

Financial Management And Internal Control Practices In Cooperative Societies In India: An Empirical Study

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Abstract

Cooperative societies unite member ownership with enterprise responsibilities; sound budgeting, accounting, cash planning, and controls protect resources and credible reporting. This paper models how financial management and internal control relate to accountability through reproducible simulation, not fieldwork. No primary data were supplied; all 180 records, scores, tables, figures, and estimates are synthetic, not findings about actual societies. Four cooperative categories and six regional labels form an illustrative cross sectional dataset. Financial management, internal control maturity, digital capability, and accountability use 0–100 scores. Analysis includes descriptives, adoption rates, quartile comparisons, correlations, and HC3 regression controlling for size, category, and region. Mean financial management and internal control scores are 49.6 and 46.8; accountability averages 48.9. Audit recommendation tracking appears in 21.1% of records and duty separation in 21.7%. Mean accountability rises from 41.2 in the lowest control quartile to 58.0 in the highest. In the adjusted model, financial management and internal control associate positively with accountability ($B=0.257$ and 0.442 per index point); adjusted R^2 is 0.378 . These designed patterns are neither national prevalence nor causal effects. Their direction resembles prior cooperative studies, but different samples and outcomes preclude direct comparison. The paper offers a field study template, with measures for reconciliation, authorization, independent review, audit remediation, training, digital records, and member accessible disclosure. Validation requires a sector stratified sample, verified records, validated measures, and informed consent. This contribution is a replicable analytical workflow linking practices to accountability without inventing observations.

Keywords: Cooperative societies¹; Financial management²; Internal control³; Member accountability⁴; Audit follow-up⁵; Synthetic data⁶; India⁷.

1. Introduction

1.1 Cooperative finance and governance

Indian cooperatives are not a single institutional form: member owned credit, dairy, producer, marketing, housing, and service societies face distinct cash cycles, accounting requirements, and supervisory arrangements. Their shared feature is collective ownership and democratic control, making stewardship and clear disclosure to members central to legitimacy [3]. India's National Cooperation Policy 2025 emphasizes professional, transparent, technology enabled institutions, while the National Cooperative Database documents the sector's scale and heterogeneity [1], [2]. The Multi State Cooperative Societies Act and its 2023 amendment provide a statutory framework for societies operating across state boundaries; most societies remain governed by state laws [4]. This breadth makes a one size fits all assessment risky. Financial stewardship is governance, not merely bookkeeping. Nonfinancial societies also manage dues, inventories, procurement, and member payments, so control failures can undermine benefits as well as solvency.

1.2 Financial management and internal control

Financial management translates member resources into budgets, working capital, cash planning, reliable records, and timely reports. Internal control adds governance oversight, risk assessment, authorization, segregation of duties, reconciliations, asset protection, information quality, and corrective monitoring. These systems are complementary: budgets set expected limits, controls test whether transactions follow them, and audit follow up repairs weaknesses. Earlier Indian reform analysis identified accounting standardization, delayed audit, and weak management information as longstanding concerns in rural credit cooperatives [5]. Recent supervisory reporting and modernization initiatives likewise emphasize resilience, accurate data, computerized accounts, and stronger risk management in relevant cooperative banking and PACS contexts [6]–[11]. Reconciliation, assigned custody, and recorded audit responses make exceptions visible before they become losses.

1.3 Research question and contribution

The study asks: in a transparent illustrative model, how do stronger financial management and internal control scores relate to accountability and reporting

quality? It distinguishes financial results from accountability, avoids treating association as causation, and includes society size, category, and region as controls. Since no primary records were provided, the paper uses a reproducible synthetic dataset, not actual respondents or audited accounts. Its contribution is therefore methodological rather than an estimate of national practice: it demonstrates linked measures, descriptive tables, visual analysis, and a controlled regression that a future field study could reproduce with verified data. The design also makes explicit what a credible evidence claim would require: defined constructs, traceable observations, comparable samples, and disclosed uncertainty. Controls must fit scale: village societies need not copy a bank's architecture, but can use proportionate records, independent checks, periodic review, clear roles, documentation, and routine monitoring that members can inspect.

