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Warning Indicators in Nepalese Savings Cooperatives: A Longitudinal Financial and Governance Transparency Analysis

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Abstract

Purpose: *This study examines whether publicly available annual reports of Nepalese savings cooperatives contain measurable financial or governance indicators of institutional failure and the efficacy of either by itself or through a combined approach.*

Methods: *A comparative longitudinal design analyzed four years of annual report data (2079-2082 BS) from a sample of seven institutions: two distressed cooperatives, one stable cooperative comparator, one NRB-regulated comparator, and three additional failed cooperatives contributed terminal-year cross-sectional profiles drawn from parliamentary investigation records. A modified CAMEL-based ratio panel covering capital adequacy, asset quality, management efficiency, earnings, and liquidity was used to derive the financial indicator, and a four-dimension Governance Transparency Index (GTI) was scored from annual reports for the governance indicator.*

Results: *Distressed institutions exhibit a consistent deterioration pattern: loan growth acceleration is observed prior to bad loan escalation by one to two years, while nominally stable capital ratios mask expanding provision shortfalls. Related-party disclosure is absent across all distressed cooperatives. The three supplementary failed institutions had severely distressed financial profiles, with capital-to-asset ratios ranging from negative (Ideal Yamuna,-1.30%) to critically low (Gorkha, 2.47%), and liquidity ratios below 1.5% across all three.*

Conclusion: *The combined approach using joint assessment of provisioning adequacy against external audit status was found to separate distressed from stable cooperatives across all observation years, surfacing concealed insolvency that neither financial ratios nor governance disclosure detects in isolation.*

Keywords: Camel framework, Cooperative failure, Early warning indicators, Financial distress, Governance

JEL Classification: G21, G38, G34

I. Introduction

Nepal's cooperative sector burgeoned between 2010 and 2020, with growth in membership

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and capital outpacing institutional count and regulatory oversight. Between fiscal year 2068 BS (2011 AD) and fiscal year 2077 BS (2020 AD), registered cooperatives increased from 23,301 to 29,886, a 28.3% growth, while membership surged from 1.4 million to 7.3 million individuals, representing a 421.4% expansion (Department of Cooperatives [DEOC], 2011, p. 1; DEOC, 2021, p. 22). The growth of share capital during this period was similarly higher than institution count at 365.8%, from NPR 20.2 billion to NPR 94.1 billion (DEOC, 2011, p. 1; DEOC, 2021, p. 22). Within this context, this study focuses on savings and credit cooperatives (SACCOS), which represented 40.9% of all registered institutions, and functioned as localized financial intermediaries that offer members both higher deposit interest rates and ownership stakes in the institution itself (DEOC, 2018, p. 1).

However, this sectoral expansion did not occur without accumulating structural vulnerabilities which began surfacing toward the end of the decade. Between 2018 and 2020, a wave of institutional consolidation led to the closure of 4,626 cooperatives, representing a 13.4% decline in the total count, even as aggregate membership continued to grow by 15.9%, rising from 6.3 million to 7.3 million individuals (DEOC, 2018, p. 1; DEOC, 2021, p. 22). This consolidation implies that membership and, by extension, financial exposure became progressively concentrated among a shrinking pool of entities. This then led to the widely publicized cooperative crisis of 2020-2022 in Nepal during which high-profile failures, along with collapses of smaller local cooperatives, inflicted substantial depositor losses and ultimately prompted a parliamentary investigation (Parliamentary Special Investigation Committee on Misuse of Cooperative Savings [PSICMCS], 2024, pp. 181-315).

The report from the parliamentary investigation identified some recurring patterns leading to failures of high-profile cooperative institutions: concentrated lending to connected parties, liquidity erosion below prudential thresholds, and inadequate governance oversight (PSICMCS, 2024, p. 114). These documented issues raise the question of whether publicly available cooperative annual reports contain measurable warning indicators preceding financial distress. Previous financial distress literature suggests they might: deterioration in liquidity, capital adequacy, asset quality, and leverage has been shown to precede insolvency in banking (Imbierowicz & Rauch, 2014; Chiaramonte & Casu, 2017) and corporate settings (Altman, 1968; Tinoco & Wilson, 2013). Building on these, the questions this paper aims to answer are: what macro-level structural weaknesses characterize the cooperative sector, whether failing cooperatives exhibit detectable financial patterns, and how do these patterns differ from those of stable cooperatives. Two analytically distinct deficits in the prior literature motivate this design: the absence of longitudinal CAMEL-aligned analyses of Nepalese cooperatives and the absence of joint financial-governance assessment for distress detection in cooperative setting where diffuse ownership might be expected to weaken member incentives to demand related-party transaction disclosure.

The paper proceeds as follows: Section II reviews relevant literature. Section III describes data sources, sample selection, and methodology. Section IV presents result and discusses implications. Section V concludes with limitations and future research directions.

II. Reviews

This section reviews four areas of literature that are relevant. First is the theoretical frameworks that explain mechanisms of institutional collapse. Second is the empirical methodologies underlying early warning systems in regulated financial institutions. Third is the relevant literature on similar, member-owned credit union distress prediction. Fourth is the research on governance structures and regulatory conditions within Nepal's cooperative sector.

