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Research Article

Impact of Financial Inclusion on Women's Economic Empowerment: Evidence from Self Help Group-Bank Linkage Programs in West Bengal

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Abstract: *The present research paper explores the role of financial inclusion in fostering women's economic empowerment in the state of West Bengal, India, focusing on the Self-Help Group-Bank Linkage Programs (SHG-BLP). Utilizing data consisting of a sample of 500 women who are either participants or non-participants of SHG-BLP, this paper examines the association of holding a bank account, that is, Financial Inclusion, with indicators of economic empowerment, such as owning a business, asset acquisition, income levels, with controlling socio-demographic factors of age and education. The key statistical tests that have been used, namely the Chi-Square test, Mann-Whitney U tests, Kruskal- Wallis test and Logistic Regression, reveal significant positive associations between financial inclusion and these empowerment outcomes, pointing out the potential of inclusive financial services for sustainable development with reduced gender disparities. Results indicate that targeted financial inclusion policies are required to enhance women's economic independence.*

Keywords: *Asset Ownership, Bank Account, Business Ownership, Economic Empowerment, Financial Inclusion, Self-Help Groups, Women's Empowerment.*

I. INTRODUCTION

Financial inclusion is easy and cheap financial services. Nowadays, financial inclusion can be regarded as a vehicle for eradicating poverty and promoting gender equality and women's empowerment. This is because opening formal financial systems has contributed to sustainable economic development as individuals, especially females, have the opportunity to save and invest, further providing means of securing unexpected resources. Financial inclusion leads to a "virtuous spiral of social, economic, and political empowerment" (Rastogi & Ragabiruntha, 2018). This is consistent with the Sustainable Development Goals (SDG), which have placed gender parity at the forefront. Perhaps one of the most ambitious programs for expanding financial access has been the Prime Minister's Jan Dhan Yojana in India, which still has a gap within its reach, particularly among rural women. Women face huge barriers despite all the progress in formal financial service access. Cultural norms and credit systems, with a focus on lesser financial literacy and limited collateral for women, reinforce ingrained biases within the financial institution. This sets an obstacle that nudges women toward informal sources of finance, which offers limited scope for growth. The current study finds how SHG-BLP in West Bengal aids financial inclusion as an empowering element for women's economies in terms of business ownership, asset accumulation, and income generation after controlling socio-demographic factors of age and education.

II. OBJECTIVES AND RESEARCH HYPOTHESES

The objectives of the study are:

1. To examine whether the economic empowerment indicators vary with regard to accessing a bank account among women.
2. To understand the determining factors of socio-demographic factors, such as education and age, regarding financial inclusion and economic outcomes.
3. To identify the important predictors of economic empowerment for women within self-help group programs.

Given these objectives, the following are the hypotheses of this study:
Hypothesis 1: The higher the control of women over their bank accounts, the higher will be the economic empowerment
Hypothesis 2: Education affects the economic empowerment indicators, and, in particular, higher levels of education are related to higher rates of business and asset ownership.
Hypothesis 3: The Age factor impacts the results related to financial inclusion and empowerment highly, as older women have greater activities in economic affairs than younger ones.

III. LITERATURE REVIEW

Empirical studies highlight that financial inclusion can significantly empower women, particularly by enabling economic participation and independence. Financial access has been shown to positively influence decision-making power and enhance household economic stability (Holvoet, 2005; Pitt et al., 2006). In Bangladesh, Siddik (2017) demonstrated that financial inclusion programs substantially improved women's income and purchasing power, leading to greater economic security and familial well-being. These findings align with evidence from India, where direct wage deposits into women's accounts have enhanced labor supply and challenged restrictive gender norms, particularly among women with prior financial constraints (Field et al., 2021).

However, women's financial inclusion continues to be hindered by systemic inequalities. Studies such as Demirgüç-Kunt and Klapper (2013) reveal that women globally are significantly less likely than men to own bank accounts or secure loans. Structural and societal barriers, including limited financial literacy, reduce women's financial access, particularly in rural areas (Morsy, 2020; Baluja, 2016). In response, programs like SHG-BLP aim to bridge these gaps by enabling women to access formal financial systems and fostering business ownership and asset acquisition, as shown by Dupas and Robinson's (2013) findings in Kenya on increased investment from formal savings access.