2. Survey Of Literature

Internal control research often uses the COSO framework's five components: control environment, risk assessment, control activities, information and communication, and monitoring [12]. Cooperative principles add a distinct test: controls should protect member assets without displacing democratic oversight, member participation, or autonomy [3], [13]. Corporate governance guidance connects transparent reporting, board accountability, and effective oversight [14]. Agency theory explains how information asymmetry between members, boards, and managers can create monitoring needs [15], [16]. Yet cooperatives differ from investor owned firms because members may be both users and owners, with ownership rights distributed across membership [17]. This distinction cautions against uncritical transfer of corporate benchmarks. Cooperative scholarship warns against reducing performance to profit alone. Cook's institutional analysis and Chaddad and Cook's ownership control typology show that organizational form shapes incentives and governance choices [18], [19]. Fulton links member commitment to cooperative performance, while Nilsson examines organizational principles that preserve member orientation [20], [21]. Cornforth and Spear describe governance tensions in democratic and mutual organizations, including the need to balance representative participation with competent management [22], [23]. Ebrahim's accountability framework distinguishes upward compliance from downward accountability to beneficiaries, useful for member owned societies [24]. These ideas motivate an outcome combining report timeliness, record reliability, audit compliance, and member facing transparency.

Evidence on cooperative controls is promising but context specific. A systematic review finds that studies frequently concern credit organizations,

apply COSO, and identify capacity, technology, and staff awareness as recurring constraints [25]. Shabri, Saad, and Bakar's Malaysian case study discusses internal control and profitability, but its single organization design cannot support national generalization [26]. Bhusal's survey of 38 savings and credit cooperatives in Nepal reports a positive relationship between perceived controls and financial performance [27]. Beloy's 108 respondent study in the Philippines associates internal control with accountability [28].

Indian evidence addresses related but different outcomes. Misra analyzes loan recovery across 19 states during 1997–2005 and links recovery to institutional and policy factors, not to a contemporary composite control score [29]. Basu and Paul examine published financial trends and challenges in Assam's cooperative credit institutions [30]. Neither provides comparable society level observations on the full range of financial management practices. Thus prior work supports a plausible positive relationship, but sector, country, measurement, and design differences preclude direct coefficient comparisons. The present simulation fills no empirical data gap; it provides an explicit measurement and analysis template for a future, properly sampled Indian field study.

3. Methodology

This is a cross sectional simulation study designed as an analytic demonstration, not a survey of actual Indian cooperative societies. A deterministic random seed generated 180 synthetic society records, allocated across four cooperative categories and six equally sized regional labels. The categories and labels are modeling strata only; they do not represent a verified sampling frame, named states, or population proportions. No respondents, interviews, institutional books, audit reports, or personal information were collected. This disclosure is essential because simulated cases cannot establish prevalence, policy impact, or causal effects for real societies. Companion CSV supports full replication of each reported result.

Three 0–100 indices represent financial management, internal control maturity, and accountability and reporting performance; a fourth records digital capability. The first covers budgeting, cash planning, and reporting discipline; the second covers authorization, segregation, reconciliation, asset checks, audit planning, and follow up; the outcome represents timeliness, traceability, completeness, and member facing disclosure. Employee count, training, category, and region are generated as covariates. Eight separate synthetic practice indicators are simulated as binary adoption items. Scores are simulated, not response averages; questionnaires require piloting, reliability checks, and content validation before field use. An

instrument should keep indices separate and pretest each item.

Analysis comprises means, standard deviations, ranges, adoption percentages, Pearson correlations, and outcome comparisons across quartiles of internal control. The adjusted model regresses the accountability score on financial management, internal control, digital capability, log size proxy, category indicators, and region indicators. Coefficients use ordinary least squares with HC3 heteroskedasticity robust standard errors and two sided tests. Tables and figures are generated directly from the same seeded records. Estimates describe only this parameterized simulation; significance values are not evidence about India. Reproduction requires the disclosed seed, formula definitions, and companion CSV, while external validity requires verified observations and a defensible sampling design.

