

Financial Inclusion and Women Entrepreneurship in India: Evidence from NFHS-5 and District-Level Financial Access

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Abstract

This study investigates whether formal financial inclusion is associated with women's participation in self-employment and entrepreneurship in India, and whether the relationship varies across rural and urban settings and across education, social-group and wealth categories. The study focuses on three dimensions of inclusion: personal use of a bank or savings account, access to microcredit, and personal mobile-phone ownership. The proposed empirical design uses women aged 15–49 from the National Family Health Survey (NFHS-5), 2019–21, with the women's work module used to identify self-employment. The individual-level information is to be merged with district-level financial-access indicators obtained from authoritative institutional sources such as the Reserve Bank of India (RBI) and NABARD. Weighted descriptive statistics, probit models, average marginal effects, instrumental-variable probit models, heterogeneity analysis and robustness checks are specified. The manuscript deliberately distinguishes the published NFHS-5 evidence from estimates that require the researcher's respondent-level dataset. Published NFHS-5 evidence establishes a strong expansion of women's formal account use and personal mobile-phone access during 2019–21, while independent analysis of the NFHS-5 women's work module indicates that self-employment is a much smaller outcome. However, the supplied research material does not contain the respondent-level estimation file or regression output. No coefficient, marginal effect, importance level or causal estimate is presented in this manuscript. The inferential results are explicitly reserved for estimation from the researcher's data. The study connects demand-side financial inclusion with women's entrepreneurial activity and proposes a supply-side strategy using district financial infrastructure to address selection and reverse causality. The framework also separates account ownership/use, credit access and digital access, rather than treating financial inclusion as a single undifferentiated indicator.

Keywords: financial inclusion; women entrepreneurship; self-employment; India; NFHS-5; microcredit; digital inclusion; PMJDY; women's economic empowerment

JEL Classification: G21; J16; L26; O16; C25

Introduction

Financial inclusion has moved from a narrow concern with bank-account ownership to a broader development question involving access, use, affordability, digital capability and the ability to convert financial services into productive economic activity. For women, this distinction is particularly important. A bank account improves the security and control of household resources, but account ownership alone does not demonstrate that a woman obtain productive credit, make independent financial decisions or establish an enterprise. India provides an important setting for examining this issue. The expansion of the Pradhan Mantri Jan-Dhan Yojana (PMJDY), digital payments, and self-help-group bank linkage and microenterprise finance has substantially widened formal financial access. The World Bank's Global Findex evidence shows that 77.6% of women aged 15 and above in India had an account in 2021, compared with 26.5% in 2011; by 2024 the corresponding female indicator was 89.2%. These figures demonstrate remarkable progress in access, but they do not establish whether access has translated into entrepreneurship. The 2021 India country brief also reports substantial inactivity among accounts, reinforcing the importance of distinguishing access from effective use.

NFHS-5 provides an unusually useful micro-level platform for this question because its women's questionnaire includes information on account use, personal mobile-phone use and women's work. The national NFHS-5 evidence indicates that the proportion of women who themselves use a bank or savings account increased sharply between NFHS-4 and NFHS-5. NFHS-5 also directly asks women about work and self-employment. A recent analysis of the NFHS-5 women's work module reports that 30.5% of women in that module worked during the previous 12 months and about 3.4% were self-employed. The central issue of this paper is therefore not whether financial inclusion expanded. That is already well documented. The more important question is whether individual-level inclusion is associated with the probability that a woman becomes self-employed, after accounting for demographic, socioeconomic and spatial differences.

The study addresses three related problems which are given below:

- First, financial inclusions are endogenous: women who are economically active are more likely to obtain accounts and credit.
- Second, the supply of financial services is uneven across districts.
- Third, the effect of financial access differs according to rural residence, education, social group and household economic position.

Objectives:

- To examine the relationship between women's bank-account use and self-employment.
- To assess whether microcredit access is associated with entrepreneurial activity.
- To examine whether personal mobile-phone ownership complements financial inclusion.
- To identify differences in the relationship across rural/urban residence, education, social group and wealth.
- To test the robustness of the relationship using alternative specifications and matching methods.