The selection of study variables—bank account ownership, asset ownership, business ownership, education level, age, and income—is well-supported in the literature. For example, bank account ownership is identified as a critical entry point for financial inclusion, enabling women to access savings, credit, and transaction services necessary for empowerment (Demirgüç-Kunt & Klapper, 2013). Asset ownership is a recognized indicator of economic stability and capital control, essential for women to secure financial independence and access collateral-based credit (Bruhn & Love, 2014). Business ownership and employment offer insights into women's economic participation, as income-generating activities facilitate independence and decision-making (Kwong, Jones-Evans, & Thompson, 2012).

Moreover, education is linked to financial literacy and service utilization, with educated women more likely to engage in formal financial systems and manage resources effectively (Aslan, 2022; Kaur & Kapuria, 2020). Similarly, age is a significant demographic factor, with younger women often facing greater barriers to accessing financial services than older, more established women (Amin, 2018). Finally, income levels not only enable financial access but are also crucial indicators of economic well-being and empowerment (Bhatia & Singh, 2019). Including these variables allows for a comprehensive analysis of financial inclusion's role in enhancing women's economic autonomy.

IV. METHODOLOGY

This paper discusses financial inclusion and women's economic empowerment with variables such as ownership of bank accounts, owning a business, accumulation of assets, educational levels, age, and income. The sample includes 500 women from the rural districts of West Bengal, India. Out of these 500 women, 450 were participating in the SHG-BLP and 50 non-participants as controls. A questionnaire was designed to collect the data. The structured questions are to gather information in relation to financial access, economic activities, and socio-demographic factors. The variables used to analyze the study are:

- Bank Account Ownership (an indicator of financial inclusion).
- Business Ownership/Employment and Asset Ownership (economic empowerment indicators).
- Monthly income (economic stability indicator).
- Education and age (socio-demographic controls).

These variables have been selected after reviewing the literature, which established how crucial they were to understanding the effects of financial inclusion on women's empowerment. (Demirgüç-Kunt & Klapper, 2013; Kaur & Kapuria, 2020). Ownership of a bank account, ownership of a business and ownership of assets are the prime proxies of financial access and economic participation, whereas education, age and income provide socio-economic and demographic insights into financial inclusion.

V. RESULTS AND DISCUSSION

The relationship between financial inclusion and women's economic empowerment shall be evaluated through a quantitative approach using primary data collected from the SHG participants in rural West Bengal. For this purpose, this study focuses on key indicators of empowerment, i.e. business ownership, asset ownership, and income levels. Chi-square, Mann-Whitney U tests, and logistic regression were used to examine relationships between financial inclusion - measured through bank account ownership - and these economic empowerment outcomes. In addition, the analysis probes into how educational and aging factors affect each empowerment indicator. The outcomes provide critical insights into what factors drive economic empowerment for women, highlighting the role of financial inclusion within this process.

Table 1: Chi-Square test to test association with bank account ownership for each of the economic empowerment indicators, i.e. asset ownership, business ownership, and income

Chi-Square Tests	Pearson Chi-Square Value χ^2	df	p-value
Bank Account and Employed/ Business Ownership	154.170	1	$p = 0.000 < 0.001$
Bank Account and Asset ownership	166.574	1	$p = 0.000 < 0.001$
Bank Account and Monthly Income	29.750	4	$p = 0.000 < 0.001$

Source: *computed by researcher*

Interpretation: Interpretation: From Table 1, Chi-square tests have been calculated in order to establish whether any statistically significant correlation exists between the ownership of a bank account and business ownership ($\chi^2 = 154.170$, $p < 0.001$), asset ownership ($\chi^2 = 166.574$, $p < 0.001$), and income levels of women ($\chi^2 = 29.750$, $p < 0.001$). The results indicate that each indicator of empowerment exhibits a positive relation with bank account ownership, which in turn posits the hypothesis regarding the economic empowerment of women due to financial inclusion.

Table 2: Mann-Whitney test to compare the means of economic empowerment indicators between those with and without a bank account

	Business ownership/ employment	Asset ownership	Monthly income
Mann-Whitney *U*	3250.000	3275.000	6305.000
Wilcoxon *W*	4525.000	4550.000	7580.000
Z	-12.404	-12.893	-5.256
p-value	$p = 0.000 < 0.001$	$p = 0.000 < 0.001$	$p = 0.000 < 0.001$
Grouping Variable: bank			

Source: *computed by researcher*

A) Interpretation

In Table 2, it is seen in the case of business ownership that the *U* value for the Mann-Whitney is 3250.000 with a *Z* value of -12.404 and *p*-value (= 0.000) < 0.001, thus indicating that there is a statistically significant difference between business ownership/ employed women with bank accounts and those who do not. Hence, by extension, the women who hold bank accounts can be picked out as likely to have a business more than their counterparts without having bank accounts.