4. Data Collection And Analysis

Because no primary material was provided, “data collection” here means generation of a synthetic teaching dataset, not field collection. The companion CSV contains 180 rows and all analysis variables; the random seed is 20261005. Six broad region labels receive 30 records each, while category totals are fixed at 72 credit oriented, 45 dairy, 36 producer or marketing, and 27 multipurpose or service societies. These are imposed design choices, not observations, named states, or population shares. Continuous indices are bounded from 0 to 100. Table 4’s binary timeliness flag is defined as an accountability score at or above the generated sample’s 55th percentile; this arbitrary threshold is neither a legal deadline nor an observed reporting date. The figures and tables therefore describe a parameterized example only.

Table 1: Composition of the illustrative synthetic records

Stratum	Synthetic label	n	Share (%)
Category	Credit-oriented	72	40.0
Category	Dairy	45	25.0
Category	Producer/marketing	36	20.0
Category	Multipurpose/service	27	15.0
Region label	North	30	16.7
Region label	South	30	16.7
Region label	East	30	16.7
Region label	West	30	16.7
Region label	Central	30	16.7
Region label	Northeast	30	16.7
Overall	All simulated cases	180	100.0

Note: Category quotas and regional labels are generated by design. Percentages are rounded; region labels are not named states. Source: synthetic records.

Table 1 identifies the constructed case mix and the deliberate balance across six broad regional labels. The cooperative type shares are design inputs (40%, 25%, 20%, and 15%), not sample estimates; regional proportions are fixed at 16.7% each. Balancing labels prevents empty categories in this teaching

model, but it does not approximate India’s national cooperative distribution. Since governance and financial routines can vary by legal form and economic activity, type and region indicators are included in the regression. A real study should replace both quotas with a documented probability sampling frame, report nonresponse by stratum, and align categories with official sector classifications [2].

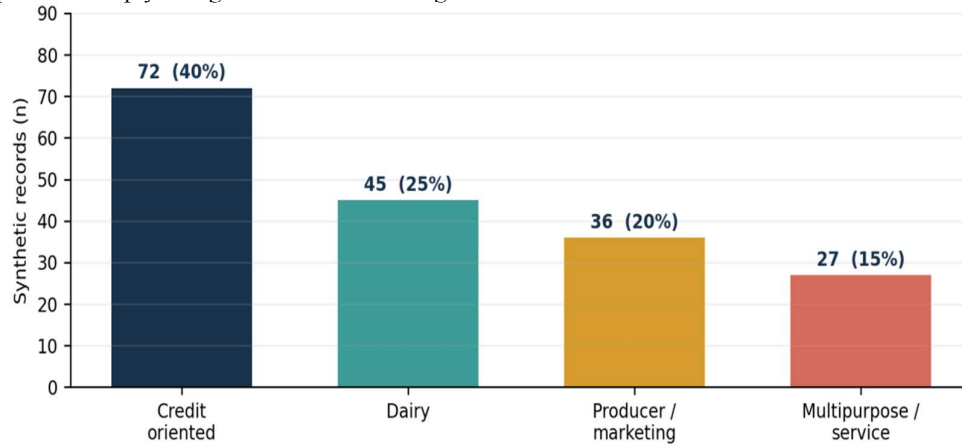


Figure 1: Synthetic sample composition by cooperative category

Source: Authors' calculations from the disclosed synthetic dataset (seed 20261005). Illustrative only.

Figure 1 shows the composition of 180 generated records: credit-oriented societies form 40%, dairy 25%, producer or marketing 20%, and multipurpose or service societies 15%. The six regional labels each contain 30 records by design, so regional balance is an allocation rule, not geographic representativeness. This chart describes only the synthetic frame and should not be read as the sectoral distribution of Indian cooperatives. Its purpose is to make heterogeneity visible and motivate controls for cooperative type and region in later analysis. Actual national composition must be estimated from an authenticated sampling frame and probability selection. For simulation only.

Table 2: Descriptive statistics for simulated indices and society size

Variable	Mean	SD	Minimum	Maximum
Financial management index (0–100)	49.6	12.3	13.2	84.9
Internal control maturity index (0–100)	46.8	10.5	18.2	71.1
Accountability / reporting index (0–100)	48.9	12.1	22.4	75.0
Digital capability index (0–100)	30.9	15.4	0.0	79.6
Employees (count)	3.8	2.1	1.0	14.0

Note: Index scores are simulated constructs, not observed questionnaire averages, audit grades, financial ratios, or rupee amounts. Source: synthetic records.

