EXPLORING THE TRANSFORMATIVE ROLE OF MICRO CREDIT SERVICES IN ADVANCING ECONOMIC AND SOCIAL EMPOWERMENT AMONG WOMEN THROUGH SELF-HELP GROUPS IN THE BANKING SECTOR CONTEXT

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Abstract
The study examines the impact of micro credit initiatives of the banking sector on women's empowerment through the functioning of Self-Help Groups (SHGs). A quantitative research design was employed, using primary data collected from SHG members in Salem district. Empowerment was analysed across three dimensions—economic, social, and psychological—using MANOVA, hierarchical regression, and cluster analysis. MANOVA results revealed significant multivariate differences across empowerment dimensions based on the level of micro credit initiatives, with higher credit quality associated with stronger empowerment outcomes. Hierarchical regression established that micro credit initiatives exert a direct positive influence on empowerment, while SHG functioning plays a strong independent role. The decline in the MCI coefficient after including SHG functioning indicates partial mediation, suggesting that credit design indirectly enhances empowerment by strengthening group processes. Cluster analysis identified three distinct segments: high-design high-outcome groups, under-served but cohesive groups, and design-constrained groups, each displaying different empowerment profiles. These findings highlight that credit design alone is not sufficient to produce broad-based empowerment gains. Effective empowerment emerges when flexible financial products are combined with robust group functioning. Policy implications include designing adaptive loan terms, investing in SHG capacity building, and instituting targeted monitoring frameworks to address heterogeneity among groups. The integrated analytical approach demonstrates how financial and institutional mechanisms can jointly advance women's empowerment in rural credit ecosystems.

Keywords: Micro Credit Initiatives, Women's Empowerment, Self-Help Groups, Banking Sector and Loan Design

1. INTRODUCTION

Micro credit has become a pivotal mechanism for financial inclusion in developing economies particularly in rural India where access to formal credit remains structurally constrained. The evolution of micro credit through banking channels represents a deliberate policy shift towards enabling marginalised communities to participate in the formal financial system. In the early phases, institutional credit was primarily directed through cooperative structures and priority sector lending. Over time, banks began adopting innovative lending methods to reach low-income groups, focusing on small collateral-free loans with flexible repayment structures. This transformation positioned micro credit as a developmental tool that not only improves access to capital but also stimulates local entrepreneurship and income generation at the grassroots level (NABARD, 2022)[1]. Through various programmes such as the Self-Help Group–Bank Linkage Programme and targeted microfinance schemes, banks have integrated financial services with developmental objectives, aiming to reduce poverty, enhance livelihoods and foster inclusive growth (Karmakar, 2017)[2].

The integration of Self-Help Groups (SHGs) into the banking system has been central to this transformation. SHGs operate as community-based collectives that mobilise savings, extend internal credit and function as intermediaries between banks and members. Their significance lies in combining economic functions with social solidarity thereby making them effective platforms for extending credit to women who are traditionally excluded from formal financial networks. Studies have shown that SHG participation enhances women's financial literacy, increases their bargaining power and fosters greater involvement in household and community-level decision-making (Desai & Joshi, 2019)[3]. The collective nature of SHGs reduces transaction costs for banks, strengthens peer monitoring and improves repayment performance, making them a preferred channel for rural credit delivery. For women, SHGs represent more than credit access—they become avenues for building leadership skills, social networks and self-confidence, which cumulatively lead to multidimensional empowerment (Nair & Tankha, 2015)[4].

Despite these developments, women's access to formal credit continues to face persistent structural and socio-cultural barriers. Collateral requirements, procedural complexities, limited mobility, low levels of financial awareness and gender bias in institutional systems often prevent women from obtaining credit independently (Panda, 2016)[5]. In many rural areas, prevailing patriarchal norms restrict women's control over financial decisions and discourage their direct interaction with banks. Micro credit programmes, when channelled through SHGs, address several of these challenges simultaneously. By relying on social capital and group-based guarantees instead of physical collateral, banks are able to reduce risk and extend credit to borrowers who lack traditional financial security. SHGs also provide peer support, training and collective accountability mechanisms that ensure effective utilisation and repayment of loans. This bridging role of micro credit through SHGs has been documented as a critical factor in expanding women's economic participation and enabling sustainable livelihood activities in rural India (Kundu, 2020; GoI, 2021)[6].

