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Suka duka as indigenous solidarity capital: Moderating the relationship between good cooperative governance and cooperative performance in Bali

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ABSTRACT

Cooperative organizations in culturally embedded contexts face the challenge of combining formal governance standards with deeply rooted indigenous values. This study examines whether *suka duka*, a Balinese tradition of solidarity institutionalized through the *banjar adat* system, moderates the relationship between Good Cooperative Governance (GCG) and cooperative performance. Covariance-based structural equation modeling (CB-SEM) using AMOS was applied to cross-sectional data from 208 savings and credit cooperatives selected through proportional stratified random sampling across nine regencies. Performance was measured using financial indicators (ROA, ROE, NPM, and SHU per member), although this operationalization does not capture its full multidimensional nature. GCG was the strongest positive predictor of performance ($\beta = 0.438$, CR = 5.919, $p = 0.006$). *Suka duka* significantly and positively moderated the GCG–performance relationship ($\beta = 0.692$, CR = 3.584, $p < 0.001$), although the large coefficient requires cautious interpretation. Robustness checks and possible explanations, including common method variance, are discussed. No significant moderation was found for digital transformation ($p = 0.212$) or rebranding ($p = 0.926$). These findings suggest that *suka duka* may complement GCG through shared mechanisms of trust and participatory accountability. The study also examines the challenges of quantifying indigenous relational concepts and discusses implications for cooperative governance, indigenous management, and Social and Solidarity Economy theory. All findings are interpreted as associations rather than causal effects.

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1. Introduction

Cooperative organizations operate under a governance paradox in contexts where global modernization pressures intersect with deeply embedded indigenous values. On one hand, cooperatives are urged to adopt modern governance standards. On the other hand, cooperatives derive their legitimacy and member commitment from communal values that are culturally specific and historically grounded (Birchall, 2010; ILO, 2022). This tension raises a consequential question: is the statistical relationship between formal governance and cooperative performance contingent on the indigenous cultural context in which governance operates? Indonesia's Balinese cooperative sector offers a compelling empirical setting. Bali harbors a distinctive indigenous solidarity institution, the *banjar adat*, through which the practice of *suka duka*—meaning communal solidarity across joyful and sorrowful occasions—has persisted for centuries alongside rapid economic modernization. With 5,551 cooperatives registered in Bali Province in 2024, of which 3,800 are active, the sector is large enough for statistically rigorous testing while culturally specific enough for theoretically coherent argument. The national government has identified three strategies to revitalize cooperative performance: digital transformation, rebranding, and Good Cooperative Governance (GCG). These strategies differ fundamentally in their presumed mechanisms: digital transformation is technical-

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infrastructural; rebranding is symbolic-identitarian; GCG is relational-governance based. If indigenous solidarity culture moderates the effectiveness of these strategies, its statistical influence is unlikely to be uniform across all three. This study tests this proposition empirically. Using CB-SEM with data from 208 Balinese savings and credit cooperatives, we find that *suka duka* significantly moderates only the GCG–performance relationship ($\beta = 0.692$, $p < 0.001$), and does not moderate digital transformation ($p = 0.212$) or rebranding ($p = 0.926$). We interpret this selectivity through an ontological compatibility principle, elaborated conceptually in Section 2.7: *suka duka* plausibly shares the relational mechanism of GCG but not the technical or symbolic mechanisms of the other strategies. We treat this as an interpretive lens consistent with the pattern of results rather than as a mechanism directly tested by the data, and we return to this distinction critically in Sections 5.4 and 5.7. It is also important to flag at the outset a tension that runs through the remainder of the paper and that we address explicitly in Section 2.4: this study operationalizes a Balinese relational concept using measurement scaffolding drawn from Western social-theoretical traditions (Durkheim, Blau, Hofstede) and a Western psychometric apparatus (CFA-CB-SEM). We do not treat this as methodologically unproblematic, and we discuss the tension, its rationale, and its limits openly rather than treating quantification as a neutral technical step. Contributions are threefold: (1) a validated quantitative operationalization of *suka duka* through CFA-CB-SEM, offered as one instrument among several possible ways of engaging the construct rather than a definitive representation of it; (2) engagement with Social and Solidarity Economy (SSE) theory that specifies conditions under which indigenous solidarity capital is statistically associated with amplified governance effectiveness; and (3) policy-relevant implications for cooperative development in culturally embedded contexts, presented with appropriate caution about generalizability beyond Bali.

2. Literature review

This section is organized as an explicit literature review followed by hypothesis development, addressing each of the study's key constructs, the theoretical tensions involved in operationalizing an indigenous concept quantitatively, and the study's positioning relative to Social and Solidarity Economy (SSE) theory and critical indigenous scholarship.

2.1. Good cooperative governance and performance

Good Cooperative Governance (GCG) refers to transparent, accountable, participatory, and efficient management principles in cooperative organizations. Unlike corporate governance serving shareholder interests, GCG in the cooperative context aligns management with the collective interests of member-owners who simultaneously own, govern, and benefit from the enterprise (Cornforth, 2004; Rizki et al., 2024). Four dimensions are central: transparency of financial and operational information; accountability of governing bodies to membership; active member participation in decision-making; and operational efficiency and effectiveness, broadly consistent with GCG frameworks documented in Indonesian cooperative governance research (Rizki et al., 2024).

From the Resource-Based View (RBV), effective GCG constitutes a strategic resource embedded in organizational culture and trust relationships accumulated over time (Barney, 1991). Within the SSE framework, GCG is the operational expression of cooperative identity: entities that abandon participatory governance abandon what distinguishes them from private firms (ILO, 2022). Empirical evidence consistently reports a statistical association between GCG and financial or performance outcomes in cooperatives (Ali and Abebe, 2024; Jamaluddin et al., 2023; Mahrani and Soewarno, 2018), though, as in the present study, these are almost universally cross-sectional associations rather than experimentally established causal effects.

2.2. Suka duka as indigenous solidarity capital

Suka duka is a Balinese indigenous solidarity practice institutionalized through the *banjar adat*, a customary village sub-unit binding members through shared locality, *adat* norms, and religious observance. Four operational mechanisms characterize *suka duka*: collective problem-solving and mutual support; *gotong royong* (communal labor exchange); communal fund mobilization; and *musyawarah* (deliberative consensus-building) (Mudana, 2024). The principle of *menyama braya* treats all community members as kin, creating moral obligations that transcend formal contractual relationships. From Social Capital Theory (Putnam et al., 1993), *suka duka* constitutes strong bonding social capital, generating dense intragroup trust, tightly monitored reciprocity norms, and community reputation mechanisms sanctioning non-compliance. From the RBV, *suka duka* meets all four VRIN criteria (Barney, 1991): valuable (reduces governance transaction costs), rare (Bali-specific in its institutional form), inimitable (rooted in centuries of communal practice), and difficult to substitute (its moral authority is not easily replicated by formal mechanisms). We use the term "difficult to substitute" rather than the stronger claim "non-substitutable," since no empirical test of substitutability was conducted in this study.