Table 2 shows the simulated index distributions. Mean financial management is 49.6, internal control 46.8, accountability 48.9, and digital capability 30.9. The lower digital mean is part of the chosen generator, not a measurement of Indian societies.

Standard deviations of roughly 10 to 15 points ensure visible variation for plots and regression; the ranges confirm that scores are not constant. These index points are not rupees, audit grades, ratios, or independently verified performance measures. The three focal means match the abstract and conclusion, keeping the narrative, figures, and model tied to the same generated records.

Table 3: Simulated adoption of financial management and internal control practices

Illustrative practice indicator	n	Records (%)
Annual budget approved and variance reviewed	97	53.9
Quarterly cash-flow forecast prepared	64	35.6
Monthly bank reconciliation completed	80	44.4
Duties for approval, recording, and custody separated	39	21.7
Written authorization limits documented	72	40.0
Inventory/assets physically verified	53	29.4
Formal internal/external audit calendar maintained	30	16.7
Audit recommendations tracked to closure	38	21.1

Note: Binary indicators are generated from synthetic index scores; none was reported by a society or verified against documents. Source: synthetic records.

Table 3 makes practice level variation visible. Annual budgeting and variance review is the most frequent generated item (53.9%); a formal audit calendar is least frequent (16.7%). Tracking audit recommendations to closure (21.1%) and separating

approval, recording, and custody (21.7%) are also comparatively uncommon. Each percentage is generated conditionally on a synthetic index, not collected from a cooperative, interview, or audit file. The pattern illustrates why broad composite scores should be decomposed into actionable routines. In field research, adoption should be verified using dated documents and a consistent reference period, then compared by sector and size.

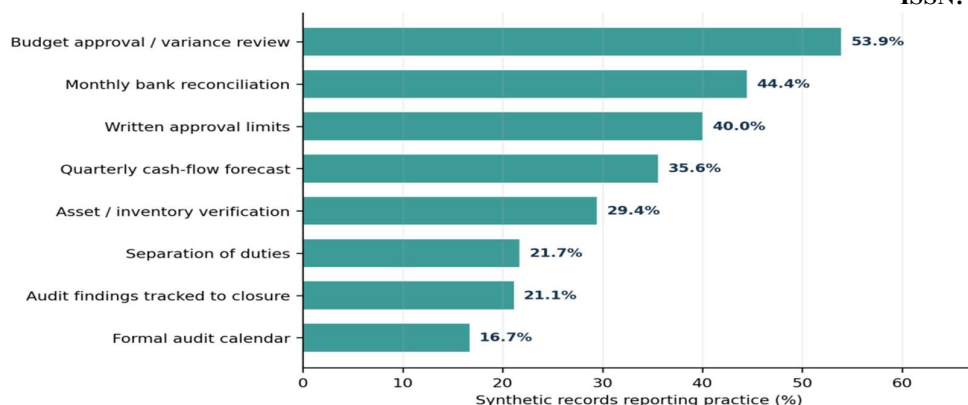


Figure 2: Generated adoption rates for eight practices

The practice chart ranks eight simulated binary controls by adoption. Annual budget approval and variance review is highest at 53.9%, while a formal audit calendar is lowest at 16.7%; audit finding closure and duty separation are only 21.1% and 21.7%. These rates are generated from synthetic control scores, not obtained from interviews or records. They illustrate how planning routines differ

from assurance and remediation controls, which operate at different stages. For real use, each item needs a time window, documentary verification, and sector appropriate definition. The ordering is a hypothesis for fieldwork, not a national diagnosis. Source: Authors' calculations from the disclosed synthetic dataset (seed 20261005). Illustrative only.

Table 4: Simulated accountability by internal control maturity quartile

IC quartile	n	Mean IC	Mean FM	Mean accountability	Index flag (%)
Q1 (lowest)	45	33.32	42.31	41.17	15.6
Q2	45	44.39	47.21	46.14	35.6
Q3	45	49.64	50.62	50.19	53.3
Q4 (highest)	45	59.91	58.11	58.02	75.6
Q4 – Q1	—	26.59	15.80	16.85	60.0 pp

Note: Quartiles contain 45 generated cases each. "Index flag" is accountability $\geq$ the synthetic sample's 55th percentile; it is not observed timeliness or a legal deadline. Source: synthetic records.

