INTERNATIONAL POLICY CENTER
Gerald R. Ford School of Public Policy
University of Michigan

IPC Working Paper Series Number 86

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June 2009

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Prepared for the World Bank Conference on

Female Entrepreneurship: Constraints and Opportunities

June 2009

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Self-Employment in Household Enterprises and Access to Credit: Gender

Differences during India's Rural Banking Reform

Abstract: This study uses use four cross sections of household survey data collected by India's National Sample Survey Organization between 1983 and 2000 to examine the role of credit in encouraging small-scale entrepreneurship among men and women in rural labor households. Results from two-stage probit least squares estimations indicate that land ownership, a key means of providing collateral, serves one of the strongest predictors of men's and women's self-employment. However, women's self-employment exhibits a substantially stronger and more positive response to having a loan compared to men. Results also point to interesting class differences within the lowest tier of India's social class system: self-employment is less likely for members of scheduled castes (who may be pressured by upper castes to remain employed by others), but higher for members of scheduled tribes (who tend to rely on their own skills to make a living).

I. Introduction

Household enterprises constitute an important source of productive employment for men and women around the world. While some individuals start their own businesses as a means toward greater flexibility and new opportunities for innovation, others resort to self-employment in micro-enterprises as a coping strategy in the face of scarce employment opportunities, and others (especially women) use self-employment as a means of combining paid employment with childcare responsibilities. In rural India for example, the female labor force rose threefold from 0.9 million to 2.7 million between 1961 and 1985, and has continued to thrive to the present day (Nussbaum 1995). Household business ventures can employ a substantial proportion of the workforce, particularly in developing countries with large informal sectors. Understanding the conditions under which people decide to operate household enterprises can contribute to policy reforms that better support self-employed individuals and promote entrepreneurial activities.

A key area of policy intervention is the provision of small-scale loans through microfinance and rural banks. Both of these sources of finance have proven track records in reducing poverty by providing a diverse range of financial services to the poor and disenfranchised. While the Self Employed Women's Association (SEWA) in India and the Bangladesh Rural Advancement Committee (BRAC) as well as the Grameen Bank in Bangladesh have received an enormous amount of attention in scholarly and policy discourse, other institutions in developing countries have also experimented with a number of financial sector reforms to provide pecuniary resources to people without access to conventional loans from commercial banks. A good example is India's rural social banking program following the nationalization of banks in 1969. This state-led expansion of the banking sector focused

primarily on opening new bank branches in previously unbanked rural locations and led to a statistically significant reduction in poverty in India (Burgess and Pande 2005).

In exploring the roots of this poverty reduction, an interesting question is whether greater access to financial resources through India's rural social banking program increased the likelihood of people becoming self-employed. The rural banking program arguably generated new opportunities to finance business ventures in rural areas that otherwise may not have been viable. Another question of interest is how the increased presence of bank branches in the rural sector affected existing entrepreneurs, and whether there were differences along gender lines. As noted in Das (2003), in addition to social affiliation and religion, rural entrepreneurship showed marked disconnect in gender segmentation. Our study addresses both of these questions through a detailed examination of the determinants of self-employment for men and women using combined micro-data and macro-data sources that cover the years 1983 to 2000, a period of substantial increase in access to banks in the rural sector.

Background

In India's rural areas, a substantial proportion of the labor force is subject to crop-cycle fluctuations that result from seasonality and unexpected weather patterns. Seasonality coupled with the lack of access to formal insurance mechanisms implies that poor rural households can undergo marked fluctuations in their annual income flows. Absent sources of income which do not depend on weather outcomes, these fluctuations in income flows have the potential to not only affect household consumption patterns, but also decisions about employment. Greater access to credit through micro credit programs and the spread of rural banking facilities can improve the ability of household members to withstand such shocks to consumption and production (Menon 2006). New loans, particularly if they are earmarked for household

production purposes, establish a source of cash that is unlikely to co-vary with agricultural shocks such as weather.

In response to this need for credit in the rural sector and the inadequate coverage of formal credit and savings institutions, India's government made an active effort to increase the number of rural bank branches throughout India. Described in Burgess and Pande (2005) as the biggest bank expansion agenda followed by any country, the government embarked on an aggressive social banking program to increase opportunities for poor households in the rural sector to acquire credit and deposit savings in formal institutions. Between 1969, when the government nationalized India's commercial banks, and 1990, when the official program ended, approximately 30,000 new bank branches opened in previously unbanked rural locations. The program included several provisions based on population and stock of branches per capita, with a particularly ambitious licensing reform in 1977 that required banks to open branches in four unbanked locations if they wanted a license to open a branch in a location that already had banks.

Not only did the government encourage branch openings in unbanked rural locations, it also controlled deposit and lending policies so as to provide individuals with incentives to use the new banks. It set savings rates above those in urban areas and lending rates below those of urban areas. Additional mandates imposed targets on lending in priority areas including agriculture and small-scale entrepreneurs. After 1990 when the program ended, no additional bank branches were opened in unbanked rural locations (Burgess and Pande 2005). However, rural banking activity continued to grow throughout the 1990s. As shown in Figure 1, total bank branches, commercial bank deposits in the rural sector, and commercial bank advances in the rural sector all continued to expand.

A growing body of research has found positive effects of credit on entrepreneurship and employment among individuals and households in low-income countries. For example, Pitt and Khandker (1998) found that credit given to female participants in Grameen programs had strong beneficial effects on both male and female labor supply. Also evaluating the effects of the Grameen bank, Hashemi *et al*. (1996) argue that participants mostly used the loans for small-scale self-employment, in activities as diverse as rice paddy processing, animal husbandry, artisan crafts, and small trade. They find that the program increased women's financial control over funded enterprises and raised women's economic and social empowerment. Millions of poor women have received loans from the Grameen Bank and the Bangladesh Rural Advancement Committee (BRAC), and many have proven to be effective entrepreneurs. Nussbaum (1995) argues that through training, credit, and other extension services, BRAC in particular has stimulated women's productivity in and out of the home. Other research shows that a vast majority of BRAC and Grameen Bank participants profit from self-employment because of the credit that is made available to them (McKernan 2002). All of these results are consistent with findings for industrialized countries that the decision to become self-employed is constrained by access to credit, and relief of those constraints through a loan or a windfall gain increases the probability of becoming or remaining self-employed (e.g. Lindh and Ohlsson 1996, Holtz-Eakin *et al.* 1994a, 1994b).