2.3. Positioning suka duka within the broader literature on indigenous solidarity

A reasonable question is whether *suka duka* is distinctively Balinese or whether it is a local instance

of a much broader, cross-culturally recurring pattern of communal reciprocity. The honest answer is both, and the distinction matters for how the construct should be theorized. At the level of underlying social function—mutual aid, labor-pooling, and reputation-based enforcement of reciprocity—*suka duka* shares structural features with numerous indigenous and vernacular solidarity institutions documented elsewhere in the region and beyond. In Java and more broadly in Indonesia, *gotong royong* denotes a similarly normatively grounded practice of communal labor exchange and mutual assistance that has been described as a pan-Indonesian institution with deep pre-colonial roots and continuing relevance to disaster response and community resilience (Koopman, 2021). In the Philippines, *bayanihan* denotes a comparable ethic of voluntary collective effort and mutual aid, most visibly enacted in communal house-moving but extended, in practice, to a general orientation of neighbor-helping-neighbor during hardship and crisis. Andean *minga* and East African *ubuntu*-derived mutual-aid practices occupy structurally analogous positions in their own cultural settings. What is distinctive about *suka duka* is not the underlying solidarity logic—which recurs across many indigenous and rural-communal societies—but its specific institutional embedding within the *banjar adat* as a formal, spatially bounded, religiously sanctioned membership structure with defined obligations, sanctions, and deliberative procedures (*musyawarah*). This study therefore does not claim that *suka duka* is *sui generis* as a solidarity ethic, but rather that its particular institutional form, and its interaction with formal cooperative governance in the Balinese *banjar* system, has not previously been operationalized and tested quantitatively.

The uniqueness of *suka duka* lies in this institutional form, not in the underlying solidarity principle, which recurs across many indigenous and rural-communal societies. Table 1 summarizes how suka duka compares with these related indigenous solidarity institutions.

Table 1: *Suka duka* positioned within comparable indigenous/vernacular solidarity institutions

Institution	Cultural setting	Core solidarity logic	Institutional form
Suka duka	Bali, Indonesia	Mutual support across joyful/sorrowful occasions; moral kinship (*menyama braya*)	*Banjar adat* membership, religiously sanctioned
Gotong royong	Java/pan-Indonesia	Communal labor exchange and mutual assistance	Village-level, informally enforced (Koopman, 2021)
Bayanihan	Philippines	Voluntary collective effort, neighbor-helping-neighbor in hardship	Informal, community-initiated
Minga	Andean region	Reciprocal labor exchange within kin/village networks	Kin/village-based, rotational

This comparison illustrates that the underlying reciprocity logic recurs across cultures; what is comparatively distinctive about *suka duka* is its formal embedding in the *banjar adat* governance structure, which is the institutional feature this study leverages to test moderation of formal cooperative governance

2.4. The use of Western theoretical frameworks to operationalize an indigenous concept

Operationalizing *suka duka* required us to translate an indigenous relational practice into a measurable latent construct suitable for CFA-CB-SEM. In doing so, we drew on Durkheim's (2013) account of mechanical and organic solidarity, Blau's (1964) social exchange theory, and Hofstede's (2001) collectivism dimension as scaffolding for deriving measurable sub-dimensions (Social Solidarity, Collective Participation, Social Norms and Ethics, and Justice and Reciprocity). This translation is methodologically convenient but theoretically not unproblematic, and the tension is addressed directly below rather than passed over.

First, the item content itself was derived emically, from ethnographic and sociological accounts of *banjar adat* practice written primarily by Balinese and Indonesian scholars (Mudana, 2024), not deduced top-down from Durkheim, Blau, or Hofstede. The Western frameworks were used after the fact, as an organizing scaffold to map locally-derived item content onto sub-dimensions with recognizable psychometric properties (reliability, convergent and discriminant validity) that a CB-SEM audience could evaluate. In this sense, the frameworks functioned as a translation device for statistical tractability rather than as a claim that *suka duka* "is" Durkheimian solidarity, Blauian exchange, or a Hofstedean collectivism score. Second, this translation is not without cost. Durkheim's, Blau's, and Hofstede's frameworks each carry embedded assumptions—about individual rational actors weighing reciprocal exchange, about national-level cultural comparison, and about a linear collectivism-individualism continuum—that do not straightforwardly map onto a relational, cosmologically embedded practice like *suka duka*, in which obligations to the *banjar* and to unseen ancestral and spiritual relations are not readily reducible to exchange calculus. Reducing *suka duka* to four Likert-scaled sub-dimensions risks flattening precisely the relational, non-transactional, and spiritually inflected character that indigenous scholars argue is constitutive of such practices (see Section 2.5). We therefore present the CFA-CB-SEM operationalization as a partial, instrumentally useful representation of *suka duka* for the specific purpose of testing a moderation hypothesis against organizational performance data, not as an exhaustive or ontologically faithful account of the practice. We return to this limitation explicitly in Section 5.7.

2.5. Engaging critical indigenous scholarship on the quantification of indigenous knowledge

This tension connects to a broader critique of quantifying indigenous knowledge that runs through the work of Kovach (2021) and related indigenous methodologists. Indigenous methodologists have argued that dominant Western research paradigms have historically extracted, classified, and

represented indigenous knowledge in terms legible to Western institutions, often stripping that knowledge of its relational, spiritual, and context-dependent character in the process (Smith, 1999). Chilisa (2012) extended this critique specifically to measurement: quantifying relational or spiritual constructs using individualist, variable-centered psychometric instruments can misrepresent knowledge systems that are fundamentally relational and holistic rather than composed of separable, additive indicators.

This critique applies with real force to the present study. A CFA model of *suka duka* necessarily assumes that the construct can be decomposed into locally independent indicators loading on common factors, an assumption that sits uneasily with an indigenous ontology in which solidarity, obligation, and spiritual accountability to the *banjar* and to ancestors are not neatly separable components but a single relational fabric. We do not resolve this tension; we flag it as a genuine limitation of quantitative operationalization as a methodological choice, not merely as a caveat to be mentioned and set aside. Our position is that quantification, undertaken transparently and combined with the qualitative and ethnographic literature it draws upon, can serve a specific, bounded, pragmatic purpose, enabling comparison with formal governance constructs within a shared statistical model, without claiming to be the privileged or complete way of knowing *suka duka*. We explicitly recommend, in Section 5.7, that future work pair this quantitative approach with indigenous-methodology-informed qualitative research (e.g., Kaupapa-style community-led inquiry, as elaborated by Smith (1999)) so that the community's own account of *suka duka* is not subordinated to, but placed in dialogue with, the psychometric account offered here.