Table 4 shows a monotonic gradient across internal control quartiles: mean accountability increases from 41.17 in Q1 to 58.02 in Q4, a 16.85-point difference. Mean financial management also rises

from 42.31 to 58.11. The model defined timeliness flag increases from 15.6% to 75.6%, but it is a score threshold, not observed punctuality. Because the outcome was generated partly from internal control and financial management, this pattern is expected by design. It supports the abstract's description of the synthetic relationship, while warning against interpreting quartile gaps as causal or national evidence.

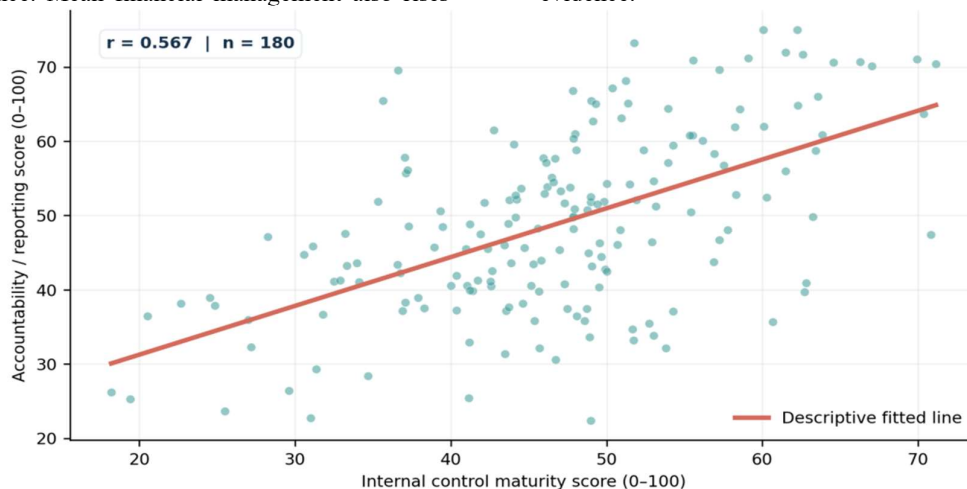


Figure 3: Relationship between internal control and accountability

The scatterplot relates each generated society's internal control score to its accountability score; the fitted line slopes upward, and the synthetic Pearson correlation is 0.567. Dispersion around the line indicates that controls do not explain every accountability difference, even in this designed dataset. Because the simulation equation explicitly gives internal control a positive contribution to the outcome, the slope is expected by construction. The

plot checks that coding and visualization reproduce the stated relationship; it is not independent evidence about India. A field replication should show observed points, confidence bands, and sensitivity checks for sector, size, and reporting definitions.

Source: Authors' calculations from the disclosed synthetic dataset (seed 20261005). Illustrative only.