Literature Review

The finance-and-development literature suggests that financial systems reduce liquidity constraints, facilitate investment and broaden economic opportunity. Beck, Demirgüç-Kunt and Levine (2007) show that financial development is associated with improved outcomes for poorer groups. Sarma (2008) and Sarma and Pais (2011) develop and apply broader concepts of financial inclusion. More recent Global Findex research treats account ownership as a gateway to saving, payments and other formal financial services. Entrepreneurship often requires working capital, investment finance and mechanisms for managing irregular income. Evidence is nevertheless mixed. Bruhn and Love (2014) find substantial economic effects following expanded financial access in Mexico; while Banerjee and Duflo (2014) show that Indian firms face constraints extending beyond simple credit availability. Randomized evidence from microfinance also suggests that credit alone does not automatically generate large increases in business creation.

Women face constraints that operate through collateral, property ownership, mobility, information, household bargaining and social norms. Duflo (2012) emphasizes the two-way relationship between women's empowerment and development. Kabeer (2005) study cautions against treating microfinance as a universal mechanism of empowerment. Evidence from Indian self-help groups suggests that participation improve dimensions of women's empowerment, although effects depend on context and institutional design. Ghosh and Vinod (2017) study shows that gender-related differences in access to and use of finance remain important in India. Mobile access lower information and transaction costs and facilitate digital payments. The device ownership is not equivalent to financial capability or digital financial use. The NFHS-5 measure of a mobile phone that the woman herself uses is treated in this study as a complementary digital-access indicator rather than as a complete measure of digital financial inclusion.

Research Gap

Existing studies often examine financial inclusion or women's entrepreneurship separately, use localized programme samples, or rely on correlational evidence. The present design brings together individual-level

measures of financial inclusion and self-employment and supplements them with district-level financial infrastructure. Its main methodological value lies in making the endogeneity problem explicit and testing whether the association survives alternative specifications.

Hypotheses:

H1: Women who use a bank or savings account themselves have a higher probability of self-employment, conditional on observed characteristics.

H2: Women with access to microcredit have a higher probability of entrepreneurial activity, conditional on observed characteristics.

H3: Personal mobile-phone ownership is positively associated with women's entrepreneurial activity and strengthens the association between financial inclusion and self-employment.

H4: The association between financial inclusion and entrepreneurship varies systematically across rural/urban residence, education, social group and household wealth.

Data and Methodology

Primary database:

The primary individual-level database is NFHS-5, 2019–21, produced by the International Institute for Population Sciences (IIPS) and ICF under the Ministry of Health and Family Welfare. The final India report is the authoritative documentation for the survey design and variables. NFHS-5 covered India and provides state and district estimates for numerous indicators. An important sampling issue stated clearly. The women's work questions are available for a defined work-module subsample rather than every NFHS-5 woman. Therefore, the final analytical dataset must be constructed from the relevant women's work module and linked to the financial-inclusion variables. The final manuscript should report the exact unweighted and weighted analytical N produced by the researcher's extraction.

Supplementary databases

District-level financial supply variables are constructed from RBI banking statistics and, where applicable, NABARD's SHG-Bank Linkage Programme statistics. RBI maintains branch banking statistics and Basic Statistical Returns on bank credit and deposits. NABARD publishes annual SHG-Bank Linkage Programme statistics, including women-only SHGs, savings linkage and credit linkage. The exact year used for each instrument must proceed, or be plausibly predetermined relative to, the NFHS-5 outcome period. PMJDY is used as policy context rather than as a direct respondent-level variable unless the microdata contain a valid PMJDY indicator. Government reporting demonstrates the scale of the programme and its continuing emphasis on women beneficiaries, but aggregate PMJDY counts should not be merged mechanically into individual observations.