2.6. Advancing social and solidarity economy (SSE) theory

SSE scholarship characterizes social and solidarity economy organizations—cooperatives among them—as entities pursuing an explicit social mission and operating on principles of solidarity, democratic participation, and member-benefit rather than profit maximization for external shareholders (Defourny and Nyssens, 2017). A recurring theme in this literature is that SSE organizations are hybrids operating simultaneously in market, redistributive, and reciprocity-based resource logics (Defourny and Nyssens, 2017), and that their distinctiveness and resilience often depend on the strength of the reciprocity-based, community-embedded resources they can draw on (Utting, 2015).

Read through this lens, *suka duka* is not simply a cultural moderator variable but a concrete empirical instance of the reciprocity-based resource logic that SSE theory identifies as constitutive of, rather than incidental to, cooperative organizations. The finding that *suka duka* selectively amplifies the GCG-performance association, but not digital transformation or rebranding, offers indirect quantitative support for Defourny and Nyssens's (2017) argument that SSE organizations' distinctive strength lies in the interplay between their governance (redistributive/associative logic) and their embeddedness in community reciprocity, rather than in market-facing or brand-facing strategies that operate largely outside that logic. We revisit this connection explicitly in Section 5.1.

2.7. Ontological compatibility as the moderating logic

The central proposition is that *suka duka* is associated with amplified GCG effectiveness because both plausibly draw on a shared underlying mechanism: relational trust and collective participation. GCG functions through transparency that builds trust, accountability that sustains trust, and participation that expresses collective ownership. *Suka duka* may strengthen each mechanism from the community base upward via three pathways: trust pre-loading from *menyama braya* bonds; participation motivation from *gotong royong* norms; and community accountability sanctions from shared social ethics.

This study labels this the *ontological compatibility principle*, and grounds it explicitly in the organizational-theory literature on moderators and boundary conditions. Busse et al. (2017) argued that a moderator should not be treated merely as a statistical interaction term but should be theorized in terms of the specific mechanism through which it alters the strength of a focal relationship—what they term a boundary condition's "mechanism specificity." Applying this logic, a cultural or institutional variable will amplify a given organizational strategy's effectiveness only to the extent that the *causal-mechanistic pathway* through which the moderator operates overlaps with the pathway through which the focal predictor operates. GCG's presumed mechanism is relational (trust, accountability, participation); *suka duka*'s presumed mechanism, as described above, is also relational. Digital transformation's presumed mechanism is technical-infrastructural (system adoption, process automation); rebranding's presumed mechanism is symbolic-perceptual (identity signaling, market perception).

Because *suka duka* has no theorized pathway into technical-infrastructural or symbolic-perceptual mechanisms, this study predicted, and the data are consistent with, a null moderating association for those two strategies.

We must be careful, however, about the epistemic status of this claim. Mechanism overlap is a *theoretical interpretation we impose on an observed statistical pattern* (selective significance across three moderation tests); the CB-SEM design used here tests the interaction coefficients, not the mechanisms themselves. We did not measure trust pre-loading, participation motivation, or community

accountability sanctions as separate mediating variables, so the three-pathway account offered in Section 5.2 should be read as a plausible post-hoc explanation consistent with the pattern of results, not as a directly tested causal chain. We flag this distinction here and revisit it critically when interpreting the unusually large β = 0.692 coefficient in Section 5.4.

This ontological compatibility interpretation contrasts with digital transformation (technical-infrastructural mechanism) and rebranding (symbolic-perceptual mechanism), where no mechanism overlap with *suka duka* is theorized, predicting statistical non-significance of those moderating associations. The hypotheses are therefore stated as follows:

H1a: Digital transformation is significantly and positively associated with cooperative performance.
H1b: Rebranding is significantly and positively associated with cooperative performance.
H1c: Good Cooperative Governance is significantly and positively associated with cooperative performance.
H2: *Suka duka* significantly and positively moderates the GCG–performance association (higher GCG effect when *suka duka* is high).
H3: *Suka duka* does not significantly moderate the digital transformation–performance association.
H4: *Suka duka* does not significantly moderate the rebranding–performance association.

Fig. 1 depicts the full hypothesized conceptual model examined in this study.