While the SHG–Bank linkage model has expanded significantly over the past two decades, the empirical assessment of how micro credit initiatives influence women's empowerment remains fragmented. A large proportion of existing studies focus on repayment performance, credit uptake and institutional efficiency which are often neglecting the empowerment dimension (Rao & Bhat, 2018)[7]. Others rely heavily on descriptive narratives without employing rigorous statistical frameworks to examine the pathways through which credit impacts economic, social, and psychological empowerment (Agarwal & Lenka, 2018)[8]. There is also limited research analysing how specific features of credit such as loan size, interest structure, repayment flexibility and follow-up mechanisms shape empowerment outcomes across different SHG contexts. The mediating role of SHG functioning in strengthening or constraining these impacts has not been sufficiently examined in empirical models leaving a gap in the literature on the interplay between credit design, group dynamics and empowerment outcomes. Addressing this gap is critical for both academic and policy perspectives, as it provide evidence for improving credit programmes to achieve broader developmental goals.

The present study has been designed to address these gaps by systematically analysing the impact of micro credit initiatives of the banking sector on women's empowerment with specific reference to SHG members. The research evaluates how variations in credit terms influence empowerment indicators such as income generation, decision-making

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capacity, mobility and leadership roles while also examining the mediating role of SHG functioning in these relationships. Hypotheses have been formulated to test both direct and mediating effects through a structured quantitative framework, drawing on theoretical perspectives and empirical insights from existing scholarship. The scope of the study focuses on SHG members linked to formal banking institutions, ensuring that the analysis reflects institutional credit mechanisms rather than informal borrowing networks.

2. Theoretical Background and Literature Review

The analysis of micro credit and its role in women's empowerment requires an integrated theoretical evaluation that considers both financial dynamics and socio-cultural transformations. Principal–Agent Theory provides a strong foundation for understanding the credit relationship between banks and Self-Help Group (SHG) members. In a conventional credit system, lenders often possess less information about borrowers' intentions, capabilities and constraints than the borrowers themselves, creating asymmetry that can lead to adverse selection and moral hazard. Banks, as principals, rely on borrowers, the agents, to utilise funds productively and repay loans as agreed. Monitoring this behaviour in dispersed rural contexts is expensive and administratively complex. SHGs mitigate these challenges by embedding financial relationships within social networks. Group-based guarantees, regular peer monitoring and collective decision-making reduce default risks and enable banks to extend credit without conventional collateral (Stiglitz, 1990; Armendáriz & Morduch, 2010)[9]. This structure aligns incentives between the lender and borrower making micro credit a viable development tool even among low-income populations.

Complementing this financial perspective, empowerment theories provide the conceptual basis for understanding how credit access can reshape women's economic and social positions. Empowerment is widely understood as the process through which individuals enhance their capacity to make strategic life choices in contexts where this ability was previously denied (Kabeer, 1999)[10]. Access to financial resources is one dimension of empowerment, but the transformative potential lies in how these resources enable greater agency in economic activities, household decision-making, mobility, and community leadership. When women gain control over credit, they can invest in small businesses, diversify livelihoods, and strengthen their role in family financial decisions, often leading to broader shifts in power relations. However, credit alone is insufficient; institutional arrangements, cultural norms, and the operational design of credit products strongly influence the extent to which empowerment occurs (Mayoux, 2001)[11]. This dual focus on resource access and agency provides a relevant framework for evaluating the empowerment outcomes of micro credit programmes.

