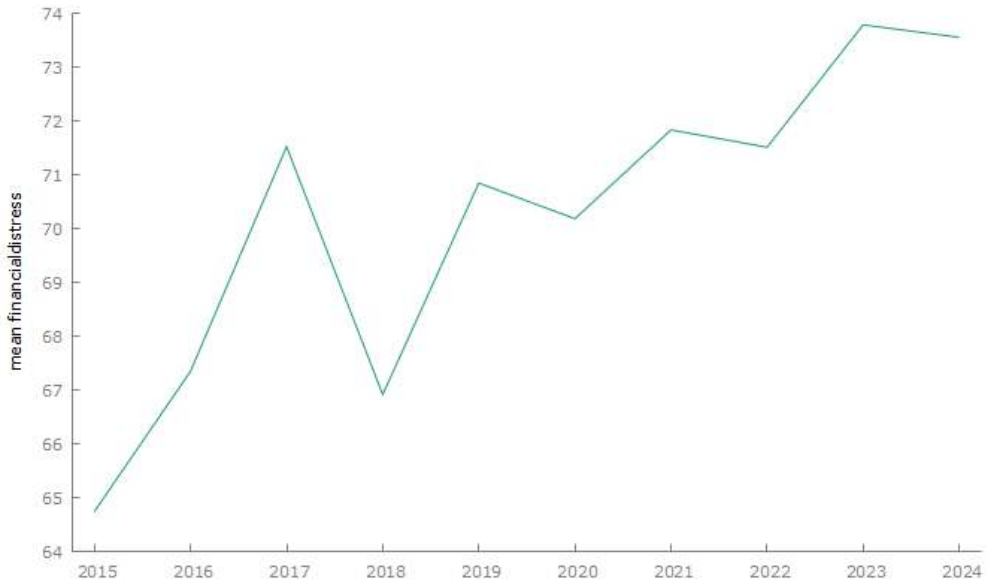

Figure 3: Financial Distress Trend plot

Diagnostic Tests

Prior to estimating the panel regression model, diagnostic tests were conducted to establish whether the assumptions underlying panel data analysis were satisfied. The tests included autocorrelation, normality, heteroscedasticity, multicollinearity, stationarity, and model specification tests.

Autocorrelation Test

Autocorrelation occurs when error terms are correlated across time periods, resulting in inefficient parameter estimates and biased standard errors (Kock & Lynn, 2012). The study employed the Wooldridge test for autocorrelation in panel data. The null hypothesis stated that there was no first-order autocorrelation.

The results presented in Table 1 indicate an F-statistic of 0.236 and a p-value of 0.6275. Since the p-value exceeded the 0.05 significance level, the null hypothesis was not rejected. This implies that there was no evidence of first-order autocorrelation in the panel data, and therefore the assumption of independence of errors was satisfied.

Table 2: Wooldridge Test for Autocorrelation

Test Statistic	Value
F-statistic	0.236
p-value	0.6275

Normality Test

The Jarque-Bera test was used to assess whether the variables followed a normal distribution. According to Gujarati (2022), the null hypothesis of the Jarque-Bera test states that the data are normally distributed. The results revealed that financial distress recorded a p-value of 0.061, asset tangibility recorded a p-value of 0.552, and asset quality recorded a p-value of 0.072. Since all p-

values were greater than 0.05, the null hypothesis of normality was not rejected. Therefore, the variables were considered normally distributed and suitable for regression analysis.

Table 3: Jarque-Bera Normality Test

Variable	JB Statistic	p-value
Financial Distress	1.183	0.061
Asset Tangibility	1.125	0.552
Asset Quality	1.112	0.072

Heteroscedasticity Test

The Breusch-Pagan test was employed to determine whether the error terms exhibited constant variance. The null hypothesis stated that the residuals were homoscedastic. The results produced a Chi-square statistic of 1.70 and a p-value of 0.611. Since the p-value exceeded 0.05, the null hypothesis was not rejected, indicating that heteroscedasticity was not present. Thus, the assumption of constant error variance was satisfied.

Table 4: Heteroscedasticity Test

Test Statistic	Value
Chi-square	1.70
p-value	0.611

Multicollinearity Test

Multicollinearity was assessed using the Variance Inflation Factor (VIF). According to Cooper and Schindler (2015), VIF values below 10 indicate the absence of harmful multicollinearity. The findings showed that asset tangibility had a VIF of 1.55 while asset quality recorded a VIF of 1.04. The mean VIF was 1.30. Since all VIF values were substantially below the threshold value of 10, multicollinearity was not a concern in the study.

