

ORIGINAL ARTICLE

Determinants of women's financial inclusion: evidence from India

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Abstract

A number of studies have analyzed the determinants of financial inclusion in India, but few if any have focused specifically on the factors that shape women's access to finance. This paper draws on the trove of women-specific data collected in the fourth round of the National Family Health Survey (NFHS-4), conducted in 2015–16 in India, to examine the factors that influence women's access to finance. The results indicate that while the forces that shape women's access to finance function at multiple levels, micro-level factors appear to be powerful drivers of inclusion. The analysis reveals that household-level economic indicators like wealth, gender of household head and their rural-urban location are crucial, but so are individual-level characteristics which explain approximately 83% of the variation in the multilevel regressions. Informal gender norms that govern women's mobility and economic activity crucially influence the ability of women to access loans and open bank accounts.

KEYWORDS

Financial inclusion, Household finance, Gender, India

1 | INTRODUCTION

The past few decades have witnessed a phenomenal expansion of financial markets. In terms of intermediary efficiency, quality of institutions and depth of markets, there has been a sea change in the role and functioning of the financial sector (Krishnan 2011). For least developed countries, for example, the average credit-GDP ratios have more than doubled since the 1990s, increasing from an average of 10% in the 1990s to 24% in 2010–18. Similar transformations have been experienced by emerging economies like China and India where the figures averaged at 92% and 24% in the 1990s and 142% and 51% respectively in the 2010–18 period.¹ Previous studies have noted the several beneficial effects of financial development on growth, savings, and a range of macroeconomic variables (Levine 2005; Rajan and Zingales 1998). But even as the recent explosion of financial development has aided investments, risk sharing, growth and industrialization, there have been concerns that the pattern of financial development has been lopsided and that even as it has transformed economies and contributed to their growth, its benefits have not trickled down to the most vulnerable households, resulting in “discernible gap between the availability of finance and its accessibility and use” (Ghosh and Vinod 2017: 60).

It is in this context that financial inclusion has acquired immense importance in recent policy discourse. The increasing importance being given to financial inclusion stems from the recognition that the ability to participate in financial markets and have access to cheap, reliable financial products can have important welfare implications for households. Financial inclusion has been shown to increase household savings, promote employment, improve resilience to economic and environmental shocks and to decrease poverty (Ellis et al. 2010; Ruiz 2013; Swamy 2014). But despite its multiple benefits, scores of studies have drawn attention to inequities in financial access. In the context of developing economies where societies have long been characterized by interlocking social and economic gradients, there remain major barriers to accessing financial services for households and individuals from socially marginalized backgrounds (Kumar and Venkatachalam 2019; Kumar 2013; Ghosh and Vinod 2017; Asiedu et al. 2012; Demirgüç-Kunt et al. 2013; De Andrés et al. 2021; Aristei and Gallo 2016).

It is with this background that this paper studies factors that shape women’s financial inclusion in India based on micro evidence drawn from the latest available round of the National Family Health Survey (NFHS-4). The focus on understanding women’s access to finance is important for two reasons. First, there exist large gender differentials in economic opportunities, mortality, nutrition, education and a whole range of crucial indicators of well-being (Duflo 2012; Pande 2003; Osmani and Sen 2003; Sen 1989; Demirgüç-Kunt and Singer 2017; Ghosh and Vinod 2017). The persistence of such inequalities erodes the agency of women and thus constrains their ability to participate fully in social and political life. Eliminating such gaps holds immense intrinsic value and is a prerequisite for building democratic and sustainable societies.² It is precisely in recognition of this that gender empowerment has become a central plank in today’s development discourse, perhaps best reflected in the UN’s Sustainable Development Goals which has established, as one of its aims, the goal to “achieve gender equality and empower all women and girls”. Improving women’s financial inclusion can contribute to this goal because access to financial

¹ World Bank Database.

² Additionally, it is worth noting that women’s empowerment has also come to be seen as a powerful instrument of development, as several studies have asserted that women’s status in society can have powerful spill-over effects on educational and nutritional outcomes for children, the overall human capital for the economy and its aggregate savings and growth as well (Prina 2015; Duflo 2003, 2012; Seguino and Floro 2003; Klasen and Lamanna 2009).

markets has been shown to reduce women's economic vulnerabilities, encourage entrepreneurship, and so on (Fareed et al. 2017; Pitt et al. 2006; Suri and Jack 2016).

The focus on financial inclusion as an instrument of women's empowerment then brings us to a second point. There is widespread belief that economic growth tends to dilute the importance of identities, and thus the most effective guarantee of eliminating gender inequalities may simply lie in the promises of development rather than specific gender-oriented policies (Duflo 2012). Valuable as these insights are, the very fact that gender differences have been so persistent and the very fact that they continue to shape contemporary societies, points to the complex entanglements between economic development and gender. This was precisely what the wave of feminist scholarship that emerged in the 1970s, and that paved the way for bringing gender into the forefront of academic debates, insisted when they first began analyzing deep-rooted structural causes of gender differentials and cultural biases in society (Federici 1975; Smith 1974; Pateman 1988). These studies emerged as a reaction to the dominant post-War discourse which either ignored gender inequalities altogether or recognized it only to dismiss it as a temporary, and hence relatively unimportant, phenomena (Boserup 1974). Feminist scholarship instead asserted the central role of women in shaping modern-day economies (Amsden 1988, 1990; Friedan 1963). It noted the multiple ways in which women contributed to value creation through their unpaid work as caregivers and child bearers, much of which was rendered invisible and, hence, underestimated by society (Vogel 1983; Federici 1975). This underestimation was, in turn, seen as being part and parcel of broader patriarchal values that were deeply ingrained in society and which even shaped academic discourse. By asserting the socially constructed nature of gender differences and by indicating the centrality of women's economic contributions, this scholarship critiqued the simplistic view that had held sway until then, which treated gender inequalities as temporary aberrations in an otherwise linear teleological development journey. Today, of course, the centrality of gender and its complex entanglements with development have come to be widely recognized and this has resulted in an enormous new literature that has been shaped by feminist concerns (Duflo 2012; Pande 2003; Osmani and Sen 2003; Sen 1989; Aterido et al. 2013; Demirgüç-Kunt and Singer 2017; Bhattacharya 2017). Concomitantly, there has been increasing stress on the fact that gender inequalities may be persistent and may need active policies oriented towards ending gender differentials (Eckhoff et al. 2019; Hendriks 2019). Here financial inclusion may provide a powerful instrument towards this important goal.

Given the crucial importance of women in the development process, this paper focuses on exploring the factors that shape women's access to financial markets in India. In doing so it makes two central contributions. First, it draws on the fourth round of NFHS which consists of a women-specific questionnaire containing information on key dimensions of women's status in the country, including data on women's access to bank accounts and microfinance loans. To the best of our knowledge, this is the first paper to utilize the NFHS survey to analyze the question of women's financial access in the context of India (see Table 1). Second, while analyzing outcomes for women, it is important for us to remember that gender disparities are socially constructed and that they are shaped by a combination of factors, some that are formal and others that are informal; some that function within the household sphere and others that function beyond it (Sen 1990, 1989; Osmani and Sen 2003; Holvoet 2005; Vijaya et al. 2014; Agarwal 1997; Deere et al. 2012; Mabsout and Steveren 2010). Existing studies in the Indian context tend to ignore these multi-level forces as they largely take households as their starting units of analysis (Ghosh and Vinod 2017; Kaur and Kapuri 2020; Rajeev et al. 2011). This paper by contrast is able to address these multi-faceted factors driving women's financial inclusion using the information at the state, household as well as individual levels. In particular, the NFHS dataset allows us to analyze the salience of intra-household

TABLE 1 Gender as a determinant of financial inclusion in India

Author(s)	Data source	Methodology	Results
Ghosh & Chaudhury (2019)	World Bank's Findex (2017)	Fairlie nonlinear decomposition technique	Explains gender gaps in FI to be the result of socio-economic differences between men and women
Ghosh & Vinod (2017)	NSSO 70th Round AIDIS (2013)	Probit and Double Hurdle model	Uses three different measures of FI and shows that gender of household head significantly affects FI.
Chaudhuri, Sasidharan & Raj (2020)	4th Round of the Indian MSME Survey (2006–07)	Logit estimation; Oaxaca Decomposition	Firm-owner's gender influences access to credit from formal institutional sources.
Rajeev, Vani & Bhattacharjee (2011)	NSSO 59th Round AIDIS & SAS (2003)	Exploratory statistics	Female-headed households have lower access to credit (especially poorer and self-employed)
Kaur & Kapuria (2020)	NSSO 70th Round SAS (2013)	Multinomial logistic regression	Female-headed households have greater access to non-institutional finance and have relatively lesser access to institutional finance. Females from socially disadvantaged groups have lower access to institutional finance.
Chavan (2020)	BSR (from 1996) and CMIE (2014–18)	Linear probability model	Points to gender gaps in access to credit.

