Financial Access and Gender-wise Entrepreneurship: Evidence from Rural India

Sandhya Garg (IEG),
Samarth Gupta (Ahmedabad University),
Sushanta Mallick (Queen Marry University London)

Gender inequalities in Entrepreneurship

➢ **Gender gap in economic activity** (IFC 2013, Coleman 2002; Fairlie and Robb 2009; Bardasi, Sabarwal and Terrell 2011; Chaudhuri, Sasidharan, and Raj 2020)
  - Women-owned enterprises are lesser in number, smaller in size of output, sales and employment concentrated in less efficient sectors

➢ **Acquiring financial resources** as one of the key barriers (Raghuvanshi, Agarwal and Ghosh 2017; Kairiza et al. 2017, and Panda 2018)
  - Why? Restrictive social norms may limit women's ability to seek credit

➢ Counter-view: Lack of preference of women for entrepreneurship and credit uptake may create demand-side obstacles (Kumar et al. 2019; Fairlie and Robb, 2009; Langowitz and Minniti 2007)

Research Question

Does bank branch proximity increase entrepreneurship of women in India?

How does the effect compare with the effect for men?

What is the role of institutional credit?

➢Credit Channel

- Improved proximity to banks can reduce cost of collecting soft information about the potential borrowers (Rajan and Peterson, 1994; Agarwal and Hauswald 2010; Ergungor 2010)

- Digital banking still in its initial stages; bricks and mortar branches still important for lending (Srinivas and Wadhwani, 2019; NABARD, 2016)

Preview of Results

➢ We develop a novel dataset of distance to the nearest banked centre for each unbanked village in India (1951-2019)

➢ When a village becomes proximate to a bank branch (within 5 kms)
  ➢ Women's entrepreneurship in non-agricultural sector increases by 6.3%
  ➢ Men's entrepreneurship in non-agricultural sector increases but decreases by a corresponding margin in the agricultural sector

➢ Mechanism: Controlling for credit uptake (extensive margin) attenuates the effect on women's non-agri enterprises but not for men

Related Literature

We contribute toward role of finance in enhancing women empowerment

➢ Bruhn & Love (2011): In Mexican municipalities with a new bank branch,
  – women's income increased by a higher margin (9%)compared to men's (4.8%),
  – A higher proportion of women worked as wage earners, and a lower proportion of women reported to be unemployed.
  – Previously unemployed women and wage earning men were more likely to start an informal business in Azteca municipalities.

➢ Menon and Rodgers (2011): Social banking period in India in 1970s encouraged women's self-employment as own-account workers and employers.

Contributions

➢ Financial Inclusion one of key Sustainable Development Goals: Low demand for financial services may restrict supply-side effects (Kochar 1997; Kumar, Pal, and Pal 2019)

    ➢ We find evidence of supply-side effects for women

➢ Effects of bank branch establishment: Previous literature finds district-level representative effects (Burgess and Pande, 2005; Kochar, 2011; Menon and Rodgers, 2011)

    ➢ Ours is the first to estimate effects at the village-level

➢ Financial infrastructure allows for structural transformation (Banerjee and Newman, 1993; Rajan and Zingales, 1998; Ross, 2005)

   ➢ Nature of structural transformation varies by gender

Outline

➤ Reform Period for the Study

➤ Data Construction

➤ Empirical Methodology

➤ Robustness Check

➤ Conclusion

Expansion of banking sector in India after 2005

➤ 1990-2005: Villages allotted to Service Area Branches; borrowers required no-objection certificate to borrow from non-SAA branch

➤ Reforms after 2005: Removal of Service Area Approach

➤ Other Reforms:
  • 4 license for metro cities for opening 1 branch in under-banked districts of under-banked states
  • Fast approval for annual bank branch expansion