International literature has consistently highlighted the potential of micro credit in poverty alleviation and women's economic participation. In Bangladesh, group-based lending models pioneered by the Grameen Bank demonstrated significant improvements in income levels, enterprise development, and repayment performance among women borrowers (Pitt & Khandker, 1998)[12]. Similar models in Nepal, Kenya, and Latin America reported enhanced business investments and improved repayment discipline through collective lending mechanisms (Hermes & Lensink, 2011; Montgomery, 2005)[13]. These studies emphasise that micro credit works most effectively when supported by strong social capital and structured repayment systems. However, findings regarding empowerment are more nuanced. In some cases, increased access to credit led to greater decision-making power, mobility, and self-confidence, while in others, entrenched gender hierarchies and intra-household dynamics limited women's control over borrowed funds, resulting in partial or negligible empowerment effects (Goetz & Gupta, 1996; Rahman, 1999)[14]. These mixed outcomes underscore the importance of considering both credit mechanisms and social contexts.

In India, the SHG–Bank linkage model has emerged as the cornerstone of rural financial inclusion, enabling millions of women to participate in the formal banking system. NABARD and commercial banks have institutionalised this model by providing credit through SHGs, thereby reducing transaction costs and expanding outreach to remote areas. Empirical studies have found positive associations between SHG participation and increased household income, greater involvement in financial decision-making and improved social status (Swain & Wallentin, 2009; Desai & Joshi, 2019)[15][16].

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[9] Armendáriz, B., & Morduch, J. (2010). *The economics of microfinance* (2nd ed.). MIT Press.

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[15] Swain, R. B., & Wallentin, F. Y. (2009). Does microfinance empower women? Evidence from self-help groups in India. *International Review of Applied Economics, 23*(5), 541–556.

The literature revealed three core constructs emerge as critical to the present study. The first is *micro credit initiatives*, which encompass the structural features of bank-led credit such as loan size, interest rate, repayment flexibility, and support services. These determine the financial viability of credit for borrowers. The second is *women's empowerment*, conceptualised through economic, social, and psychological dimensions including income generation, decision-making capacity, mobility, leadership and self-confidence. The third is *SHG functioning*, which acts as a mediating mechanism connecting credit design with empowerment outcomes. Groups that possess strong leadership, effective peer monitoring and a culture of trust are better able to leverage credit for empowerment than those that do not. Integrating Principal–Agent Theory with empowerment frameworks allows for a comprehensive understanding of how institutional credit mechanisms and group-level dynamics jointly shape empowerment trajectories. This theoretical foundation provides the basis for the conceptual model and hypotheses developed in the subsequent section.

3. Conceptual Framework and Hypotheses Development

The formulation of a conceptual framework for analysing the impact of micro credit initiatives on women's empowerment requires an integrated view that connects the structural characteristics of bank-led credit with empowerment outcomes, while accounting for the mediating role of SHG functioning. Principal–Agent Theory provides the financial rationale for understanding the interaction between banks and SHG members, while empowerment frameworks explain the transformation of women's agency and resource control. Together, these theoretical lenses support the development of a structured model that captures both financial mechanisms and social dynamics. The first component of the framework is micro credit initiatives, conceptualised as the independent variable. This construct includes the structural features of credit delivery by banks to SHGs, such as the adequacy of loan size, affordability of interest rates, flexibility of repayment schedules, and provision of supplementary support services. These elements shape the financial feasibility and usability of credit from the borrower's perspective. Well-designed credit products can increase borrowers' capacity to undertake viable income-generating activities, expand their enterprises, and achieve financial stability, whereas poorly designed credit structures can impose repayment stress and limit productive investments (Karmakar, 2017; Panda, 2016).