Note: AIDIS: All India Debt and Investment Survey; SAS: Situational Assessment Survey; BSR: Basic Statistical Returns of Scheduled Commercial Banks; MSME: Micro, Small and Medium Enterprises; CMIE: Center for Monitoring Indian Economy.

arrangements on women's financial inclusion which is not often captured by other studies. The empirical analysis suggests that women's access to financial services are shaped by broader state-level factors, by household endowments, but most importantly by individual-level factors as well, including informal norms that govern women's freedom of mobility or their economic autonomy vis-à-vis male members of the household.

It is with this background in mind that the rest of the paper is structured as follows: Section 2 outlines a brief literature review, followed by a detailed description of the data and methodology in Section 3. Section 4 explains the results and the final section provides some concluding remarks.

2 | LITERATURE REVIEW

Financial inclusion has been defined as “a process that ensures the ease of access, availability, and usage of the formal financial system for all members of an economy” (Sarma and Pais 2011: 613). Its importance has come to be recognized by policy makers because even as financial markets in developing countries have experienced a sea change in their scope and efficiency, these transformations have not always gone hand in hand with balanced, equitable access to financial markets

for households (Kumar 2013; Dymksi 2005; Ghosh and Vinod 2017). Socially marginalized households in particular have lagged behind, leading scholars to suggest “that it is not enough to assume that FI [financial inclusion] will happen on its own... the onus has come onto the policymakers to provide the same” (Swamy 2014: 2).

Given these findings, a large body of literature has emerged that has explored the determinants of financial inclusion. Some studies have looked at micro-level determinants of financial inclusion in the context of developing countries (Zins and Weill 2016; Soumaré et al. 2016; Asuming et al. 2019; Dar and Ahmed 2020), while others have focused on cross country evidence and have emphasized the role of macroeconomic, social and human development indicators in influencing the levels of financial inclusion (Sarma and Pais 2011; Datta and Singh 2019; Alber 2019). Within this emerging body of work, several studies have emphasized the gendered nature of financial inclusion and have pointed to evidence of wide gender gaps in access to financial services (Demirgüç-Kunt et al. 2013; Asiedu et al. 2012; De Andrés et al. 2021; Aristei and Gallo 2016).

In the Indian context, gender gaps in access to finance have received substantial attention (Table 1). Drawing on household-level data from the 70th round of NSSO's All India Debt and Investment Survey (AIDIS), Ghosh and Vinod (2017) look at the determinants of financial inclusion using probit as well as double hurdle models. After controlling for household and state-level variables their analysis finds a statistically significant relationship between financial inclusion and gender, with female-headed households being less likely to be financially included than male-headed households. In a similar vein, Kaur and Kapuria (2020) utilize the Situational Assessment Survey (SAS) from the same NSSO round using multinomial logit and find that female-headed households tend to have lesser access to formal credit than male-headed households (but that in the case of informal credit that situation is reversed). These results are also confirmed by the exploratory analysis of Rajeev et al. (2011) who analyze the 59th round of NSSO's AIDIS and its Situational Assessment Survey (2003). NSSO rounds provide rich household-level data to analyze these questions and have thus been widely used but studies have come to similar conclusions utilizing other datasets as well. The empirical studies conducted by Chavan (2020), Chaudhuri et al. (2020), and Ghosh and Chaudhury (2019) use the CMIE consumer pyramid's survey (2014–15), 4th round of Indian Micro, Small and Medium Enterprises (2006–07) and Global Findex 2017 respectively, to confirm the gender gap that has been widely noted. Chavan (2020), in particular, notes how even though women's access to banking services in India has increased over time, women still lag behind men on crucial dimensions like bank account usage and credit access.

The studies discussed above in the Indian context are primarily focused on investigating the existence or non-existence of gender differentials in financial access. Much of the survey data that they rely on is collected at the household level and thus gendered differentials in financial access are usually estimated by comparing male- and female-headed households. This is undoubtedly a valuable exercise and can reveal important information for policymakers. But from a policy perspective, it is not enough just to assert the existence of gender differentials across households or even estimate their sizes. In addition to knowing whether or not women are treated unequally, it is extremely important to unearth what barriers they face and what factors promote the financial inclusion of women by taking individuals as the starting point of analysis. Moreover, given that gendered outcomes are perpetuated by a wide range of factors, it is necessary to explicitly incorporate the multi-level forces that shape them (Agarwal 1997; Deere et al. 2012; Vijaya et al. 2014; Mabsout and Steveren 2010). It is with this context in mind that the next sections empirically study the multi-faceted dynamics that drive women's financial inclusion.

3 | DATA AND METHODOLOGY

As is evident, much of the work that has been done on India has focused on household determinants of financial inclusion and how gender in particular shapes it. This paper by contrast seeks to specifically understand the determinants of women's access to finance. Towards this end, we draw on the NFHS-4 dataset which provides a wealth of evidence on household assets, fertility practices, nutrition, education, social and behavioural norms and so on. To the best of our knowledge this is the first paper that utilizes the NFHS survey to analyze financial inclusion in the Indian context. The fourth round of the Survey, which is the most recent, was conducted in 2015–16, in 17 different languages and was based on a two-stage stratified sampling strategy which identified 28,586 primary sampling units³ (of which 28,522 were finally completely surveyed corresponding to 601,509 households). For our purposes, we make use of the fact that NFHS-4 has collected data on two crucial dimensions of women's access to finance. The NFHS questionnaire has gathered information regarding women's ownership and use of bank or savings accounts. This is our primary proxy for financial inclusion. In a separate set of questions, surveyed women were asked if they were aware of any microcredit programmes in their vicinity and whether they took loans from it for their businesses. Women's response to whether they took loans or not was a binary response. We use this binary response variable as our second measure for women's financial inclusion.

To statistically analyze the determinants of financial inclusion, we estimate the regression model given below:

$$FI_{ihs} = \alpha + \beta X_{ihs} + \varepsilon_{ihs} \quad (1)$$

where FI refers to our measure of financial inclusion for the i th female in the household, h and state, s ; X_{ihs} is a matrix of explanatory variables which include a wide range of individual, household and state-level variables; ε_{ihs} is the error term.

Coming to our primary measure, which is women's access to bank/savings accounts, we estimate Equation (1) using probit as it is a binary response variable. Additionally, we try to account for the hierarchically clustered nature of NFHS sampling by using a multi-level probit regression. Although we are focusing on the determinants of women's financial inclusion, women are nested in households, which in turn are nested in primary sampling units within states (Dey and Raheem 2016). Previous studies have shown that broader institutional factors on the one hand and more micro-level factors on the other hand can work in opposite, contradictory directions, often overruling one another in the context of women's well-being. For example, in culturally conservative regions where patriarchal norms are deep seated at the group-level, improvements in women's individual economic status may attract greater backlash from men, resulting in greater rather than lesser domestic violence against women (Bhalotra et al. 2021; Weitzman 2014); worse rather than better labour outcomes (Dhamija and Roychowdhury 2020). Thus extra-household patriarchal institutions can play an important role in setting boundaries for what women can and cannot legitimately claim. In many cases, it is therefore necessary to explicitly disentangle these forces (Mabsout and Staveren 2010). Since women belong to households which are in turn nested in villages and states, we would like to account for this clustering when interpreting the results. More explicitly, women within households are likely to make decisions based on household characteristics as well as their own individual characteristics and these may vary across states as well.

