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Credit Risk Mitigation Through Social Innovation and Community Collateral: A Case Study of Accountability in Art-Based Savings and Loan Cooperatives

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ABSTRACT
Credit risk in informal finance serving vulnerable populations remains a development challenge, where conventional collateral requirements often exclude artisans and creative workers from credit. This study examines associations between art-based community collateral systems, credit risk, social accountability, and sustainability in savings and loan cooperatives (KSP). A case study covered seven art-based cooperatives and 1,225 members in Central Java during 2022–2024. It combined qualitative inquiry with quantitative portfolio analysis, using semi-structured interviews with 54 participants, 12 focus group discussions involving 84 participants, and 36 months of lending and repayment records. Hybrid collateral arrangements incorporating artistic assets, group guarantees, and reputational capital were associated with a reduction in portfolio-at-risk (PAR) from 18.6% to 6.4%, a 65.6% relative decrease. Member participation was higher under the hybrid model than under conventional arrangements (76.4% versus 42.3%; $p < .001$), as was loan repayment compliance (91.1% versus 74.2%; $p < .001$). Net income increased by 156%, while member surplus distributions rose from 8.2% to 14.6% of cooperative revenue. These findings suggest that culturally embedded accountability mechanisms may improve credit portfolio performance while maintaining social inclusion. However, the absence of an external control group limits causal interpretation. Quasi-experimental studies are needed to assess the model elsewhere.

Keyword: *Credit Risk, Social Innovation, Community Collateral, Savings And Loan Cooperatives, Accountability Mechanisms, Creative Economy, Informal Finance*

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INTRODUCTION

Access to formal credit markets remains fundamentally constrained for economically vulnerable populations across Southeast Asia, particularly artisans, creative workers, and informal sector enterprises whose income streams and productive assets do not conform to conventional banking collateral requirements. The World Bank's Global Findex Database 2025 estimates that approximately 1.3 billion adults worldwide still lack a financial account, and that more than half of them live in just eight economies, Indonesia among them (World Bank, 2025). Within this excluded population, creative workers, encompassing textile artisans, traditional craftspeople, visual artists, and cultural practitioners, represent a particularly marginalized segment, constrained simultaneously by income volatility, intangible productive assets (skills, social networks, cultural capital), and banking institutions' risk-averse postures toward informal sector lending.

Savings and loan cooperatives (*koperasi simpan pinjam*, KSP), prevalent across Indonesia as membership-based financial institutions serving specific occupational or community groups, have emerged as adaptive alternatives to conventional banking, leveraging social capital and peer monitoring to overcome information asymmetries and collateral deficiencies inherent to informal sector lending (Besley & Coate, 1995; Postelnicu et al., 2014). However, cooperatives targeting artisan populations face acute credit risk challenges: in the seven cooperatives studied here, portfolio-at-risk (PAR) under conventional collateral-based models ranged from 16.8% to 21.2% (Table 1).

Recent scholarship emphasizes social innovation, defined as novel organizational or operational approaches that yield social value while addressing systemic market failures, as a promising avenue for restructuring informal financial institutions toward simultaneous credit risk reduction and social accountability enhancement (George et al., 2012; Cajaiba-Santana, 2014). Within this framework, community-based collateral systems represent an emerging innovation: leveraging artistic production, social relationships, and community reputation as risk mitigation mechanisms that simultaneously activate economic participation and cultural engagement. Preliminary evidence suggests such systems generate superior outcomes across multiple dimensions (credit risk reduction, borrower engagement, and organizational sustainability), yet remain undertheorized and inadequately studied in academic literature, particularly within Southeast Asian contexts.

Collateral requirements are a particularly acute barrier for creative workers. In Indonesia, Government Regulation No. 24 of 2022 on the implementation of the Creative Economy Law introduced intellectual property-based financing, which in principle allows intellectual property rights to be pledged as collateral for credit (Government of Indonesia, 2022). Intangible assets are, however, inherently harder to value and enforce than physical collateral, and the assets that artisans actually hold, such as work in progress, workshop networks, and standing in the local craft community, are not obviously captured by such a scheme. Community-based arrangements that recognize these assets are therefore worth examining as a complement to, rather than a substitute for, formal intellectual property financing.

The theoretical case for substituting social for physical collateral rests on the economics of group lending. Joint liability gives group members an incentive to screen, monitor, and enforce repayment among their peers, and social collateral can mitigate the tendency of whole groups to default together (Besley & Coate, 1995). Empirical work continues to show that repayment is shaped by group social capital. Geographical proximity, trust, friendship, group homogeneity, and acquaintanceship have been found to be important for group repayment (Parmeter & Sarangi, 2020), and a proxy for group-level social capital based on group names was associated with a 9.9% improvement in repayment performance in a metropolitan joint-liability program (Sahan & Phimister, 2023). Evidence from

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Indonesia indicates that group loan appraisal, group loan control, and social capital are positively associated with repayment capacity (Indriani et al., 2023), and research on financial cooperatives has linked social capital to cooperative business models (Chronopoulos et al., 2021). The broader social capital literature stresses that the value of social capital arises from network structure, shared norms, and trust that can be mobilized for collective action (Granovetter, 1973; Adler & Kwon, 2002).

