

What Constrains Financial Inclusion for Women? Evidence from Indian Micro data

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Summary. — The role and relevance of gender in financial inclusion has been an evolving area of research in recent times. Although there are several cross-country studies on this aspect, few within-country studies have addressed this issue in a comprehensive manner. In this context, exploiting disaggregated household-level data for India, we analyze the interface between gender and finance. More specifically, we examine whether gender matters for financial inclusion and if so, what are the possible factors that influence this relationship. Our findings suggest significant disparity in both the access to as well as the use of finance by gender. On average, female-headed households are 8% less likely to access formal finance and 6% more likely to access informal finance as compared to households that are headed by males, after taking into account other relevant household and state-level characteristics that are important in explaining financial access by households. Similar evidence carries over to the use of finance: households headed by female use 20% less cash loans as compared to male-headed households. Subsequently, we investigate the possible channels which impede financial inclusion for female-headed households. Our analysis highlights that for female-headed households, education and wages are more relevant in explaining the access to finance whereas political and social factors are much more germane in explaining the use of finance.
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1. INTRODUCTION

The relevance of financial inclusion in improving economic growth has been widely discussed in the literature. Financial inclusion entails several benefits for poor households. It provides them with opportunities to build savings, make investments and access credit (Ellis, Lemma, & Rud, 2010). In addition, it also enables them to successfully handle income shocks and tide over unforeseen emergencies such as illness or loss of employment (Collins *et al.*, 2009). Macroeconomic evidence suggests that economies with deeper financial intermediation tend to grow faster (Beck, Demirguc Kunt, & Levine, 2007).

Notwithstanding its beneficial effects and despite exhortations by the G-20, finance does not appear to have adequately permeated vast segments of the population.¹ In 2014, although 700 million adults became first time account holders during 2011–14, only 62% of adults globally had an account with a formal financial institution as compared with 51% in 2011 (Demirguc Kunt, Klapper, Singer, & Van Oudheusden, 2015). What this suggests is a discernible gap between the availability of finance and its accessibility and use.

One area where the disparity is quite pervasive and is receiving increasing attention is the gender gap in access to finance. Globally, 47% of women own or co-own a bank account, compared with 55% of men (Gender and Development Unit, 2013). How far does this gender gap in financial inclusion manifest itself in emerging economies remains an empirical question.

To inform this debate, the paper analyzes the gender differences in the access to (demand) and use of (supply) of financial services, using India as a case study. To be more specific, we examine three issues. Firstly, what does the evidence suggest regarding the access to and use of finance by gender of the household head? Second, how do these findings vary across household characteristics, such as size, asset base, employment and education? And finally, what are the possible channels

which influence the attitude toward finance by gender? We posit several channels of discrimination, such as those relating to cost, social, political, educational and even in the sphere of employment. The findings suggest that there exists significant disparity in access to finance as well as the extent to which it is used. More specifically, households headed by a female are not only less likely to access formal finance than their male counterparts, but their use of finance is significantly lower as well.

The Indian case provides a compelling study to explore this issue in some detail. First, although women account for two-fifths of the workforce, access to finance among women is still very low. To illustrate, nearly 63% of men had an account at a formal financial institution in India in 2014 as compared with 43% for women (Demirguc Kunt *et al.*, 2015). Likewise, as regards use of finance, of the estimated US \$ 158 billion for the 3 million women-owned enterprises across India, formal sources have been able to provide only US \$ 42 billion, leaving a significant unfinanced gap of US \$ 116 billion, or 73% of total demand (Annual Report, 2014). Second, the marginalization of females with regard to opportunities has been no less important. Using a non-cooperative model of household behavior within an endogenous growth framework, Doepke and Tertilt (2014) show that better targeted transfers at women can ensure Pareto-optimal outcomes. Buvinic (1997) find that the children exhibit better nutritional and health outcomes when the household head is a woman. The 2011 Census data for India indicate that the female literacy rate is 20 percentage points lower than the male literacy rate of 85%. Third, both the Government and the Reserve Bank have undertaken

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several steps to enhance financial inclusion for women. For instance, loans to individual women beneficiaries up to Rs.100,000 per borrower are recognized as priority sector lending under the 'weaker sections' category by banks. The newly constituted Micro Units Development and Refinance Agency (MUDRA), a new institution established to promote lending to micro and small business entities, offers an interest rate concession to non-banking and microfinance institutions which provide loans to women entrepreneurs. In addition, both the Federal and the state governments offer several schemes to enhance financial inclusion of women. The *Sukanya Samriddhi Yojana* (literally, girl child prosperity scheme), a government-backed savings scheme targeted at the girl child, encourages parents to build a fund for the future education and expenses of the girl child. Likewise, several state governments also have conditional cash transfer programs for the empowerment of adolescent girls and women in general, such as those by West Bengal (Kanyashree Prakalpa), Madhya Pradesh (Laadli Laxmi Yojana), Andhra Pradesh (Bangaru Talli), Maharashtra (Bhagyashree) and Uttar Pradesh (Rani Laxmi Bai Pension scheme). Finally, India is one of the few important emerging economies for which a comprehensive and reliable household-level database has recently become available which provides detailed information on both access to and use of finance by gender. The granularity of the database and its rich information content makes it amenable to rigorous statistical analysis.