Methodology and Data

The analysis examines the probability of engaging in self-employment, conditional on a person's loan activity and a set of personal and household characteristics. We use the value of outstanding debt as the measure of loan activity and specify the following reduced form equation for the amount of outstanding loans L held by an individual i in state j:

$$L_{ij} = \alpha^L X_{ij} + \beta Z_{ij} + \lambda_j^L + \varepsilon_{ij}^L \quad . \qquad (1)$$

The notation X_{ij} is a vector of personal and household characteristics; Z_{ij} denotes a different set of household characteristics that affect a person's loan activity but not the employment decision; and α^L and β are both parameters to be estimated.[1] The parameter λ_j^L is an unobserved determinant of loan activity specific to a state, and ε_{ij}^L is an error term that captures unobserved factors affecting loan activity that vary by individuals and have an expected conditional mean of zero. The vector X includes variables for education, caste, religion, whether the person owns land, whether the person is married, regional residence, age, number of household members, and number of pre-school children.

Next, we specify the probability of self-employment S of individual i in state j conditional on their personal and household characteristics X_{ij} and on their loan activity L_{ij} as:

$$S_{ij} = \alpha^S X_{ij} + \varphi L_{ij} + \lambda_j^S + \varepsilon_{ij}^S \quad . \qquad (2)$$

As before, α^S and φ are both parameters to be estimated, λ_j^S is an unobserved determinant of self-employment specific to a state, and ε_{ij}^S is an error term capturing unobserved factors affecting self-employment that vary by individuals and have an expected conditional mean of zero. Because the variable L_{ij} in equation (2) is endogenous (that is, there is potential correlation between λ_j^L and λ_j^S and between ε_{ij}^L and ε_{ij}^S), identification of its effect on self-employment requires the use of an instrumental variables approach.

Intuitively, endogeneity of an individual's loan activity could occur if individuals with higher unobserved ability are more likely to obtain a loan from a bank and are also more likely to engage in entrepreneurial activities. Also, if new rural bank branches are deliberately placed in areas that are relatively poorer than others, then estimates of the effects of loan activity could also be biased. Finding appropriate instruments for loan activity can be a challenge. As discussed

in Menon (2006), the use of state-level fixed effects that capture systematic differences in attributes across states, such as interest rate differentials and variations in poverty, aids in removing some of the bias. We also use as instruments several household-level indicators, including female headship, age of the oldest person in the household, the number of household members with a primary education, and the number of household members with secondary schooling and above. The loan and self-employment equations for men and women are estimated using a two-stage probit least squares model. To test for instrument validity, we report the F-statistic and the p-value on the null that all variables are jointly zero in the first stage regression. If $p<0.05$, we can reject the null and support the validity of the instruments. In addition, we use Stata's cluster-analysis management tool to correct for correlated standard errors at the level of the household (StataCorp 2007).

To estimate these models, we use four cross sections of household survey data collected by the National Sample Survey Organization (NSSO). The data include the years 1983 (38th round), 1987-1988 (43rd round), 1993-1994 (50th round), and 1999-2000 (55th round), and sampling techniques ensure a nationally representative sample in every year. For each round, we utilize the "Activity" file of the Employment and Unemployment module - Household Schedule 10, which contains detailed information on individual and household socioeconomic characteristics for an average of about 643,000 individuals in each year. To construct our working sample, we retain all working-age individuals (ages 18-59) living in rural households classified as agricultural labor and other labor households, leaving us with a sample of about 109,000 people in each year. We have to restrict our analysis to rural labor households since information on household loan activity in the NSSO is available only for these types of

households. This restriction entails dropping other rural households classified as self-employed in non-agriculture and in agriculture, and those classified as "other" types.

Despite this restriction according to household type, sample statistics in Table 1 indicate that about 14 percent of working-age adults residing in rural labor households report being self-employed as their primary economic activity in every year, thus making our proposed analysis feasible. Table 1 also shows that men make up more than half the sample in every year, and more than two-thirds of the sample has no formal schooling in every year except the last, when this figure drops below 60 percent. Interestingly, almost half the sample in every year is included in the lowest tier of India's class system: the scheduled castes and scheduled tribes (also known as backward castes). Note that a comparison of these sample statistics with other types of rural households indicates a relatively high representation of uneducated adults and of the lowest-tier social classes for the rural labor households. Table 1 further indicates that the vast majority of the sample is Hindu and married, with a heavier concentration in southern and central states compared to other regions of India. Reflecting social norms of extended families living together, the average household size is between five and six people, often one of whom is a pre-school child.

To examine how rural banks affect the decision to be self-employed in a household enterprise, we merge into the employment data a set of credit variables contained in the NSSO data files on household loan activity for 1983, 1987-88, 1993-94, and 1999-2000. This source provides detailed information on loans and debt, including the type, source, and purpose of the loans as well as the value of outstanding debt. Table 2 provides a brief overview of the NSSO loan data, showing that close to 40 percent of working-age adults in rural labor households have at least one outstanding loan in every year. These loans are more than twice as likely to be cash-

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based loans, as compared to in-kind and other types of loans. In addition, people with current loans are more than three times as likely to have obtained their loan from an informal source (including employers, landlords, moneylenders, shopkeepers, relatives, and friends) as from a formal source (including the government, co-operative societies, and banks). Also of note is the purpose of outstanding debt: individuals with current loans are two to three times more likely to use their loans for consumption rather than production. People also use their loans for other purposes such as debt repayment, a reason that was particularly important in the final year. While on average there has been a steady increase in the nominal value of outstanding debt, the real value of outstanding debt has fallen during the period.