³ Primary Sampling Units (PSUs) are villages and Census Enumeration Blocks that are selected for the NFHS survey (with the probability proportional to population). The number of households surveyed in a PSU are between 15 and 60.

If clustering of this sort is indeed ignored, then there is the danger of interpreting the standard errors and confidence intervals incorrectly (Rabe-Hesketh and Skrondal 2008). To eliminate the potential bias that may arise due to correlations across these levels, we add a multi-level probit regression that incorporates three levels (individual, household and state-level).

We use a probit regression to analyze the second measure of financial inclusion as well, but the estimates may be biased because this measure of financial inclusion is incidentally truncated as arguably, it can only be observed for women who have knowledge about microfinance programmes in the first place. Analyzing women's participation in microfinance loan schemes while ignoring their selection into the sample can lead to biased estimates because of the inherent selectivity bias (Heckman 1979; Winship and Mare 1992). To overcome this issue, we utilize a bivariate probit model with a Heckman style correction which incorporates explicitly the truncated nature of our binary outcome variable (Greene 2009; Maddala 1983). The procedure involves estimation by two stages in which, first, the selection mechanism is considered and then the regression for the outcome variable is analyzed considering only those who have been selected into the sample.

As mentioned above, we use *bankaccess* and *tookloan* as the main dependent variables. *bankaccess* refers to the question "has bank or savings account that respondent uses". *tookloan* refers to the question "ever taken a loan, cash or in kind, from these programmes, to start or expand a business" as asked in the NFHS questionnaire. *knowloan* refers to the question "knows programme in this area that give loans to women to start or expand a business". There are 122,351 observations that give information about both *bankaccess* as well as *knowloan*. While 52% of the women in our sample have access to a bank account, 48% don't have one. Only 37% of women know of microcredit options while the rest do not. Of the total sample only 15.5% have ever taken a loan through microcredit programmes. Table A1 shows the number of women who did or did not take loans by *bankaccess* and *knowloan*. About 18% of those women who have bank accounts took loans, and about 15.5% of those who knew of available credit programmes took loans. Those who do not know about the credit programmes obviously have not taken loans. Table A2 shows the distributions of those with *bankaccess* by education and wealth. We use *bankaccess* and *tookloan* for the probit and multi-level probit regressions. We use *tookloan* with respect to *knowloan* (as the selection variable) for our Heckman selection probit model.

Conceptually speaking, women's access to finance ought to be seen as being driven by a broad set of factors. Previous literature that has analyzed female deprivation by employing household bargaining models, have emphasized how dynamics of conflict and cooperation within households determine outcomes for women (Caridad Bueno and Henderson 2017; Doss 2013). This theoretical tradition posits that as women's endowments—education, access to land or income and so on—increase, so do their fallback options or threat points, all of which positively contribute to their well-being (Panda and Agarwal 2005; Datta 2006; Aizer 2010; Agarwal 1997). An important implication of these studies is that they indicate that intra-household arrangements are crucial determinants of gender inequalities. Thus, from the bargaining literature perspective, the use of aggregative lenses to analyze women's deprivations can potentially miss individual experiences of deprivation that women face.⁴ Having said this, as mentioned earlier, other strands of literature

⁴ To take an example, in the context of sub-Saharan Africa, Brown et al. (2019) find that nutritional deprivation measured at the individual level diverged considerably from household level in the sense that approximately 75% of nutritionally deprived women and children did not belong to the poorest 20% of households. Similarly, for the Indian state of Karnataka, Vijaya et al. (2014) found that while the differences between male- and female-headed households were small, individual poverty rates were significantly different for men and women. Deere et al. (2012) similarly point to how poverty lines based on household headship often underestimate the extent of women's poverty in Latin America and Caribbean.

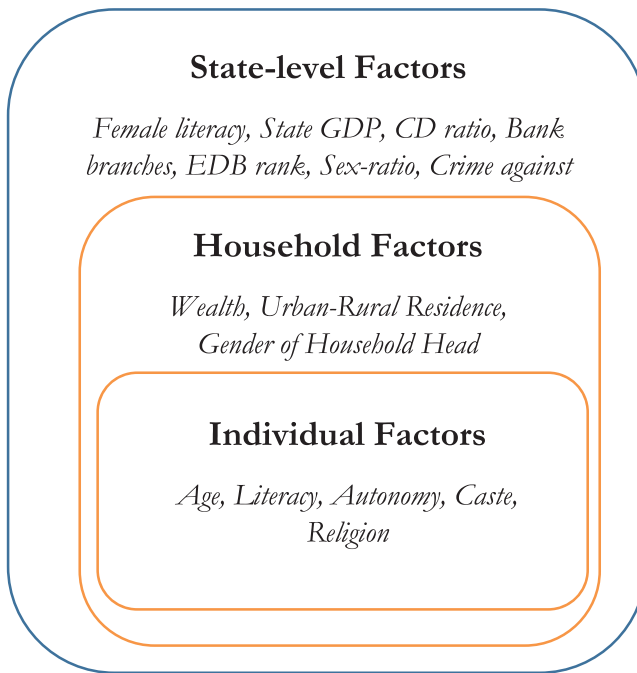


FIGURE 1 Conceptual framework
[Colour figure can be viewed at
wileyonlinelibrary.com]

have indicated how the capabilities of women are crucially mediated by household and broader, extra-household institutional contexts. Demirgüç-Kunt et al. (2013), for example, show how legal and cultural barriers at the country level impinge upon women's access to finance. Further, studies have shown how in patriarchal cultural settings, improvements in women's endowments may actually attract penalties rather than rewards because any effect emanating from increasing individual endowments "may be overruled by the influence of culture, and more specifically of gendered institutions in society, or gendered structures of constraint which generally limit women's behavior more than men..." (Mabsout and Staveren 2010: 784). Accordingly, having greater access to education, income or assets at the individual level may not guarantee individual well-being given the factors that work at extra-household levels (Dhamija and Roychowdhury 2020; Mabsout and Staveren 2010). All this strongly suggests that economic and developmental outcomes for women are governed by wide-ranging forces that function at multiple, yet interrelated levels (Agarwal 1997). We therefore posit that the ability of women to access financial services is likely to be influenced by individual, household and broader community/state-level forces. Figure 1 provides a sketch of the conceptual framework that informs our empirical analysis. Accordingly, the regressions use the following independent variables and in this we follow the lead of previous studies that use micro-level data.

Individual-level variables:

- *Age*: age refers to the age of the woman at the time of survey. The mean age of the women in our sample is 29.89 years. We expect a positive effect on the dependent variable. *agesq* is the squared term of age which we include to capture the quadratic effect of age (Zins and Weill 2016). We expect that as age increases, its effect on the dependent variable will initially increase and eventually decrease beyond a certain limit.