Theoretical Perspectives on Institutional Failure

Previous research defines mechanisms of financial failure beyond simple insolvency, identifying systematic erosion of capital through distorted structures as a key mechanism. Akerlof et al. (1993) formalize this phenomenon as "looting," demonstrating that control agents can extract value through seemingly legitimate transactions, accelerating bankruptcy,

while remaining harder to spot. Their model showed that reported financial metrics can mask ongoing value extraction, appearing healthy even as the institution deteriorates. This framework proves especially relevant for member-owned institutions where diffuse ownership structures can obscure principal-agent conflicts.

While Akerlof et al. explain how value is extracted from within, the question remains what this extraction looks like in the financial statements. Wheelock and Wilson (2000) find that low capital ratios, concentrated loan portfolios, and deteriorating asset quality are shared indicators that portend a high chance of institutional failure.

Additionally, DeYoung (2003) show that newly chartered institutions follow a distinct life-cycle pattern of failure: they begin with high capital cushions that erode as they expand their loan portfolios, and their failure risk is particularly sensitive to adverse environmental conditions, indicating that rapid balance-sheet growth without commensurate retention of capital is a structural source of vulnerability.

Early Warning Systems in Regulated Financial Institutions

Empirical research demonstrates that publicly available financial data contains strong predictive information about institutional health. Cole and Gunther (1998) compare on-site regulatory examinations with off-site monitoring systems based on publicly available accounting data. Their off-site model draws on the same categories that the regulatory CAMEL framework is built on, supporting the view that publicly disclosed accounting data carries supervisory-grade informational content about institutional health. This is also relevant in the context of cooperatives where financial ratios and reporting have to be pieced together from unstandardized annual reporting. While cooperatives differ from banks in ownership structure, which could in principle weaken the applicability of CAMEL-based monitoring, the case for applicability rests on the consideration that both institution types perform the same core economic functions of deposit-taking and credit intermediation. As such, balance-sheet exposures that drive distress such as capital erosion, asset-quality deterioration, illiquidity, and provisioning shortfalls could arise through analogous mechanisms regardless of ownership form.

Sahajwala and Van den Bergh (2000) outlined a conceptual architecture for supervisory early warning systems, which emphasizes that effective systems require calibration to specific institutional contexts and regulatory environments. This principle suggests value in independently scoring each institution's disclosure quality alongside its financial metrics.

Berger and Bouwman (2013) found that banks with higher capital ratios have higher survival probabilities during financial stress, indicating that capital adequacy is a genuine determinant of resilience. However, this relationship may be attenuated where provisioning adequacy is not independently verified, a condition characteristic of lightly supervised cooperative institutions.

Previous Studies on Credit Union Distress

A more directly relevant strand of literature examines financial distress and early-warning prediction in cooperative and credit union settings, where mutual ownership and non-profit orientation distinguish the institutional form from joint-stock banks. Wilcox (2007), in a long-term econometric analysis of US credit union and commercial bank failures over 1981 to 2005, found that the likelihood of failure rose at institutions with smaller asset bases, higher ratios of net loans, delinquent loans, and non-interest expenses to assets, and lower returns on assets or capital ratios. Coen, Francis, and Rostom (2019) extend this framework to a non-US setting, developing an early-warning model of UK credit union failure and showing that a small set of financial attributes related to capital adequacy, asset quality, earnings performance, and liquidity, augmented with unemployment rates, reliably identifies failures within one year. In their multi-period specification, asset size, capitalization, and earnings are negatively associated with the probability of failure, while arrears rates and the proportion of

unsecured loans are positively associated with it, indicating that the likelihood of failure rises as asset quality deteriorates.

Regulatory Context in Nepal's Cooperative Sector

The expansion of Nepal's cooperative sector has been documented as being under fragmented supervision, with insufficient internal controls and board oversight identified as some of the potential risk factors needing further research (Shilpakar, 2024; Tiwari, 2025; Simkhada, 2017). Legislative amendments have sought to address these gaps by bringing large savings and credit cooperatives under Nepal Rastra Bank supervision, though implementation remains limited (Nepal Rastra Bank, 2024). The International Monetary Fund (2023) also acknowledged that cooperatives collectively represent substantial financial intermediation activity but notes serious data limitations and supervisory capacity constraints at subnational levels where most cooperatives operate.

Studies also document substantial heterogeneity in cooperative financial performance, with wide variation in profitability, liquidity, and asset quality (Simkhada, 2017) and leadership capacity and governance structures significantly influencing outcomes (Pradhan & Sharma, 2025). However, these studies do not systematically distinguish failing from stable institutions or develop longitudinal frameworks tracking pre-collapse deterioration (see also Nepal Rastra Bank, 2024, noting persistent data gaps limiting cooperative risk assessment).

Identified Research Gap

The three research streams remain largely disconnected: early warning systems developed for commercial banks in advanced regulatory environments, cooperative governance literature identifying structural vulnerabilities without quantitative evidence linking disclosure patterns to failure, and Nepal-specific research documenting sectoral challenges without systematic comparative analysis of distressed versus stable institutions. This gap is particularly significant given cooperatives' growing role as a vehicle for household savings across Nepal.