Number of New Branches opened each year in Rural and Urban Areas
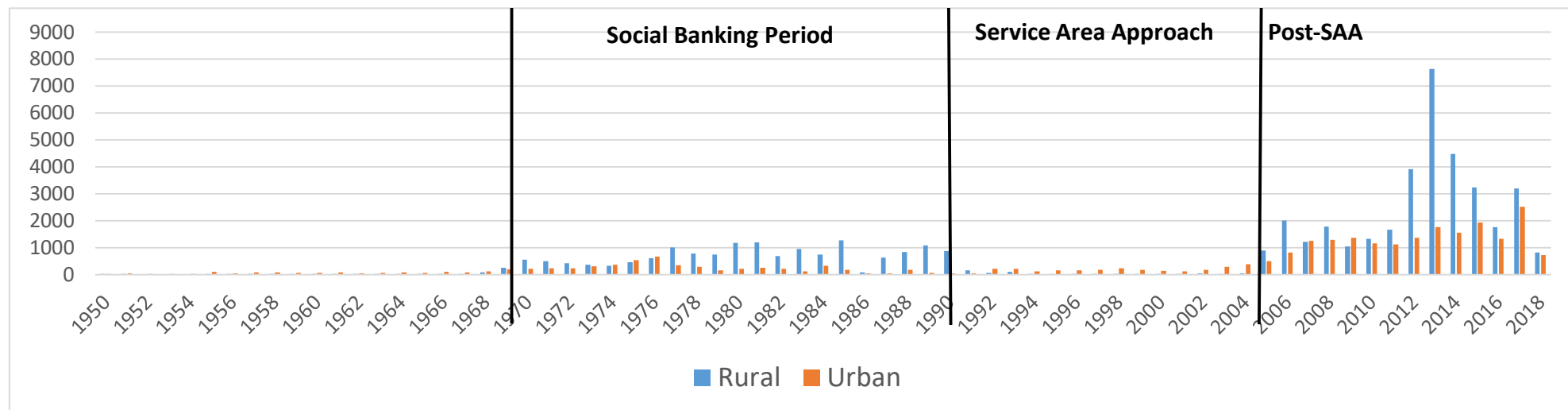
Financial Access at the Village level (1951-2019)

➤ We define financial access as the distances of each unbanked village to its nearest village/town with bank branch (banked-center)

➤ Computed for each year from 1951 to 2019 *(Garg and Gupta, 2020).*
  - RBI Directory of bank branches of October 2019 with date of opening and location
  - Includes 154,505 bank branches and offices
  - Matched 151,104 branches with 45,911 unique villages and towns (PC 2011) - a match rate of 97.4%.
  - Spatial data of villages/towns to measure distance between banked and unbanked villages

Entrepreneurship and Credit uptake

➢ Village-level Panel from Economic Census *(EC 1998, 2005, 2013)*

➢ Entrepreneurship
  • Number of female/male enterprises in agricultural, and non-agricultural sector

➢ Uptake of credit
  • Number of female/male enterprises with institutional finance as major source of credit in agricultural, and non-agricultural sector; Extensive Margin measure

➢ Other village-level characteristics: PC of 2001 and 2011
  • Literacy rate, distance to the nearest town, population size, dummies for paved road, cooperative bank, post office, agricultural credit society, electricity for commercial purpose

➢ Merge Financial Access Data with Village-level Panel using SHRUG Identifiers (Asher et al. 2020)

Methodology

➤ Identification Issues: Endogeneity of bank branch location
  - Unobservable time-constant village characteristics and macro changes
  - Unobservable time-trend of villages
  - Confounders which affect entrepreneurship and bank branch proximity

➤ Difference-in-Difference (D-I-D) estimation technique
  - Control Group: Unbanked villages which did not have a bank branch within 5km in 1998, 2005, and 2013.
  - Treatment Group: Unbanked villages which did not have a bank branch within 5km in 1998 and 2005, but received a new branch within a 5km between 2006 and 2013.

➤ Proximity to banks in 2013 correlated with village characteristics: literacy rate, size of population, distance to town, road, presence of domestic power and PACS from PC 2001
  - We include time trend of these indicators. (Covariate Selection)

➤ Choice of threshold as 5km driven by RBI's National Strategy of Financial Inclusion 2019-2024: A bank branch within 5 km of each village; results robust to 3km threshold

Intensity of Treatment

Size of the Treatment and Control Group

	Number	Proportion*
Treatment Group	74,444	13.90
Control Group	187,814	35.06

Note: *Proportion of villages with respect to all 535,663 villages in EC 2013.

Mean Distance of un-banked villages to the Nearest Banked-Centre (kms)

	1998	2005	2013
Treated	8.45	8.3	3.23
Control	9.81	9.84	8.42

Econometric specification

Measuring impact on Enterprises

We use the following difference-in-difference specification:

$$y_{vdt} = \gamma.Treat_{vd} * Post_t + \varphi_v + \varphi_t + \varphi_{dt} + Z_{vd(2001)} * Trend + \varepsilon_{vdt} \qquad (1)$$

- where, y_{vdt} is the outcome variable in village v, district d and at time t.