In the case of asset ownership, it is found that the Mann-Whitney *U* value is 3275.000 and also its respective *Z* value is -12.893 while the *p*-value (= 0.000) < 0.001, therefore it results that the ownership of assets of women who have bank accounts and that of who do not hold bank accounts is statistically different. Therefore, it is represented that women who have opened their bank accounts are relatively vulnerable to building appreciable assets compared to those women who have not opened their bank accounts.

In the case of monthly income, the value of the Mann-Whitney *U* is 6305.000, which produces a *Z*-value of -5.276 and *p*-value (= 0.000) < 0.001), meaning it is statistically significant for the difference in monthly income between women with and without bank accounts. The result indicates that women with bank accounts obtain higher monthly income than those women who do not have their savings in a bank account.

Table 3- Kruskal-Wallis test for examining the differences in economic empowerment variables by education level and indicators of empowerment

	Business ownership/ employment	Asset ownership	Monthly income
Chi-Square χ^2	96.657	113.353	11.397
df	3	3	3
p-value	$p = 0.000 < 0.001$	$p = 0.000 < 0.001$	$p = 0.010 < 0.001$
Grouping Variable: Education			

Source: *computed by researcher*

Interpretation: In Table 3, The Kruskal-Wallis test found that business ownership, $\chi^2 = 96.657$, $p < .001$, asset ownership, $\chi^2 = 113.353$, $p < .001$ and income level, $\chi^2 = 11.397$, $p < .001$ is significantly differing with education level. It indicates that women with no education or only primary education have higher ranks for business and asset ownership, whereas women with high secondary education reported higher income levels.

Table 4: Kruskal-Wallis test for examining the differences in economic empowerment variables by age group and indicators of empowerment

	Business ownership/ employment	Asset ownership	Monthly income
Chi-Square χ^2	32.939	33.181	14.110
df	3	3	3
p-value	$p = 0.000 < 0.001$	$p = 0.000 < 0.001$	$p = 0.003 < 0.001$
Grouping Variable: Education			

Source: *computed by researcher*

Interpretation: In Table 4, Business ownership, asset ownership, and income show a significant variation across age groups ($\chi^2 = 32.939$, $p = 0.004$; $\chi^2 = 33.181$, $p = 0.003$; and $\chi^2 = 14.110$, $p < 0.001$, respectively). It is understood that the income rank of women is significantly higher at ages 18-24. Rank in business and asset ownership is also higher among the women aged 25-34. Age is a key variable in economic activities, and younger women have more income-generating activities with the likelihood of fewer familial obligations, whereas older age groups are more involved in asset accumulation and business ownership.

Table 5: Binary logistic regression analysis to test the probability of business ownership based on having a bank account, education level, and age.

Omnibus Tests of Model Coefficients		
Chi-square	**df**	**Sig.**
114.529	7	.000
Nagelkerke R Square		0.514
Hosmer and Lemeshow Test		
Chi-square	df	Sig.
10.404	8	.238

Variables in the Equation						
	B	S.E.	Wald	df	Sig.	Exp(B)
bank	3.214	.447	51.818	1	.000	24.890
Education			14.526	3	.002	
Education (1)	1.066	.377	7.991	1	.005	2.905
Education (2)	.952	.283	11.279	1	.001	2.590
Education (3)	.557	.330	2.849	1	.091	1.746
Age			13.312	3	.004	
Age (1)	-1.955	.536	13.312	1	.000	.142
Age (2)	-1.563	.527	8.805	1	.003	.210
Age (3)	-1.220	.444	7.564	1	.006	.295
Constant	-.741	.285	6.738	1	.009	.477

Source: *computed by researcher*

Interpretation: From Table 5, the results show the binary logistic regression model in predicting the probability of business ownership as a function of bank account ownership, education level, and age interaction. It is seen that the model is a good fit since its Nagelkerke R^2 value is at 0.514. For this case, 51.4% of the variance in business ownership is explained by the predictors.