This study addresses the gap by applying ratio-based financial analysis and governance disclosure assessment to multi-year public disclosures of Nepalese savings cooperatives, testing whether quantitative indicators and governance transparency must be assessed in combination for effective early warning detection in weakly supervised environments.

III. Methodology

This study employs a structured longitudinal comparative case design relying exclusively on publicly available annual reports from select cooperatives. The theoretical reasoning behind this design choice is to answer the research question, for a sample of cooperatives, on whether data from public reports contain detectable warning signals, following the demonstrated predictive capacity of off-site ratio-based monitoring (Cole & Gunther, 1998). For this purpose, the analytical structure follows a modified CAMEL approach, incorporating capital adequacy (C), asset quality (A), management quality (M), earnings (E), and liquidity (L) dimensions consistent with Sahajwala and Van den Bergh (2000). The sensitivity-to-market-risk component (S) is excluded as savings cooperatives do not carry trading books, have no direct foreign exchange exposure, or hold derivative positions.

Sample Selection, Institutional Classification, and Two-Tier Design

The sample employs a two-tier structure to reflect the differences in data availability. The primary longitudinal sub-sample comprises four institutions that are observed across a shared four-year window (2079-2082 BS): two distressed cooperatives, Sahara Nepal SACCOS Ltd. (Birtamod-2, Jhapa), and Margadarshan Saving and Credit Co-operative Ltd. (Bharatpur-16, Chitwan), classified as distressed on the basis of being identified in the Parliamentary Special Investigation Committee on Misuse of Cooperative Savings (PSICMCS, 2024, pp. 181–315) as having been subject to investigation for inability to honor member deposit withdrawals. The third institution is the stable comparator, Natural Cooperative (Kathmandu), classified

based on continuous operations, uninterrupted annual general meetings, and sustained audit engagement across the full observation period. The fourth institution is SKBBL (Sana Kisan Bikas Bank Ltd., Kathmandu), a listed NRB-regulated wholesale microfinance institution. SKBBL is included in this study as an upper-bound regulatory benchmark. Its purpose in the analysis is to anchor the achievable range of CAMEL-aligned ratios under a structured regulatory environment, against which the cooperative-sector ratios can be calibrated. A supplementary cross-sectional sub-sample comprises three additional failed cooperatives for which only terminal-year financial data are available from parliamentary investigation reports, and their annual reports were either unavailable due to there being no requirements for public disclosure or made private after the crisis. Table 1 presents the full sample while Table 2 summarizes the analytical role assigned to each sub-sample.

The observation window covers four consecutive fiscal years from 2022/23 to 2025/26 AD (2079-2082 BS). All dates in this study are reported using the Gregorian (AD) convention as the primary reference, with the corresponding Bikram Sambat (BS) year given parenthetically on first occurrence in each section to maintain traceability to the source documents, which are issued in BS. The Nepalese fiscal year runs from mid-July to mid-July so a given BS fiscal year corresponds to a split AD year (e.g., 2081 BS = 2024/25 AD). Within the observation window, years are indexed as Yr-2, Yr-1, Yr 0, and Yr+1 for analytical comparability across institutions. Yr 0 is defined as the fiscal year 2024/25 AD (2081 BS), which is the fiscal year in which the parliamentary investigation report identifying the distressed institutions was issued (PSICMCS, 2024); Yr-2 and Yr-1 are the two preceding fiscal years, and Yr+1 is the subsequent fiscal year. This window is chosen to examine two things: whether pre-crisis metrics show any recurring pattern across different institutions and whether crisis-period deterioration produces detectable signals in subsequent reports, consistent with the one-to-two-year recognition lag documented in banking distress warning literature (Cole & Gunther, 1998).

Table 1

Sample Cooperative Institutions

Institution	Location	Type	Status	Classification	Sub-sample Role
			Primary Longitudinal Sub-sample		
Sahara Nepal SACCOS	Jhapa	Multipurpose SACCOS	Operational (monitoring)	Distressed	Longitudinal distressed
Margadarshan SACCOS	Chitwan	SACCOS	Operational (monitoring)	Distressed	Longitudinal distressed
Natural Cooperative	Kathmandu	SACCOS	Operational	Stable comparator	Longitudinal stable comparator
SKBBL (Sana Kisan Bikas Bank Ltd.)	Kathmandu	Wholesale MFI	Operational / Listed	Sector benchmark	Longitudinal NRB-regulated benchmark
			Supplementary Cross-sectional Sub-sample (terminal year only)		
Gorkha SACCOS	Lalitpur	SACCOS	Failed	Failed	Cross-sectional terminal year corroboration

Kantipur SACCOS	Kathmandu	SACCOS	Failed	Failed	Cross-sectional terminal year corroboration
Ideal Yamuna SACCOS	Lalitpur	Multipurpose SACCOS	Failed	Failed	Cross-sectional terminal year corroboration