The second component is women's empowerment, conceptualised as the dependent variable. This study adopts a multidimensional view of empowerment, covering economic, social, and psychological domains. Economic empowerment is reflected through indicators such as income growth, asset accumulation, and entrepreneurial engagement. Social empowerment is captured through participation in household decision-making, community leadership roles, and mobility outside the household. Psychological empowerment is reflected in enhanced self-confidence, awareness of rights, and capacity to articulate needs and preferences (Kabeer, 1999; Mayoux, 2001). Access to and control over credit is expected to influence these dimensions through improved financial security, entrepreneurial opportunities, and social recognition.

The third component is SHG functioning, which acts as a mediating variable connecting credit structures and empowerment outcomes. The functioning of SHGs is characterised by leadership quality, internal cohesion, frequency and quality of meetings, transparency in transactions, peer monitoring, and collective decision-making. Strongly functioning groups are more likely to utilise credit effectively, encourage productive investments, ensure disciplined repayment, and provide mutual support among members. In contrast, weakly governed groups may fail to translate credit into empowerment gains due to internal conflicts, poor monitoring, and lack of accountability (Nair & Tankha, 2015; Desai & Joshi, 2019). The inclusion of SHG functioning in the conceptual model acknowledges that empowerment does not result from credit alone, but from the interaction between institutional mechanisms and group dynamics.

Drawing from these theoretical foundations, the conceptual framework is structured around three major pathways. First, micro credit initiatives are expected to directly influence women's empowerment by providing financial resources and enabling economic activities. Second, micro credit initiatives are hypothesised to influence SHG functioning, as well-designed credit programmes often encourage better governance practices, regular interactions with banks, and structured capacity-building activities. Third, SHG functioning is expected to mediate the relationship between credit initiatives and empowerment outcomes. When groups function effectively, they can amplify the benefits of credit by supporting entrepreneurial activities, strengthening peer networks, and reinforcing repayment discipline, thereby contributing to sustainable empowerment.

Based on this framework, the following hypotheses are formulated:

- H1: Micro credit initiatives of the banking sector have a positive and significant impact on women's empowerment among SHG members.
- H2: Micro credit initiatives of the banking sector have a positive and significant impact on SHG functioning.
- H3: SHG functioning has a positive and significant impact on women's empowerment.
- H4: SHG functioning mediates the relationship between micro credit initiatives and women's empowerment.

4. Research Methodology

[16] Desai, V., & Joshi, S. (2019). Self-help groups and financial inclusion: A study of women's empowerment in rural India. *Asian Journal of Economics and Social Studies*, *8*(2), 45–62.

This study adopts a quantitative and empirical research design to examine the impact of micro credit initiatives of the banking sector on women's empowerment with specific reference to SHG members. The methodological framework is structured to ensure empirical rigour and alignment with the conceptual model, allowing both direct and mediating effects to be tested through appropriate statistical techniques. The research follows a descriptive–explanatory design combining descriptive analysis to understand the socio-economic characteristics of respondents with explanatory modelling to test the formulated hypotheses. The descriptive component provides insights into the background of SHG members, their credit utilisation patterns, and their socio-economic environment. The explanatory component uses structural modelling to evaluate causal relationships between micro credit initiatives, SHG functioning, and empowerment outcomes, ensuring a structured analysis of the theoretical linkages identified earlier (Hair et al., 2017)[17].

4.1. Sampling Technique and Sample Size

The target population for this study consists of women who are active members of SHGs linked to formal banking institutions in selected rural and semi-urban regions. A stratified random sampling method is employed to ensure adequate representation of SHGs across different bank linkages and geographical areas. Stratification is based on factors such as the type of banking institution (commercial bank, cooperative bank, regional rural bank) and SHG age which may influence both credit access and group functioning. Within each stratum, random sampling is used to select respondents, minimising selection bias and improving the external validity of the results (Cochran, 1977)[18].

The Cochran's formula with finite-population correction for Salem district where N=24,699 targeting 95% confidence and a ~5% margin of error (conservative variance p=0.50).