- $Treat_{vd}$ takes value '1' for villages which received treatment and '0' otherwise,

- $Post_t$ takes value '1' for year 2013 and '0' for pre-treatment years – 1998, 2005.

- φ_v, φ_t and φ_{dt} are village, year and district-year fixed effects

- $Z_{vd(2001)} * Trend$ are time trends of the covariates of bank proximity

The coefficient γ on the interaction measures the impact of bank branch becomes proximity within 5kms after 2005.

Results

Impact on Female Enterprises

Number of Female Enterprises	Total	Ag	Non-ag
Treated*Post 2005	**0.117**	**0.011**	**0.114***
	(0.097)	**(0.059)**	**(0.043)**
Village Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
District-Year Fixed Effects	Yes	Yes	Yes
Time trend of Covariates	Yes	Yes	Yes
Observations	6,54,192	6,54,192	6,54,192

➢ Non-agricultural enterprises owned by women increase by 0.114 units; equivalent to 6.33% of mean

Impact on Male Enterprises

Number of Male Enterprises	Total	Ag	Non-Ag
Treated*Post 2005	**0.059**	**-0.431****	**0.484*****
	(0.313)	**(0.192)**	**(0.189)**
Village Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
District-Year Fixed Effects	Yes	Yes	Yes
Time trend of Covariates	Yes	Yes	Yes
Observations	6,54,192	6,54,192	6,54,192

➢ Non-agricultural enterprises owned by men increase by 2.4% of mean but decrease in agricultural sector by 5.3%

➢ Shift in men's entrepreneurship from agri to non-agri.

➢ We use the following specification

$$y_{vdt} = \gamma.Treat_{vd} * Post_t + \boldsymbol{\beta_1}.(\boldsymbol{Treat_{vd}} * \boldsymbol{Post_t} * \boldsymbol{FF_{vdt}}) + \boldsymbol{\beta_2} * \boldsymbol{FF_{vdt}} + \sum \varphi_i + \varepsilon_{vdt} \qquad (2)$$

− where, FF_{vdt} is the *corresponding* number of firms which reported institutional credit as a major source of finance.

− Measure of credit uptake at the extensive margin

− Other covariates and fixed effects from equation (1) included.

➢ Hypothesis: Higher Credit Uptake affects entrepreneurship $\Rightarrow \beta_1 > 0$ and $\gamma \downarrow$;

i.e. Effect on y_{vdt} should get attenuated after controlling for uptake of institutional finance (number of enterprise which use institutional finance as major source)

Credit Uptake Channel for Women

Credit Channel	Total	Ag	Non-Ag
Treated*Post 2005	0.05	0.017	**0.081****
	(0.094)	(0.060)	**(0.041)**
Treated*Post 2005*FO_InstFin	1.562**		
	(0.611)		
Treated*Post 2005*FO_Ag_InstFin		-0.106	
		(0.158)	
Treated*Post 2005*FO_NonAg_InstFin			**0.450***
			(0.249)
Village Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
District-Year Fixed Effects	Yes	Yes	Yes
Time trend of Covariates	Yes	Yes	Yes
Observations	6,54,192	6,54,192	6,54,192

➤ Uptake of institutional credit explains effect on women entrepreneurship in treated villages

Credit Uptake Channel for Men

Credit Channel	Total	Ag	Non-ag
Treated*Post 2005	-0.046	-0.49***	0.429**
	(0.309)	(0.187)	(0.184)
Treated*Post 2005*MO_InstFin	0.144		
	(0.194)		
Treated*Post 2005*MO_Ag_InstFin		0.683	
		(0.469)	
Treated*Post 2005*MO_NonAg_InstFin			-0.019
			(0.157)
Village Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
District-Year Fixed Effects	Yes	Yes	Yes
Time trend of Covariates	Yes	Yes	Yes
Observations	6,54,192	6,54,192	6,54,192

➢ No evidence increase in institutional credit uptake for men; distance less of a barrier for men

➢ The credit uptake reflects extensive margin

➢ Men may increase usage at the intensive margin; *size* of loan amount may allow men to move away from agri. to non agri.