Study Population and Sample Construction:

Population	Women aged 15–49 in NFHS-5
Work module	Women with valid responses to the women's work/self-employment questions
Financial inclusion	Valid bank-account, microcredit and mobile-phone measures
Controls	Age, age squared, education, marital status, children, religion, social

	group, wealth, rural residence, state
District merge	District identifiers linked to RBI/NABARD supply indicators
Final sample	Complete cases or transparent missing-data strategy

Variable definitions:

Variable	Operational definition	Analytical role
Self-employed	1 if the woman reports self-employment in the NFHS-5 work module; 0 otherwise	Dependent variable
Account use	1 if the woman reports a bank/savings account that she herself uses	Main explanatory variable
Microcredit	1 if the woman reports the specified microcredit/loan access measure available in the extracted NFHS-5 data	Main explanatory variable; exact coding must follow questionnaire
Mobile phone	1 if the woman has a mobile phone that she herself uses	Digital-access variable
Age / Age ²	Age in completed years and its square	Control
Education	Categorical or ordered education level	Control / heterogeneity
Marital status	NFHS-5 marital-status categories	Control
Children	Number of children or appropriate fertility/child variable	Control
Social group	Scheduled Caste/Scheduled Tribe/Other Backward Class/other categories where available and analytically justified	Control / heterogeneity
Wealth quintile	NFHS household wealth index quintile	Control / heterogeneity
Residence	Rural or urban	Control / heterogeneity
State fixed effects	State/UT indicators	Spatial controls
District financial supply	Branch density / banking-correspondent or other pre-specified supply indicator	Instrument candidate

Econometric strategy:

The baseline model is a binary-response model:

$$\Pr(Y_i = 1 \mid X_i) = \Phi(\alpha + \beta_1 \text{Account}_i + \beta_2 \text{Credit}_i + \beta_3 \text{Digital}_i + \gamma X_i + \delta_s),$$

where Y_i denotes self-employment, Φ is the standard normal cumulative distribution function, X_i is the vector of individual and household controls, and δ_s represents state fixed effects. Average marginal effects (AMEs), 95% confidence intervals and p-values should be reported because probit coefficients are not directly interpretable as percentage-point changes. Because financial inclusion endogenous, an instrumental-variable strategy is proposed as:

- The first stage predicts individual inclusion from predetermined district financial-supply indicators and controls.
- The second stage estimates the entrepreneurship outcome using the predicted component of inclusion.

The instrument satisfies relevance and the exclusion restriction. The manuscript should report first-stage diagnostics and should not describe the estimates as causal unless the identification assumptions are defensible. The exclusion restriction deserves special attention. Districts with more bank branches are more economically developed, and economic development directly influence women's entrepreneurship. State fixed effects and rich district controls reduce, but do not automatically eliminate, this concern. The IV results are described as causal only with strong institutional justification and appropriate diagnostics.

Heterogeneity:

Heterogeneity is estimated through interaction terms and, as a secondary presentation, stratified models. The main subgroups are rural versus urban residence, lower versus higher education, disadvantaged social groups versus others, and lower versus higher wealth. Pre-specified subgroup definitions are retained across specifications to avoid data-driven subgroup selection.

Robustness checks:

Logit estimates as an alternative binary-response model. Linear probability model has seen with appropriate clustered or survey-adjusted standard errors. Alternative definitions of entrepreneurship based on the NFHS-5 work questions. Propensity-score matches or inverse-probability weighting as a complementary, non-causal robustness exercise. Alternative financial-inclusion specifications using separate indicators rather than a composite index. Exclusion or sensitivity analysis for districts/states with unusually high or low financial-access values as an Alternative clustering levels consistent with the survey design and the level at which the merged supply variables vary.

Results:

This section is intentionally divided into published benchmark evidence and researcher-generated estimates. The supplied manuscript contains no respondent-level regression output, so numerical regression results are not fabricated.

Table 1.1 Published national benchmarks:

Women with bank/savings account they themselves use	About 78.6% in NFHS-5 (2019–21)	Shows substantial expansion of formal account use
Women personally using a mobile phone	53.9% in NFHS-5 India	Shows that digital access remained less universal than account use
Women self-employed in NFHS-5 work module	About 3.4% in an independent NFHS-5 analysis	Shows that self-employment is much less prevalent than account ownership
India female account ownership, Global Findex 2021	77.6% of women age 15+	Independent international benchmark
India female account ownership, Global Findex 2024	89.2% of women age 15+	Later benchmark; not used as an NFHS-5 observation

The figures shown in the above table are contextual benchmarks and must not be substituted for the researcher's final weighted descriptive statistics. The final paper should report the exact analytical sample, weighted prevalence, standard errors/confidence intervals and missingness from the extracted NFHS-5 file.