Results for Self-Employment Determinants

Individual and Household Characteristics

The study continues with an examination of the base regressions for the likelihood of self-employment from 1983 to 2000 without the credit variables. The marginal probability estimates are reported for men in Table 3 and for women in Table 4, with all variables set at their means in the calculations of the self-employment probabilities. Results indicate that for men, the likelihood of self-employment in most years depends positively on education. For example, in 1999-2000, the probability of self-employment was 0.09 points higher for men with secondary education and 0.03 points higher for men with primary education compared to men with no education (both $p<0.01$). Caste and religion also play an important role in predicting men's self-employment, although in contrasting ways. While men who are part of the scheduled caste group are about 0.04 to 0.06 percentage points less likely to be self-employed compared to men in higher tiers of the caste system, men in the scheduled tribes category are about 0.03 percentage points more likely to be self-employed ($p<0.01$ in all years except for one). A similar result holds

for religion, with men of Hindu backgrounds having a 0.02 to 0.04 point higher probability of self-employment and Muslim men showing no statistically significant difference compared to men with other religious backgrounds. Results further show that land ownership is one of the strongest predictors of men's self-employment: the probability of self-employment is about 0.07 higher in most years, and goes up to 0.12 in 1999-2000, for men who own land compared to those who do not (all $p<0.01$). Finally, being married and having a larger household tend to be positively associated with men's self-employment, while age and the number of pre-school children have a negative association; however, the magnitudes of these coefficients tend to be fairly small and are not statistically significant in all years.

Many of these conclusions also hold for the likelihood of women's self-employment, although there are some nuances. Having an education is not as important an indicator of self-employment for women compared to men, with the marginal probabilities tending to be smaller and showing less precision than those of men. Only in 1993-94 do we see a strong effect of education for women, when the probability of self-employment was 0.06 points higher for women with secondary education and 0.03 points higher for women with primary education compared to women with no education (both $p<0.01$). There is a positive effect of secondary education in 1999-2000 as well. Just like men, women also show strong and interesting differences across caste in the likelihood of self-employment: women in scheduled castes are 0.02 to 0.05 percentage points less likely to be self-employed compared to women in higher castes, and women in scheduled tribes are 0.03 to 0.04 percentage points more likely to be self-employed ($p<0.01$ in most years).

Religion operates a little differently for women compared to men, with being Muslim serving as a considerably stronger negative predictor of women's self-employment and

Hinduism having a positive and significant influence in only one of the four years. As with men, owning land is also one of the most important predictors of women's self-employment, with an increase in the probability of being self-employment ranging from 0.04 points to 0.11 points compared to women who own no land (all p<0.01). Interestingly, being married appears to be a more important predictor of self-employment for women compared to men, with marginal probabilities that are higher than those of men in every year and generally estimated with greater precision. Also in contrast to men, women are more likely to become self-employed as they age, with an additional year contributing on average about 0.01 points to the likelihood of women's self-employment. Finally, as with men, having pre-school children does not play much of a role in rural women's decisions to become self-employed.

Household Loan Activity

The analysis continues by examining the effect of household loan activity on the self-employment decision using the NSSO loan data merged into the NSSO employment files. Results for men and women are illustrated in Figure 2 and reported in fuller detail in Appendix Table 1. Each reported coefficient and standard error is obtained from a separate two-stage probit least squares estimation in which we instrument for six alternative measures of household loan activity. The first stage includes the state-level fixed effects and household-level instruments discussed earlier, and the second stage includes the full set of individual and household characteristics listed in the previous tables. The first measure of loan activity, "Loan total," is the total nominal value of a loan. The next two loan variables represent nominal loan values used for production and for consumption; the next two loan variables represent nominal loan values from formal sources and from informal sources; and the final variable is nominal loan values based in

cash. In all six measures, individuals who live in households with no loans are assigned a zero for the loan value variables.

For the first stages of each regression, we obtain the F-statistic and the p-value on the null hypothesis that the identifying instruments are jointly zero. Because this F-statistic was statistically significant ($p<0.05$) in every first-stage regression for men and women, we reject the null and conclude that our instruments are valid. In order to ascertain whether the instruments are important, we estimated "naïve" versions of the models that treated credit exogenously. The different coefficients obtained from these naïve estimates underline the importance of treating credit endogenously.

The most striking overall result in Figure 2 is the substantially stronger and more positive response of women's self-employment to having a loan compared to men. In every year for almost every measure of loan activity, the probability of women's self-employment depends positively and significantly on the loan amount ($p<0.05$ in 21 out of 24 regressions), while the relationship between men's self-employment and loan activity is small (or even negative) and statistically insignificant in most regressions. For example, in 1983, women's self-employment rose by 0.03 percentage points for every 1000 rupees in total loans ($p<0.01$), compared to no change for men. A similar result holds in terms of women having a substantially greater and more precisely estimated responsiveness to total loan activity compared to men in 1987-88 and 1993-94. Even in 1999-2000, when the marginal probabilities for men show somewhat greater precision compared to the earlier years, the magnitude of the male response to total loan value is still half that of women (both $p<0.001$). The difference between men and women is especially pronounced for loans used for production purposes, and loans that are cash-based. In both these measures of loan activity, men's self-employment has a very small and statistically insignificant

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marginal probability, while that of women is relatively large and precisely estimated in every year.

Interestingly, in three of the four years, women's probability of self-employment shows a considerably greater responsiveness to loans from informal sources such as moneylenders, employers, and family members compared to loans from formal sources. For example, in 1983, the probability of women's self-employment rises by 0.10 points for every 1000 rupees in loans from informal sources, compared to 0.06 points for every 1000 rupees in loans from formal sources. Also of note, except for 1987-88, women's self employment is more responsive to loans used for consumption purposes compared to loans used for production purposes. Finally, women's marginal probabilities most measures of loan activity drop off somewhat in magnitude in the final year. Note that we re-ran all regressions using loan values deflated with India's CPI as a robustness check, and our results did not differ in any meaningful way.

Finally, the increased availability of finance may have served to mitigate circumstances that tended to make women's work in self-employment less productive. For example, since much of rural female labor in India is uneducated and restricted in mobility, women are likely to be self-employed in "female" trades which tend to be small-scale and unprofitable (spinners, weavers, and makers of tobacco products). In this context, improved access to credit provided the opportunity for female entrepreneurs to move up the ladder of self-employment activities and to undertake more profitable work in larger-scale operations. Although we do not have the data on measures of scale such as profits or number of employees hired to formally test this assertion, we can examine occupational patterns over time to assess the extent to which credit may have facilitated shifts to more productive activities. To this end, Figures 3 and 4 present results for men and women for the most common occupational categories among the self-employed with

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and without loans in 1983 and in 1999-2000. As clearly shown, the most common occupation for men and women in both years, and also during the intervening years, was cultivators (owners). The dominance of cultivating land as the primary occupation was particularly true for the self-employed with no loans. While men showed more variation in other leading occupational categories during the 1983-2000 period, women (especially women with loans) were quite consistent in the high ranking of livestock farming and dairy farming over time. Although these descriptive results are simple correlations, they do suggest that for women, credit helped to facilitate the move from cultivation toward more capital-intensive livestock and dairy farming. A final point of interest is the steady rise of bidi making as a leading occupation among rural self-employed women during the 1990s, especially for women with no loans. Producing these hand-rolled cigarettes is a highly labor-intensive process in an industry comprised of both factory-based and home-based enterprises. The predominance of women with no loans in bidi production is consistent with the low capital needs in this industry.