- *Literacy*: *educ* refers to the highest educational level attained by the women. There are four categories, namely no education, primary, secondary and higher education. We expect that those with higher education would have access to bank accounts. Previous studies have indicated the importance of literacy as a determinant of financial inclusion (Ghosh and Vinod 2017). Female literacy is closely related to women's bargaining power within families (Wang et al. 2020).
- *Autonomy*: Autonomy has been used in a number of different ways in literature but in the most fundamental sense it refers to the control that women exert on their own lives. Previous studies have shown that autonomy can play an important role in women's well-being (Rizkianti et al. 2020; Duflo 2012; Abadian 1996; Bloom et al. 2001). In our regressions we use two measures of autonomy. To measure economic autonomy, we use *labpart* which measures women's labour participation (Duflo 2012; Andersen and Eswaran 2009; Murthi et al. 1995). The questionnaire asked if the "respondent is currently working". About 23% of the women were working. We expect those with jobs are more likely to have bank accounts and take out loans. Table A3 shows that 19.75% of female-headed households have a bank account and are working. For male-headed households this number is 12%. Furthermore, 31% of female-headed households neither work nor have a bank account and 39% in male-headed households don't. We also use women's freedom of mobility to incorporate non-economic, physical, dimensions of female autonomy, which can play a very important role in determining outcomes for women (Hanson 2010; Bloom et al. 2001). A question in the NFHS questionnaire asks women if they are "usually allowed to go to the market". The respondents are asked to choose from "not at all", "alone" and "with someone else only". We use "not at all" as the base category (no autonomy). Partial autonomy refers to "with someone else only" and full autonomy refers to "alone".
- *Religion*: *religion* refers to the religion of the respondent. We use four categories, namely, Hindu, Muslim, Christian and Other minorities (Sikh, Buddhist, Jain, Jewish, Parsi, other and those who report "no religion"). Of those interviewed, 73.3% are Hindus, 14.9% are Muslim, 7.2% are Christian and the remaining are Other minorities. We expect that those belonging to the dominant religion are more likely to have bank access, as previous studies have pointed to the existence of persistent discrimination against religious minorities in India (Basant 2007; Jamil 2017).
- *Caste*: Caste, like gender, is an important marker of social hierarchies in India. The questionnaire divides respondents into four categories, namely Scheduled Caste (18.3%), Scheduled Tribe (19.2%), OBC (40.7%) and Others (21.8%). We treat Others as forward castes for this analysis. *castedum* is a dummy variable consisting of two categories, namely, upper caste and lower castes, with the lower caste as the base category for the purpose of this paper. Previous studies have noted barriers to financial inclusion for lower castes and thus we may expect to find significant differences between upper and lower caste households (Kumar and Venkatachalam 2019; Kumar 2013; Kaur and Kapuria 2020).

Household-level variables:

- *Gender of Household Head*: *hhgender* refers to the gender of the household head—84.5% are male-headed households and the remaining 15.5% are female-headed households. If women lack sufficient bargaining power within households, we expect women who are a part of male-headed households will be less likely to be financially included. As mentioned in the previous section, there is considerable evidence of a gender gap in financial inclusion and while much of this work has focused on extra-household forces that constrain women's access,

intra-household bargaining dynamics may also matter (Agarwal 1997; Gammage et al. 2020; Eckhoff et al. 2019).

- *Urban-Rural Effect*: Previous studies have shown wide urban rural gaps in economic outcomes, thus we incorporate *residencetype*, which refers to the type of place of residence, which is either rural or urban—70% are from rural areas and 30% are from urban areas (Anand and Thampi 2016).
- *Wealth*: *wealthindex* is a categorical variable that is divided into five categories ranging from poorest to richest with each category being represented equally in our data. NFHS does not report actual income of those interviewed. It reports an index of wealth based on household ownership of certain consumer goods and utilities. This is divided into five wealth quintiles. We expect that women from wealthier households are more likely to open and use bank accounts (Ghosh and Vinod 2017). However, we expect women from lower wealth quintiles to be more likely to seek loans from microfinance organizations given the general structure of microfinance institution (MFI) models which target low income women (Armendáriz and Morduch 2010).

State-level variables:

- For the multilevel regressions we use some state-level variables. *LSDPPC* refers to the log of state domestic product per capita. *female* refers to female literacy rates (%), *CDR* refers to the credit-deposit ratio as per sanction (%) and *branch* refers to the number of bank branches at the state level. *EDBrank* refers to the ease of doing business rank for the year 2016. *CDR* has been used as a proxy for financial development in previous studies, while *EDBrank* is widely used as a measure of institutional quality (Guru and Yadav 2019; Corcoran and Gillanders 2015). *sexratio* refers to the sex ratios, and lastly *rateofcrime* refers to the rate of crimes against women in each state. In the context of India, where sex-ratios have been historically low (indicating more men per 1000 women in the population), *sexratio* can be interpreted as a measure of discriminatory social norms or “son-preference” at the state level (Murthi et al. 1995; Sen 1992). All state-level variables are taken for the year 2016. The descriptive statistics for the state-level variables are given in Table A4. Data for *LSDPPC*, *female*, *CDR*, *branch* and *sexratio* are drawn from the EPW time series data set. We draw *rateofcrime* from the National Crime Records Bureau. *EDBrank* is drawn from the Reserve Bank of India website.

Table A5 provides the correlation matrix for some variables of interest. As can be seen from the matrix, the highest correlation coefficient is 0.47, between female education and wealth. The correlation coefficient of female education and age is -0.32 , potentially suggesting some kind of a generational effect. The correlation between wealth and caste is 0.28. Also, as mentioned above those who have bank accounts are not necessarily the ones who took loans. As Table A5 shows, the correlation between women who took loans and those who have bank accounts is 0.08.

4 | RESULTS

Table 2 results show the coefficients of the probit and multilevel probit estimations for both *bankaccess* and *tookloan* as dependent variables. We first discuss the probit results for *bankaccess*. We find that the coefficients of *age*, *wealthindex* and *labpart* are all positive and strongly significant at the 1% level. We can say that an increase in any of these variables would result in an

TABLE 2 Probit and multilevel probit regressions for *bankaccess* and *tookloan* dependent variables

VARIABLES	(1) <i>bankaccess</i>	(2) <i>tookloan</i>	(3) <i>bankaccess</i>	(4) <i>tookloan</i>
<i>age</i>	0.0464*** (0.00281)	0.150*** (0.00653)	0.0467*** (0.00295)	0.159*** (0.00724)
<i>agesq</i>	−0.000444*** (4.43e-05)	−0.00186*** (9.74e-05)	−0.000442*** (4.65e-05)	−0.00198*** (0.000107)
<i>Primary</i>	0.113*** (0.0137)	0.0864*** (0.0265)	0.115*** (0.0143)	0.104*** (0.0288)
<i>Secondary</i>	0.442*** (0.0116)	0.0776*** (0.0229)	0.453*** (0.0122)	0.0897*** (0.0250)
<i>Higher</i>	0.931*** (0.0173)	−0.246*** (0.0338)	0.965*** (0.0183)	−0.246*** (0.0371)
<i>Partial autonomy</i>	0.0806*** (0.0146)	0.00142 (0.0313)	0.0818*** (0.0155)	−0.0117 (0.0343)
<i>Full autonomy</i>	0.491*** (0.0145)	0.0852*** (0.0297)	0.504*** (0.0154)	0.0793*** (0.0327)
<i>hhgender</i>	−0.212*** (0.0110)	0.0299 (0.0215)	−0.225*** (0.0118)	0.0306 (0.0236)
<i>castedum</i>	−0.0657*** (0.0105)	−0.0872*** (0.0217)	−0.0668*** (0.0111)	−0.101*** (0.0235)
<i>wealthindex</i>	0.108*** (0.00399)	−0.0548*** (0.00834)	0.113*** (0.00423)	−0.0619*** (0.00912)
<i>labpart</i>	0.207*** (0.00973)	0.224*** (0.0173)	0.211*** (0.0102)	0.230*** (0.0189)
<i>Muslim</i>	−0.155*** (0.0133)	−0.0482 (0.0298)	−0.163*** (0.0142)	−0.0377 (0.0324)
<i>Christian</i>	−0.0294 (0.0233)	−0.0560 (0.0414)	−0.0417* (0.0245)	−0.0353 (0.0443)
<i>Other minorities</i>	0.0816*** (0.0220)	−0.134*** (0.0467)	0.0820*** (0.0230)	−0.123** (0.0497)
<i>residencetype</i>	0.0194* (0.0101)	0.000473 (0.0194)	0.0242** (0.0107)	0.0247 (0.0213)
<i>LSDPPC_2016</i>			0.407*** (0.124)	0.0361 (0.139)
<i>female_2016</i>			−0.0172** (0.00727)	−0.00914 (0.00815)
<i>CDR_2016</i>			0.000428 (0.00253)	0.00460 (0.00287)
<i>EDBrank_2016</i>			0.0146** (0.00702)	0.00805 (0.00783)

(Continues)

TABLE 2 (Continued)