Despite this body of work, little is known about whether social collateral anchored in artistic production, and not in group liability alone, can lower credit risk in cooperatives of artisans, and whether the same arrangements strengthen accountability within the cooperative. This study therefore addresses three research questions: (RQ1) How do portfolio-at-risk and repayment compliance differ between conventional collateral-based lending and a hybrid model that adds artistic production collateral, group guarantees, and reputational capital? (RQ2) How is the hybrid model's accountability mechanism, a monthly forum embedded in the production cycle, associated with member engagement and cooperative sustainability? (RQ3) Under what conditions does the model appear to work, and how robust are the findings to the limitations of the study design? The corresponding expectations are that the hybrid model is associated with lower portfolio-at-risk (H1), higher repayment compliance and member engagement (H2), and stronger organizational sustainability indicators (H3).

This study addresses this research gap through an intensive case study of seven art-based savings and loan cooperatives in Central Java that operate hybrid credit risk models combining traditional collateral mechanisms with social innovation elements. The study's theoretical contribution extends social credit theory into creative economy contexts, while practical findings suggest operational models that merit testing in replication studies for scaling social innovation in informal financial institutions. The paper proceeds as follows: the Methods section presents the research methodology; the Results section presents the empirical findings; the Discussion section interprets the findings against theoretical frameworks; and the Conclusions section closes with implications and future research directions.

METHODS

1. Research Design and Case Selection

This research employed qualitative case study methodology combined with quantitative credit portfolio analysis. Case selection employed purposive sampling targeting art-based cooperatives in the Central Java region (Yogyakarta Special Region and the municipalities of Solo and Semarang) that met the following inclusion criteria: (1) formally registered savings and loan cooperative with a minimum of 50 active members; (2) membership comprising primarily artisans or creative workers; (3) documented implementation of community-based collateral mechanisms; (4) a minimum of 3 years of operation; and (5) administrator willingness to provide access to lending records. Seven cooperatives met the inclusion criteria: KOPRA Batik (n = 187), KOPSA Keramik (n = 156), KOPKA Perhiasan (n = 203), KOPTI Tekstil (n = 142), KOPRA Seni Rupa (n = 178), KOPBR Bordir (n = 164), KOPTU Ukir (n = 195). Total active membership was 1,225 individuals. Data collection spanned January 2022 through December 2024 (36-month observation period).

2. Data Collection Methods

Primary data collection incorporated: (1) semi-structured interviews with 54 key informants (cooperative board members n = 21, loan officers n = 18, active members n = 10, defaulted borrowers n = 5), employing topic guides addressing collateral mechanisms, accountability processes, and risk perception; (2) twelve focus group discussions (1–2 per cooperative) with 84 participants, discussing

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group-level accountability mechanisms and institutional norms; and (3) documentary analysis of cooperative administrative records: lending ledgers, loan applications, repayment schedules, and compliance reports covering the 36-month period, providing quantitative credit portfolio data. Analysis procedures involved thematic analysis of qualitative data with inter-rater reliability verification (Cohen's kappa = .82) and statistical comparison of pre/post implementation metrics using two-proportion *z*-tests and independent *t*-tests (significance threshold $p < .05$). The two-proportion *z*-tests and independent *t*-tests were applied at the loan level, with sample sizes of $n = 1{,}225$ loans in the pre-implementation period and $n = 1{,}225$ loans in the post-implementation period (one active loan per member). The pre-implementation (baseline) period covered 12 months and was compared with the 24-month post-implementation period that followed. Tests at the cooperative level ($n = 7$) are reported separately under "Cooperative-Level Analysis and Internal Consistency Checks" and in Table 2.

3. Measures and Operational Definitions

The principal outcome was portfolio-at-risk (PAR), the share of the outstanding loan portfolio that is overdue beyond a delinquency threshold of 30 days, measured at period end. Repayment compliance was measured as the share of installments paid on or before the due date. Member engagement was measured as average monthly attendance at the accountability forum (PAM) and contrasted with attendance at conventional cooperative meetings. Organizational sustainability was assessed through net cooperative income (IDR million), member surplus distributions as a share of cooperative revenue, loan portfolio growth, and member retention. The conventional-model values refer to the cooperatives' collateral-based lending before the hybrid model (pre-implementation data of the same cooperatives), with a baseline period of 12 months, consistent with the pre/post comparison described under "Data Collection Methods."