General significance of the model: Omnibus Tests of Model Coefficients $\chi^2 = 114.529$, $p < 0.001$. Hosmer-Lemeshow Test shows no significant difference between observed and predicted values and is a good fit at $\chi^2 = 10.404$, $p = 0.238$. Among the predictors, having a bank account proved to be the strongest predictor and, going by the fact that the respondents have a bank account, they have 24.89 times more chance of having a business than those who lack such an account ($B = 3.214$, $p < 0.001$). Education emerged as another predictor whereby high levels of education established a high likelihood of the process of business ownership. The people who have medium and high levels of education have 2.59-2.9 times the probability of business ownership than those who have the lowest level of education, but for the highest category, the effect is slightly diminished. Young people have significantly lower probabilities of being a business owner.

Table 6: Binary logistic regression analysis to test asset ownership probability based on bank account, education level, and age.

Omnibus Tests of Model Coefficients		
Chi-square	df	Sig.
218.055	7	.000
Nagelkerke R Square		0.601

Hosmer and Lemeshow Test		
Chi-square	df	Sig.
4.634	8	0.705

Variables in the Equation						
	B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
bank	3.564	.522	46.667	1	.000	35.292
Education			29.753	3	.000	
Education (1)	-4.965	1.065	21.741	1	.000	.007
Education (2)	-4.328	1.052	16.943	1	.000	.013
Education (3)	-3.210	1.080	8.829	1	.003	.040
age			17.418	3	.001	
Age (1)	-1.722	.505	11.612	1	.001	.179
Age (2)	.149	.508	.086	1	.769	1.161
Age (3)	-.257	.499	.267	1	.606	.773
Constant	2.538	1.076	5.560	1	.018	12.658

Source: *computed by researcher*

Interpretation: In Table 6, the results show the binary logistic regression model in predicting asset ownership as a function of bank account ownership, education level, and age interaction. Moreover, the value for Nagelkerke R^2 is 0.601, meaning that predictors explain 60.1% of the variance in owning assets. Overall significance is confirmed by the Hosmer and Lemeshow Test: $\chi^2 = 4.634$, $p = 0.705$, without any significant difference between observed and predicted values, thus showing a good fit. The bank account is the most critical determinant among the predictors. The subjects having a bank account are about 35.29 times more likely to have assets than those who do not have a bank account ($B = 3.564$, $p < 0.001$). Education is also relevant, but it negatively relates to this analysis. Those with primary schooling are 0.007 times as likely to own an asset as those without education; secondary-educated respondents are 0.013 times as likely; and graduates or higher-educated individuals are 0.040 times as likely. For this $B = -4.965$, $p < 0.001$; $B = -4.328$, $p < 0.001$; and $B = -3.210$, $p = 0.003$, respectively. These might be presumptions that saving or investing is more important than having a certain asset for the higher education groups.

Age is also another significant predictor in which individuals as they become older, are less likely to have certain assets. Though, on average, it can still vary. If compared with people who are 45 years and older, compared to them, those aged between 18 and 24 years are substantially less likely to have any assets $B = -1.722$, Exp(B) = 0.179, $p = 0.001$. However, the level of difference is not practically significant in asset ownership between respondents aged 25-34 years, as indicated by the values of B = 0.149, Exp(B) = 1.161, $p = 0.769$; or 35-44 years, as indicated by $B = -0.257$, Exp(B) = 0.773, $p = 0.606$.

VI. CONCLUSION

This study reflects the significant role of financial inclusion- the ownership of a bank account- in improving women's economic empowerment in the rural settings of West Bengal, India. The results indicate that the women who hold accounts are more likely to have more businesses owned by them, possess more assets, and have higher incomes. Statistically, chi-square tests and logistic regression underscore that bank account ownership is a high predictor of women's economic participation because it forms the underpinning for gains in financial independence and control over resources.

Besides, education and age are the most critical socio-demographic factors that can influence the implications of empowerment. A high level of educational attainment correlates highly with women's business and asset ownership, representing what is central in educating a woman: possession of information and skills to utilize financial services and, eventually, more resources and experience. Additionally, this factor shows the differences between old and more likely women in economic activities when comparing old women with young women.

These findings align with the existing literature, thus confirming the theory that financial inclusion positively impacts women's economic well-being, particularly in low-income districts. However, the persistence of barriers across the dimensions of financial literacy, socio-cultural constraints, and digital access suggests that more policy interventions are needed. Financial

inclusion through access to a bank account is an extremely important instrument for improving women's economic empowerment in rural India. These expansion programs and related barriers will have to be addressed to achieve broader financial inclusion goals and operationalize the agenda of sustainable development.

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