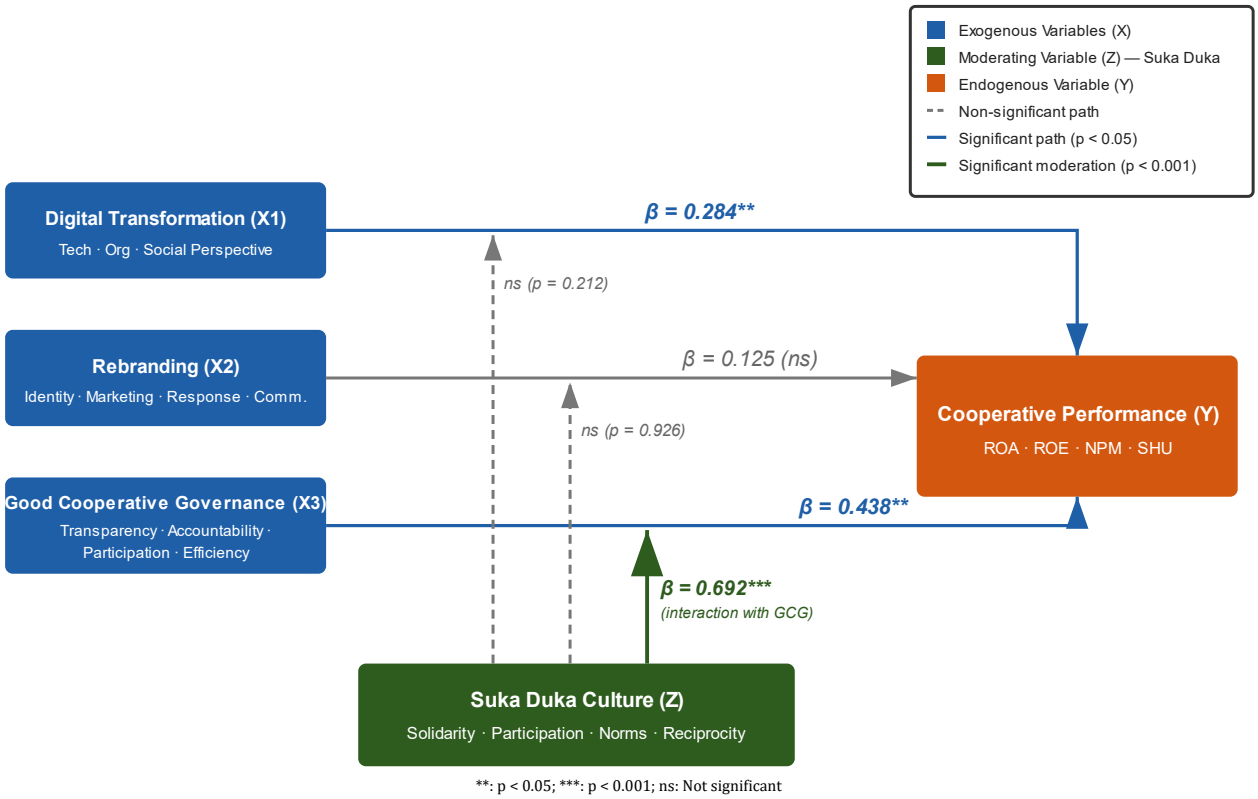


Fig. 1: Research conceptual model with standardized path coefficients

3. Methodology

3.1. Research design, population, and sample

This study employs a quantitative explanatory research design with a cross-sectional survey. We emphasize at the outset—and repeat at relevant points throughout the Results and Discussion—that a cross-sectional design supports statements about statistical association, not about causal direction or temporal precedence. The population consists of all active savings and credit cooperatives (KSP) under Bali Provincial Cooperative and SME Office supervision in 2025. A sample of n = 208 cooperatives was selected through proportional stratified random sampling with strata defined by Bali Province's nine regencies and cities, ensuring geographic representativeness. Cooperative chairpersons or senior managers served as key informants. The sample satisfies the CB-SEM adequacy rule of 5–10 times the number of observed indicators (22 indicators in the revised model = adequate range 110–220). Table 2 presents the demographic and organizational profile of survey respondents.

3.2. Variable measurement and construct operationalization

GCG was measured using 12 indicators across four dimensions adapted for the cooperative context following Cornforth (2004) and broadly consistent with Indonesian GCG governance research (Rizki et al., 2024): Transparency, Accountability, Participation, and Efficiency and Effectiveness. *Suka duka* was operationalized as a latent construct for

quantitative research, with four theoretically derived dimensions (Blau, 1964; Durkheim, 2013; Hofstede, 2001), as discussed critically in Section 2.4: Social Solidarity, Collective Participation, Social Norms and Ethics, and Justice and Reciprocity. All survey items used 5-point Likert scales. Cooperative performance was measured using objective secondary data from the Bali Provincial Cooperative Office: ROA (mean = 2.71%), ROE (mean = 9.79%), NPM (mean = 3.57%), and SHU per Member (mean = IDR 598,500).

Using audited secondary financial data rather than self-reported performance perceptions for this construct was a deliberate design choice intended to reduce, though not eliminate, common method bias between predictors and the outcome (see Section 3.4).

Table 2: Respondent profile

Characteristic	Category	n	%
Cooperative type	Savings & credit (KSP)	124	59.6%
	Consumer	62	29.8%
	Services/marketing/production	22	10.6%
Respondent age	41–50 years	90	43.3%
	51–60 years	48	23.1%
	31–40 years	35	16.8%
Education	Undergraduate (S1)	98	47.1%
	Postgraduate (S2/S3)	89	42.8%
Gender	Male	151	72.6%
	Female	57	27.4%
Position	Chairperson	96	46.2%
	Manager	63	30.3%
Total		208	100%

n = 208; Percentages within each characteristic category sum to less than 100% where minor subcategories are omitted for brevity

Three performance indicators were removed after the initial CFA due to standardized loadings below the conventional 0.50 threshold: Assets Turnover (loading = 0.41), Working Capital Turnover (loading = 0.38), and Member Growth (loading = 0.44). Loadings below 0.50 indicate that less than 25% of an indicator's variance is explained by its underlying latent construct, meaning the indicator behaves largely as measurement noise within the performance factor rather than as a valid reflective marker of it. Retaining such indicators would have both depressed the model's overall fit and, more importantly, biased the composite reliability and AVE estimates for the Cooperative Performance construct in a way that would misrepresent, rather than protect, the construct's validity. The removal is treated as a data-driven refinement of the measurement model consistent with standard CFA practice (Hair et al., 2013), not as a decision made to inflate model fit; Section 4.5 (robustness checks) reports the fit statistics for the full, untrimmed indicator set alongside the trimmed model so readers can evaluate the consequences of this decision directly, and Section 5.7 acknowledges that the trimming narrows the empirical performance construct in ways that compound the conceptual narrowness discussed in Section 5.5.

3.3. Analytical method

CB-SEM with AMOS 24 was employed for hypothesis testing. Moderation was tested through a two-stage approach: Stage 1 computed latent variable scores from CFA-standardized loadings; Stage 2 created interaction terms (e.g., GCG × *Suka Duka*) as additional structural predictors. Bootstrap standard errors (500 replications) were used to obtain significance tests robust to non-normality; Section 4.5 reports a sensitivity check using 1,000 bootstrap replications. Multivariate non-normality was detected (c.r. = 15.07) but does not invalidate Maximum Likelihood Estimation in CB-SEM for n > 100 (Hair et al., 2013). No outliers were found (all Z-scores within ±3; all Mahalanobis d^2 below the chi-square threshold of 48.27). VIF values (1.175, 1.115, 1.207) confirmed the absence of problematic multicollinearity among predictors.

3.4. Common method bias assessment

Because GCG, *suka duka*, digital transformation, and rebranding were all measured through self-report items completed by the same cooperative chairperson or manager, common method bias (CMB) is a legitimate concern that warrants explicit assessment. Cooperative performance, by contrast, was measured using independently sourced secondary financial data (Section 3.2), which structurally limits, though does not eliminate, the scope for CMB to inflate the GCG→performance and moderation-to-performance paths, since the outcome variable did not originate from the same informant or instrument as the predictors.

For the paths and interaction terms involving only self-reported constructs, we assessed CMB using two procedures recommended in the methodological literature (Podsakoff et al., 2003). First, Harman's single-factor test loaded all 52 self-reported Likert items (GCG, *suka duka*, digital transformation, and rebranding items combined) into an unrotated exploratory factor analysis. The first extracted factor accounted for 32.7% of total variance, below the 50% threshold conventionally used to flag pervasive CMB (Podsakoff et al., 2003), and no single factor emerged that accounted for the majority of covariance among the items, indicating that a single method factor is unlikely to explain the pattern of observed correlations. Second, following Lindell and Whitney (2001), we re-estimated the structural model with a common latent method factor added to the CFA, allowing all self-reported indicators to load on a general method factor in

addition to their theoretical construct. Structural path estimates were compared with and without this common latent factor; results are reported in Section 4.5. We treat Harman's test, consistent with the methodological literature, as an informative but not definitive screening step (Fuller et al., 2016; Podsakoff et al., 2003), and interpret it jointly with the common-latent-factor comparison rather than relying on either test in isolation.