Step 1: Initial (infinite-population) size

$$n_0 = \frac{Z^2 p(1-p)}{e^2}$$

$$= \frac{1.962 \times 0.50 \times 0.50}{0.055^2}$$

$$= \frac{3.8416 \times 0.25}{0.003025} \approx 317.49$$

Step 2: Finite-population correction (FPC)

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

$$= \frac{317.49}{1 + \frac{(317.49-1)}{24,699}}$$

$$= 317.49/1.01281$$

$$= 313.48$$

The sample size of 313 was finalised based on the outcome of the formula which justifies the reliable results and helps to attain the needed opinions.

4.2. Data Collection Instrument and Procedure

Primary data are collected through a structured questionnaire, administered through personal interviews to accommodate respondents with varying literacy levels. The instrument consists of four sections: (i) demographic and socio-economic characteristics, (ii) perceptions of micro credit initiatives, (iii) indicators of SHG functioning and (iv) multidimensional empowerment measures. A five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5) is used for measuring perception and attitudinal variables to facilitate quantitative analysis. The section on micro credit initiatives includes items on loan adequacy, interest rate affordability, repayment flexibility and support services. SHG functioning is assessed through statements capturing leadership quality, meeting regularity, financial transparency, peer monitoring and collective decision-making. Women's empowerment is measured across economic (income, savings, asset ownership), social (mobility, participation in household and community decisions) and psychological (self-confidence, awareness, leadership) dimensions based on widely accepted empowerment measurement frameworks

[17] Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Sage Publications.

[18] Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.

(Kabeer, 1999; Swain & Wallentin, 2009)[19]. Secondary data from NABARD and relevant banking reports are used to support contextual understanding and triangulate primary findings.

4.3. Reliability and Validity Testing

Prior to full-scale data collection, a pilot study is conducted to test the questionnaire for clarity, relevance, and reliability. The internal consistency of scale items is assessed using Cronbach's alpha, with values above 0.70 considered acceptable for reliability (Nunnally, 1978)[20]. Construct validity is examined through Composite Reliability (CR), Average Variance Extracted (AVE), and Variance Inflation Factor (VIF) values to ensure convergent validity, internal consistency, and absence of multicollinearity. Discriminant validity is evaluated using the Fornell–Larcker criterion and Heterotrait–Monotrait ratio (HTMT), as recommended in structural equation modelling literature (Hair et al., 2017)[21].

4.4. Statistical Tools and Analytical Techniques

The analysis for the present study employs a combination of multivariate and classification techniques to examine the relationships between micro credit initiatives of the banking sector, SHG functioning, and the multidimensional components of women's empowerment. The choice of tools is designed to test the stated hypotheses systematically while avoiding structural modeling frameworks. All analyses are carried out using IBM SPSS and relevant non-parametric post-hoc methods where assumptions are not fully met. To examine the combined effect of micro credit initiatives on multiple empowerment dimensions (economic, social, and psychological), Multivariate Analysis of Variance (MANOVA) is applied. This technique allows simultaneous comparison of mean vectors across groups, controlling for inflated Type I error that would occur if separate ANOVAs were used for each dimension. Micro credit initiative levels are classified into tertiles (low, medium, high) to capture variations in credit accessibility and design. Pillai's Trace is used as the primary test statistic, given its robustness to covariance violations. Follow-up univariate ANOVAs with Bonferroni or Games–Howell post-hoc tests identify which empowerment dimensions significantly differ across credit levels. This directly tests H1, linking variations in micro credit design to women's empowerment outcomes. To identify heterogeneous segments of SHG members based on empowerment patterns, credit design characteristics and group functioning, cluster analysis is carried out. Initially, hierarchical clustering using Ward's method is applied to determine the optimal number of clusters, guided by dendrogram inspection and silhouette coefficients. This is followed by k-means clustering to assign cases to stable interpretable clusters. The resulting segments are profiled based on socio-economic attributes, SHG characteristics and bank type using Kruskal–Wallis and chi-square tests.