Discussion and Future Research

This paper has examined the role of personal characteristics, household factors, and access to credit in decisions among men and women in India's rural labor households to become self-employed. The main finding is a pronounced difference between men and women in the responsiveness of the self-employment decision to credit: women's likelihood of engaging in self-employment is substantially stronger in response to a loan relative to men. Given the difficulty that poor women in India's rural sector have historically had in gaining access to the formal financial system, it is not surprising that when they are able to secure a loan, their probability of engaging in entrepreneurial activity shows a strong increase. As noted in Bennett (1992: 31), "Credit is, in a sense, the gateway to productive self-employment."

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Our results also indicate a strong reliance by both men and women on a variety of types of loans, including loans from formal and informal institutions, as well as cash-based and in-kind loans. This diversification of credit sources is a result that is not specific to India's rural sector. Previous evidence for Madras, one of India's largest cities, indicates that the majority of women who had obtained a relatively low-interest rate loan from the Working Women's Forum (a grass-roots social organization and credit network), had also obtained an informal loan from a high-interest rate money lender (Noponen 1991). Also similar to our results for rural laborers, Noponen also found that loan recipients in Madras used the loans they received from the credit network not only to generate income through self-employment, but also to smooth consumption and to repay outstanding loans, particularly those of the high-interest money lenders.

One of the most striking results for both men and women related to class differences within the lowest tier of India's social class system: belonging to a scheduled caste had a negative impact on the likelihood of becoming self-employed while belonging to a schedule tribe had a positive impact. In India, the scheduled castes and scheduled tribes categories are often banded together, so their different effects cannot be due to different policies. As of the early 1990s, the government has consistently used policy measures to over-represent these groups in public schools, public universities, and public office positions. Our results suggest that scheduled tribes consist of men and women who have some prior experience with home-based work producing artisan- and cottage-industry goods. This interpretation is supported with findings in Kijima (2006) that scheduled tribes, often found living in more remote areas than scheduled castes, have relatively limited access to infrastructure, irrigation facilities, communication facilities, and other employment opportunities in their villages. This observation suggests that scheduled tribes as a group rely more on their own skills to make a living and are more likely to

be self-employed. The scheduled tribes are known for their seasonal migration, particularly to areas with markets to sell their crafts and produce income. In contrast, scheduled castes tend to be pressured by upper castes to remain in their traditional occupations. Therefore, members of scheduled castes are often employed by others, as opposed to operating their own businesses (Vaid 2007).

Owning land serves as one of the strongest predictors of both men's and women's self-employment decisions. This result is largely explained by the use of land as collateral in obtaining credit. As argued in Bennett (1992), women's relative lack of land to use as collateral has limited their access to credit from institutional sources and made it much more difficult for them to acquire capital and tools for self-employment. Another interesting result was that having a pre-school child does not have much of a role in explaining rural women's self-employment decisions. This result contrasts with earlier research on female manufacturing-sector workers who perform home-based work so they can combine paid work with childcare obligations (Benería 2007).

These results were all based on individual cross-sections of household-level data. The advantage of such an approach is the ability to capture variation across individuals in self-employment activities and in household loan activity. However, the plausibility of our results hinges on the quality of our instruments. In ongoing research, our aim is to provide further evidence for the impact of credit on employment by aggregating the data at the state level, merging across years, and implementing a natural experiment approach that exploits the variation across states and over time in the opening of new rural bank branches.[2]

This study's findings imply that India's rural bank expansion, by improving access to financial resources, led to increased self-employment, especially for women. Employment shifts

away from unpaid or low-wage work toward more productive entrepreneurial activities has obvious implications for poverty. In particular, rural banking reform appears to have brought sizeable benefits to women who otherwise would have been more vulnerable to inadequate credit and insufficient protection against risk. Although the government's formal program to expand rural banking has ended, there is still room for policy reforms to improve access to credit, particularly among the poorest.

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Table 1. Individual characteristics and household factors for working-age adults in rural labor households, 1983-2000, India

	1983	1987-88	1993-94	1999-2000
Categorical (% of sample)				
Male	57.5	58.3	55.6	51.9
Self-employed	12.8	13.0	14.9	16.5
Education				
No schooling	74.1	72.1	67.2	58.8
Primary school	19.9	20.1	21.5	23.8
Secondary or higher	6.0	7.8	11.3	17.4
Caste				
Scheduled castes	32.7	31.1	32.7	31.5
Scheduled tribes	13.0	14.0	14.1	13.3
Other castes	54.3	54.9	53.3	55.2
Religion				
Muslim	8.1	8.6	7.4	8.9
Hindu	86.5	86.5	87.0	86.1
Other religions	5.4	4.9	5.7	5.0
Owns land	88.4	91.2	92.4	88.1
Married	80.7	81.5	81.9	73.9
Region				
North	8.4	10.3	10.2	8.7
East	15.4	13.0	12.8	14.3
West	15.5	16.7	17.2	16.8
South	34.4	32.8	33.9	32.5
Central	26.3	27.3	25.9	27.7
Continuous				
Age (years)	33.6	33.7	33.8	35.5
No. of household members	5.4	5.2	5.0	5.9
No. of pre-school children	0.7	0.7	0.7	0.6
No. observations	127,111	126,088	105,506	78,775

Notes: Weighted to national level with weights provided by the NSSO.
Source: Authors' calculations based on NSSO (various years).