Table 2

Analytical Role by Sub-sample

Analytical Function	Sub-sample	Institutions	Data Depth	Applicable Analysis
Longitudinal trend analysis	Primary distressed	Sahara Nepal SACCOS, Margadarshan SACCOS	4 years (2022-2025 AD)	Ratio trajectories; GTI trend; cross-group comparison
Longitudinal benchmark	Primary benchmark	Natural Cooperative, SKBBL	4 years (2022-2025 AD)	Ratio trajectories; GTI trend; cross-group comparison
Terminal-year profile corroboration	Supplementary cross-sectional	Gorkha SACCOS, Kantipur SACCOS, Ideal Yamuna SACCOS	Year 0 only (parliamentary report)	Cross-sectional ratio validation; GTI scoring; structural profile comparison

Analytical Indicators

Seven quantitative indicators and one composite governance index are measured and compared between the institutions. Table 3 presents the full indicator set for the modified CAMEL framework with formula definitions and theoretical basis. While most of them are standard selections for CAMEL framework across previous studies, two indicator choices warrant brief justification. First, the bad loan ratio (BLR) (loans overdue more than 12 months, provisioned at 100%) is reported in preference to the broad non-performing loan ratio (NPLR). The preference for BLR over a broader NPLR in this study is because all cooperatives do not apply similar classification thresholds for substandard and doubtful loans, and several do not disclose the bucket-level breakdown necessary to compute a harmonized NPLR. Second, the Operating Efficiency Ratio (OER) provides a way to infer the management dimension because the standard CAMELS component for assessing management is based on on-site examiner access, which is unavailable to external researchers. OER is the most directly computable financial proxy from cooperative disclosures (Rostami, 2015; Said & Tumin, 2011). The Governance Transparency Index (GTI) complements the quantitative indicators by capturing disclosure and oversight behaviors that financial ratios alone cannot observe, and its construction is described in Table 4.

Table 3

Analytical Indicators

Dimension	Indicator (Abbreviation)	Formula	Theoretical Basis
Capital Adequacy	Capital-to-Asset Ratio (CAR)	Total Equity / Total Assets	Berger & Bouwman (2013)
Asset Quality	Bad Loan Ratio (BLR)	Bad Loans (overdue >12 months) / Gross Loans	Wheelock & Wilson (2000)
Asset Quality	Loan-to-Asset Ratio (LAR)	Gross Loans / Total Assets	Wheelock & Wilson (2000)
Earnings	Return on Assets (ROA)	Net Income / Avg. Total Assets	Cole & Gunther (1998)
Liquidity	Liquid Asset Ratio (LiqAR)	(Cash + Current Bank Balances) / Member Deposits	Sahajwala & Van den Bergh (2000)
Loan Growth	Loan Growth Rate (LGR)	(Loanst- Loanst-1) / Loanst-1	DeYoung (2003)
Management	Operating Efficiency Ratio (OER)	Total Operating Expenses / Total Operating Income	Rostami (2015); Said & Tumin (2011)
Governance	Governance Transparency Index (GTI)	Ordinal composite (0-8); four disclosure dimensions	Akerlof et al. (1993); Shilpakar (2024)

Qualitative Governance Disclosure Analysis

The Governance Transparency Index (GTI) is based on the combination of theoretical frameworks of Akerlof et al. (1993) and Nepal-specific governance literature (Shilpakar, 2024; Tiwari, 2025). This is constructed as an ordinal composite across four coding dimensions, each scored on a 0-2 scale, the GTI yields a maximum of 8 per institution-year. GTI scores are computed for each year in the longitudinal window and from parliamentary investigation records for the supplementary sub-sample. Table 4 presents the coding structure.

The GTI scores reported in this study were assigned by a single researcher applying the rubric in Table 4 to the underlying annual reports and parliamentary records. A formal inter-rater reliability statistic could not be computed because resources for a second independent coder were not available within the scope of this study. To reduce the scope for subjective scoring bias, the rubric specifies disclosure-presence criteria rather than disclosure-quality judgments wherever possible (for example, D1 asks whether related-party lending is disclosed rather than whether the disclosed counterparties appear reasonable), and all 0/1/2 assignments are accompanied in the working file by the specific page reference in the underlying source document.

Table 4

Governance Transparency Index - Coding Dimensions

Coding Dimension	Operationalization	Literature Basis
D1: Related-Party Disclosure	Disclosure of related-party lending (0 = absent; 1 = partial; 2 = full)	Akerlof et al. (1993); Tiwari (2025)
D2: Lending Policy Transparency	Disclosure of loan approval criteria, concentration limits, and collateral requirements (0 = absent; 1 = partial; 2 = full)	Shilpakar (2024); Pradhan & Sharma (2025)

D3: Audit Quality Signal	Disclosure of the nature of external audit opinion (0 = no audit or adverse/disclaimer; 1 = qualified; 2 = unqualified)	Cole & Gunther (1998); IMF (2023)
D4: Provisioning Disclosure	Disclosure of loan loss provisioning and rates, with auditor confirmation (0 = absent; 1 = partial; 2 = full)	Sahajwala & Van den Bergh (2000); NRB (2024)

Note. Ordinal scores represent extent and specificity of disclosure. Low scores indicate disclosure deficiency and are not construed as evidence of intentional misconduct without corroborating financial and audit indicators.