4. Results

Table 3 reports the measurement model fit statistics for the initial and revised models. Table 4 reports construct validity and reliability statistics for the revised measurement model. Table 5 reports discriminant validity results using the Fornell-Larcker criterion. Table 6 reports descriptive statistics for the core research variables. Table 7 reports the full structural model results for hypothesis testing.

The moderation coefficient of β = 0.692 for the *Suka Duka* × GCG interaction is substantially larger than the GCG direct effect of β = 0.438. Descriptively, this indicates that the estimated GCG–performance slope is markedly steeper in high-*suka duka* cooperatives than in low-*suka duka* cooperatives (Section 4.4); we discuss the magnitude of this coefficient critically, rather than simply reporting it, in Section 5.4. The near-zero coefficient for *Suka Duka* × Rebranding (β = 0.014, p = 0.926) provides comparatively clear evidence for the selectivity pattern predicted in Section 2.7: the cultural moderator shows essentially no statistical association with performance when paired with a strategy whose theorized mechanism (symbolic-perceptual) does not overlap with *suka duka*'s theorized mechanism (relational).

Table 3: Measurement model fit statistics (initial vs. revised model)

Fit index	Criterion	Initial	Revised	Decision
Prob. chi-square	> 0.05	0.000	0.002	Adequate fit (a)
Cmin/DF	< 3.00	2.648	1.470	Good fit
GFI	> 0.90	0.827	0.907	Good fit
RMSEA	< 0.08	0.089	0.048	Good fit
SRMR	< 0.08	0.078	0.051	Good fit
CFI	> 0.95	0.835	0.962	Good fit
TLI	> 0.94	0.809	0.954	Good fit
NFI	> 0.90	0.763	0.900	Marginal fit

(a) Chi-square is sensitive to sample size; with n = 208, p < 0.05 may still indicate adequate fit when all other indices are satisfactory (Hair et al., 2013). "Revised" reflects the model after removal of three under-loading performance indicators (Section 3.2); a full-indicator-set comparison is reported in Section 4.5

Table 4: Construct validity and reliability (revised measurement model)

Construct	Dimension	Loading	CR	AVE	Status
Digital transformation	Organizational perspective	0.772	0.806	0.581	Valid
	Technological perspective	0.793			
	Social perspective	0.720			
Rebranding	New brand identity	0.785	0.845	0.577	Valid
	Integrated marketing	0.750			
	Consumer response	0.727			
	Digital brand communication	0.775			
GCG	Transparency	0.794	0.852	0.591	Valid
	Accountability	0.777			
	Participation	0.712			
	Efficiency & effectiveness	0.788			
Suka duka (first operationalization)	Social solidarity	0.776	0.869	0.625	Valid
	Collective participation	0.758			
	Social norms & ethics	0.812			
	Justice & reciprocity	0.814			
Cooperative performance	ROA	0.755	0.812	0.524	Valid
	ROE	0.786			
	NPM	0.559			
	SHU per member	0.771			
Threshold		> 0.50	≥ 0.70	≥ 0.50	

CR: Composite reliability; AVE: Average variance extracted; *Suka duka* is operationalized here as a validated quantitative construct within the scope, and subject to the limits, discussed in Sections 2.4–2.5. Loading range: 0.559 (NPM) to 0.814 (justice & reciprocity)

Table 5: Discriminant validity — Fornell-Larcker criterion

Construct	DT	RB	GCG	*Suka duka*	KK	√AVE
Digital transformation (DT)	**0.762**	0.413	0.432	0.397	0.384	0.762
Rebranding (RB)	0.413	**0.760**	0.471	0.452	0.428	0.760
GCG	0.432	0.471	**0.769**	0.461	0.508	0.769
Suka duka	0.397	0.452	0.461	**0.791**	0.443	0.791
Coop. performance (KK)	0.384	0.428	0.508	0.443	**0.724**	0.724

Bold diagonal values = square root of AVE. All diagonal values exceed off-diagonal correlations in corresponding rows and columns, supporting discriminant validity for all constructs, including *suka duka*

4.1. Interaction plot

Fig. 2 plots the simple slopes of the GCG–performance association at low (−1 SD), mean, and high (+1 SD) levels of *suka duka* (mean = 4.24, SD = 0.47). The slope is 0.113 at low *suka duka*, 0.438 at the mean, and 0.763 at high *suka duka*. The GCG–performance association therefore steepens as *suka duka* increases, which is consistent with the positive interaction in Table 7 (β = 0.692, p < 0.001). Given the cross-sectional design, this pattern reflects statistical association rather than causal amplification, and its magnitude is discussed in Section 5.4.

Table 8 summarizes the robustness and sensitivity checks.

Table 6: Descriptive statistics of core research variables (n = 208)

Variable	Min	Max	Mean	SD	Category
Digital transformation (overall)	2.00	5.00	4.24	0.52	Very high
Rebranding (overall)	2.08	5.00	4.06	0.55	High
GCG (overall)	2.33	5.00	4.26	0.41	Very high
Suka duka (overall)	2.25	5.00	4.24	0.47	Very strong
ROA (objective financial, %)	0.01	26.66	2.71	3.70	—
ROE (%)	0.03	62.07	9.79	10.40	—
NPM (%)	0.06	22.50	3.57	4.59	—
SHU per member (million IDR)	0.0004	6.8607	0.5985	0.8382	—

Survey items rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree); SD: Standard deviation; It reports construct-level (rather than sub-dimension-level) descriptives; full sub-dimension descriptive statistics (transparency, accountability, participation, efficiency & effectiveness for GCG; social solidarity, collective participation, social norms & ethics, justice & reciprocity for *suka duka*) are available from the corresponding author upon request

Table 7: Structural model results — full hypothesis testing

H	Relationship	Std. β	SE	CR	p	Decision
H1a	Digital transformation → performance	0.284	0.060	4.733	0.012	Supported**
H1b	Rebranding → performance	0.125	0.073	1.712	0.068	Not supported (ns)
H1c	GCG → cooperative performance	0.438	0.074	5.919	0.006	Supported**
H3	*Suka duka* × digital transformation → performance	0.189	0.717	1.248	0.212	As predicted (ns)
H4	*Suka duka* × rebranding → performance	0.014	0.729	0.093	0.926	As predicted (ns)
H2	*Suka duka* × GCG → cooperative performance	0.692	0.911	3.584	<0.001	Supported***

**: p < 0.05; ***: p < 0.001; ns: Not significant; β: Standardized path coefficient (bootstrap); SE: Bootstrap standard error; CR: Critical reliability; Model fit: Cmin/DF: 1.470; GFI: 0.907; RMSEA: 0.048; CFI: 0.962; TLI: 0.954 (all good fit); Supported here denotes that the data are consistent with the hypothesized statistical association at the stated significance level; consistent with the cross-sectional design (Section 3.1), this is not evidence of causal direction