Table 4: Multicollinearity Test

Variable	VIF	Tolerance
Asset Tangibility	1.55	0.645
Asset Quality	1.04	0.962
Mean VIF	1.30	

Stationarity Test

The Levin-Lin-Chu (LLC) unit root test was conducted to determine whether the panel data series were stationary. The null hypothesis stated that the panels contained unit roots. The results indicated that financial distress had a p-value of 0.001, asset tangibility had a p-value of 0.000, and asset quality had a p-value of 0.000. Since all p-values were below 0.05, the null hypothesis was rejected, implying that the variables were stationary and suitable for panel regression analysis.

Table 5: Stationarity Test

Variable	p-value	Adjusted t	Verdict
Financial Distress	0.001	-17.3710	Stationary
Asset Tangibility	0.000	-23.4971	Stationary
Asset Quality	0.000	-22.0016	Stationary

Hausman Specification Test

The Hausman test was performed to determine the appropriate panel regression model between fixed effects and random effects. The null hypothesis stated that the random effects model was appropriate. The results generated a Chi-square statistic of 184.97 and a p-value of 0.000. Since the p-value was less than 0.05, the null hypothesis was rejected. Therefore, the fixed effects model was considered more appropriate and was subsequently used for hypothesis testing and interpretation of results.

Table 6: Hausman Test

Statistic	Value
Chi-square	184.97
p-value	0.000
Decision	Fixed Effects Model Preferred

Correlation Analysis

The correlation analysis was utilized as a statistical measure of the strength and direction of the relationships between each of the study variables. The Pearson correlation coefficients r lie between +1 and -1. The correlation analysis in Table 4.8 shows a strong, negative correlation between asset tangibility and financial distress ($r = -0.617$, $p=0.000 < .05$), indicating that DT-SACCOs with a higher proportion of tangible assets tend to have lower financial distress. This inverse relationship is consistent with empirical findings that tangible assets enhance firms' ability to access external finance and reduce bankruptcy probability by providing lenders with collateral, thereby lowering firms' distress risk (Irungu, 2018).

The correlation matrix shows a significant positive correlation between asset quality and financial distress ($r = 0.655$, $p=0.024 < .05$). Accordingly, the positive correlation here indicates that DT-SACCOs with poorer asset quality higher NPLs or provisions exhibit greater financial distress. This interpretation is supported by (Barus, Muturi, & Kibati, 2018), showing that rising non-performing loans and deteriorating asset quality results in declines in performance and heightened distress among DT-SACCOs recent panel evidence for 2018–2022 likewise finds worsening asset-quality ratios associated with deteriorating financial performance.

Table 7: Pairwise correlations

Variables	financial distress	asset tangibility	asset quality
(1) financial distress[r]	1.000		
[sig]			
(2) asset tangibility[r]	-0.617*	1.000	
[sig]	(0.000)		
(4) asset quality [r]	0.655*	-0.0893*	1.000
[sig]	(0.024)	(0.002)	
N= 1760			

Regression Results

The fixed effects regression model was employed to examine the effect of asset tangibility and asset quality on the financial distress of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya.

The results indicate that the model explained 55.1% of the variation in financial distress (R^2 = 0.551), implying that asset tangibility and asset quality, together with other firm-specific factors included in the original model, significantly influenced the financial distress of DT-SACCOs. The remaining 44.9% of the variation is attributable to factors not captured in the model. The overall model was statistically significant (F = 78.245, $p < 0.05$), indicating that the explanatory variables jointly influenced financial distress.

The findings revealed that asset tangibility had a negative and statistically significant effect on financial distress (β = -424.456, $p < 0.001$). The results suggest that an increase in asset tangibility reduces financial distress among DT-SACCOs. This implies that institutions with higher levels of tangible assets are more financially stable because tangible assets can be utilized as collateral, thereby improving access to credit and enhancing financial resilience. The findings are consistent with Mutua and Ondieki (2017), who found that asset tangibility improves financial soundness among Kenyan cooperative institutions by enhancing borrowing capacity and reducing financial vulnerability.

The study further established that asset quality had a positive and statistically significant effect on financial distress (β = 324.480, $p < 0.001$). This finding implies that deterioration in asset quality, reflected by increased levels of non-performing loans, significantly increases financial distress among DT-SACCOs. Poor asset quality constrains income generation, weakens liquidity positions, and increases credit risk exposure. The findings corroborate those of Barus, Muturi, and Kibati (2017), who established that non-performing loans adversely affect the financial performance of SACCOs in Kenya. Similarly, Mwangi and Jagongo (2020) found that declining asset quality undermines institutional resilience and increases susceptibility to financial distress.