Data Quality and Limitations

There are four noteworthy data quality constraints that affect interpretation. Firstly, inconsistencies in the way different cooperatives report financial condition limit computability of certain indicators. Secondly, audit quality varies substantially outside NRB supervision and differences in accounting classification between different cooperatives introduce cross-institutional noise. The study does not assert causality and any observed association between low GTI scores and distress in financial ratios does not establish with full certainty on the reasoning behind deterioration. Lastly, there is data-source asymmetry between the primary and supplementary sub-samples, where only terminal-year cross-sectional data drawn from parliamentary records are available for the sub-samples. Findings from the supplementary sub-sample are therefore reported as cross-sectional corroboration only, and inferences about pre-collapse dynamics are restricted to the primary longitudinal sub-sample. All observational findings discussed in this study warrant further investigation with larger samples as well as internal data from cooperatives.

IV. Results And Discussion

Table 5 presents the master financial indicator panel for all sampled institutions. Panels A and B report year-by-year observations across the shared window 2022-2025 AD for the two longitudinal distressed cooperatives and two comparators respectively. Panel C presents terminal-year profiles for three supplementary failed cooperatives from parliamentary investigation records. Table 6 presents the Governance Transparency Index scoring matrix with dimension-level scores.

Table 5

Master Financial Indicator Panel: All Sampled Institutions, Individual Observation Years (2022-2025 AD)

Institution	Status	Period (AD)	CAR (%)	BLR (%)	LAR (%)	ROA (%)	OER (%)	LiqAR (%)	LGR (%)	GTI (/8)
Panel A: Longitudinal Failed / Distressed Institutions (2022-2025 AD)										
Sahara Nepal SACCOS	Distressed	Yr-2 2022 AD	18.00	0.31	84.49	3.46	75.23	13.75	+29.82	4
Sahara Nepal SACCOS	Distressed	Yr-1 2023 AD	18.76	1.83	72.37	2.93	78.7	21.06	−13.81	4
Sahara Nepal SACCOS	Distressed	Yr 0 2024 AD	19.27	3.72	68.63	0.41	97.0	13.97	−2.41	4

Sahara Nepal SACCOS	Distressed	Yr +1 2025 AD	19.87	4.31	68.87	1.49	86.2	12.09	+4.91	4
Margadarshan SACCOS	Distressed	Yr-2 2022 AD	14.54	2.49	85.57	2.39	73.4	13.67	+13.95	3
Margadarshan SACCOS	Distressed	Yr-1 2023 AD	14.97	3.77	77.77	1.91	81.8	27.57	−9.06	3
Margadarshan SACCOS	Distressed	Yr 0 2024 AD	14.89	9.98	76.06	1.34	84.5	12.79	−6.82	3
Margadarshan SACCOS	Distressed	Yr +1 2025 AD	15.65	13.18	72.14	1.40	77.7	25.31	−5.50	3
Panel B: Stable Comparator and Sector Benchmark (2022-2025 AD)										
Natural Cooperative	Stable	Yr-2 2022 AD	9.04	9.34	81.61	1.47	49.75	14.23	−17.43	5
Natural Cooperative	Stable	Yr-1 2023 AD	11.20	11.00	78.69	0.47	71.09	14.64	−19.92	5
Natural Cooperative	Stable	Yr 0 2024 AD	14.11	3.51	78.89	2.01	46.67	18.17	−4.99	4
Natural Cooperative	Stable	Yr+1 2025 AD	13.55	2.83	71.29	1.04	56.9	23.78	+2.51	4
SKBBL	Benchmark	Yr-2 2022 AD	13.51	N/A	95.36	2.45	21.56	N/A	+22.74	7
SKBBL	Benchmark	Yr-1 2023 AD	17.75	N/A	91.35	1.95	21.79	N/A	+51.34	7
SKBBL	Benchmark	Yr 0 2024 AD	21.39	N/A	89.45	1.98	20.08	N/A	−12.78	7
SKBBL	Benchmark	Yr+1 2025 AD	24.87	3.84	86.52	2.04	23.85	N/A	−9.38	7
Panel C: Supplementary Point-in-Time Distressed Institutions (terminal year only)										
Gorkha SACCOS	Failed	Terminal year	2.47	—	29.34	—	—	1.10	n/a	0
Kantipur SACCOS	Failed	Terminal year	9.29	—	39.96	—	—	1.15	n/a	0
Ideal Yamuna SACCOS	Failed	Terminal year	−1.30	100.0	87.00	—	—	1.39	n/a	0

Note. Panels A-B: longitudinal data from published annual reports (see references). Panel C: terminal-

year data from parliamentary investigation records (PSICMCS, 2024); ROA and OER not computable from available records (no income statement data). Kantipur BLR not reported in parliamentary records. SKBBL: LiqAR structurally N/A (wholesale-funded, no member deposits). Panel C missing values denoted by em dash.

Governance Transparency Index Scoring Matrix

Table 6 presents GTI dimension scores for all four longitudinal institutions across each individual observation year within the shared window and the supplementary institutions at terminal year. Each institution is presented as a labelled panel block.