Tables to be generated from the supplied respondent-level data

Table 1.2 Financial Inclusion among Women in India

Indicator	Women (%)	Men (%)	Total (%)
Account ownership	89.2	88.8	89.0
Account ownership, 2021	77.6	77.5	77.5
Account ownership, 2017	76.6	83.0	79.9
Account ownership, 2014	43.1	62.8	53.1
Account ownership, 2011	26.5	43.7	35.2
Saved at financial institution or using mobile money account	22.8	31.1	—
Borrowed any money	59.2	—	—

(Source: World Bank Global Findex Database/Gender Data Portal. The 2024 female account-ownership figure is 89.2%, compared with 88.8% for men.)

Table 1.3 Women's Saving, Borrowing and Business Finance in India:

Indicator	Women (%)
Saved at a financial institution or using mobile money	22.8
Borrowed any money	59.2
Borrowed to start or operate a business	9.0
Main source of emergency funds: loan from bank/employer/private lender	14.3
Received government transfer	26.0
Saved formally	22.8
Borrowed for health or medical purposes	—

The World Bank specifically shown in above table reports that **9.0% of women aged 15+ in India borrowed to start or operate a business in 2024**. This is particularly relevant to your study of financial inclusion and women's entrepreneurship. The 2024 World Bank India Gender Data Landscape also reports formal saving among women at **22.8%**, compared with **31.1% among men**.

Table 1.4. Digital Financial Inclusion among Women in India:

Digital-finance indicator	Women (%)
Own a mobile phone	54.3
Used internet during previous three months	36.3
Used mobile phone/internet to check account balance	26.9

Used card or mobile phone to make payments	19.0
Used mobile phone/internet to buy something online	11.4
Used mobile phone/internet to pay bills	10.3
Digital account ownership	21.6

The above data indicators show that India's female financial-account ownership is very high, while digital financial use remains considerably lower. For example, 89.2% of women have an account, but 19.0% used a card or mobile phone to make payments and 26.9% used mobile/internet technology to check an account balance. The World Bank's 2024 data also show 10.3% of women used a mobile phone or internet to pay bills.

Table 1.5. Women's Economic Participation and Entrepreneurship-related Indicators:

Female labour-force participation rate, age 15+ (2025)	32.4
Female wage and salaried workers as % of employment (2025)	21.2
Female employment in agriculture (2025)	59.8
Female vulnerable employment (2025)	78.2
Women borrowing to start/operate a business (2024)	9.0
Firms with female participation in ownership (2022)	3.88
Firms with female top manager (2022)	6.85
Female share of employment in senior/middle management (2024)	11.9

The World Bank's India Gender Data Landscape reports female labour-force participation at **32.4% in 2025** and female employment in agriculture at **59.8%**. It also reports **3.88% of firms with female participation in ownership** and **6.85% with a female top manager**. The Global Findex measure is different from the enterprise-level indicators: **9.0% of women aged 15+ reported borrowing to start or operate a business** in 2024.

Table 1.6. Gender and Labour-force Differences in Financial Inclusion

Account ownership, 2024	89.2	88.8	+0.4 women
Account ownership, 2021	77.6	77.5	+0.1 women
Formal saving, 2024	22.8	31.1	−8.3 women
Used mobile phone/internet to pay bills	10.3	19.9	−9.6 women
Own a mobile phone	54.3	—	—
Women in labour force with an account	94.0	—	—
Women outside labour force with an account	86.0	—	—
Female participation in firm ownership	3.88	—	—
Female top managers	6.85	—	—

The World Bank reports that 94% of women in India's labour force have an account compared with 86% of women outside the labour force. This is particularly useful for your research argument linking financial inclusion with women's economic participation. The gender comparison also shows an important distinction: India has achieved almost equal account ownership, but women still lag men in formal saving and digital financial use.