Table 2. Loan activity for working-age adults in rural labor households, 1983-2000, India

	1983	1987-88	1993-94	1999-2000
Total sample				
Has at least one current loan (%)	44.4	35.5	37.3	34.1
No. observations	127,111	126,088	105,506	78,775
Sub-sample with current loans				
Type of loan (%)				
Cash only	80.5	73.6	76.4	77.9
Other types	29.2	35.1	30.2	54.4
Source of loan (%)				
Formal source	27.1	34.1	24.4	23.8
Informal source	82.4	74.8	82.2	88.3
Purpose of loan (%)				
Consumption	75.9	67.4	71.8	77.4
Production	28.0	34.6	25.2	26.3
Other purpose	7.4	9.2	11.4	41.5
Nominal value outstanding loans (rupees)	4,407	6,323	6,808	10,115
Real value outstanding loans (rupees)	4,407	4,961	3,016	2,852
No. observations	54,488	43,654	37,815	27,995

Notes: Weighted to national level with weights provided by the NSSO. Because some individuals live in households with multiple loans, the dummy variables for type, source, and purpose of current loans do not sum to 100.
Source: Authors' calculations based on NSSO (various years).

Table 3. Men's self-employment decisions: Marginal probabilities and standard errors for effects of individual and household characteristics, 1983-2000, India.

	1983	*1987-88*	*1993-94*	*1999-2000*
Education (ref=no schooling)				
Primary school	0.023***	0.013**	0.003	0.030***
	(0.006)	(0.005)	(0.006)	(0.008)
Secondary or higher	0.028***	0.009	0.002	0.086***
	(0.009)	(0.008)	(0.007)	(0.009)
Caste (ref=other castes)				
Scheduled castes	-0.038***	-0.045***	-0.040***	-0.057***
	(0.006)	(0.005)	(0.006)	(0.007)
Scheduled tribes	0.034***	0.038***	0.041***	0.011
	(0.009)	(0.008)	(0.010)	(0.009)
Religion (ref=other religions)				
Muslim	-0.015	-0.013	-0.005	-0.008
	(0.012)	(0.013)	(0.014)	(0.018)
Hindu	0.028***	0.036***	0.036***	0.021
	(0.009)	(0.009)	(0.009)	(0.014)
Owns land	0.067***	0.071***	0.067***	0.117***
	(0.006)	(0.006)	(0.010)	(0.006)
Married	0.008	0.014**	-0.002	0.031***
	(0.006)	(0.006)	(0.008)	(0.008)
Region (ref=Central)				
North	-0.021**	0.007	0.001	-0.015*
	(0.009)	(0.008)	(0.008)	(0.009)
East	-0.016*	-0.004	0.019**	-0.035***
	(0.008)	(0.008)	(0.009)	(0.009)
West	-0.016**	-0.030***	-0.009	-0.051***
	(0.007)	(0.007)	(0.008)	(0.009)
South	-0.025***	-0.016***	-0.017**	-0.057***
	(0.006)	(0.006)	(0.007)	(0.008)
Age (years)	-0.003**	-0.005***	-0.004***	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Age^2 (years^2/100)	0.008***	0.011***	0.009***	0.002
	(0.002)	(0.002)	(0.002)	(0.003)
No. of household members	0.011***	0.008***	0.015***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)
No. of pre-school children	-0.002	-0.002	-0.008**	-0.006
	(0.002)	(0.003)	(0.004)	(0.004)
No. observations	73,976	74,081	59,304	41,046

Notes: Weighted to national level with weights provided by the NSSO. The notation *** is statistically significant at 1%, ** at 5%, and * at 10%. Standard errors clustered at household level.
Source: Authors' calculations based on NSSO (various years).

Table 4. Women's self-employment decisions: Marginal probabilities and standard errors for effects of individual and household characteristics, 1983-2000, India.

	1983	*1987-88*	*1993-94*	*1999-2000*
Education (ref=no schooling)				
Primary school	0.012	-0.006	0.026***	0.009
	(0.009)	(0.009)	(0.010)	(0.008)
Secondary or higher	0.010	-0.010	0.060***	0.019*
	(0.017)	(0.015)	(0.017)	(0.011)
Caste (ref=other castes)				
Scheduled castes	-0.020***	-0.039***	-0.049***	-0.036***
	(0.006)	(0.006)	(0.007)	(0.007)
Scheduled tribes	0.035***	0.041***	0.025**	0.037***
	(0.009)	(0.009)	(0.011)	(0.010)
Religion (ref=other religions)				
Muslim	-0.042***	-0.034**	-0.054***	-0.042***
	(0.011)	(0.013)	(0.014)	(0.014)
Hindu	-0.007	0.025**	0.009	-0.002
	(0.010)	(0.011)	(0.012)	(0.012)
Owns land	0.035***	0.043***	0.103***	0.114***
	(0.008)	(0.008)	(0.010)	(0.007)
Married	0.033***	0.051***	0.052***	0.039***
	(0.006)	(0.006)	(0.008)	(0.006)
Region (ref=Central)				
North	0.013	0.111***	0.221***	0.167***
	(0.010)	(0.012)	(0.015)	(0.015)
East	-0.042***	-0.015	0.028**	-0.039***
	(0.008)	(0.009)	(0.013)	(0.009)
West	-0.005	0.004	-0.005	0.009
	(0.008)	(0.009)	(0.010)	(0.011)
South	-0.031***	0.015**	-0.015	-0.028***
	(0.006)	(0.007)	(0.009)	(0.008)
Age (years)	0.005***	0.002	0.007***	0.009***
	(0.002)	(0.002)	(0.002)	(0.002)
Age^2 (years^2/100)	-0.004**	-0.001	-0.007***	-0.009***
	(0.002)	(0.002)	(0.003)	(0.002)
No. of household members	0.007***	0.004***	0.012***	0.006***
	(0.001)	(0.001)	(0.002)	(0.002)
No. of pre-school children	0.001	0.001	-0.004	0.001
	(0.003)	(0.003)	(0.004)	(0.004)
No. observations	53,135	52,007	46,202	37,729