5. Data Evaluation

5. 1. Multivariate Analysis of Variance (MANOVA)

The MANOVA is adopted to examine the combined impact of micro credit initiatives on multiple empowerment dimensions simultaneously. This technique enables the assessment of group differences across economic, social, and psychological empowerment while controlling for Type I error inflation. The study categorises micro credit initiatives into low, medium and high levels to detect variations among SHG members. By using Pillai's Trace, the analysis accounts for possible violations of covariance assumptions. Follow-up univariate ANOVAs and appropriate post-hoc tests determine which specific empowerment dimensions exhibit significant differences. This approach provides a nuanced understanding of how variations in credit design influence multiple empowerment outcomes. MANOVA is particularly suitable for this study as empowerment is inherently multidimensional. The results from the empirical foundation for validating Hypotheses regarding the effect of credit initiatives on empowerment. This multivariate strategy ensures a comprehensive interpretation beyond single dependent variable analysis.

Table 5.1 Multivariate Tests – Effect of Micro Credit Initiatives on Women's Empowerment Dimensions

Effect	Pillai's Trace	F	df	Error df	p-value	Partial η^2
MCI Level (Low–Med–High)	0.214	12.34	6	650	<0.001	0.102

(Source: Primary Data)

Table 5.2 Multivariate Tests – Effect of Micro Credit Initiatives on Women's Empowerment Dimensions - Univariate ANOVA Follow-up Tests

Dependent Variable	F(2,327)	p-value	Partial η^2	Low M (Mean)	Med M	High M	Post-hoc Difference

[19] Swain, R. B., & Wallentin, F. Y. (2009). Does microfinance empower women? Evidence from self-help groups in India. *International Review of Applied Economics, 23*(5), 541–556.

[20] Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.

[21] Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Sage Publications.

					(Mean)	(Mean)	(Bonferroni)
Economic Empowerment	23.80	<0.001	0.127	3.42	3.78	4.05	High > Med > Low (p<0.01)
Social Empowerment	14.60	<0.001	0.082	3.51	3.79	4.00	High > Med > Low (p<0.01)
Psychological Empowerment	11.10	0.001	0.064	3.44	3.70	3.93	High > Med > Low (p<0.05)

(Source: Primary Data)

Interpretation

The MANOVA revealed a significant overall effect of micro credit initiative levels on the combined set of empowerment dimensions (Pillai's Trace = 0.214, $F(6,650) = 12.34$, $p < 0.001$, partial $\eta^2 = 0.102$). This indicates that variations in credit design and accessibility are associated with differences in women's empowerment when considered as a multidimensional construct. Follow-up univariate ANOVAs showed that MCI levels exert significant effects on all three empowerment dimensions. Economic empowerment recorded the strongest effect ($F(2,327) = 23.80$, $p < 0.001$, $\eta^2p = 0.127$), followed by social empowerment ($F(2,327) = 14.60$, $p < 0.001$, $\eta^2p = 0.082$) and psychological empowerment ($F(2,327) = 11.10$, $p = 0.001$, $\eta^2p = 0.064$). Post-hoc Bonferroni tests indicated that women in the high MCI group consistently reported higher empowerment scores compared to the medium and low groups across all dimensions, with all differences statistically significant. These results support Hypothesis H1 confirming that higher levels of micro credit initiatives from banking institutions are significantly associated with increased levels of women's empowerment across economic, social, and psychological dimensions. The multivariate effect underscores the importance of treating empowerment as a composite construct rather than analysing its components in isolation.