The resulting regression equation was:

$$\mathbf{FDit = 93.344 - 424.456ATit + 324.480AQit}$$

Where:

FDit = Financial Distress of DT-SACCO i at time t

ATit = Asset Tangibility of DT-SACCO i at time t

AQit = Asset Quality of DT-SACCO i at time t

Table 8: Fixed Effects Regression Results

Variable	Coefficient (β)	Std. Error	t-value	p-value
Asset Tangibility	-424.456	74.044	-5.73	0.000
Asset Quality	324.480	50.867	6.38	0.000
Constant	93.344	7.893	11.83	0.000
Model Statistics	**Value**			
R^2	0.551			
F-statistic	78.245			
Prob > F	0.000			
Number of Observations	1,760			

p < 0.05

Hypotheses Testing

H_{01}: Asset Tangibility has no significant effect on financial distress of DT-SACCOs in Kenya.

The results revealed a statistically significant negative relationship between asset tangibility and financial distress ($\beta = -424.456$, $p < 0.001$). Therefore, the null hypothesis was rejected. The study concludes that asset tangibility significantly reduces financial distress among DT-SACCOs in Kenya.

H_{02}: Asset Quality has no significant effect on financial distress of DT-SACCOs in Kenya.

The results showed a statistically significant positive relationship between asset quality and financial distress ($\beta = 324.480$, $p < 0.001$). Therefore, the null hypothesis was rejected. The study concludes that asset quality significantly influences financial distress among DT-SACCOs in Kenya.

Conclusion

The first objective of the study was to examine the effect of asset tangibility on the financial distress of DT-SACCOs under SASRA in Kenya. The study concluded that asset tangibility significantly predicts financial distress, suggesting that SACCOs with higher proportions of tangible assets are less likely to experience distress. The contribution of this finding lies in demonstrating that asset tangibility not only strengthens collateral value and borrowing capacity but also plays a critical role in stabilizing cooperative financial institutions. This extends prior studies by highlighting the unique importance of asset tangibility in regulated SACCOs, where asset structures directly influence solvency and compliance under SASRA's prudential framework.

The second objective of the study was to establish the effect of asset quality on the financial distress of DT-SACCOs under SASRA in Kenya. The study concluded that asset quality positively affected financial distress, meaning that deterioration in asset quality often reflected in higher non-performing loans exacerbates the likelihood of distress. This study contributes to existing scholarship by reinforcing the centrality of credit risk management in cooperative finance and demonstrating how poor asset quality erodes both income stability and compliance with regulatory thresholds. The contribution lies in situating asset quality as a key early-warning indicator of distress within SACCOs, extending beyond traditional banking contexts.

Recommendations

Managerial and Policy Recommendations

The findings established that asset tangibility significantly reduces financial distress among DT-SACCOs. Consequently, SACCO management should prioritize the acquisition and maintenance of productive tangible assets that can serve as collateral and enhance institutional stability. In addition, SACCOs should develop asset management policies that promote prudent investment in tangible assets while ensuring optimal utilization of existing resources.

The study further found that asset quality has a significant positive effect on financial distress. This suggests that deterioration in loan portfolio quality increases the likelihood of financial distress. Accordingly, SACCOs should strengthen their credit risk management frameworks through rigorous credit appraisal procedures, continuous monitoring of loan performance, and enhanced debt recovery mechanisms. Management should also implement early warning systems

for identifying potentially delinquent borrowers and establish effective strategies for reducing non-performing loans.

Regulators, particularly the Sacco Societies Regulatory Authority, should intensify monitoring of asset quality indicators and encourage compliance with prudent credit risk management practices. Regular supervision and timely intervention can help prevent deterioration in asset quality and enhance the financial stability of DT-SACCOs.

Theoretical Implications

The findings provide empirical support for the theoretical foundations underpinning the study. The significant negative relationship between asset tangibility and financial distress supports the Trade-Off Theory, which argues that firms with greater collateralizable assets can access financing more easily and reduce the likelihood of financial distress through improved financial flexibility.

The positive relationship between asset quality and financial distress lends support to the Wrecker Theory of Financial Distress. The findings demonstrate that deterioration in asset quality, particularly through increased non-performing loans, accelerates financial vulnerability and weakens institutional stability. The results suggest that effective management of loan portfolios is critical in mitigating financial distress and ensuring long-term sustainability of DT-SACCOs.

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