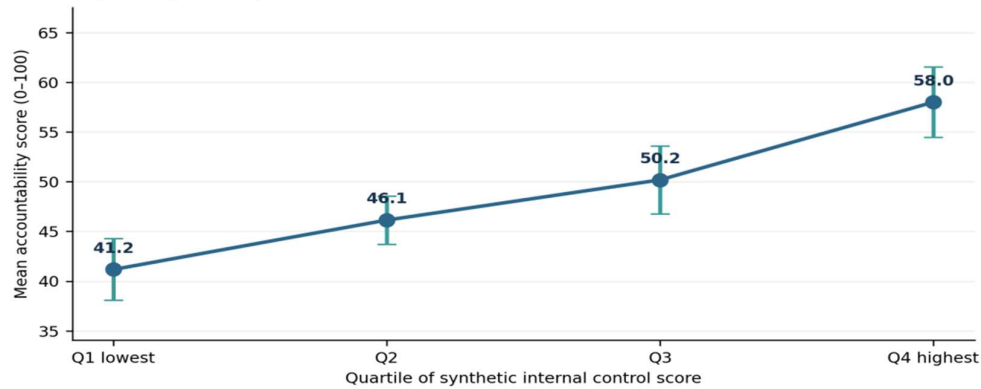


Figure 4: Accountability across internal control quartiles

Figure 4 presents mean accountability by quartile of the generated internal control score, with 95% confidence intervals. The mean rises from 41.2 in Q1 to 58.0 in Q4, a 16.8 point difference; each quartile contains 45 records. The steady sequence matches the simulated relationship reported in the abstract and Table 4. Confidence intervals quantify sampling variation under the generated records only; they do not capture uncertainty about model assumptions or representativeness. The plot suggests a useful nonparametric diagnostic for future work, but real observations are required before interpreting quartile gaps as institutional differences. Not a field estimate.

Source: Authors' calculations from the disclosed synthetic dataset (seed 20261005). Illustrative only.

Table 5: OLS model of the simulated accountability index

Predictor	B	HC3 SE	Std. β	95% CI	p
Financial management score	0.257	0.078	0.260	[0.103, 0.410]	0.001
Internal control score	0.442	0.101	0.381	[0.243, 0.641]	<0.001
Digital capability score	0.071	0.059	0.090	[-0.045, 0.188]	0.230
Log size proxy	1.677	1.633	0.071	[-1.546, 4.900]	0.306

Note: N=180; $R^2=0.419$; adjusted $R^2=0.378$. Model includes cooperative type and region indicators (reference categories: credit oriented and Central). HC3 robust SE; two sided t tests. Source: synthetic records.

Table 5 estimates conditional associations within the generated records. A one point higher internal control score corresponds to 0.442 more accountability points (HC3 SE 0.101; $p<0.001$), and a one point higher financial management score

corresponds to 0.257 points (SE 0.078; $p=0.001$), controlling for digital capability, log size proxy, cooperative type, and region. The 95% robust intervals exclude zero for these two variables but cross zero for digital capability and staff size. R^2 is 0.419 and adjusted R^2 is 0.378. These are designed coefficients and model diagnostics, not estimates for India; controls cannot cure synthetic data's lack of external validity.

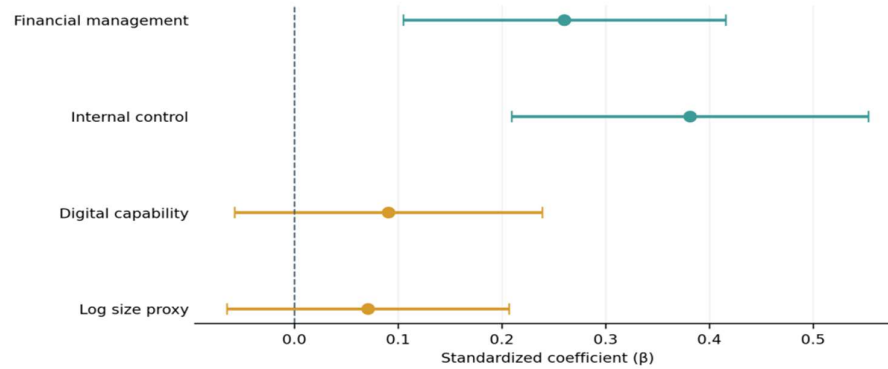


Figure 5: Standardized adjusted coefficients and robust confidence intervals

Figure 5 displays HC3 robust standardized regression coefficients for four predictors with 95% intervals; category and region indicators enter the model but are omitted from the plot. Financial management and internal control estimates are both positive, and their intervals exclude zero in this simulation. Digital capability and log size proxy have intervals that cross zero. These are partial associations conditional on listed covariates, not causal effects. The plot shows magnitude and uncertainty rather than p values alone, while Table 5 supplies estimates. All points and intervals arise from seeded synthetic data; field estimates may differ in sign, size, and precision.

Source: Authors' calculations from the disclosed synthetic dataset (seed 20261005). Illustrative only.