VARIABLES	(1) <i>bankaccess</i>	(2) <i>tookloan</i>	(3) <i>bankaccess</i>	(4) <i>tookloan</i>
<i>sexratio</i>			0.00236** (0.00108)	0.00428*** (0.00124)
<i>rateofcrime</i>			0.00128 (0.00156)	0.00131 (0.00177)
<i>branch_2016</i>			1.40e-05 (1.57e-05)	9.08e-06 (1.75e-05)
var(_cons[<i>stateid</i>])			0.0621*** (0.0164)	0.0737*** (0.0199)
var(_cons[<i>stateid</i> > <i>hhlevel</i>])			0.0776*** (0.00501)	0.143*** (0.0190)
Constant	−1.211*** (0.0829)	−4.251*** (0.193)	−7.834*** (1.747)	−8.359*** (1.966)
Observations	115,925	43,373	113,078	42,008
Number of groups			31	31

Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

increase of predicted probability of *bankaccess*. The coefficients indicate that as we move to higher levels of education, the probability of having bank access increases. The average marginal effects (not reported here) show that an increase in probabilities for *wealthindex* and *labpart* are 3.7% and 7%, respectively. These results, which indicate the importance of literacy and wealth, are in line with much of the previous literature (Zins and Weill 2016; Fungáčová and Weill 2015; Ghosh and Vinod 2017). The importance of women's autonomy is reflected in our results for the dummy variables we have taken for women's freedom of mobility. These results are statistically significant and show that women who tend to have more freedom of mobility have higher predicted probabilities of owning bank accounts. Women who have full autonomy to go to markets and by proxy handle money have a 17% increased probability of owning bank accounts. This variable gives us the strongest effect in our regression. The positive effect of *labpart* can be explained partially by the fact that female labour force participation can increase women's bargaining power within households, which positively impacts their financial autonomy (Andersen and Eswaran 2009, Murthi et al. 1995; Wang et al. 2020). In South Asian settings where women are usually viewed as economic burdens to families, market work may also contribute to enhancing their social status by reducing demands for dowry (Makino 2021). This result is in line with previous literature, which indicates a positive relationship between labour participation and financial inclusion (Aterido et al. 2013).

As far as age-related variables are concerned, we find that age is positive while *agesq* is strongly significant and negative. The results suggest an Inverted-U kind of effect, that is, as women grow older they initially are more likely to be financially included but beyond a point the likelihood to use bank accounts declines. This result aligns with previous studies which show that deprivations faced by women tend to get worse as they grow older. For example, it has been noted that excess female mortality in India—or what has come to be known as the “missing women” phenomenon—is driven primarily by missing women in older age groups (Anderson and Ray

2010). Much of this can be explained by declining access to household resources and concomitant increases in poverty as women age (Calvi 2020).

Similarly, the gender of the household head (*hhgender*) is significant but negative, implying that women belonging to households headed by males are less likely to have bank accounts. The average marginal effects are 0.07 for gender of household head, which means there is a 7% lower chance of having and using bank access if the women belong to households headed by men. This may be due to the fact that women in male-headed households are likely to have lesser autonomy to take care of their own or family finances. There is vast evidence that has been unearthed on gender gaps in financial inclusion in India (Table 1). Our result aligns with this literature but in addition it suggests that women's access to financial markets may be influenced by power relations within the household level suggesting that "informal structural domains" may be important driving forces behind gender gaps in financial inclusion (Eckhoff et al. 2019: 974).

For religion, we find that Muslim and Christian women have lower predicted probabilities than Hindu women to have *bankaccess* with negative coefficients. Muslim and Christian women have 5% and 1% lesser probability of having bank accounts as compared to Hindu women. The caste dummy shows that as we move from lower to upper caste women, we get lower predicted probabilities of having *bankaccess*. This result seems to be unexpected given that considerable evidence has pointed to a caste gap in financial inclusion (Kumar 2013; Kumar and Venkatachalam 2019; Kaur and Kapuria 2020; Ghosh and Vinod 2017; Chavan 2020). Our result, however, may be explained by the complex "intersectionality"⁵ of caste and gender in India that can get overlooked by studies that take households as their units of analysis. Ambedkar (2014) once noted that the perpetuation of caste hierarchies in Indian society was premised on patriarchy. Caste rankings, he stressed, were built upon feudal notions of status and purity, which could only be perpetuated by observing strict rules of endogamy and thus by strictly controlling women's reproductive labour. Accumulation of status was therefore premised on strengthening chains of patriarchy. In the context of India, several studies have found that the women in upper caste families are in many ways far more constrained due to the status seeking behaviour of their families which foster segregation, discourage women's labour force participation and so on (Eswaran et al. 2013; Makino 2021). In particular, studies have noted how women in upper caste households are more likely to engage in status production within households rather than market work, thus suggesting that status is accumulated at the cost of women's earning capacities and thus their financial autonomy (Das 2006). These studies suggest that the "perceived collective gain to households by way of family status may come at the expense of women's individual status, especially among the higher castes" (Eswaran et al. 2013: 330). We can speculate that this probably explains why the results on the caste dummy take the signs that they do in Table 2.

Finally, the urban-rural location (*residencetype*) variable shows that women from urban areas tend to have higher probabilities of owning a bank account, which is consistent with evidence of wide urban-rural differentials in India (Anand and Thampi 2016).

Estimation (2) analyzes *tookloan* as the dependent variable, taking the same independent variables as Estimation (1). Here age variables (*age*, *agesq*), female labour participation (*labpart*) and caste (*castedum*) are the only variables that have a similar impact on *tookloan*, as in Estimation (1). But in contrast with (1), we find that those with higher education and those from wealthier families tend to have lower probabilities of taking microfinance loans. We should note here that the average marginal effects are smaller for primary and secondary education when compared to women with tertiary education in Estimations (1) and (3) and larger for Estimations (3)

⁵ See Shields (2008) and Folbre (2020) for a discussion of this term.

and (4). Compared to uneducated women, those with primary education are more likely to take loans while those with tertiary education are less likely to take loans. This is reflective of the fact that microfinance schemes are generally targeted at individuals—especially women—from poorer households (NABARD 2019; Armendáriz and Morduch, 2010). It is interesting to note that the gender of the household head is not significant, suggesting that programmes that are targeted at the poor and women—as many microfinance programmes tend to do—may be effective in overcoming at least some of the intra-household barriers that exist in financial inclusion. Neither is religion statistically significant, except for those belonging to the “other” religions wherein their predicted probabilities are lowered for taking loans. Freedom of mobility, only when considering full mobility, has a positive effect on *tookloan* with an increase in marginal probability. Urban-rural location of household (*residencetype*) is not significant in this regression. Thus, microfinance programmes that are specifically targeted to the needs of vulnerable households, alleviate many—though not all—barriers that are statistically significant in Estimation (1). All the estimations in Table 1 have *p*-values less than 0.01 from the LR tests, showing that at least one of the coefficients is different from 0.

We also run logit regressions in Estimations (9) and (10), provided in Table A6 in the Appendix, to check the robustness of the model and to ensure that the choice of link functions has not significantly shaped the results. We find that most of the results in the logit estimation correspond to the ones we have obtained in Table 2. State dummies were included in all the regressions but are not reported here for brevity.

In Estimations (3) and (4) we run multilevel-probit regressions. We include household-level and state-level explanatory variables along with individual characteristics to see if they contribute to the variance. We find that the individual- and household-level results remain more or less the same as in the first two estimations. Both estimations have *p*-values less than 0.01 for both LR and Wald tests. For state-level variables, we find that state domestic product (*LSDPPC*) has a positive and significant impact on *bankaccess*. Like at the micro level, higher female literacy shows lower predicted probabilities than those with lesser education. Ease of doing business rank has a positive effect on *bankaccess*. As expected, higher sex ratios in states result in higher probabilities of women having *bankaccess*. Surprisingly, cash-deposit ratio (*CDR*) and number of bank branches in the state (*branch*), which can be taken as measures of financial development, do not have any significant effect on the dependent variable. As a follow-up we also check the inter-class correlation coefficients (ICCs), which show us how much of the variance in the data can be attributed to each level. ICC measures the general contextual effect of group level variables on individual outcomes. High ICC is indicative of the prevalence of strong general contextual effect (Merlo et al. 2018). In our estimations we find that the state context explains only 5% of the variance whereas households account for 12% of the variance. The remaining variance of 83% can be attributed to individual characteristics of women. This result shows that individual- and household-level factors are more important than state-level variables in explaining women's access to bank accounts as well as to micro-credit. This result stands in contrast to some studies that suggest that extra-household forces “override”, individual/household level forces in determining outcomes for women (Mabsout and Staveren 2010).