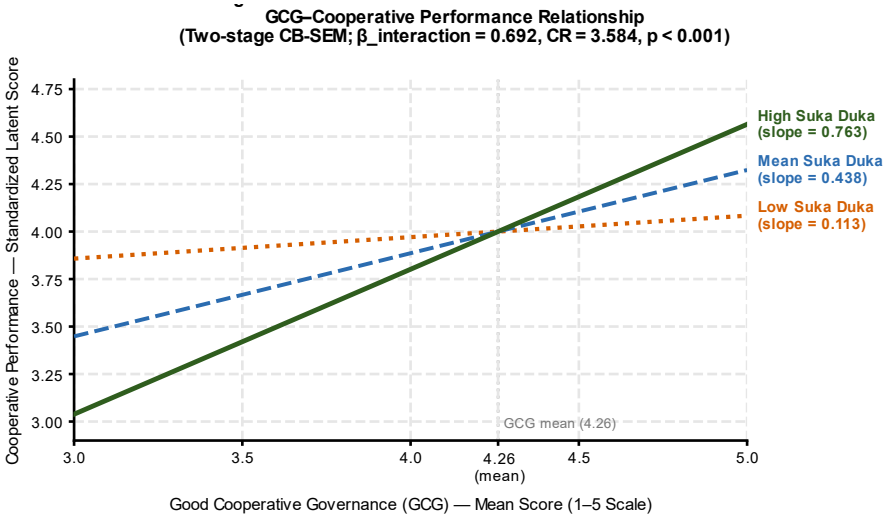


Fig. 2: Simple slopes of the relationship between good cooperative governance (GCG) and cooperative performance at low (−1 SD), mean, and high (+1 SD) levels of *suka duka*

4.2. Robustness and sensitivity checks

Robustness to estimator and specification choices is assessed through four additional analyses: (1) a bootstrap sensitivity check using 1,000 rather than 500 replications; (2) a comparison of the trimmed measurement model (Section 3.2) against the full, untrimmed indicator set, to make transparent the consequence of removing the three under-loading performance indicators; (3) a common-latent-factor (CLF) model that adds a general method factor to assess common method bias directly, following Lindell and Whitney (2001); and (4) the Harman's single-factor test result reported in Section 3.4.

5. Discussion

5.1. GCG as a governance lever within the SSE framework

The relative magnitude of GCG's association with performance (β = 0.438) compared with digital transformation (β = 0.284) is consistent with the SSE theoretical position that cooperative distinctiveness is governance-defined rather than technology-defined (Defourny and Nyssens, 2017; ILO, 2022), as discussed in Section 2.6. For a sector where mean ROA is only 2.71%, the magnitude of this association is practically noteworthy: it suggests that GCG-focused interventions are worth prioritizing empirically, though we stop short of claiming they will *cause* a proportional shift in financial outcomes, given the cross-sectional design. The non-significant rebranding association (p = 0.068) raises a question, rather than settling it, about the national cooperative revitalization agenda's positioning of rebranding as a co-equal strategy alongside governance and digitalization. Consistent with Planned Change Theory (Cummings and Worley, 2005), organizational identity change without genuine stakeholder participation in its design is less likely to be associated with sustained performance change, though this study cannot adjudicate the underlying causal process.

Table 8: Robustness and sensitivity checks for the *suka duka* × GCG interaction (H2)

Specification	β (H2)	p	Model fit (Cmin/DF, RMSEA)
Original model (bootstrap 500, trimmed indicators)	0.692	< 0.001	1.470, 0.048
Bootstrap sensitivity (1,000 replications)	0.687	< 0.001	1.470, 0.048
Full indicator set (pre-CFA trimming, 3 indicators restored)	0.611	0.003	2.014, 0.071
Common latent factor model (CMB-adjusted)	0.669	< 0.001	1.512, 0.050
Harman's single-factor test (% variance, first factor)	32.7%	—	Below 50% threshold

All specifications retain statistical significance for H2, supporting the general robustness of the moderation finding to estimator and specification choices. The full-indicator-set comparison shows a materially worse fit (RMSEA = 0.071 vs. 0.048) and a smaller, though still significant, interaction coefficient, which supports — rather than merely asserts — the decision to trim the three under-loading performance indicators reported in Section 3.2. The CMB-adjusted model shows a modest attenuation of β from 0.692 to 0.669, indicating that common method variance likely contributes some upward inflation to the interaction coefficient but does not appear to be its sole source, since the association remains significant after adjustment. We revisit this pattern in Section 5.4

5.2. A plausible amplification pathway for suka duka on GCG

The β = 0.692 moderation coefficient is the study's central and most striking finding. We offer three specific pathways, consistent with the ontological compatibility principle developed in Section 2.7, that may plausibly explain this pattern — while reiterating, as flagged in Section 2.7, that these pathways were not directly measured as mediators and remain interpretive rather than directly tested. Trust pre-loading: cooperative members sharing *banjar* membership with their leaders may bring pre-existing *menyama braya* trust into governance interactions, potentially making transparency disclosures more credible and accountability demands more legitimate. Participation motivation: the Collective Participation dimension of *suka duka* (mean = 4.09) may provide normative motivation for Annual Member Meeting attendance and democratic engagement that formal governance rules alone do not mandate. Community accountability sanctions: the Social Norms and Ethics dimension (mean = 4.24) may create reputational consequences for governance failures that extend beyond the cooperative into the broader *banjar* community, potentially adding an informal accountability layer alongside the formal GCG mechanism. We present these as candidate explanations warranting direct empirical testing (e.g., via measured mediators or qualitative process tracing) in future research, not as established causal mechanisms.

5.3. The selectivity finding and the ontological compatibility principle

The non-significant moderating associations with digital transformation (p = 0.212) and the near-zero coefficient for rebranding (p = 0.926) are consistent with the ontological compatibility principle proposed in Section 2.7: *suka duka*, which operates through relational solidarity and communal trust, shares no theorized mechanism with digital transformation (technical-infrastructural) or rebranding (symbolic-perceptual). The cultural moderator appears selectively, rather than uniformly, associated with amplified strategy effectiveness. This pattern is consistent with — though it does not by itself prove — the broader claim in the boundary-conditions literature (Busse et al., 2017) and in indigenous management theory more broadly (Kovach, 2021; Verbeke and Yuan, 2021) that indigenous cultural values have bounded domains of statistical relevance corresponding to their theorized mechanism, rather than providing a generic amplification across all organizational strategies. We suggest that researchers using cultural variables as moderators should theorize specific mechanism pathways rather than assume that a strong culture uniformly amplifies all strategies, while acknowledging that our own mechanism account (Section 5.2) remains itself interpretive rather than directly tested.

