Banking and Marriage Markets

Evidence from India's Branch Licensing Policy

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Abstract

This paper estimates the effect of rural bank branch expansion on the probability of marriage of women and men in India. Using an instrumental variables approach, I find that the probability of marriage increases for girls but decreases for boys in response to an increase in per capita rural bank branches. Together these results lead to a tighter "marriage squeeze", that is, younger girls and older boys enter the marriage market. Consistent with previous literature the results are more concentrated in wealthier households who benefited more from a larger formal banking network. Lastly, I explore if positive female labor demand shocks can increase the value of an unmarried daughter and loosen the "marriage squeeze" effect of banking. However, using female labor demand shocks in the agricultural industry, I fail to find that such short-term increases in women's labor market opportunities can significantly mitigate the marriage market effects of the rural bank branch expansion.

1 Introduction

Increasing access to finance is one of the most popular development policy instruments used by governments and non-governmental organizations across the developing world today. There also exists a large and growing literature on the effects of access to finance, especially through microfinance programs, on socio-economic outcomes such as household consumption, health, education, agricultural investment and productivity, and many more (Banerjee, Duflo, Glennerster and Kinnan, 2015; Kaboski and Townsend, 2011, 2012). However, a large gap in the literature remains in understanding how these policies differentially affect women during critical stages of their lives.

Qualitative evidence suggests that, In India, parents dislike delaying a daughter's marriage for several reasons like higher dowry, declining number of potential matches, protection from sexual assault and pregnancy. However, early marriage can have long-run adverse effects on the health and education of women and their children (Field and Ambrus, 2008; Sekhri and Debnath, 2014; Chari, Heath, Maertens and Fatima, 2016). Therefore, marriage timing has been a major focus of research on women's welfare in developing countries. Additionally, in India, almost always, a daughter's wedding is accompanied with large dowry payments to the groom's family. This implies that access to finance is likely to play a key role in the probability of marriage of daughters. In this paper, using an instrumental variables approach, I present the estimates of the effect of access to rural banking in India on the marriage timing of women and men.

2 Conceptual Framework

Assume a simple model with two periods during which the household maximizes their utility, $(U(c_1, c_2))$, subject to the intertemporal budget constraint and credit constraint. The instantaneous utility, $u(c_t)$, is increasing and concave in consumption. The household chooses consumption, c_t, in each period. The household also chooses how much to borrow in the first period, b, which is constrained by a constant, α. The household pays an interest rate, r, on their borrowings. The household is saving instead of borrowing when $b < 0$. Lastly, the household chooses the period in which their daughter marries. m is an indicator that is equal to 1 if the daughter marries in the first period and zero if the daughter marries in the second period. Households will marry their daughter by the second period. This model focuses on the brides' side of the market and assumes that households can have their daughters married with certainty if they choose to.

The household income, y_t, is subject to idiosyncratic shocks and is an i.i.d. stochastic process. The household has to pay dowry, d_t, for their daughter's marriage in period t. The household has to invest i_1 in their daughter during the first period if she does not marry in that period. Daughter contributes positively to household consumption when $i_1 < 0$.

The household's optimization problem can be written as

$$\begin{aligned} \underset{c_1,c_2,m,b}{\text{maximize}}\ & U(c_1,c_2) = u(c_1) + \beta E_1[u(c_2)] \\ \text{subject to}\ & c_1 + md_1 + (1-m)i_1 = y_1 + b \\ & c_2 + (1-m)d_2 + (1+r)b = y_2 \\ & b \leq \alpha. \end{aligned}$$

Suppose μ is the Lagrange multiplier associated with the credit constraint, $b \leq \alpha$. The household will decide to have their daughter married in the first period rather than wait and have her marry in the second period if the value of the former is greater than the value of the latter. If the credit constraint binds, that is, $\mu > 0$ and $b = \alpha$, then the daughter marries in the first period if

$$u(y_1 + \alpha - d_1) + \beta E_1[u(y_2 - (1+r)\alpha)] > u(y_1 + \alpha - i_1) + \beta E_1[u(y_2 - d_2 - (1+r)\alpha)].$$