Discussion

The study's conceptual expectation is that formal financial access reduces some barriers to entrepreneurial entry, but the relationship should not be interpreted as automatic. A bank account facilitates savings and payments without providing productive credit. Microcredit loans are used for consumption smoothing or household needs rather than enterprise creation. Personal mobile access support digital finance but does not by itself establish financial literacy, market access or control over financial decisions. If the estimated account-use effect is positive and robust, the finding would support the argument that moving from financial access to effective financial use is economically relevant. If the effect becomes substantially smaller after controls or instrumentation, that would indicate that simple correlations partly reflect socioeconomic selection. If credit is unimportant while account use is positive, the evidence would suggest that transaction and saving functions matter more than borrowing alone. These results are selected only after the actual estimates are available. The heterogeneity analysis is particularly important. A positive average association conceals weak effects among women facing severe mobility, education, wealth or market constraints. Stronger effects among disadvantaged groups would suggest that formal finance partly substitute for missing informal financial networks. Either pattern would have different policy implications. The findings are also read alongside evidence that account ownership and account use are not identical. The World Bank's India Findex brief reports substantial account inactivity, illustrating why an account-opening metric are not treated as equivalent to effective financial participation. This distinction is central to the present study.

Policy Implications

Move from account opening to account use:

Financial-inclusion policy should monitor meaningful use, including saving, receiving payments, making digital payments and accessing suitable credit, rather than counting accounts alone.

Strengthen women-oriented productive finance:

Where credit is relevant, women entrepreneurs need appropriate loan products, transparent documentation, repayment structures compatible with irregular enterprise income and mechanisms that reduce collateral constraints.

Combine finance with non-financial support:

Finance is more likely to translate into enterprise activity when accompanied by entrepreneurship training, digital skills, market linkages, mentoring and childcare or time-saving support.

Address the digital gender gap:

Personal mobile ownership and digital capability is treated as complementary infrastructure. Access to a device is accompanied by safe digital-finance training and practical use opportunities.

Use district-level targeting:

District-level financial supply indicators help identify areas where formal infrastructure remains weak. Monitoring combine access are indicators with women's actual use and enterprise outcomes.

Limitations

The cross-sectional NFHS-5 design limits strong causal interpretation because financial inclusion and entrepreneurship influence one another. The NFHS-5 age range of 15–49 does not represent all adult women entrepreneurs. Self-employment measured through a household survey is not capturing every informal, seasonal

or home-based enterprise. District-level bank infrastructure is correlated with local economic development, creating a possible exclusion-restriction problem for instrumental-variable estimation. The exact availability and wording of the microcredit variable must be verified against the NFHS-5 questionnaire before final model estimation. Survey weights and the complex sample design are handled consistently; the final estimation software and variance strategy is reported in the methods section. Results from published NFHS-5 benchmark studies are not replace estimates from the researcher's own analytical extract.

Future Research

Future research improves identification by linking repeated survey rounds, administrative credit records or policy-timing information. A quasi-experimental design around differential exposure to financial-inclusion programmes could provide stronger causal evidence. Longitudinal data would also help establish whether women move from account ownership to credit use and subsequently to enterprise entry, survival and growth.

Conclusion

Financial inclusion has expanded rapidly among Indian women, but access and entrepreneurship remain analytically distinct outcomes. The proposed study uses NFHS-5 to examine whether a woman's own use of a bank or savings account, access to microcredit and personal mobile-phone ownership are associated with self-employment. Its principal contribution is methodological: it connects individual-level inclusion to women's work outcomes while explicitly addressing endogeneity through a district-level supply-side strategy. Published evidence already establishes the large expansion of women's account use and the continuing digital gap. The next empirical step is to estimate whether these changes are associated with entrepreneurial activity after accounting for observed and potentially unobserved selection. The final conclusions on H1–H4 are based on the researcher's actual weighted regression and robustness results rather than on assumed coefficients.

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