Table 6

Governance Transparency Index: Dimension Scores and Audit Opinion Summaries — All Longitudinal Institutions, Individual Observation Years (2022-2025 AD)

Institution	Year (AD)	D1 Rel.-Party	D2 Lending Policy	D3 Audit Quality	D4 Provisioning	GTI Total	External Audit Opinion (Summary)
Sahara Nepal SACCOS: Distressed							
Sahara Nepal SACCOS	2022 AD (Yr-2)	0	1	1	2	4	Modified opinion: NFRS non-compliance (KPN & Associates, Kathmandu).
Sahara Nepal SACCOS	2023 AD (Yr-1)	0	1	1	2	4	Modified opinion: NFRS non-compliance (KPN & Associates, Kathmandu).
Sahara Nepal SACCOS	2024 AD (Yr 0)	0	1	1	2	4	Qualified: 5 findings including AML/KYC gaps, collateral adequacy, interest capitalisation (G.R.B. Associates, Birtamode).
Sahara Nepal SACCOS	2025 AD (Yr+1)	0	1	1	2	4	Qualified: 2 findings on loan documentation. First KAM disclosure (ISA 701). PEARLS analysis satisfactory (G.R.B. Associates, continuing).
Margadarshan SACCOS: Distressed							
Margadarshan SACCOS	2022 AD (Yr-2)	0	1	0	2	3	No external audit. Provision coverage 27.0% (held NPR 5.48M vs required NPR 20.27M).
Margadarshan SACCOS	2023 AD (Yr-1)	0	1	0	2	3	No external audit (2nd consecutive year). Provision coverage 27.9% (held NPR 9.20M vs required NPR 32.96M). Adjusted net loss -NPR 13.67M.
Margadarshan SACCOS	2024 AD (Yr 0)	0	1	0	2	3	No external audit (3rd year). PEARLS P1 = 25.53%. Adjusted net loss -NPR 21.48M. Deposits+19.6% while loans -6.82%.
Margadarshan SACCOS	2025 AD (Yr+1)	0	1	0	2	3	No external audit (4th year). NFRS first adopted. Provision shortfall NPR 35.47M (up from NPR 14.79M at Yr -2). Adjusted net loss -NPR 28.44M.

Natural Cooperative: Stable Comparator							
Natural Cooperative	2022 AD (Yr-2)	0	1	2	2	5	Yr -2 reconstructed from comparative columns; GTI not independently scored.
Natural Cooperative	2023 AD (Yr-1)	0	1	2	2	5	Unqualified opinion (Pradhan & Shakya Associates, Kathmandu). PEARLS analysis included.
Natural Cooperative	2024 AD (Yr 0)	0	1	1	2	4	Qualified: NAS 19 employee benefit not actuarially valued; ICAN carve-out for loan impairment. 21 regulatory findings (Pradhan & Shakya Associates).
Natural Cooperative	2025 AD (Yr+1)	0	1	1	2	4	Qualified: same two bases as Yr 0 (repeat). 23 regulatory findings (Pradhan & Shakya Associates).
SKBBL: Sector Benchmark							
SKBBL	2022 AD (Yr-2)	2	1	2	2	7	Unqualified. No KAMs. Clean BAFIA 2073 compliance. NRB CAR = 12.66% (Sujan Kafle & Associates).
SKBBL	2023 AD (Yr-1)	2	1	2	2	7	Unqualified. RMDC merger completed; goodwill NPR 89.8M recognized. NRB CAR = 15.74% (Sujan Kafle & Associates).
SKBBL	2024 AD (Yr 0)	2	1	2	2	7	Unqualified. Two KAMs: interest income recognition, IT controls (J.B. Rajbhandary & DiBins).
SKBBL	2025 AD (Yr+1)	2	2	1	2	7	Unqualified. Three KAMs: interest income, ECL model (NFRS 9 first applied), IT controls. NRB CAR = 16.62% (J.B. Rajbhandary & DiBins).
Supplementary Cross-sectional Institutions: Terminal Year Only							
Gorkha SACCOS	Terminal year	0	0	0	0	0	No audit available. Source: PSICMCS (2024). 76.48% of loans to 23 members. Deposit gap ~NPR 996M.
Kantipur SACCOS	Terminal year	0	0	0	0	0	No audit available. Source: PSICMCS (2024). Board loans ~NPR 3.24B.
Ideal Yamuna SACCOS	Terminal year	0	0	0	0	0	No audit available. Source: PSICMCS (2024). 100% NPL; negative equity -NPR 101.8M. Connected to Kantipur SACCOS via board member.

Note. Supplementary institutions scored from parliamentary records; all four dimensions absent. Abbreviations used in audit opinion summaries: NFRS = Nepal Financial Reporting Standards (NFRS 9 refers to the financial instruments standard); PEARLS = Protection, Effective financial structure, Asset quality, Rates of return, Liquidity, Signs of growth (credit union monitoring framework); KAM = Key Audit Matters (per ISA 701, International Standard on Auditing 701); AML/KYC = Anti-Money Laundering /

Know Your Customer; BAFIA 2073 = Banks and Financial Institutions Act 2073 BS; ECL = Expected Credit Loss model

Capital Adequacy

The two distressed cooperatives in the primary subsample reported stable or improving Capital-to-Asset Ratios across the observation window. Sahara Nepal reported CAR rising from 18.00% (Yr-2) to 19.87% (Yr+1), and Margadarshan reported 14.54% to 15.65% improvement. This improvement in CAR would indicate that both cooperatives are sufficiently capitalized under conventional thresholds. However, at Sahara Nepal the improvement was driven by asset reduction rather than capital growth, as net profit collapsed from NPR 396M to NPR 65.3M. Similarly, at Margadarshan, provision coverage remained at approximately 25-28% of the required amount across all four years. Adjusting for full provisioning, reported profits convert to net losses deepening from-NPR 2.31M (Yr-2) to-NPR 28.44M (Yr+1), and the provision shortfall grew from NPR 14.79M to NPR 35.47M.