4. Cooperative-Level Analysis and Internal Consistency Checks

The tests described under "Data Collection Methods" treat members or loans as the unit of analysis. Because these observations are clustered within seven cooperatives, and consistent with the multiple-case logic of case study research (Yin, 2018) and the combination of qualitative case evidence with quantitative portfolio analysis (Creswell & Plano Clark, 2023), the quantitative analysis was complemented with cooperative-level procedures that treat each cooperative as one observation: (i) descriptive statistics of PAR, relative PAR reduction, and repayment compliance; (ii) a paired *t*-test and an exact Wilcoxon signed-rank test of PAR under the conventional and hybrid models; (iii) Pearson and Spearman correlations among baseline PAR, hybrid-model PAR, relative reduction, cooperative size (active members), and compliance; and (iv) a simple linear regression of hybrid-model PAR on baseline PAR. Effect sizes are reported as the mean paired difference with its 95% confidence interval and Cohen's d_z (the mean difference divided by the standard deviation of the differences). The values in Table 1 were also checked for internal consistency by recomputing the relative reductions from the PAR columns, summing the cooperative memberships, and comparing the aggregate row with the simple and member-weighted means of the seven cooperatives. With $n = 7$ these analyses are exploratory and complement, rather than replace, the member- and loan-level tests reported above. Calculations were carried out in Python (SciPy). The aggregate row of Table 1 and the standard deviations reported under "Credit Portfolio Performance" in the Results were computed from pooled loan-level data across the seven cooperatives. The cooperative-level statistics in Table 2 are recomputed from the seven rows of Table 1 and therefore differ slightly from them (means by no more than 0.1 percentage points; standard deviations by up to 0.4 percentage points).

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5. Research Ethics and Data Management

Cooperative records were used with the permission of the administrators, as required by inclusion criterion (5) under "Research Design and Case Selection." Informed consent was obtained from all interviewees and focus-group participants prior to data collection. Borrower records were anonymized by assigning unique codes and removing all personal identifiers; the five defaulted borrowers interviewed are referred to only by pseudonyms. Data were stored on a password-protected, encrypted drive accessible only to the research team, in accordance with institutional data protection guidelines.

RESULTS

1. Credit Portfolio Performance

Analysis identified three integrated community collateral mechanisms operationally embedded within the hybrid lending models: (1) artistic production collateral, under which membership agreements stipulated that approved loan recipients would allocate 8–12% of productive output to cooperative inventory as physical collateral; (2) group guarantee mechanisms, under which members were organized into borrowing circles of 5–8 individuals who collectively guaranteed one another's loan obligations (the analysis revealed group guarantee engagement in 89.3% of cases approaching delinquency); and (3) reputational capital activation, whereby cooperatives maintained formal reputation scoring systems that influenced loan eligibility and interest rate assignments.

Table 1. Portfolio-at-risk (PAR) and repayment compliance by cooperative under conventional and hybrid models

Cooperative	PAR (Conv.)	PAR (Hybrid)	Reduction %	Active Members	Compliance %	Period
KOPRA Batik	16.8%	5.2%	69.0%	187	92.5%	36-mo
KOPSA Keramik	19.2%	7.1%	63.0%	156	90.4%	36-mo
KOPKA Perhiasan	20.4%	6.8%	66.7%	203	91.6%	36-mo
KOPTI Tekstil	18.4%	5.6%	69.6%	142	91.5%	36-mo
KOPRA Seni Rupa	17.6%	5.8%	67.0%	178	91.0%	36-mo
KOPBR Bordir	21.2%	7.4%	65.1%	164	90.2%	36-mo
KOPTU Ukir	17.2%	6.2%	63.9%	195	89.7%	36-mo
AGGREGATE	18.6%	6.4%	65.6%**	1,225	91.1%**	36-mo

Note. PAR = portfolio-at-risk. **$p < .001$. For PAR, the test is a paired t-test across the seven cooperatives ($n = 7$), $t(6) = 31.2$ (Table 2). For compliance, the test is a two-proportion z-test at the loan level, with $n = 1{,}225$ loans in the conventional period and $n = 1{,}225$ loans in the hybrid period (one active loan per member).

Table 1 presents portfolio-at-risk (PAR) comparisons across seven cooperatives. Aggregate values and standard deviations in this paragraph were computed from pooled loan-level data (see "Cooperative-Level Analysis and Internal Consistency Checks" under Methods); cooperative-level statistics recomputed from the seven rows of Table 1 are given in Table 2. Conventional models averaged 18.6% ± 1.8% PAR. Implementation of hybrid models was followed by a fall in aggregate PAR

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to 6.4% ± 0.8%, a 65.6% reduction relative to the conventional baseline (p < .001). Repayment compliance rates improved from 74.2% ± 4.1% to 91.1% ± 1.4%, representing a 16.9 percentage-point improvement (p < .001).