Notes: Weighted to national level with weights provided by the NSSO. The notation *** is statistically significant at 1%, ** at 5%, and * at 10%. Standard errors clustered at household level.
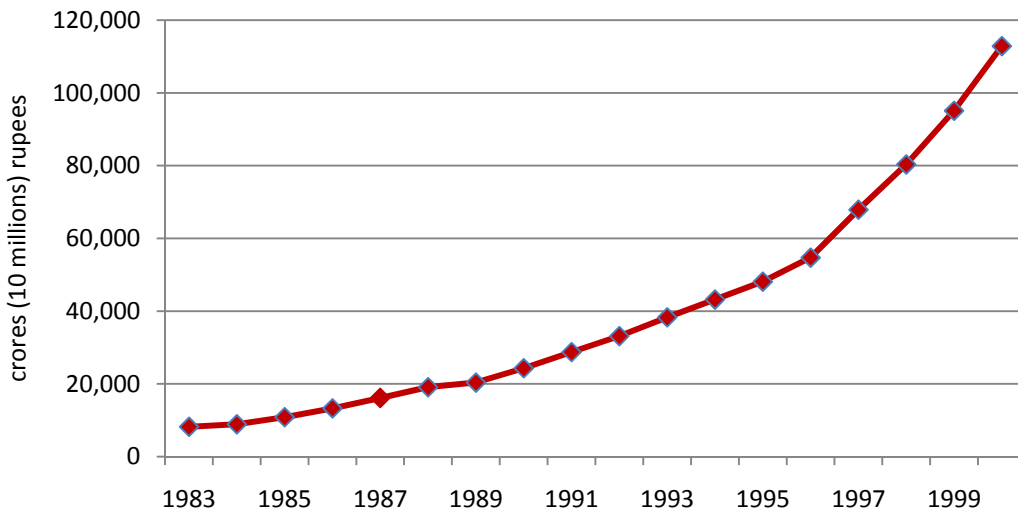**Source:** Authors' calculations based on NSSO (various years).

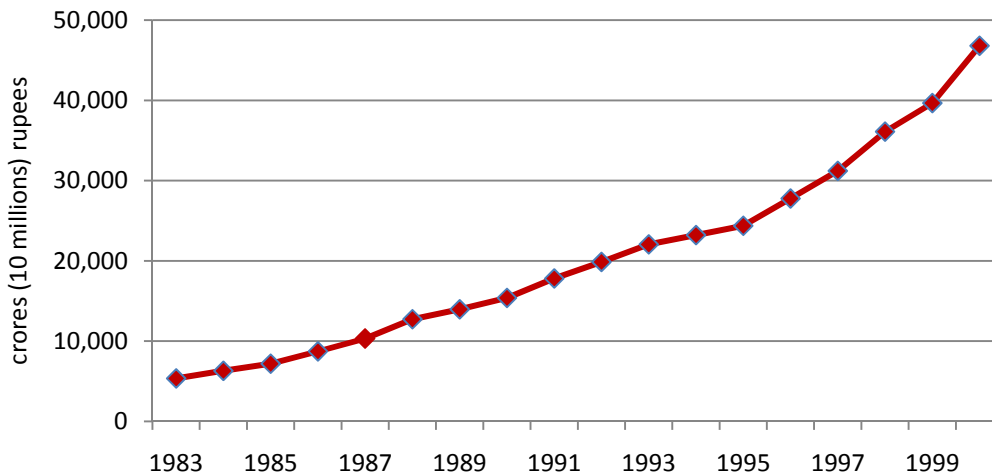**Figure 1.** Commercial bank activity in India, 1983-2000.

Panel A. Cumulative Branch Openings
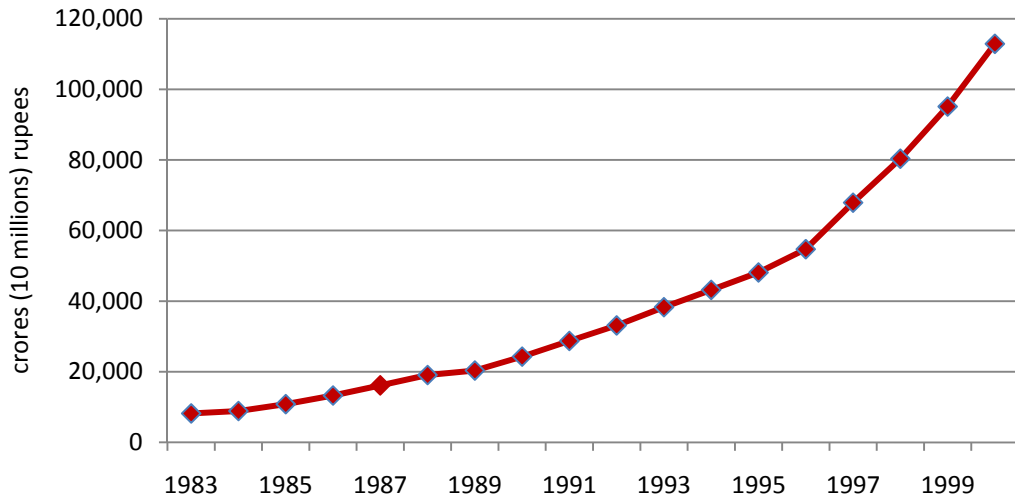
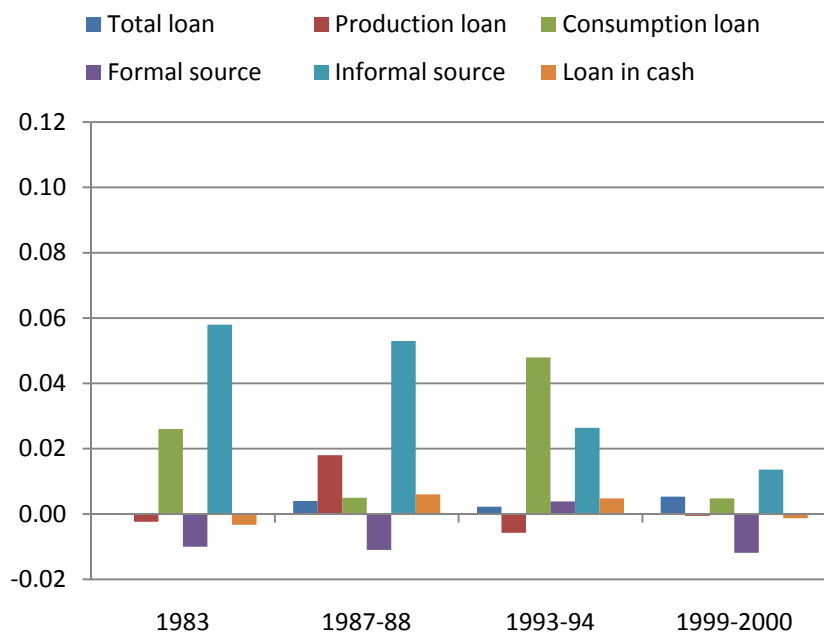Panel B. Total Commercial Bank Deposits in Rural Sector