Robustness Checks

➢ Parallel Pre-Treatment Trends

➢ Analysis using 3kms

➢ Impact on Employment

➢ Analysis using Contemporaneous Covariates

➢ To check parallel pre-trends, we limit our data to pre-treatment period and use this specification

$$y_{vdt} = \gamma . Treat_{vd} * I(2005)_t + \varphi_v + \varphi_t + \varphi_{dt} + Z_{vd(2001)} * Trend + \varepsilon_{vdt} \quad (3)$$

where, $I(2005)_t = 1$ if year 2005 and 0 for 1998.

➢ If $\gamma \neq 0$, then divergence between the treated and control group *prior to the treatment.*

Testing Pre-Trends	Female enterprises			Male enterprises		
	All	Ag	NonAg	All	Ag	NonAg
Treated*I(2005)$_t$	-0.003	0.025	-0.004	0.56	0.228	0.312
	(0.082)	(0.041)	(0.038)	(0.355)	(0.168)	(0.257)
Observations	4,16,409	4,16,409	4,16,409	4,16,409	4,16,409	4,16,409

➢ We check for robustness by using 3kms as the threshold; i.e. $Treat_{vd} = 1$ if village receives a bank branch within **3kms**.

	Female Owned Enterprises			Male owned Enterprises		
	All	Ag	NonAg	All	Ag	NonAg
Treated*Post 2005	0.211**	-0.061	**0.217***	0.22	**-0.576***	**0.896***
	(0.096)	(0.056)	**(0.045)**	(0.314)	**(0.177)**	**(0.212)**
Observations	1,015,786	1,015,786	1,015,786	1,015,786	1,015,786	1,015,786

Impact on Employment

➢ Increase in non-agricultural entrepreneurship should also reflect in labour markets.

➢ We test for increase in male and female employment in these sectors

	Female employment			Male employment		
	All enterprises	Ag enterprises	NonAg enterprises	All enterprises	Ag enterprises	NonAg enterprises
Treated*Post 2005	0.908**	-0.417**	1.258***	0.843	-0.698***	1.647***
	(0.4)	(0.199)	(0.274)	(0.564)	(0.253)	(0.426)
Observations	6,54,192	6,54,192	6,54,192	6,54,192	6,54,192	6,54,192
Adjusted R-squared	0.542	0.492	0.496	0.638	0.536	0.624

➤ Alternative Empirical Strategy: Use TWFE on EC 1998 and EC 2013 (not EC 2005)

➤ Advantage: Control for *near*-contemporaneous covariates from PC 2001 and PC 2011 instead of time-trend interacted with PC 2001 covariates

| | Dependent variable: Number of Enterprises | | | | | |
| | Female Owned | | | Male owned | | |
	All	Ag	NonAg	All	Ag	NonAg
Treated*Post 2005	0.204	0.024	**0.206*****	0.268	-0.469	**0.749****
	(0.156)	(0.092)	**(0.072)**	(0.508)	(0.297)	**(0.316)**
Observations	4,23,693	4,23,693	4,23,693	4,23,693	4,23,693	4,23,693

Conclusion

➢ Banking and financial sector aids in structural transformation and occupational choices (Banerjee and Newman, 1993).

➢ Women's occupation choice less elastic due to restrictive social norms (Morrison and Jutting, 2005)

➢ Our finding: Nature of structural transformation varies for men and women.
- Increase in female entrepreneurship is fully driven by expansion in non-agricultural sector
- Men exit agricultural sector and move toward non-agriculture enterprises
- Labour markets reflect the overall changes in entrepreneurship

➢ Mechanism: Proximity to bank branches allow women to obtain credit; Men *may be* increasing value of loans.