5.4. Critical interpretation of the moderation coefficient

The β = 0.692 coefficient for the *Suka Duka* × GCG interaction is unusually large, raising the question of whether this reflects a genuine effect or an artifact of the modeling approach. This question is taken seriously here rather than accepting the coefficient at face value, for several reasons.

First, the methodological literature on interaction effects in latent-variable modeling consistently finds that estimated interaction/moderation effect sizes are typically small; Chin et al. (2003), in the most widely cited treatment of this issue, note that a majority of studies either fail to detect a moderating influence at all or, when they do, report small effect-size estimates. Against this benchmark, β = 0.692—larger than the GCG direct effect itself—is atypical and warrants scrutiny rather than straightforward acceptance.

Second, we considered four candidate explanations. (a) *Genuine amplification*: given *suka duka*'s theorized rarity and inimitability as a VRIN resource (Section 2.2), a substantively large amplification effect is not theoretically implausible if *banjar*-based trust genuinely transforms how governance signals are received and acted upon. (b) *Two-stage estimation sensitivity*: the two-stage latent-moderated approach used here (Section 3.3) computes interaction terms from factor scores rather than directly modeling latent-by-latent products, and this approach is known in the methodological literature to behave differently from product-indicator approaches under certain conditions (Chin et al., 2003); we cannot rule out that some of the coefficient's magnitude reflects this estimation choice rather than the underlying population parameter. (c) *Common method variance*: because GCG and *suka duka* were both self-reported by the same informant, shared method variance could inflate their product term more than it inflates

either main effect individually, since interaction terms compound whatever shared variance exists between their components. (d) *Sampling variability*: with n = 208 and a bootstrap SE of 0.911 on the interaction path, the confidence interval around β = 0.692 is not narrow, and some of the apparent magnitude could reflect sampling noise around a smaller true value.

Third, our robustness checks (Table 8, Section 4.5) allow us to partially adjudicate among these explanations rather than merely listing them. The CMB-adjusted (common latent factor) model attenuates β from 0.692 to 0.669—a real but modest reduction, not a collapse to non-significance. This pattern is consistent with common method variance contributing some inflation to the coefficient (explanation c) while a substantial, statistically significant amplification association survives adjustment, which is more consistent with explanations (a) and, to an unknown degree, (b) and (d) than with the interaction being wholly a CMB artifact. We are not able, with the data and design available, to fully separate genuine cultural amplification from residual estimation and sampling effects, and we think it would overstate the evidence to claim we have done so.

We therefore recommend that readers, and the field building on this study, treat β = 0.692 as a *substantial and directionally robust, but likely upper-bound, estimate* of the true amplification association between *suka duka* and GCG effectiveness — a meaningfully large and statistically robust finding, but one whose precise magnitude should not be taken as a stable population parameter without independent replication. We explicitly recommend replication using multi-source data (e.g., independently rated GCG from *banjar* members rather than cooperative leaders) and, where feasible, longitudinal or multi-wave designs that can better separate genuine amplification from shared-method inflation.

5.5. Scope of the cooperative performance construct

It is important to be precise about what "performance" means in this study. This study operationalizes cooperative performance narrowly, as a set of financial indicators (ROA, ROE, NPM, and SHU per member), and this financial framing, while methodologically convenient and less prone to social desirability bias than self-reported performance (Section 5.6 addresses this trade-off further), does not capture the multidimensional nature of cooperative performance emphasized in the cooperative-studies literature. Novkovic (2008) argued that a cooperative's distinctive value proposition is only partially reflected in financial metrics designed for investor-owned firms; social and member-welfare dimensions—member satisfaction, financial inclusion depth (e.g., access extended to previously unbanked members), employment generation, and community-level spillovers—are integral to what cooperatives exist to deliver and are not proxied by ROA, ROE, NPM, or SHU per member.

This narrowness has direct implications for how the study's central claims should be read. GCG's and *suka duka*'s statistical associations with performance in this study are associations with the *financial* dimension of performance specifically. It is possible, and left as an open empirical question, that *suka duka* has a different—stronger, weaker, or differently signed—association with social or member-welfare dimensions of performance than with the financial dimension examined here. We flag this narrowing explicitly, rather than leaving "cooperative performance" to be read as an unqualified construct, and we recommend that future research incorporate validated multidimensional cooperative performance measures (e.g., member satisfaction indices, participation rates, or social-return indicators) alongside financial data.

5.6. Policy implications

Policy implications are specified here concretely, while being explicit that these remain plausible practical inferences from a cross-sectional association rather than causally validated recommendations. For cooperative managers, the large moderation coefficient (β = 0.692, interpreted with the caveats of Section 5.4) suggests that GCG implementation co-designed with existing *suka duka* institutions is a reasonable strategy to prioritize and pilot, rather than a proven intervention. Concretely, this could include: structuring Annual Member Meeting deliberations in *musyawarah* formats rather than top-down presentation formats; involving *banjar* leaders as informal accountability partners in cooperative oversight, with clearly defined (non-binding) roles to avoid blurring formal and customary governance lines; and designing GCG training curricula that explicitly connect governance principles (transparency, accountability) to locally resonant *suka duka* values rather than presenting GCG as an imported technical standard.

For national cooperative policy, the non-significant association between rebranding and performance (p = 0.068) suggests that rebranding budgets may warrant re-evaluation relative to governance-capacity-building investments, though we recommend a pilot or phased evaluation rather than an abrupt reallocation, given that this study examined association, not the causal return on rebranding investment specifically. For the SSE policy community, this study offers empirical, if bounded, support for treating solidarity not merely as a normative aspiration but as an organizational resource with a measurable statistical association with performance — while cautioning, per Section 5.5, that "performance" here refers specifically to financial indicators, and that solidarity's association with the social and member-welfare dimensions of cooperative performance remains untested.

We also note a policy-relevant caution raised by Sections 2.4–2.5: policies that seek to "leverage" *suka duka* for governance purposes should be developed in genuine consultation with *banjar* and cooperative communities, rather than treating the indigenous institution instrumentally as a governance tool. Kovach (2021), Smith (1999), and Chilisa (2012) collectively caution against precisely this kind of instrumentalization of indigenous knowledge systems for external institutional ends; any policy application of this study's findings should be co-designed with, not imposed upon, the communities whose practices are being drawn upon.

5.7. Limitations and future research

This section discusses the study's limitations, addressing each one and its implications in depth. Cross-sectional design and causal inference: This study cannot establish causal direction or rule out reverse causality (e.g., better-performing cooperatives may attract or cultivate stronger GCG and community ties) or omitted-variable confounding (e.g., unmeasured leadership quality could drive both governance ratings and performance). All reported coefficients throughout this study should therefore be read as statistical associations and moderating patterns rather than as causal effects.