Comparing this to the two comparators in the primary subsample, Natural Cooperative's CAR improved from 9.04% to 13.55% through genuine equity accumulation rather than asset contraction, and SKBBL's rose from 13.51% to 24.87%. As such, using CAR to indicate potential financial problems depends on whether provision adequacy is jointly assessed, and whether the changes in CAR are from capital side or asset side. A nominal CAR above 14% could coexist with effective insolvency.

Asset Quality and the Loan Growth Lead Signal

The most significant longitudinal pattern observed in this sample is the association between prior-period loan growth and subsequent credit quality deterioration. Sahara Nepal's Yr-2 loan growth of+29.82% preceded a bad loan ratio escalation from 0.31% to 4.31% over four years. Margadarshan exhibited a similar pattern where bad loans rose from 2.49% to 13.18%, with the sharpest acceleration (6.21 percentage points) between Yr-1 and Yr 0, following a Yr-2 LAR peak of 85.57%. This one-to-two-year lag between credit expansion and quality deterioration is a consistent pattern across both distressed institutions.

Natural Cooperative's BLR trajectory provides a contrast: an initial spike to 11.00% (Yr-1) followed by recovery to 2.83% (Yr+1), suggesting elevated delinquency can be transient when accompanied by corrective governance responses including continuous external audit and PEARLS-based monitoring (Protection, Effective financial structure, Asset quality, Rates of return, Liquidity, Signs of growth). The supplementary sub-sample reveals the terminal state of uncontrolled deterioration: Ideal Yamuna's investigation classified 100% of loans as bad loans with only 15% average provisioning, while the anomalously low LAR values for Gorkha (29.34%) and Kantipur (39.96%) reflect advanced write-offs of non-recoverable assets.

Earnings, Efficiency, and Liquidity

Sahara Nepal's ROA trajectory (3.46% to 0.41% to 1.49%) illustrates provision-driven earnings volatility. The Yr 0 near-collapse reflects an NPR 994.7M provision charge, while Yr+1 recovery is attributable to a NPR 179.8M provisioning reduction rather than revenue improvement. Margadarshan's reported ROA (2.39% to 1.40%) converts to adjusted returns of-0.44% to-5.68% on a full-provision basis, a continuously deepening negative trajectory concealed by chronic under-provisioning. Natural Cooperative and SKBBL both maintained positive ROA throughout, with SKBBL's OER consistently below 24%, substantially below all cooperative-sector observations (range 46-97%).

Liquidity patterns reinforce the distressed-stable distinction. Both distressed cooperatives reported LiqAR oscillating between 12% and 27%, with Margadarshan's spikes driven by loan contraction rather than deposit growth. Natural Cooperative's LiqAR improved steadily from 14.23% to 23.78%. The supplementary sub-sample exhibits catastrophic liquidity: Gorkha (1.10%), Kantipur (1.15%), and Ideal Yamuna (1.39%) all report LiqAR below 1.5% against a

10% PEARLS minimum.

Governance Transparency

The GTI analysis reveals three structurally significant patterns. First, D1 = 0 (absent related-party disclosure) is an invariant feature of every distressed cooperative in every scored year, while SKBBL consistently scores D1 = 2 with counterparty-level disclosure across all 231 promoter SFACLs. Natural Cooperative also scores D1 = 0 throughout, suggesting this dimension alone does not distinguish stable from distressed institutions. However, D1 = 0 is present across all distressed cooperatives in every scored year, indicating that absent related-party disclosure is a necessary but not sufficient condition within the distressed profile observed in this sample. A related limitation is that both D1 and D2 exhibit a ceiling effect within the cooperative sector: no cooperative in the sample scores above 0 on D1 or above 1 on D2 (only SKBBL reaches 2 on either dimension), which means the effective GTI range among cooperatives is 0 to 6 rather than 0 to 8. The GTI therefore captures meaningful variation primarily through D3 (audit quality) and D4 (provisioning disclosure) within the cooperative sub-sample.

Second, D3 (audit quality) also has some similarities across distressed cooperatives. Sahara Nepal maintained continuous external audit (D3 = 1) with qualification findings escalating from NFRS non-compliance to AML/KYC and collateral concerns. Margadarshan lacked external audit entirely (D3 = 0 for all four years of annual report), relying on internal PEARLS reporting without independent verification. All three supplementary institutions also score D3 = 0.