Given that the utility function is strictly concave, $d_1 > i_1$, and $d_2 > 0$, an increase in the credit limit, α, increases the value of marrying in the first period compared to the value of marrying in the second period, as

$$\frac{\partial[[u(y_1+\alpha-d_1) + \beta E_1[u(y_2-(1+r)\alpha)] - [u(y_1+\alpha-i_1) + \beta E_1[u(y_2-d_2-(1+r)\alpha)]]]}{\partial\alpha} > 0.$$

The above framework shows the main prediction of marriage timing in response to an increased access to credit: if the credit constraint is binding, an increase in the credit limit will increase the amount borrowed and consequently increase the probability of marriage of daughters.

3 Empirical Methodology

3.1 Branch Licensing Policy

From 1979 to 1993, the Indian Central Bank implemented the *Branch Licensing Policy* to expand the country's formal banking network to its rural areas. The policy was initiated so that the new rural bank branches could help in the distribution of the government's primary poverty alleviation program at the time, the *Integrated Rural Development Program*. The *Branch Licensing Policy* followed district-level rules, such that, districts that were above a pre-determined rural population-to-bank ratio cutoff received rural bank branches as an increasing function of their initial rural population-to-bank ratio. Therefore, I exploit these to rules to instrument for the per capita rural banks in a district and estimate its effect on the probability of marriage using a discrete-hazard model.

3.2 Data

The household data used in this study is the 1999 wave of the Rural Economic and Demographic Surveys (REDS). This is a nationally representative survey covering 7,500 rural households across 100 districts and 16 states in India. The REDS data is uniquely suited for this study as it records retrospective marriage information (such as, year of marriage and dowries paid and received) on all sons and daughters of the surveyed households. This enables me to match the rural banking data to a girl's natal district before and at the time she is in the marriage market.

To measure rural bank access, I use the Reserve Bank of India's Directory of Commercial Banks from 1951 to 1999. This data records the state, district, revenue division, and date of open of all commercial bank branches in India. Other data sources include 1971 and 1981 Indian Census and University of Delaware's Precipitation Data.

3.3 Identification Strategy

For causal identification, I use an instrumental variables approach by exploiting the district-level rules implemented during the Branch Licensing Policy. During the policy, if targeted rural branch expansion was successful, we should observe a higher per capita rural bank branches in deficit districts with high rural population-to-bank ratio. I test the effectiveness of the Branch Licensing Policy in increasing rural access to formal banking as follows:

$$\begin{aligned} PerCapitaRuralBanks_{dt} = & \sum_{N=1}^{3} \alpha_N [PhaseN_t * I(DeficitN_d > 0) * DeficitN_d] \\ & + \sum_{N=1}^{3} \beta_N [PhaseN_t * I(DeficitN_d > 0)] \\ & + \sum_{N=1}^{3} \gamma_N [PhaseN_t * DeficitN_d] + \sum_{N=1}^{3} \psi_N PhaseN_t \\ & + X_{dt} + District_d + Year_t + District_d * Year + u_{dt} \end{aligned} \tag{1}$$

In equation (1), N denotes the three *Branch Licensing Policy* periods: $Phase1$, $Phase2$ and $Phase3$ correspond to 1979 to 1981, 1982 to 1984 and 1985 to 1992, respectively. $PhaseN_t$ is an indicator variable that is equal to one during the years of policy period N and zero otherwise. $DeficitN_d$ is the difference between district d's initial population-per-bank ratio and the cutoff during policy period N. A higher $DeficitN_d$ indicates a higher initial rural population-to-bank ratio for district d. $I(DeficitN_d > 0)$ is an indicator variable that is equal to one if district d has a initial rural population-per-bank ratio above the cutoff and qualifies as a *deficit district*.