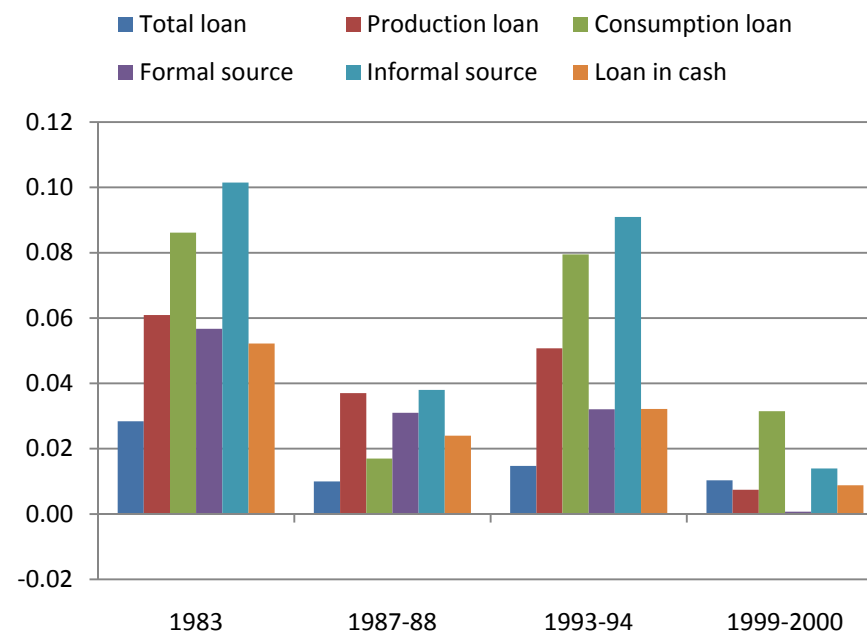Panel C. Total Commercial Bank Advances in Rural Sector

Source: Authors' calculations using Burgess and Pande (2005).

Figure 2. Effects of loan values on self-employment: Marginal probabilities from two-stage probit least squares models.
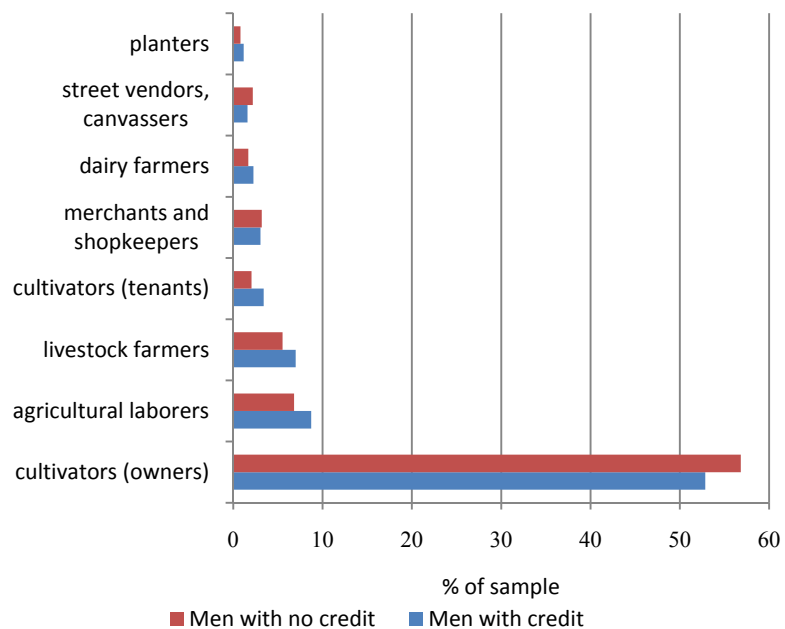
Panel A. Men (p<0.05 in 5 cases)   Panel B. Women (p<0.05 in 21 cases)
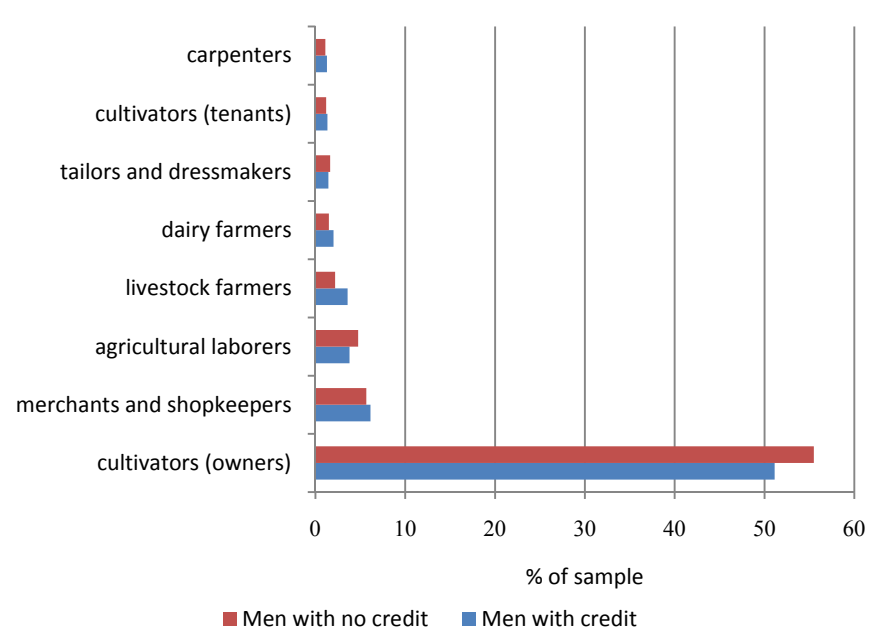

Source: Authors calculations based on NSSO (various years) and reported in Appendix Table 1.