5. Discussion

5.1 Critical analysis of the simulated results

The simulated results show a constructed gradient. Control maturity correlates with accountability ($r=0.567$). Mean scores rise from 41.17 in Q1 to 58.02 in Q4; the model defined timely reporting flag occurs in 76% of Q4 and 16% of Q1. This direction is built into the simulation. Adjusted estimates are positive for internal control ($B=0.442$, HC3 $SE=0.101$, $p<0.001$) and financial management ($B=0.257$, $SE=0.078$, $p=0.001$). Adjusted R^2 is 0.378. Digital capability and staff count are not statistically distinguishable from zero after adjustment, reflecting chosen parameters and collinearity, not evidence that technology or capacity are unimportant. Practice rates show an illustrative bottleneck: audit calendars, recommendation closure, and duty separation are least common. Fieldwork could examine record ownership, reconciliations, authorization, and closure tracking. Scores and outcomes share simulated latent components. The gradient validates data processing logic, not causal mechanisms, effect size, or the condition of any real society. A defensible policy inference is a research proposition: test whether verifiable records and timely correction accompany stronger accountability, stratifying by activity, regulation, and size. Quartile contrasts

remain descriptive and cannot eliminate reverse direction or omitted factors in actual organizations.

5.2 Critical comparison with past work

Directional comparison, not coefficient equivalence, is appropriate. Shabri et al. study one Malaysian cooperative qualitatively; they discuss controls and profitability but note losses persisted despite functioning controls [26]. Our positive simulated coefficients resemble the direction but cannot replicate that case: unit, outcome, evidence, and design differ. Bhusal examines 38 SACCOs in Butwal, Nepal, using questionnaire measures of perceived control and financial performance, and reports a positive association [27]. Beloy's Panabo, Philippines, study uses 108 cooperative employees and reports a positive relationship between controls and accountability [28]. Because the simulation was parameterized for a positive direction, this similarity is not independent corroboration.

Indian studies are closer institutionally but measure different constructs. Misra analyzes PACS loan recovery across 19 states during 1997–2005, emphasizing recovery and structural or policy correlates rather than a contemporary internal control index [29]. Basu and Paul use secondary financial trends for Assam's credit cooperatives and identify performance and stability challenges [30]. Their periods, sectors, data levels, and outcomes do not match this simulation. Official task force and policy sources identify standardization, audit timeliness, digitization, and governance as priorities [5], [1], [8]; they establish relevance, not effects.

Comparability is limited by sectoral laws, uneven audit mandates, scale, and member control arrangements. A pooled Indian estimate could obscure differences among PACS, cooperative banks, dairy societies, and producer organizations. Future fieldwork should report sector stratified estimates and objective indicators: book closure time, reconciliation exceptions, audit finding age, cash flow variance, and member access to annual accounts. Longitudinal records could test temporal ordering and reduce common method bias. Until such evidence exists, these coefficients are examples of how a preregistered model might report results, not evidence that Indian cooperatives with stronger

controls perform better. Future field comparisons should measure implementation costs and member voice alongside audit compliance, composite scores, and outcomes.

6. Conclusion

This simulation offers a framework linking cooperative finance, controls, and accountability, not field evidence about India. All 180 records are synthetic; averages, adoption rates, quartile gaps, correlations, coefficients, and p values are not national estimates or causal effects. In simulation, accountability rises with control maturity, and both scores retain positive adjusted associations. Illustrative gaps are audit follow up, duty separation, and formal audit scheduling. The exercise shows how linked measures can be tabulated, visualized, and modeled without claiming uncollected observations.

For real cooperatives, the framework suggests hypotheses, not prescriptions. Routines including monthly bank reconciliation, written approval limits, cash forecasts, asset verification, assigned audit ownership, closure tracking, and member accessible annual statements could be assessed against timely, complete, verifiable reporting. Digitization may help when staff have training, access and backup controls, clear responsibility, and error correction. Members and boards should retain oversight; control design should support democratic accountability and fit sector and scale rather than copy banking templates. Keep implementation proportionate.

The next step is primary research with a sampling frame stratified by state, sector, and size; documented consent; verified accounts and audit dates; validated scales; and preregistered hypotheses. Researchers should pair self reports with objective measures, report data gaps, estimate sector specific effects, and follow societies over time. Such work could test whether controls precede better reporting, separate operating capacity from governance quality, and compare jurisdictions. Until then, use this paper as a template, not evidence for judging any society, state, or programme. Genuine empirical conclusions require real, auditable data.

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