Looking at Estimation (4), we find that the individual- and household-level explanatory variables have results similar to those in Estimation (2). In the case of state-level explanatory variables, we find that only sex ratios are significant at the 1% level. That is, as the sex ratio increases, there are higher probabilities of women having *bankaccess*. Since sex-ratios have been interpreted as measures of “son preference” in the Indian context, this result suggests that the less biased the gender-norms at the state-level, the more likely it is that women will have access to banks

(Sen 1992). Unlike with access to bank accounts (*bankaccess*), in this case the state-level cash-deposit ratio (*CDR*) is positive and significant at the 10% level, which suggests that overall financial development is an important factor for women accessing microfinance loans. Here again, the household-level variables explain about 18% of variability in the data and state-level variables explain 6%. The multi-level logit regressions in Estimations (11) and (12) in Table A6 show that these results are stable in terms of sign and significance.

An important implication of our results above is that women straddle multiple identities and that the deprivations that they face “can take manifold forms, intersecting, overlapping, and interacting within complex hierarchical systems where actors often find themselves in somewhat contradictory positions” (Folbre 2020: 452). We further probe these intersectionalities by including interaction terms in our regressions. We first include an interaction term of education and autonomy. Access to education is a crucial mechanism through which women can gain better economic opportunities and can potentially improve their status and social standing (Hindin 2000). But the effect of education on financial inclusion is likely to be determined also by how status is reinforced by autonomy. Improved status of women does not always lead to greater autonomy and can even conflict with it (Abadian 1996). The interaction term captures this. A second interaction term we introduce is gender of household head and caste. From our previous regressions we know that upper caste women were less likely to be financially included, so we also see if the relationship holds even when interacting with gender of household head, that is, we check how upper caste women in male-headed households fare when compared to lower caste women in male-headed households. We report only the results of the interaction terms in Table 3. The remaining variables are the same as those in Table 2 and are robust to the addition of interaction terms and hence are not reported here.

We find that when women have primary or tertiary education and have full autonomy, they are more likely to have access to bank accounts. From this result we can understand that autonomy matters significantly in determining women’s access to formal financial institutions. When women have no education and no autonomy, and when they have some education and no autonomy, all coefficients are zero and hence they are not reported in Table 3. The predictive margins of the interaction terms show that full autonomy is associated with higher probabilities of having access to a bank account. For example, for those women with no education, the predictive margins are 31% for women with no autonomy, and 47% for women with full autonomy. These probabilities increase to 60% and 80% for those women with the highest levels of education respectively.

An interaction term of caste and gender of household head, shows that women from higher caste male-headed households are less likely to have bank accounts, but this result is not significant as can be seen in Estimations 1a and 3a. For Estimations 2a and 4a, the coefficient on the interaction term is positive but also insignificant. Although the signs on the coefficients on the interaction terms are unstable, the caste dummy remains negative and significant across all estimations even after the addition of the interaction terms, confirming our previous results. Table 3 does not show the results of those interaction terms where the coefficients are all zeros.

The results discussed thus far come with two caveats. First, it is possible that women’s autonomy may be endogenous given that previous studies have shown that access to microfinance can improve the decision-making power of women within households (Swain and Wallentin 2009; Pitt et al. 2006). Second, given that women’s access to loans (*tookloan*) is incidentally truncated, the probit estimates may be biased due to self-selection issues. We do not have sufficient information to handle the first of the potential biases, but we can control for the second. Hence we check our results by running a Heckman selection probit model (Table 4). We run this model to observe determinants of women’s access to loans from microfinance institutions given their knowledge

TABLE 3 Interaction terms

VARIABLES	(1a) <i>bankaccess</i>	(2a) <i>tookloan</i>	(3a) <i>bankaccess</i>	(4a) <i>tookloan</i>
<i>Primary</i>	0.0434 (0.0450)	0.183** (0.0894)	0.0385 (0.0473)	0.223** (0.0978)
<i>Secondary</i>	0.410*** (0.0319)	−0.00565 (0.0669)	0.416*** (0.0336)	0.00359 (0.0740)
<i>Higher</i>	0.805*** (0.0508)	−0.459*** (0.113)	0.845*** (0.0544)	−0.440*** (0.125)
<i>Partial Autonomy</i>	0.0528* (0.0286)	−0.0506 (0.0611)	0.0531* (0.0300)	−0.0560 (0.0674)
<i>Full Autonomy</i>	0.444*** (0.0275)	0.0353 (0.0569)	0.452*** (0.0289)	0.0322 (0.0632)
<i>Primary#Partial Autonomy</i>	0.0354 (0.0501)	−0.114 (0.102)	0.0381 (0.0526)	−0.150 (0.111)
<i>Primary#Full Autonomy</i>	0.103** (0.0483)	−0.101 (0.0950)	0.113** (0.0508)	−0.121 (0.104)
<i>Secondary#Partial Autonomy</i>	0.0353 (0.0347)	0.0877 (0.0746)	0.0381 (0.0365)	0.0848 (0.0821)
<i>Secondary#Full Autonomy</i>	0.0327 (0.0337)	0.0922 (0.0699)	0.0420 (0.0355)	0.0979 (0.0773)
<i>Higher#Partial Autonomy</i>	0.0586 (0.0558)	0.274** (0.125)	0.0511 (0.0595)	0.268* (0.137)
<i>Higher#Full Autonomy</i>	0.185*** (0.0536)	0.213* (0.117)	0.177*** (0.0573)	0.188 (0.128)
<i>hhgender</i>	−0.208*** (0.0125)	0.0198 (0.0238)	−0.223*** (0.0133)	0.0183 (0.0263)
<i>castedum</i>	−0.0482* (0.0248)	−0.131*** (0.0503)	−0.0565** (0.0262)	−0.154*** (0.0546)
<i>hhgender#castedum</i>	−0.0216 (0.0265)	0.0521 (0.0539)	−0.0131 (0.0280)	0.0615 (0.0584)
<i>var(_cons[stateid])</i>			0.0622*** (0.0165)	0.0733*** (0.0198)
<i>var(_cons[stateid>hhlevel])</i>			0.0776*** (0.00501)	0.143*** (0.0191)
Constant	−1.181*** (0.0860)	−4.185*** (0.199)	−7.819*** (1.749)	−8.337*** (1.962)
Observations	115,925	43,373	113,078	42,008
Number of groups			31	31

Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 4 Probit estimations with Heckman selection for *tookloan*

VARIABLES	(5) <i>tookloan</i>	(6) <i>knowloan</i>	(7) <i>tookloan</i>	(8) <i>knowloan</i>
<i>age</i>	0.147*** (0.00837)	0.0444*** (0.00285)	0.130*** (0.00941)	0.0440*** (0.00285)
<i>agesq</i>	-0.00184*** (0.000117)	-0.000543*** (4.47e-05)	-0.00162*** (0.000128)	-0.000545*** (4.47e-05)
<i>Primary</i>	0.0793** (0.0311)	0.161*** (0.0139)	0.0400 (0.0284)	0.146*** (0.0139)
<i>Secondary</i>	0.0639* (0.0382)	0.316*** (0.0117)	-0.00734 (0.0312)	0.289*** (0.0118)
<i>Higher</i>	-0.265*** (0.0531)	0.454*** (0.0165)	-0.350*** (0.0396)	0.415*** (0.0166)
<i>Partial autonomy</i>	0.000411 (0.0313)	0.0283* (0.0148)	-0.00328 (0.0300)	0.0251* (0.0148)
<i>Full autonomy</i>	0.0758** (0.0365)	0.222*** (0.0146)	0.0266 (0.0325)	0.211*** (0.0146)
<i>hhgender</i>	0.0302 (0.0215)	-0.00677 (0.0109)	0.0301 (0.0206)	-0.00551 (0.0109)
<i>castedum</i>	-0.0870*** (0.0216)	0.000541 (0.0104)	-0.0834*** (0.0208)	-0.00794 (0.0104)
<i>wealthindex</i>	-0.0577*** (0.0105)	0.0717*** (0.00404)	-0.0699*** (0.00856)	0.0451*** (0.00430)
<i>labpart</i>	0.213*** (0.0306)	0.258*** (0.00952)	0.148*** (0.0274)	0.258*** (0.00953)
<i>Muslim</i>	-0.0457 (0.0303)	-0.0572*** (0.0134)	-0.0305 (0.0289)	-0.0327** (0.0135)
<i>Christian</i>	-0.0505 (0.0433)	-0.134*** (0.0229)	-0.0202 (0.0410)	-0.117*** (0.0230)
<i>Other minorities</i>	-0.136*** (0.0467)	0.0344 (0.0216)	-0.137*** (0.0446)	0.0299 (0.0216)
<i>residencetype</i>	0.000303 (0.0194)	0.00500 (0.00995)	0.00117 (0.0186)	-0.0551*** (0.0105)
<i>avgmediastate</i>		8.396*** (1.181)		
<i>avgmediapsu</i>				0.0761*** (0.00419)
<i>athrho</i>		-0.0652 (0.145)		-0.397*** (0.103)
Constant	-4.117*** (0.365)	-31.23*** (4.202)	-3.272*** (0.348)	-1.883*** (0.0794)
Observations	115,925	115,925	115,925	115,925

Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

about such credit providing programmes. The Heckman correction entails a two-step estimation of a selection equation and outcome equation (Heckman 1979). The first of these models the participation decision and the second regresses the outcome variable on fitted values obtained from the first step (in addition to other possible exogenous factors). For the Heckman two-step to be valid, data should either follow normal distribution, which is unlikely to happen; or alternatively some valid exclusion restriction must be identified, that is, an instrumental variable that appears in the first step but not in the second must be identified (Wolfolds and Siegel 2018). The dataset that we employ contains information on media exposure of women to newspapers, TV and radio. In developing countries, electronic and print media are important sources of information (Dasgupta 2019). Media is widely used by government agencies to disseminate information especially to rural households (Ghosh 2006). We take the average media exposure at the state and primary sampling unit-level as a proxy for women's access to information. Women situated in localities with better exposure to mass media may be more aware and better informed than others. We use this as an exclusion restriction as average media exposure can be said to influence women's knowledge of microfinance loans (*knowloan*) but is unlikely to impact their decisions to actually take such loans (*tookloan*).

Respondents in the survey are asked three questions regarding the frequency of use of television, radio and newspapers. The answers are categorized as "not at all", "less than once a week", "at least once a week" or "almost every day". These responses are coded from 0 to 3 respectively. Following Dasgupta (2019), an index is constructed by adding the responses to the three questions. The media exposure index thus lies between 0 and 9 where 0 implies no media exposure and 9 means the women have a reasonably high level of media exposure. We then take averages both at the primary sampling unit level as well as at the state level.

In Table 4, Estimation (6) we specify the selection equation where the independent variables are all those household- and individual-level variables and *mediaexposure*, which is our exclusion restriction. We find that age, education, autonomy, wealth and labour participation are positive and significant. This tells us that a unit increase in any of these variables results in an increased predicted probability of respondents knowing about microcredit programmes. In the case of autonomy, those women who have partial autonomy regarding mobility decisions have a smaller probability of knowing about these programmes, while those who have full autonomy are more likely to know about them. The base category for auto is women who have no autonomy. Caste has a negative and significant coefficient, showing that higher caste women have a lesser probability of seeking out micro-finance loans, even as they know about them. *mediaexposure*, aggregated at the state level is positive and significant too, meaning that the more exposure women have to the media, the higher is the probability of knowing about micro-finance loans. Previous studies have shown how access to media is a crucial source of information regarding family-planning initiatives, information regarding prenatal health, child nutrition and so on (Abadian 1996; Ajaero et al. 2016; Sharma et al. 2007; Evans et al. 2006). Our results are in line with these findings.

Estimation (5) shows the probit estimation for this selection mechanism. We find that age, autonomy and labour participation remain positive and significant with respect to taking out loans. A unit increase in *education* and *wealthindex* reduces the probability of taking microcredit. This result is not surprising, given the nature of microcredit programmes. Such programmes are mainly targeted towards women from lower socioeconomic backgrounds who could benefit from participating in them (Armendáriz and Morduch, 2010; Chavan 2020). We find that *hhgender* and *residencetype* are not significant. The results for *religion* and *caste* remain the same as in earlier estimations, seemingly robust to all specifications.

In Estimations (7) and (8) we have the probit estimation and selection model using *mediaexposure* as our exclusion criteria, but at the PSU level and the full variable specification. The results are similar to those in Estimations (5) and (6) with the exception of religion, where Muslim and Christian women are less likely to know of loan programmes than the base group of Hindu women in the selection model but is insignificant in the probit estimation. The last two estimations show that the impact of religion is not as robust as the others. This result, however, still shows that women from marginal communities are at a disadvantage when compared to Hindu women. Here again the estimations pass the Wald test. We find that the Heckman probit regressions lend robustness to our earlier results.

5 | POLICY IMPLICATIONS AND CONCLUSION

This paper draws on the NFHS-4 survey from India to understand the factors that influence women's access to finance. We employ probit estimations but also check these results by comparing them to multilevel probit and Heckman probit. Broadly speaking, there are two important conclusions that we can make.

First, while influential strands of literature have suggested that group-level institutional factors trump micro-level factors of women's well-being, the results of this paper indicate that the forces that shape women's access to finance function at multiple levels and that micro-level factors are powerful drivers of inclusion. Our analysis finds that household-level economic indicators like wealth, gender of household head and their rural-urban location are crucial, but so are individual-level characteristics, which explain approximately 83% of the variation in the multilevel regressions. Informal gender norms that govern women's mobility and economic activity crucially influence the ability of women to access loans and open bank accounts. These results are in line with the predictions of household bargaining models which point to the centrality of intra-household, individual-level contexts in shaping women's capabilities. Our results also show that with policies such as microfinance loans, which generally target women from poor households, some—though not all—of the barriers that women otherwise face become less binding.

Related to this is a second point. The results described above point to the complex “intersectionality” of gender and other social identities. Gender is socially constructed and, as a result, it is not an undifferentiated, homogenous category. Our results indicate that women's access to finance is affected not only through their identities as women but also by their intersecting positions in the religious and caste rankings of society. Belonging to religious minorities may reduce the probability of accessing financial services. On the other hand, caste has a more complex effect as we have seen, because even as women down the caste ladder face the most terrible kinds of deprivations, in terms of accessing finance upper caste women may be more constrained. We have speculated that this result may be driven by the fact that constraints on women's autonomy become more binding in status-seeking upper caste families.

These findings have some interesting implications for policy making. Existing policy frameworks, at least in the Indian context, have been “arrangement-focused”—to use Sen's (2009) term—in the sense that they have primarily sought to make finance cheaper and more easily available by seeking greater digitization, expansion of financial infrastructure, redesigning financial products and so on.⁶ There has therefore been a pervasive tendency within existing

⁶ See for example, Reserve Bank of India's The National Strategy for Financial Inclusion 2019–2024 (retrieved from: <https://rbidocs.rbi.org.in/rdocs/content/pdfs/NSFIREPORT100119.pdf>) and Joint Report on “The Power of Jan Dhan:

policy frameworks to overlook the informal barriers, in the shape of norms and perceptions that reproduce traditional gender divisions within households. In reality, however, the barriers that women face in accessing financial services arise not only from the broader institutional environment, but also from “informal structural domains and other barriers that inhibit women’s ability to take advantage of otherwise ‘accessible’ financial services”, including powerful “informal gender norms that limit women’s autonomy to open a bank account” (Eckhoff et al. 2019: 974). Recognizing the salience of informal norms is important because they suggest that tinkering with extra-household environment, say, by making financial services cheaper or more convenient—which by far remains the thrust of existing policies—may not be sufficient to promote financial inclusion amongst women. Our results suggest that for financial inclusion programmes to successfully reach out to women, it is also necessary that policies become “realization-focused” (Sen 2009). As Vonderlack-Navarro (2010: 132) puts it, “targeting women alone is not sufficient. . . gender equality must be an explicit component of the designs of products and programs”.