Figure 3. Most common occupations by loan status: Men, 1983-2000.
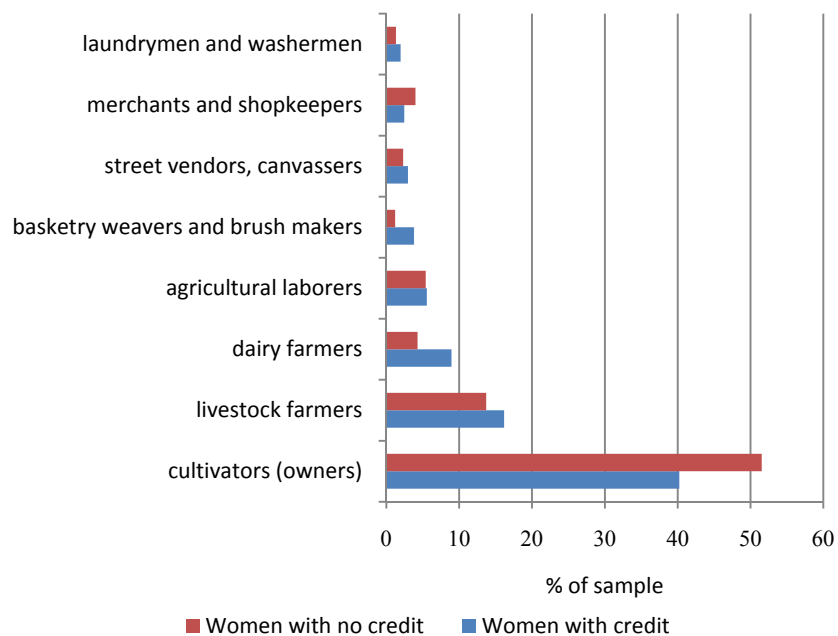
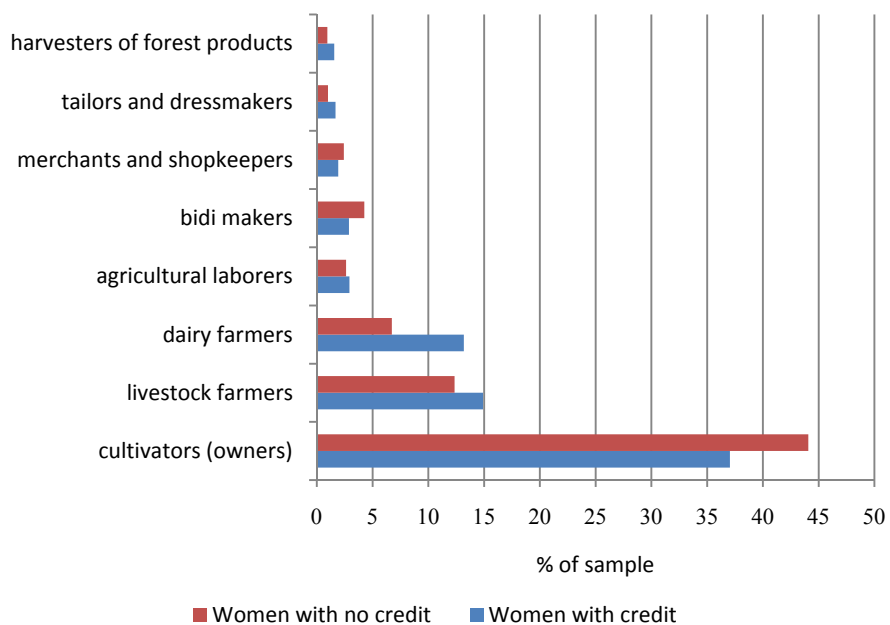Panel A. 1983

Panel B. 1999-2000

Source: Authors calculations based on NSSO (various years).

Figure 4. Most common occupations by loan status: Women, 1983-2000.

Panel A. 1983

Panel B. 1999-2000

Source: Authors calculations based on NSSO (various years).

Appendix Table 1. Men's and women's self-employment decisions: Marginal probabilities and standard errors for effects of loans using instrumental variables, 1983-2000, India.

	1983	*1987-88*	*1993-94*	*1999-2000*
Men				
Loan total	0.000	0.004	0.002	0.005[***]
	(0.007)	(0.006)	(0.004)	(0.002)
Loan for production	-0.002	0.018	-0.006	-0.001
	(0.014)	(0.024)	(0.014)	(0.003)
Loan for consumption	0.026	0.005	0.048[**]	0.005
	(0.038)	(0.021)	(0.024)	(0.004)
Loan from formal source	-0.010	-0.011	0.004	-0.012[***]
	(0.015)	(0.018)	(0.012)	(0.002)
Loan from informal source	0.058[*]	0.053[**]	0.026	0.014[***]
	(0.033)	(0.024)	(0.026)	(0.002)
Loan in cash	-0.003	0.006	0.005	-0.001
	(0.013)	(0.016)	(0.009)	(0.002)
No. observations	73,976	74,081	59,304	41,046
Women				
Loan total	0.028[***]	0.010[**]	0.015[***]	0.010[***]
	(0.006)	(0.005)	(0.005)	(0.002)
Loan for production	0.061[***]	0.037[**]	0.051[***]	0.007[***]
	(0.013)	(0.015)	(0.019)	(0.003)
Loan for consumption	0.086[**]	0.017	0.079[***]	0.031[***]
	(0.042)	(0.022)	(0.026)	(0.004)
Loan from formal source	0.057[***]	0.031[**]	0.032[**]	0.001
	(0.013)	(0.013)	(0.014)	(0.002)
Loan from informal source	0.101[***]	0.038	0.091[***]	0.014[***]
	(0.036)	(0.027)	(0.025)	(0.002)
Loan in cash	0.052[***]	0.024[**]	0.032[***]	0.009[***]
	(0.012)	(0.011)	(0.011)	(0.002)
No. observations	53,135	52,007	46,202	37,729

Notes: Weighted to national level with weights provided by the NSSO. Each estimate is obtained from a separate two-stage probit least squares regression that includes the full set of individual and household characteristics. Loan values are specified as nominal rupees/1000. The notation [***] is statistically significant at 1%, [**] at 5%, and [*] at 10%. Standard errors clustered at household level.
Source: Authors' calculations based on NSSO (various years).

ENDNOTES

[1] This first stage reduced form mirrors the reduced form in Pitt & Khandker (1998).

[2] Aggregation to the village level rather than state level may generate more precise results, but detailed banking data released by the Reserve Bank of India are at the state level rather than village level.