Because the seven cooperatives are the units of replication, and because member- and loan-level observations are nested within them, the comparison in Table 1 was re-examined at the cooperative level (Table 2, Figure 1). Recomputed from Table 1, mean PAR under the conventional model was 18.7% (*SD* 1.7; range 16.8–21.2%) and under the hybrid model 6.3% (*SD* 0.8; range 5.2–7.4%), a mean absolute reduction of 12.4 percentage points (95% CI 11.4 to 13.4). PAR fell in all seven cooperatives, and cooperative-specific relative reductions ranged from 63.0% to 69.6% (mean 66.3%, *SD* 2.5). A paired *t*-test across the seven cooperatives gave $t(6) = 31.2$, p < .001 (Cohen's $dz = 11.8$), and the exact Wilcoxon signed-rank test returned the smallest p-value attainable with $n = 7$ (p = .016) because all seven differences had the same sign. The aggregate row of Table 1 (18.6%, 6.4%, and 91.1%) differs from the simple and member-weighted means of the seven rows (conventional PAR 18.7% and 18.7%; hybrid PAR 6.3% and 6.3%; compliance 91.0% and 91.0%) by no more than 0.1 percentage points, which is consistent with an aggregate computed from pooled loan-level data and does not affect any conclusion. The relative reductions reported in Table 1 reproduce exactly from the PAR columns (largest deviation 0.05 percentage points), and the cooperative memberships sum to 1,225.

Table 2. Cooperative-level summary statistics (n = 7), recomputed from Table 1. Paired *t*-test of PAR: $t(6) = 31.2$, p < .001; 95% CI of mean difference 11.4 to 13.4 percentage points

Indicator	Mean	*SD*	Minimum	Maximum
PAR, conventional model (%)	18.7	1.7	16.8	21.2
PAR, hybrid model (%)	6.3	0.8	5.2	7.4
Absolute reduction in PAR (percentage points)	12.4	1.0	11.0	13.8
Relative reduction in PAR (%)	66.3	2.5	63.0	69.6
Repayment compliance, hybrid model (%)	91.0	1.0	89.7	92.5

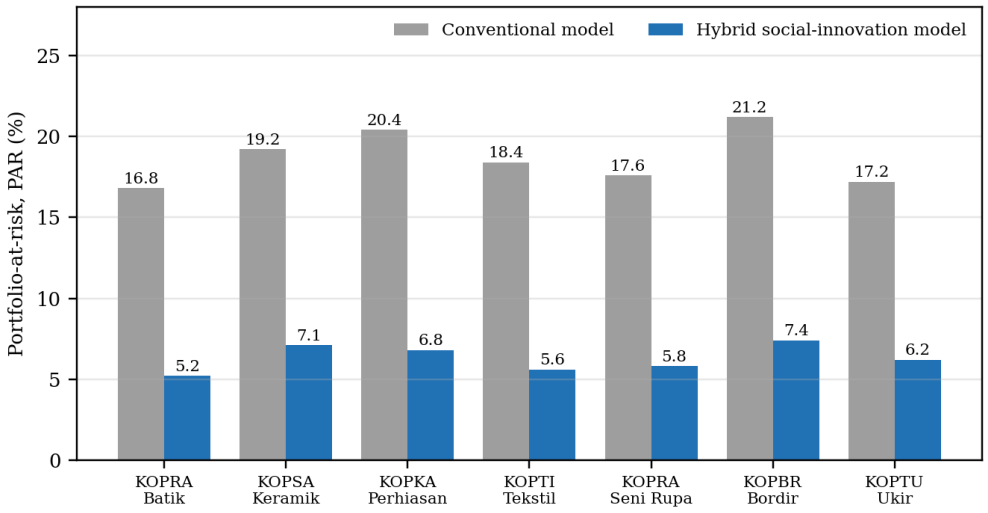


Figure 1. Portfolio-at-risk (PAR) under conventional and hybrid models in the seven cooperatives (data from Table 1).

Differences between cooperatives persisted after implementation. Hybrid-model PAR was strongly and positively related to baseline PAR (Pearson r = .85, p = .014; Spearman ρ = .82, p = .023; Figure 2), with a fitted slope of 0.42: each additional percentage point of conventional-model PAR was associated with 0.42 percentage points of additional PAR under the hybrid model (R^2 = .73). In contrast,

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the relative reduction was not related to baseline PAR (r = −.31, p = .50), and cooperative size was unrelated to hybrid-model PAR (r = −.06, p = .89) and to repayment compliance (r = .10, p = .83) (Table 3). The hybrid model therefore was associated with a similar proportional reduction in PAR everywhere, about two-thirds, rather than equalizing performance across cooperatives. With seven observations these correlations are exploratory, and only the association between baseline and hybrid-model PAR reaches conventional significance.