Finally, the parliamentary investigation findings reveal the governance conditions concealed by zero-disclosure: at Gorkha, 76.48% of loans were disbursed to 23 members with the founding chairman's family holding NPR 1.325 billion in unrepaid loans; at Kantipur, board members received approximately NPR 3.24 billion in loans representing 10.45% of total disbursements, with interest receivable exceeding loan principal; at Ideal Yamuna, nine merged cooperatives operated under connected management with institutional links to Kantipur SACCOS.

Discussion

The findings of this study are broadly consistent with prior research on financial institution failure. The analysis of annual reports from the lesser-regulated cooperatives supports patterns that have been discussed in previous studies. The association between an initial loan growth and subsequent credit quality deterioration, observed across both longitudinal distressed cooperatives with a one-to-two-year lag, aligns with the credit expansion risk factor identified by DeYoung (2003) in newly chartered banks and the exit-probability determinants documented by Wheelock and Wilson (2000). Similarly, the finding that strong capital adequacy ratios can coexist with effective insolvency when provisioning shortfalls are incorporated is consistent with the value-extraction mechanism formalized by Akerlof et al. (1993), wherein reported metrics may reflect institutional erosion rather than genuine intermediation.

The agency-cost prediction that diffuse ownership weakens member monitoring incentives is partially supported but conditional. The distressed cooperatives exhibit D1 = 0 (absent related-party disclosure) across all observed years, consistent with the prediction that members lack the concentrated incentive to demand transparency; however, Natural Cooperative also scores D1 = 0, indicating that the absence of related-party disclosure cannot, on its own, distinguish distressed from stable cooperatives. Next, the joint-signal hypothesis is the prediction most clearly supported by the comparative classification result: the combined indicator set separates distressed from stable institutions across observation years where neither approach in isolation does. The Margadarshan case is the clearest internal illustration: nominally adequate capital ratios (CAR rising from 14.54% to 15.65%) coexist with four consecutive years of absent external audit (D3 = 0) and a growing provision shortfall (from NPR 14.79M to NPR 35.47M), so that capital adequacy on its own is uninformative while the joint reading of CAR with D3 and D4 reveals deepening insolvency.

Two areas of inconsistency with prior findings warrant attention. First, the Nepal-specific governance literature identifies political interference as a major risk factor (Shilpakar, 2024; Tiwari, 2025), but the GTI as constructed does not directly capture political connections, limiting the comparability of this study's governance findings with the broader Nepal literature. Second, Simkhada (2017) documents wide variation in cooperative financial performance, which the present sample corroborates; however, Natural Cooperative's Yr -1 BLR spike of 11.00% followed by recovery to 2.83% suggests that elevated delinquency is not invariably a terminal signal. This recovery pattern, which is absent from the distressed institutions, may reflect the protective role of continuous external audit and corrective governance responses, though the small sample prevents firm conclusions about the mechanisms involved.

V. Conclusion and Implications

The findings of this study demonstrate that publicly available annual reports for lesser-regulated financial markets, such as cooperatives, contain data which could be used to compute financial ratios to predict potential failure. This is despite the lack of standardization in such markets. The longitudinal analysis identified a consistent deterioration pattern in which the loan growth acceleration is observed prior to bad loan escalation by one to two years, while nominally stable capital ratios mask expanding provision shortfalls computable from disclosed schedules. These patterns are observable before distress materializes, consistent with findings in commercial banking (Cole & Gunther, 1998; DeYoung, 2003).

For the broader financial distress literature, the Nepalese cooperative context provides preliminary evidence that CAMEL-based early warning principles extend to member-owned financial intermediaries in developing economies, provided that governance transparency dimensions are explicitly incorporated rather than proxied through audit quality alone. A surveillance framework anchored in only one information type, whether ratio-based or governance-based, will systematically miss the complementary signal dimension.

Two recommendations follow directly from the findings and are addressed to the cooperative-sector regulators identified in Section II. To the Department of Cooperatives, the comparative observation that audit-performance status and the provision-shortfall computation jointly separate the distressed cooperatives from the stable comparator suggests that minimum disclosure standards for cooperatives above a defined member-size threshold could usefully require both an audit-status declaration and a standardized provisioning schedule reconciling required against held provisions. To Nepal Rastra Bank, the same observation suggests that the off-site monitoring template used for licensed banks should not be transposed onto cooperatives without adding an explicit audit-quality input, since the bank template implicitly assumes a baseline of standardized regulatory reporting that cooperatives do not yet meet.

Future research should examine whether the combined indicator framework retains discriminatory power across larger samples controlling cooperative size, geographic concentration, and membership structure. Extension to a panel that includes cooperatives whose annual reports are not publicly available, accessible only through regulatory channels, would address the data-source asymmetry between the primary longitudinal and supplementary cross-sectional sub-samples, and would allow the supplementary failed cooperatives to be reconstructed on the same longitudinal basis as the primary sub-sample rather than relied upon only for terminal-year corroboration. Independent replication of the Governance Transparency Index scoring by at least two coders, with formal reporting of inter-rater reliability, would resolve the single-coder limitation acknowledged in the methodology. Comparative work with cooperative sectors in other emerging-market contexts where similar disclosure heterogeneity and regulatory transition dynamics are present would test whether the patterns documented here are specific to the Nepalese institutional context or generalize more broadly.

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