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How to cite this article: Govindapuram, S., Bhupatiraju, S., & Sirohi, R. A. (2022). Determinants of women's financial inclusion: evidence from India. *Annals of Public and Cooperative Economics*, 1–28. <https://doi.org/10.1111/apce.12376>

APPENDIX

TABLE A1 Distribution of women by bankaccess, knowloan and tookloan

	tookloan—Yes	tookloan—No	Row total
bankaccess—Yes	5106 (36%)	23461 (30%)	28,567
bankaccess—No	2000 (14%)	15227 (20%)	17,227
knowloan—Yes	7106 (50%)	38688 (50%)	45,794
knowloan—No	—	—	
Column total	14212 (100%)	77376 (100%)	

TABLE A2 Distribution of women by educational level and wealth

	Poorest	Poor	Middle	Richer	Richest	Row total
Educational level						
No education	3929 (28.86%)	3766 (27.66%)	3112 (22.85%)	2004 (17.7%)	803 (5.8%)	13,614 (100%)
Primary	1016 (15.05%)	1630 (24.15%)	1799 (26.65%)	1484 (21.99%)	819 (12.13%)	6748 (100%)
Secondary	2228 (6.9%)	5091 (15.81%)	7482 (23.24%)	9042 (28.09%)	8341 (25.91%)	32,184 (100%)
Higher	140 (1.22%)	529 (4.6%)	1391 (12.12%)	2827 (24.66%)	6575 (57.36%)	11,462 (100%)
Total	7313	11,016	13,784	15,357	16,538	64,008

TABLE A3 Distribution of women by bank access, labour participation and gender of household head (*hhgender*)

		<i>hhgender</i> —Female	<i>hhgender</i> —Male	Row total
<i>bankaccess</i> —No	<i>labpart</i> —No	5996 (31.77%)	40,442 (39.08%)	46,438
	<i>labpart</i> —Yes	1551 (8.21%)	10,354 (10%)	11,905
<i>bankaccess</i> —Yes	<i>labpart</i> —No	7594 (40.24%)	39,681 (38.34%)	47,275
	<i>labpart</i> —Yes	3728 (19.75%)	13,005 (12.56%)	16733
Total by <i>hhgender</i>		18,869 (100%)	103,482 (100%)	122,351

TABLE A4 Descriptive statistics for state-level variables

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>LSDPPC_2016</i>	121,616	11.31	0.525	10.255	12.731
<i>female_2016</i>	121,049	65.11	9.195	52	91
<i>CDR_2016</i>	122,351	56.95	23.844	10.5	113.7
<i>EDBrank_2016</i>	122,351	14.35	8.626	1	31
<i>sexratio</i>	121,049	940.40	43.915	618	1084
<i>rateofcrime</i>	122,351	51.87	27.22021	9.2	160.4
<i>branch_2016</i>	121,517	6472.02	4836.332	13	16,264

TABLE A 5 Correlation matrix of some variables of interest

	<i>bankaccess</i>	<i>tookloan</i>	<i>age</i>	<i>education</i>	<i>autonomy</i>	<i>gender of household head</i>	<i>caste</i>	<i>wealthindex</i>	<i>labour participation</i>	<i>religion</i>
43,393 Obs										
<i>bankaccess</i>	1.00									
<i>tookloan</i>	0.08	1.00								
<i>age</i>	0.11	0.18	1.00							
<i>education</i>	0.18	-0.12	-0.34	1.00						
<i>autonomy</i>	0.17	0.04	0.21	0.01	1.00					
<i>gender of household head</i>	-0.07	-0.01	-0.03	0.02	-0.06	1.00				
<i>caste</i>	0.02	-0.06	0.03	0.18	0.02	0.00	1.00			
<i>wealthindex</i>	0.22	-0.07	0.06	0.47	0.11	0.03	0.28	1.00		
<i>labour participation</i>	0.08	0.12	0.17	-0.10	0.12	-0.07	-0.08	-0.10	1.00	
<i>religion</i>	-0.03	0.00	0.00	0.00	0.03	-0.01	-0.01	-0.05	0.04	1.00

TABLE A6 Logit regressions for *bankaccess* and *tookloan* dependent variables

VARIABLES	(9) <i>bankaccess</i>	(10) <i>tookloan</i>	(11) <i>bankaccess</i>	(12) <i>tookloan</i>
<i>age</i>	0.0761*** (0.00464)	0.291*** (0.0125)	0.0772*** (0.00490)	0.302*** (0.0135)
<i>agesq</i>	-0.000729** (7.31e-05)	-0.00365*** (0.000184)	-0.000729** (7.71e-05)	-0.00378*** (0.000199)
<i>Primary</i>	0.186*** (0.0224)	0.162*** (0.0466)	0.190*** (0.0236)	0.191*** (0.0506)
<i>Secondary</i>	0.723*** (0.0192)	0.154*** (0.0407)	0.748*** (0.0203)	0.170*** (0.0445)
<i>Higher</i>	1.549*** (0.0293)	-0.470*** (0.0634)	1.614*** (0.0312)	-0.461*** (0.0686)
<i>Partial Autonomy</i>	0.136*** (0.0243)	-0.0170 (0.0563)	0.137*** (0.0258)	-0.0400 (0.0615)
<i>Full Autonomy</i>	0.809*** (0.0241)	0.125** (0.0530)	0.834*** (0.0257)	0.117** (0.0583)
<i>hhgender</i>	-0.349*** (0.0183)	0.0566 (0.0387)	-0.373*** (0.0196)	0.0546 (0.0422)
<i>castedum</i>	-0.110*** (0.0174)	-0.165*** (0.0402)	-0.112*** (0.0184)	-0.188*** (0.0430)
<i>wealthindex</i>	0.178*** (0.00657)	-0.0979*** (0.0151)	0.186*** (0.00703)	-0.110*** (0.0164)
<i>labpart</i>	0.335*** (0.0160)	0.394*** (0.0308)	0.344*** (0.0170)	0.405*** (0.0336)
<i>Muslim</i>	-0.256*** (0.0221)	-0.105* (0.0554)	-0.270*** (0.0236)	-0.0803 (0.0596)
<i>Christian</i>	-0.0520 (0.0387)	-0.0951 (0.0734)	-0.0707* (0.0409)	-0.0612 (0.0782)
<i>Other minorities</i>	0.129*** (0.0362)	-0.232*** (0.0885)	0.132*** (0.0381)	-0.219** (0.0925)
<i>residencetype</i>	0.0332** (0.0166)	-0.00576 (0.0353)	0.0412** (0.0178)	0.0423 (0.0383)
<i>LSDPPC_2016</i>			0.675*** (0.206)	0.0497 (0.252)
<i>female_2016</i>			-0.0286** (0.0121)	-0.0147 (0.0148)
<i>CDR_2016</i>			0.000816 (0.00420)	0.00778 (0.00522)
<i>EDBrank_2016</i>			0.0243** (0.0117)	0.0134 (0.0142)

(Continues)

TABLE A 6 (Continued)

VARIABLES	(9) <i>bankaccess</i>	(10) <i>tookloan</i>	(11) <i>bankaccess</i>	(12) <i>tookloan</i>
<i>sexratio</i>			0.00395** (0.00180)	0.00778*** (0.00225)
<i>rateofcrime</i>			0.00208 (0.00260)	0.00251 (0.00321)
<i>branch_2016</i>			2.34e-05 (2.62e-05)	1.72e-05 (3.17e-05)
<i>var(_cons[stateid])</i>			0.171*** (0.0454)	0.242*** (0.0656)
<i>var(_cons[stateid>hhlevel])</i>			0.214*** (0.0140)	0.408*** (0.0597)
Constant	-1.988*** (0.139)	-7.959*** (0.384)	-13.02*** (2.905)	-15.20*** (3.574)
Observations	115,925	43,373	113,078	42,008
Number of groups			31	31

Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.