Table 1: Branch Licensing Policy Compliance

	$PerCapitaRuralBanks$
$Phase1_t * I(Deficit1_d > 0) * Deficit1_d$	0.00015*
	(0.00009)
$Phase2_t * I(Deficit2_d > 0) * Deficit2_d$	0.00019***
	(0.00005)
$Phase3_t * I(Deficit3_d > 0) * Deficit3_d$	0.00021**
	(0.00009)
Observations	4,704
Number of districts	96
R-squared	0.95
F-test on excluded instruments	42.50
	[0.00]

α_N is my coefficient of interest in equation (1). It shows how per capita banks in *deficit district* d changes due to a one-point increase in rural population-to-bank ratio from the policy cutoff during period N. A successful *Branch Licensing Policy* implies a positive α_N for all three policy periods. The estimation results of equation (1) using bank data from 1951 to 1999 are reported in Table 1. Consistent with the aims of the *Branch Licensing Policy*, coefficient estimates of α_N are positive and statistically significant. This confirms that *deficit districts* did receive more rural bank branches during the policy as a positive function of the their initial rural population-to-bank ratio. A F-test on the three-way interactions rejects that they are jointly insignificant ($F = 42.50$, $p = 0.00$). Therefore, based on equation (2), I use the three-way interactions between the policy phases, the *deficit district* indicators and the degrees of the deficits to instrument for the per capita rural bank branches in equation (1).

I use a discrete-time hazard model to estimate the impact of rural bank expansion on the probability of marriage. For my analysis, I create a retrospective panel for each child who is at the risk of marriage from 1951 to 1999 and exits the panel at marriage. I estimate the second stage of the instrumental variables model as follows:

$$\begin{aligned} Married_{ihdt} = & \theta PerCapitaRuralBanks_{dt} + Age_t + X_{dt} \\ & + Household_h + Year_t + District_d * Year + \epsilon_{ihdt} \end{aligned} \tag{2}$$

The dependent variable, $Married_{ihdt}$, is an indicator variable that is equal to one if a daughter i in household h in districtd d is married in year t and equal to zero in every year that she is unmarried. Age_t is a vector of age dummies. $Household_h$ captures household fixed effects to control for unobserved time-invariant characteristics of a household. θ is my primary coefficient of interest and measures the effect of an increase in per capita rural banks on the probability of marriage.

4 Results

In this paper, I find that an additional rural bank branch for 100,000 persons increases the probability of marriage of a girl by 3.2 percent and decreases the probability of marriage of boys by 4.04 percent. The probability that a girl (boy) is married during the average sample year is 10.37 (7.22) percent. The average annual increase in the number of rural bank branches for every 100,000 persons is 0.1036. Therefore, evaluated at the sample averages, the result implies a $((3.2X0.1036) \div 10.37) = 3$ percent increase in the probability of marriage of daughters and a $((4X0.1036) \div 7.22) = 5.74$ percent decrease in the probability of marriage of sons during a given year. I posit that these results together indicate that rural bank branch expansion leads to the tightening of the "marriage squeeze", that is, the pool of potential brides increases with younger girls entering the marriage market and the pool of potential grooms shrinks with boys entering the marriage market at older ages.

The effects of banking on marriage timing are statistically significantly more concentrated in households in the top quintile of landownership compared to the households in the bottom quintile of landownership. This is consistent with past literature, Kochar (2011), where wealthier households have been documented to have better access to the increases in the banking network.

Lastly, I test if increases in labor market opportunities can mute the *marriage squeeze* effect of bank expansion. However, I find that a short-term agricultural female labor demand shock cannot significantly mitigate the effects of banks on the marriage market.

5 Conclusions

In the past couple of decades, we have witnessed major interest and efforts towards providing access to finance to the remotest and poorest corners of the world. Several micro finance organizations have also realized the critical implications of women in household decision-making and only provide their financial products to women. Policies aimed at increasing access to finance will also need to consider how it will differentially affect women during certain critical stages of their lives such as birth, marriage, and others.

This paper finds that access to finance policies can have adverse effects such sex imbalance in marriage markets. However, there is some indication that long-term improvements in women's labor opportunities that also provide large returns to education investments can potentially reduce these adverse effects of banking on the marriage market. Therefore, it may be desirable to accompany access to finance policies with policies that improve the value of female labor demand and increase the standing of an unmarried daughter in a household.