Thank You

Email: **samarth.gupta@ahduni.edu.in**
sandhyagarg@iegindia.in
s.k.mallick@qmul.ac.uk

Financial Access at the Village level (1951-2019)

Average distance to the nearest banked-centre: All unbanked villages (1951-2019)

Average distance of un-banked villages
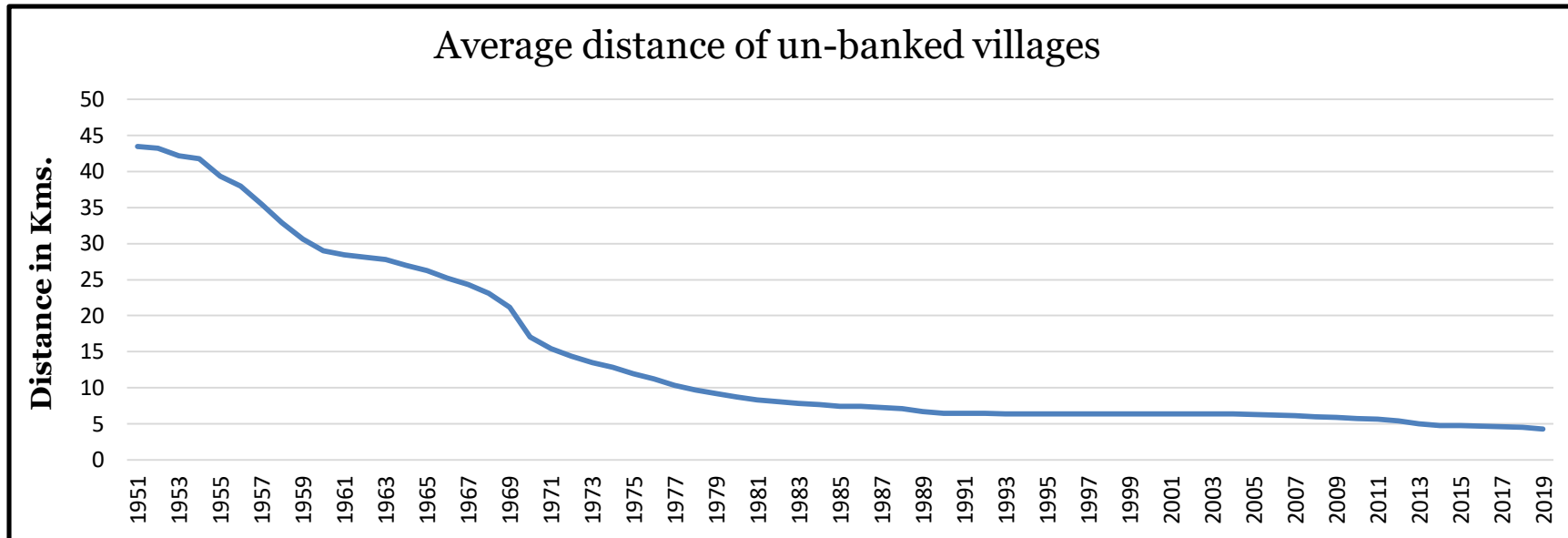
Discussion
Contd..

- ❖ Credit market results show
  - No impact on access to formal credit as major source of finance
  - Persistence of money-lenders

- ❖ Proximity to banks a source of more accurate soft information about the borrows (Rajan and Peterson, 1994).

- ❖ Rural India has a higher reliance on non-institutional sources of credit.
  - Ghosh and Vinod (2017) and Menon and Rodgers (2011)

- ❖ A possibility of moneylenders to borrow from banks and lend to people.
  - Bell (1990) and Surendra (2020)

- ❖ Lower demand of formal banking services
  - Kochar (1997) and Kumar, Pal and Pal (2019)

Proximity to a banked-center

Easier to switch labour supply than switching a self-employed occupation (i.e., an enterprise)
- Magnitude of estimated ATE was higher for employment indicators than for enterprises
- This impact is stronger for women

- Other factors could explain slower movement of women as entrepreneurs
    - Social norms may make women's occupational choices less elastic (Morrisson and Jutting, 2005),
    - Lower human capital invest for women restricts their entry in more productive sectors (Aterido, Beck and Iacovone, 2013)
    - Behavioral factors account for much of the gender gap in entrepreneurship (Langowitz and Minniti, 2007)

Summary Statistics

Table 1: Summary (Average per village)

	Treated		Control	
	Obs	Mean	Obs	Mean
Female Enterprises				
All	1,72,350	3.56	4,81,865	3.21
Non-Ag	1,72,350	1.80	4,81,865	1.55
Ag	1,72,350	1.42	4,81,865	1.39
Male Enterprises				
All	1,72,350	28.39	4,81,865	25.02
Non-Ag	1,72,350	19.77	4,81,865	16.11
Ag	1,72,350	8.10	4,81,865	8.32
Female Employment				
All Enterprises	1,72,350	22.89	4,81,865	20.46
Non-Ag Enterprises	1,72,350	15.29	4,81,865	12.71
Ag Enterprises	1,72,350	6.72	4,81,865	6.92
Male Employment				
All Enterprises	1,72,350	51.16	4,81,865	44.32
Non-Ag Enterprises	1,72,350	39.22	4,81,865	32.12
Ag Enterprises	1,72,350	10.94	4,81,865	11.16

Notes: (i) Obs refers to number of villages over three rounds of data. (ii) Mean refers to average value of respective indicator per village.