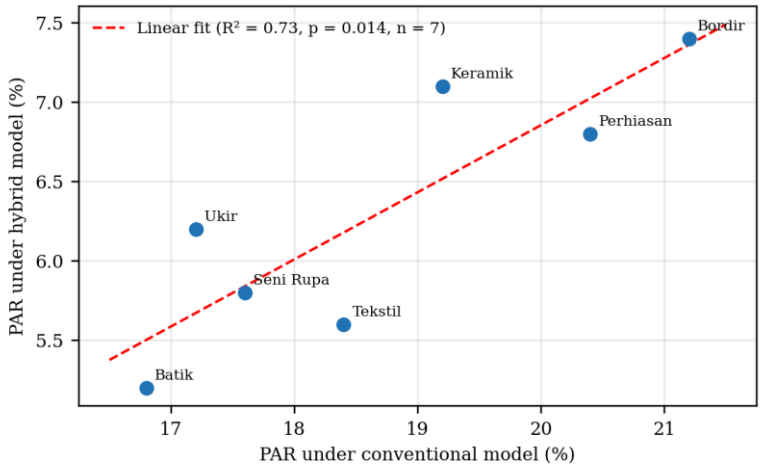


Figure 2. Relationship between PAR under the conventional model and PAR under the hybrid model across the seven cooperatives, with linear fit

Table 3. Cooperative-level correlations (exploratory; computed from Table 1)

Variable pair (n = 7)	Pearson r	p	Spearman ρ	p
Conventional PAR – hybrid PAR	.85	.014	.82	.023
Conventional PAR – relative reduction	−.31	.505	−.32	.482
Active members – hybrid PAR	−.06	.892	−.04	.939
Active members – compliance	.10	.834	.14	.760
Hybrid PAR – compliance	−.62	.140	−.61	.148
Conventional PAR – compliance	−.24	.599	−.21	.645

2. Member Engagement and Organizational Sustainability

Monthly accountability forum (PAM) participation was higher under the hybrid model: cooperatives recorded 76.4% ± 11.2% average monthly attendance, contrasting with conventional meeting participation rates (42.3% ± 8.7%, p < .001). Organizational sustainability improved substantially: net cooperative income increased 156% (from IDR 245.8 million to IDR 628.4 million, p < .001), member surplus distributions expanded from 8.2% to 14.6% of revenue (+78%, p < .01), loan portfolio growth reached 123.8%, and member retention improved from 82.4% to 91.3% (p < .01).

Table 4 and Figure 3 restate the engagement and sustainability indicators reported above and add absolute and relative changes computed from them. Net income rose by IDR 382.6 million, an increase of 155.7% that corresponds to a level 2.56 times the starting value, not a tripling. Surplus distribution rose by 6.4 percentage points (+78.0% in relative terms), member retention by 8.9 percentage points (+10.8%), forum attendance by 34.1 percentage points (+80.6%), and repayment compliance by 16.9 percentage points (+22.8%). The largest absolute gains were therefore recorded in the indicators most directly tied to the accountability forum and to repayment, and the smallest in retention, which started from a high base (82.4%). The net-income and portfolio comparisons are not

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adjusted for inflation or for changes in membership; unadjusted nominal comparisons over 36 months may overstate real growth.

Table 4. Engagement and sustainability indicators, with absolute and relative changes computed from the values reported in the text (pp = percentage points)

Indicator	Start / conventional	End / hybrid	Absolute change	Relative change (%)
Net income (IDR million)	245.8	628.4	+382.6	+155.7
Surplus distribution (% of revenue)	8.2	14.6	+6.4 pp	+78.0
Member retention (%)	82.4	91.3	+8.9 pp	+10.8
Accountability forum attendance (%)	42.3	76.4	+34.1 pp	+80.6
Repayment compliance (%)	74.2	91.1	+16.9 pp	+22.8