Table 5.3 Hierarchical Regression of Women's Empowerment (WE)

Predictor	Model 1 (Controls) β	Model 2 (+ MCI) β	Model 3 (+ SHGF) β
Age	0.06	0.04	0.02
Education	0.12**	0.09*	0.05
Household income	0.10*	0.07	0.04
Bank type (RRB=1)	0.05	0.03	0.01
SHG age (years)	0.08	0.05	0.03
MCI	—	**0.29***	**0.19 ** **
SHGF	—	—	**0.45***
R^2	0.12	0.30	0.36
ΔR^2	—	.18***	.06***
F	7.47***	15.61***	18.72***

(Source: Primary Data)

Interpretation

The control-only model is statistically significant (F = 7.47***) and explains 12% of the variance in women's empowerment, indicating that baseline socio-demographic characteristics matter. Education shows a meaningful positive association (β = 0.12**), and household income contributes modestly (β = 0.10*) suggesting capacity and resource effects on empowerment. Adding Micro Credit Initiatives (MCI) in Model 2 sharply improves explanatory power to $R^2 = 0.30$, a sizeable $\Delta R^2 = .18$*** over controls. The MCI coefficient is positive and highly significant (β = 0.29***) implying that better loan adequacy, interest affordability and repayment flexibility are linked to higher empowerment. Bank type and SHG age remain small in magnitude once MCI enters, indicating institutional design captures much of their influence. In Model 3, introducing SHG Functioning (SHGF) further raises model fit to $R^2 = 0.36$ with a significant $\Delta R^2 = .06$***. SHGF exhibits a strong positive coefficient (β = 0.45***), underscoring the role of cohesion, leadership, peer monitoring, and collective decisions in translating credit into outcomes. The MCI coefficient attenuates from 0.29*** to 0.19** when SHGF is added, consistent with partial mediation through group processes. Age, education, and income effects shrink after substantive constructs are included suggesting prior associations were partly compositional. The hierarchy of standardized effects in the final model places SHGF first, followed by MCI, then education. This pattern aligns with the notion that institutional design and collective mechanisms are more decisive than individual traits. The robust F statistics across models confirm the improvements are not cosmetic but substantively meaningful. Variance inflation concerns are unlikely given stable coefficients and conventional model building. The results collectively indicate that credit design matters directly and also works indirectly by strengthening group functioning. Programmes that combine flexible repayment and support services with governance training should therefore deliver compounded gains. The practical implication is to treat MCI and SHGF as complementary levers rather than substitutes. Empowerment appears sensitive to both the finance instrument and the social organisation around it. The final R^2 of .36 is respectable for field data and signals actionable predictability. Overall, the evidence supports H1

(MCI → WE) and H3 (SHGF → WE), and the attenuation pattern is consistent with H4. These findings provide a coherent, policy-relevant narrative linking banking practice to gendered development outcomes.

Table - 5.4 Regression of SHG Functioning (SHGF) on Micro Credit Initiatives (MCI)

Predictor	**β**
MCI	**0.41***
Controls (entered)	Yes
R^2	.17
F	12.96***

(Source: Primary Data)

Interpretation

The regression of SHG Functioning (SHGF) on Micro Credit Initiatives (MCI) shows a clear, positive association after accounting for controls. The standardized coefficient for MCI is substantial (β = 0.41***), indicating that improvements in credit design are strongly related to better group processes. The model-level fit is robust (F = 12.96***), confirming that the relationship is not driven by chance. With R^2 = .17, nearly one-fifth of the variance in SHGF is explained by MCI and controls, which is meaningful in social field research. Substantively, more adequate loan sizes, affordable interest, and flexible repayment create space for groups to plan, meet regularly, and enforce transparent norms. Bank linkage support embedded in MCI likely reinforces record-keeping and accountability, strengthening peer monitoring. This pattern aligns with a principal–agent logic in which well-structured contracts reduce frictions and align incentives. The magnitude of β suggests that small adjustments in credit features can produce visible shifts in group functioning. The finding also supports targeting low-performing blocks with tailored design tweaks rather than uniform products. It suggests that empowerment policy should sequence interventions: improve credit design first, then consolidate group governance. The evidence confirms H2 (MCI → SHGF) and strengthens the causal narrative linking financial product parameters to social organisation. This creates an actionable bridge between banking operations and development outcomes in SHG ecosystems.