Data
Contd…

- ➢ Limitations of the data *(Garg and Gupta, 2020)*
  - *Only Commercial banks.*
  - *Data on bank closures not available.*
  - *Exact location of bank branch within village/town not identifiable.*
  - *Boundaries as of 2011 population census.*
  - *Not possible to compute travel distance for past years.*
    - Studies find high correlation between straight line and travel distance in access to health facilities - in Yemen (Al-Taiar et al., 2010); in US census tracts (Boscoe, Henry and Zdeb, 2012) and in Montreal (Apparacio et al., 2008).
    - Exceptions are found in difficult terrain such as a shoreline, mountainous regions and other physical barriers (Leyshon et al, 2018).
    - We computed travel distance between for the state of Maharashtra, Punjab and Haryana for the year of 2021.
    - Villages with straight line distance between 0-5kms: The mean and median travel distance was 5.64kms and 4.79kms respectively
    - Villages with a straight-line distance above 5kms: The mean and median travel distance were 14.8kms and 10.84kms respectively. Therefore, what we consider more proximate to a banked center using straight line distance is also proximate by travel distance.

The Size of Branch Closure/Merger/Conversion: All India Level
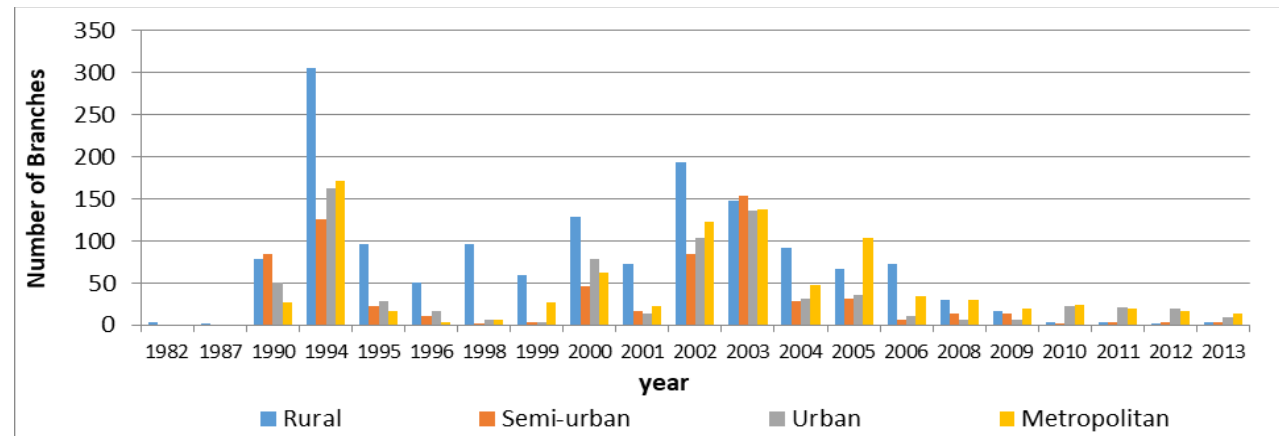
Covariates of banked-center proximity

- Literature suggests that the following factors influence location of bank branches
  - Size and density of population; Level of education; Share of urban population; Size of the profitable market; Growth rate; Unemployment rate; and Level of economic activity
  - (Alama and Tortosa-Ausina 2012; Ansong et al 2015; Crocco et al. 2010; Fernández-Olit et al. 2019; Hegerty 2016; Maudos 2017; Ghosh 2012; and Zhang et a. 2021).

- A logit regression of the treatment indicator of a village (1 if the village received treatment and 0 otherwise) on various socio-demographic and economic covariates
  - Infrastructure such as roads and domestic power; size of population, literacy rate, proximity to town, and presence of other financial service providers such as PACS are strong determinants of proximity to a bank branch.