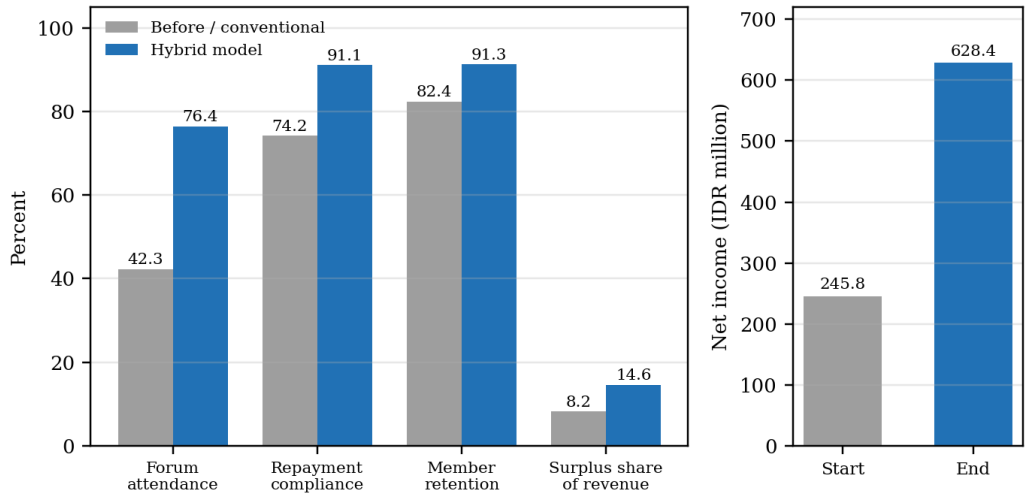


Figure 3. Engagement, compliance, retention, and surplus indicators (left) and net cooperative income (right) before and after adoption of the hybrid model

3. Operating Mechanisms of the Hybrid Model

The three collateral mechanisms and the monthly accountability forum are summarized in Table 5 and Figure 4. Artistic production collateral required approved borrowers to allocate 8–12% of productive output to the cooperative's inventory; group guarantees were organized in borrowing circles of five to eight members, and the guarantee was engaged in 89.3% of the cases approaching delinquency; and a formal reputation scoring system influenced loan eligibility and interest rates. The monthly accountability forum (PAM) linked these mechanisms to the artistic production cycle. The study design does not allow the contribution of each mechanism to be estimated separately: all seven cooperatives implemented the hybrid package, so the effects on PAR, compliance, and engagement reported above are effects of the package. The mechanism map in Figure 4 is therefore a conceptual synthesis of the design features and the qualitative evidence, not an estimated causal model.

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Table 5. Components of the hybrid model and the evidence reported for each component

Component	Operational design (as reported)	Evidence reported in the study	Effect estimated separately?
Artistic production collateral	8–12% of productive output allocated to cooperative inventory as physical collateral	Stipulated in membership agreements	No
Group guarantee circles	Borrowing circles of 5–8 members collectively guarantee members' obligations	Guarantee engaged in 89.3% of cases approaching delinquency	No
Reputational capital	Formal reputation scoring influences loan eligibility and interest rates	Scoring system described; score distributions not tabulated	No
Accountability forum (PAM)	Monthly forum embedded in the artistic production cycle	Mean attendance 76.4% vs. 42.3% at conventional meetings	No

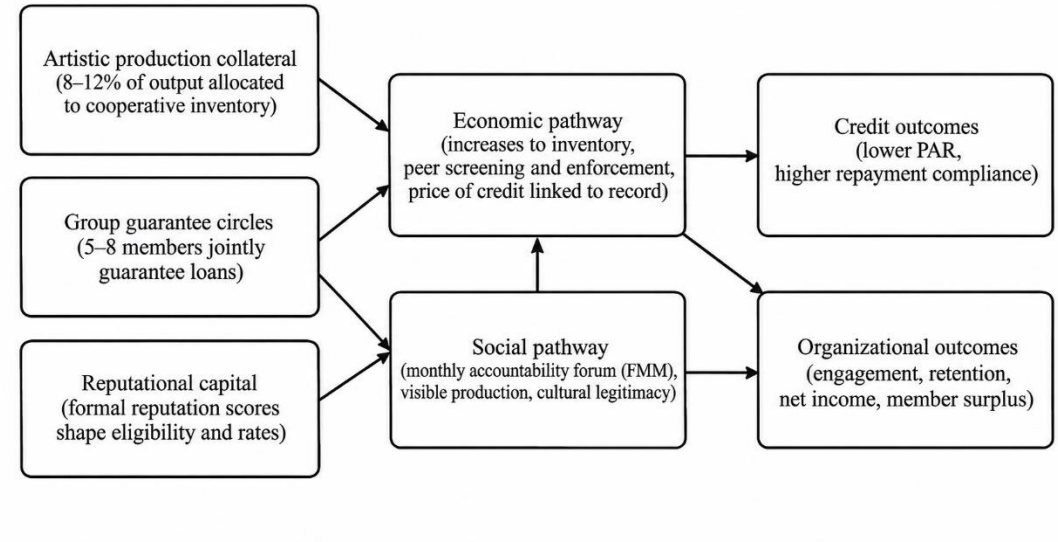


Figure 4. Conceptual map of the hybrid model: collateral mechanisms, economic and social pathways, and outcomes (synthesis of the design features reported in the Results)