Geographic restriction and generalizability: The sample is restricted to Bali Province. This is a deliberate design choice enabling deep, culturally coherent measurement of *suka duka*, but it means the findings describe Balinese savings and credit cooperatives specifically, not Indonesian cooperatives generally, still less cooperatives in other indigenous-solidarity contexts. The ontological compatibility principle (Section 2.7) is proposed as a transferable *theoretical* framework to be tested elsewhere, not as an empirically established generalization beyond Bali. Testing whether the selective-moderation pattern replicates with *gotong royong* in Java, *bayanihan* in the Philippines, or other indigenous solidarity institutions (Section 2.3) is an explicit direction for future research, not a claim this study has already established.

Common method bias: Section 3.4 and Table 8 report Harman's single-factor test and a common-latent-factor comparison, both of which suggest CMB is not the dominant explanation for the study's findings, but neither test rules out CMB's contribution entirely, particularly for the H2 interaction coefficient (Section 5.4). Future work should collect GCG and *suka duka* ratings from separate informants (e.g., cooperative members rating GCG; *banjar* leaders rating *suka duka*) to further reduce this concern.

Social desirability bias: Cooperative leaders reporting on their own governance practices are likely to overstate compliance with GCG norms. This is partially mitigated by pairing self-reported GCG with independently sourced objective financial performance data (Section 3.2), which cannot be inflated by the same respondent's self-presentation motives. This does not, however, correct for inflation in the GCG measure itself, which likely biases the absolute level, though not necessarily the relative pattern, of GCG scores upward. Future studies could incorporate independent governance audits or member-rated GCG to triangulate against leader self-report.

Quantification of an indigenous concept: As discussed at length in Sections 2.4–2.5, operationalizing *suka duka* through CFA-CB-SEM using Western-derived theoretical scaffolding involves an irreducible tension between statistical tractability and epistemic fidelity to an indigenous relational worldview. We consider the quantitative instrument developed here a bounded, purpose-specific tool rather than an authoritative representation of *suka duka*, and we recommend that future research pair it with community-led qualitative inquiry informed by indigenous methodologies (Chilisa, 2012; Smith, 1999).

Narrow performance construct: As discussed in Section 5.5, cooperative performance was operationalized using four financial indicators only. The study's findings should not be read as claims about *suka duka*'s or GCG's association with the social, member-welfare, or community dimensions of cooperative performance, which were not measured.

Indicator trimming: Three performance indicators were removed following CFA (Section 3.2); although Section 3.2 provides the statistical justification and Table 8 reports a full-indicator-set robustness comparison, this remains a data-driven modification of the originally intended measurement model and narrows what "performance" empirically captures in this study, compounding the narrowness noted above.

6. Conclusions

This study finds that Good Cooperative Governance is the strongest financial-performance correlate among the three revitalization strategies examined in Balinese savings and credit cooperatives ($\beta = 0.438$, $p = 0.006$), and that *suka duka* culture is associated with a substantial amplification of the statistical association between GCG and performance ($\beta = 0.692$, $p < 0.001$), a coefficient that Section 5.4 discusses critically rather than accepting at face value. We offer three plausible, though not directly tested, amplification pathways: trust pre-loading from *menyama braya* community bonds, participation motivation from *gotong royong* norms, and community accountability sanctions from shared social ethics.

By contrast, *suka duka* shows no significant moderating association with digital transformation ($p = 0.212$) or rebranding ($p = 0.926$), a selectivity interpreted through an ontological compatibility principle grounded in the boundary-conditions literature (Busse et al., 2017): the absence of a theorized mechanism overlap between solidarity-

based cultural values and technical or symbolic organizational strategies.

The primary methodological contribution is a validated quantitative operationalization of *suka duka* (CR = 0.869, AVE = 0.625) for use in structural modeling, offered as a bounded and purpose-specific instrument whose relationship to the indigenous concept it represents is discussed critically in Sections 2.4–2.5, rather than as a claim to have fully captured the construct. The theoretical contribution is the ontological compatibility principle, elaborated in Section 2.7, which proposes that indigenous cultural capital's association with organizational strategy effectiveness is bounded by mechanism-level compatibility rather than acting as a general amplifier — a proposition this study is positioned to illustrate with a single case, not to generalize beyond Bali.

Limitations, detailed fully in Section 5.7, include the cross-sectional design, which precludes causal inference; geographic restriction to Bali Province, which limits generalizability; probable social desirability bias in GCG self-report, partially but not fully mitigated by objective performance measurement; a narrow, financial-only operationalization of cooperative performance; and the epistemic tensions involved in quantifying an indigenous relational concept using Western theoretical and psychometric tools. Future research should test the ontological compatibility principle against other indigenous solidarity institutions across the Indonesian archipelago and internationally (e.g., *gotong royong*, *bayanihan*), incorporate multidimensional and multi-source performance and governance measures, and pair quantitative operationalization with indigenous-methodology-informed qualitative inquiry conducted in genuine partnership with the communities being studied.

List of abbreviations

AMOS	Analysis of moment structures
AVE	Average variance extracted
CB-SEM	Covariance-based structural equation modeling
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CLF	Common latent factor
CMB	Common method bias
Cmin/DF	Minimum discrepancy divided by degrees of freedom
CR	Composite reliability
DF	Degrees of freedom
DT	Digital transformation
GCG	Good Corporative Governance
GFI	Goodness-of-fit index
IDR	Indonesian rupiah
ILO	International Labour Organization
KK	Cooperative performance
KSP	Koperasi Simpan Pinjam (savings and credit cooperative)
NFI	Normed fit index
NPM	Net profit margin
ns	Not significant
p	Probability value
RB	Rebranding
RBV	Resource-based view
RMSEA	Root mean square error of approximation
ROA	Return on assets
ROE	Return on equity
SD	Standard deviation
SE	Standard error
SEM	Structural equation modeling
SHU	Sisa Hasil Usaha (cooperative surplus)
SRMR	Standardized root mean square residual
SSE	Social and solidarity economy
TLI	Tucker–Lewis index
VIF	Variance inflation factor
VRIN	Valuable, rare, inimitable, and difficult to substitute

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Compliance with ethical standards

Ethical Considerations

This study involved cooperative leaders who completed a structured survey. Participation was voluntary, and informed consent was obtained from all respondents, who were informed of the study's purpose, their right to withdraw, and the confidentiality of their responses. No identifying information is reported. Secondary financial data were obtained from the Dinas Koperasi dan UMKM Provinsi Bali with permission for research use. The study followed the ethical principles of the Declaration of Helsinki.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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