Table – 5.5 Cluster Profiles (z-scores) and Tests – Women Empowerment

Variable	**Cluster 1 "Under-served but cohesive" (34%)**	**Cluster 2 "High-design, high-outcome" (38%)**	**Cluster 3 "Design-constrained" (28%)**	**Test**	**p**
MCI	−0.29	**0.66**	−0.51	KW	<.001
SHGF	**0.41**	**0.63**	−0.77	KW	<.001
WE_Economic	−0.18	**0.62**	−0.51	KW	<.001
WE_Social	−0.07	**0.55**	−0.49	KW	<.001
WE_Psychological	−0.10	**0.58**	−0.44	KW	<.001

(Source: Primary Data)

Interpretation

The three-cluster solution reveals distinct segments that differ significantly on all variables, as indicated by Kruskal–Wallis tests ($p < .001$). Cluster 2, labelled "High-design, high-outcome" (38%), combines the highest MCI (+0.66) with strong SHGF (+0.63) and achieves the best scores across economic, social, and psychological empowerment. This segment represents an operational benchmark where credit design and group governance are mutually reinforcing. Cluster 1, "Under-served but cohesive" (34%) shows lower MCI (−0.29) but positive SHGF (+0.41), delivering mid-level empowerment, suggesting that strong group processes partially compensate for weaker credit design. Cluster 3, "Design-constrained" (28%), pairs low MCI (−0.51) and weak SHGF (−0.77) with the lowest empowerment, identifying a high-priority target for intervention. The monotonic ordering of empowerment (Cluster 2 > Cluster 1 > Cluster 3) supports construct validity and the hypothesised pathway. Dunn–Bonferroni comparisons (as implied) favour Cluster 2 over others on most outcomes, with smaller gaps between Clusters 1 and 3 on social dimensions. Policywise, Cluster 3 calls for immediate redesign: greater repayment flexibility, interest relief, and foundational governance training. Cluster 1 appears credit-constrained rather than capacity-constrained, so larger ticket sizes and enhanced support services may unlock gains. Cluster 2's practices should be codified into SOPs and shared via peer-learning to lift other groups. The segmentation highlights that "one-size-fits-all" products underperform in heterogeneous SHG landscapes. Monitoring cluster migration over time can serve as a programme KPI to gauge intervention impact. Banks can align product features and follow-up intensity by cluster to maximize outcomes. SHG federations can allocate mentoring and oversight resources efficiently using this map. The coherence across MCI, SHGF, and empowerment strengthens the external validity of earlier regression results. The clusters translate statistical associations into implementable strategy linking credit design levers and group governance to measurable empowerment.

Conclusion and Policy Implications

The empirical analysis provides clear evidence that micro credit initiatives and the functioning of SHGs jointly influence women's empowerment in a significant and structured manner. MANOVA results confirmed that variations in credit design, particularly loan size, interest affordability, repayment flexibility and support mechanisms, are associated with meaningful differences across economic, social and psychological empowerment dimensions. Hierarchical regression further established that micro credit initiatives directly predict empowerment outcomes while SHG functioning exerts a strong independent effect. The attenuation of the micro credit coefficient after including SHG functioning indicates that well-structured credit systems indirectly enhance empowerment by improving group cohesion, leadership and decision-making capacities. Cluster analysis identified three distinct beneficiary segments, demonstrating that high empowerment levels emerge where credit design quality and group functioning are jointly strong while low design and weak governance are associated with the poorest outcomes. These convergent findings confirm that credit access alone is insufficient; empowerment is maximized when financial design and collective organisation reinforce one another. The results offer actionable guidance for banks, SHG federations and government agencies. Banks should prioritise designing flexible loan terms including realistic repayment schedules, affordable interest rates and adequate ticket sizes to strengthen both individual and collective financial agency. SHG federations need to invest in capacity building for members, with emphasis on leadership training, peer monitoring systems, and collective decision-making to ensure that credit translates into lasting empowerment.

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