DISCUSSION

1. Principal Findings and Mechanisms

The empirical findings are consistent with a strong association between social innovation mechanisms specifically, community-based collateral systems integrated with cultural accountability forums and lower credit risk in informal financial institutions serving artisan populations, together with higher member engagement and organizational sustainability. The 65.6% reduction in portfolio-at-risk, the concurrent 16.9 percentage-point improvement in repayment compliance, and the 156% increase in organizational profitability are consistent with hybrid social innovation models being associated with material financial benefits (alternative explanations are discussed under "Alternative Explanations and Threats to Validity"). Mechanistically, the analysis suggests two plausible pathways, which this design cannot test separately: economic mechanisms may operate through artistic production collateral, group guarantee structures, and reputational capital activation; social mechanisms may operate through cultural legitimacy, participation incentives, and relationship deepening.

Theoretical interpretation situates these findings within social credit theory, which emphasizes that trust relationships and reputation systems substitute for formal collateral in credit markets

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characterized by information asymmetries. Art-based cooperatives' monthly accountability forums serve as institutionalized reputation systems, making implicit trustworthiness judgments explicit and verifiable through peer assessment. The artistic exhibition component provides credibility enhancement: visible production demonstrates productive capacity and market viability, reducing borrower moral hazard concerns. Implementation success required specific enabling conditions: pre-existing social cohesion, occupational homogeneity within membership, adequate organizational capacity, and member voluntarism regarding participation.

The study's findings carry significant implications for financial inclusion policy in developing economies. By showing that culturally-embedded accountability mechanisms are associated with lower credit risk, the research is consistent with the case for testing alternative institutional designs that may merit policy support. The 91.1% repayment compliance and 6.4% PAR achieved under the hybrid model compare favorably with the conventional baseline of the same cooperatives (74.2% and 18.6%). Whether they also compare favorably with external microfinance benchmarks cannot be judged from the data reported here and requires sourced benchmark data. Cooperative networks pursuing social innovation pathways are therefore best regarded as a promising alternative that deserves testing against other institutional designs.

2. Interpretation Against Social Collateral Theory and Prior Evidence

The results are consistent with the central prediction of the social-collateral literature: when physical collateral is scarce, mechanisms that make repayment observable to peers and costly to evade can substitute for it (Besley & Coate, 1995; Postelnicu et al., 2014). Group guarantees were engaged in 89.3% of the cases approaching delinquency, which suggests that peer enforcement operates at the stage at which it matters most. The proportional reduction in PAR of about two-thirds is large relative to effects reported elsewhere in the repayment literature, for example the 9.9% improvement in repayment performance associated with a group-level social capital proxy in a metropolitan joint-liability program (Sahan & Phimister, 2023), but the comparison is indicative only because the studies differ in design, outcome definition, and context. The finding that baseline PAR accounts for most of the between-cooperative variation in hybrid-model PAR (R^2 = .73) fits evidence that the composition and cohesion of groups shape repayment (Parmeter & Sarangi, 2020) and Indonesian evidence that group appraisal, group control, and social capital jointly support repayment capacity (Indriani et al., 2023). The cooperative setting adds an organizational dimension. Social capital is not only a resource of individual borrowers but also a feature of the cooperative's governance (Chronopoulos et al., 2021), and cooperative membership has been associated with social-capital benefits that improve access to bank credit (Yu et al., 2023). The monthly accountability forum appears to institutionalize these relationships by turning implicit trust into explicit, verifiable information about members' conduct.

3. Alternative Explanations and Threats to Validity

Several explanations other than the hybrid model must be considered before the improvements are attributed to it. First, the design compares the same cooperatives before and after implementation, or against a conventional baseline, without an external control group; any general improvement in borrowers' conditions over the 2022–2024 window, which coincides with the post-pandemic recovery, would be attributed to the model. Second, baseline PAR was high (16.8–21.2%), and part of any subsequent decline may reflect regression towards the mean. Third, the cooperatives were purposively selected for documented use of community collateral over at least three years and for willingness to share records, which favors well-governed institutions and limits generalizability. Fourth, PAR and

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compliance are sensitive to administrative decisions such as loan rescheduling, write-offs, and the timing of disbursement; unless these are held constant, part of the improvement may reflect changes in recording rather than in repayment behavior. Fifth, the cooperative-level inferences in the Results rest on seven observations. Finally, engagement and retention may partly reflect selection if members who value the forum are more likely to remain active.

Joint liability also has costs. Group guarantees can cause entire groups to default together and can impose social pressure on members (Besley & Coate, 1995), and the 8–12% output allocation may strain the liquidity of small producers in lean months. The data reported here include no member-level welfare indicators, such as borrowing from informal lenders or household liquidity, so the social costs of enforcement cannot be assessed. These threats do not imply that the effect is absent: its size, its uniformity across seven cooperatives (relative reductions of 63.0% to 69.6%), and the plausibility of the mechanisms are all compatible with a real effect. They do imply that the findings are best presented as strong associations, and that quasi-experimental designs, such as comparison with similar cooperatives that did not adopt the model or staggered adoption across cooperatives, are needed for causal claims.

4. Implementation Safeguards and Policy Implications

If the model is replicated, its design should anticipate these risks. Table 6 sets out safeguards and monitoring indicators that follow from the mechanisms described under "Operating Mechanisms of the Hybrid Model"; they are the authors' recommendations and have not been tested in this study.

Table 6. Suggested safeguards and monitoring indicators for replication of the hybrid model (authors' recommendations)

Component	Risk if unmanaged	Suggested safeguard	Monitoring indicator
Artistic production collateral	Liquidity strain; disputes over inventory valuation	Published valuation rules; seasonal cap on the output share; release of inventory on repayment	Share of borrowers requesting deferment; inventory turnover
Group guarantee circles	Contagion of default; peer pressure; exclusion of vulnerable members	Voluntary group formation; limits on cross-guarantee; hardship fund	Concentration of defaults within groups; reasons for member exit
Reputational capital	Opaque or biased scores that entrench existing hierarchies	Published criteria; appeal procedure; periodic audit of scores	Share of scores revised on appeal; dispersion of interest rates
Accountability forum (PAM)	Attendance becomes a formality or a burden; elite capture	Rotating chairs; circulated minutes; standing agenda item on loan performance	Attendance; share of members speaking; decisions implemented
Data and reporting	Changes in PAR definition or recording practice	Fixed PAR definition; treatment of rescheduled loans stated; external audit	Audited PAR; share of restructured loans

At the policy level, the findings are relevant to Indonesia's effort to widen collateral options for creative workers. Government Regulation No. 24 of 2022 allows intellectual property to be used as credit collateral (Government of Indonesia, 2022), but intangible assets remain harder to value than physical ones. Community collateral of the type studied here is not an alternative to such a scheme but a complement to it: it recognizes assets that artisans already hold, namely work in progress, workshop networks, and standing in the craft community, and it can serve cooperatives whose members do not yet hold registrable intellectual property. Cooperative regulators and supporting agencies could therefore consider (i) recognizing community-collateral arrangements in cooperative credit policy, (ii) standardizing PAR definitions and reporting across cooperatives so that models can be compared, and (iii) funding evaluations with comparison groups before wider scale-up.

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5. Limitations and Future Research

In addition to the threats discussed above, the study relies on cooperative records whose accuracy depends on administrative practice, and the qualitative material is summarized only briefly, which limits the reader's ability to judge how members, including defaulted borrowers, experience the accountability mechanisms. The mechanism-level interpretation is conceptual because all cooperatives adopted the full package. Future research should (i) use comparison cooperatives or staggered adoption to estimate the effect of the package with difference-in-differences or similar designs; (ii) follow members in a panel to measure household liquidity, informal borrowing, and exit; (iii) isolate the contribution of each component through variation in design across cooperatives; (iv) include a cost–benefit analysis that counts the burden of the output allocation and of forum attendance on members; and (v) test whether digital reputation systems can replicate the accountability forum at lower cost. Replication in other regions and craft sectors is needed before the model can be recommended beyond Central Java.

CONCLUSIONS

This comprehensive case study investigation is consistent with credit risk mitigation and social accountability enhancement being mutually achievable objectives. Through integrated analysis of seven cooperatives serving 1,225 artisan members over 36 months, the research shows that, under hybrid models, portfolio-at-risk was 65.6% lower, repayment compliance reached 91.1%, net income more than doubled (+156%), and member engagement was higher (76.4% accountability forum participation). Key findings include: (1) Social innovation mechanisms may operate through dual pathways, economic and social, possibly generating synergistic risk-reduction and engagement effects. (2) Accountability mechanisms embedded in artistic production cycles were associated with higher member engagement than conventional meetings and with higher repayment compliance. (3) Organizational sustainability improved substantially across multiple indicators. (4) Implementation success requires enabling contextual conditions, indicating that social innovation represents context-dependent institutional adaptation. (5) Theoretical contributions extend social credit theory into creative economy contexts. Limitations include selection bias toward successful implementations, a 36-month longitudinal window, and Indonesian-specific context. Future research should pursue longitudinal tracking 5–10 years post-implementation, comparative investigations across regions, rigorous impact evaluation employing quasi-experimental designs, and integration of digital technologies with social innovation models. Because the design compares the same cooperatives over time without an external control group, the results are best read as strong associations, and causal attribution requires quasi-experimental replication.

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