Our analysis adds to the literature in two distinct ways. First, to the best of our knowledge, this is one of the earliest studies to systematically investigate the issue of access to and use of finance by woman-headed households for an emerging economy. Empirical evidence suggests that gender is a significant determinant of broader macroeconomic outcomes, including economic development (Duflo, 2012).² Most studies are typically in the nature of cross-country research (Demirguc Kunt, Klapper, & Singer, 2013b; Lampietti & Stalker, 2000; Quisumbing, Haddad, & Pena, 1995). Even within-country studies do not adequately address the behavior of female-headed households, or even if they do, focus essentially on access alone (Fletschner, 2008; Hazarika & Guha-Khasnobis, 2008; Holvoet, 2005; Rawlings & Rubio, 2005). A broad thread running through these studies is the existence of a significant gender gap, which has been explained by lower financial literacy among women (Lusardi & Tufano, 2009), behavioral differences (Beck & Brown, 2011; Browne, 2006) or even institutional discrimination (Fletschner, 2009). Little, if any, systematic empirical evidence is available for India and this is one of the major concerns addressed by our study. The analysis appears to suggest that households with a female head are less likely to access formal finance, after taking into account several household characteristics and other state-specific controls.

Second, our analysis contributes to the literature on gender discrimination and in particular, the causes for such discrimination. We consider a broad spectrum of measures to understand which of these impede the access to and use of finance (Ashraf, Karlan, & Yin, 2010). Existing studies focus on only one or a few causes of discrimination, such as political (Beaman, Pande, Duflo, & Topolova, 2010; Chattopadhyay & Duflo, 2004; Iyer, Mani, Mishra, & Topalova, 2012), wage-related (Neumark & Stock, 2007), education-related (Coleman, 2002) or even cost-related (Shahriari, Danzer, Giovarelli, & Underland, 2009) factors. Papers that adopt a broader approach by focusing on multiple areas of empowerment are cross-national in nature (Chakrabarty, 2012). As it well recognized, cross-country studies exhibit several limitations (Honohan, 2007; Rodrik, 2012), which makes within-

country studies much more appealing. Our findings suggest that political, employment and educational discrimination are relevant in explaining the differential approach toward finance by female-headed households.

The remainder of the analysis continues as follows. Section 2 provides the theoretical backdrop on the link between gender and finance and relatedly, on the interlinkage between financial inclusion and economic growth. Section 3 briefly surveys the recent literature. In Section 4, we provide an overview of the data, including the summary statistics. The empirical framework is detailed in Section 5, followed by a discussion of the results, including robustness checks. Section 7 examines policy concerns while the final section concludes.

2. THEORETICAL BACKDROP

(a) Gender and finance

Theoretically, it is possible to discern several ways in which to link the impact of gender on finance.

First, gender equality increases the stock of human capital. A more educated female labor force entails greater accumulation of skills and expertise, and raises the overall demand for finance. Additionally, more educated women are likely to have fewer children and possibly spend more time on work. Not only is this likely to lower the dependency ratio and engender a demographic dividend, but also improve their use of finance. A number of studies in recent times have examined these causal relationships. Klasen and Lamanna (2008) show that gender equality may account for 40% of the growth gap between East Asia and the Pacific. In the case of India, the evidence suggests that increasing the ratio of female to male managers by 10% could improve per capita output by 2% (Esteve-Volart, 2004).

A second channel through which gender equality matters is through its impact on capacity enhancement. By improving the overall skill set of the labor force, gender equality raises labor productivity and promotes investment. In addition to investment, improving women's income can raise domestic savings. This can increase the propensity of women to enter the formal financial system. Seguino and Floro (2003) find that a one percentage point rise in the female share of wages raises aggregate savings by 0.25% of GDP. This could indicate a higher female propensity to save, which can cause domestic savings to rise if income is redistributed from men to women. Higher domestic savings can be channeled through the financial sector, making capital available for firms.

Third, gender equality can improve agricultural output. According to the Food and Agriculture Organisation (FAO, 2011), greater access to farming resources for females can improve agricultural production on women farms in developing countries by as much as 4%. Provided that some of the income derived thereof also accrue to women, this is likely to empower them to access the formal financial system.

(b) Financial access and development

Development theory offers useful insights as regards the impact of financial inclusion on economic development. A lack of access to finance can engender inequality and lead to poverty traps (Aghion & Bolton, 1997; Galor & Zeira, 1993). To illustrate, Galor and Zeira (1993) show that financial market frictions impede investment in education by the poor, thereby fomenting a vicious cycle of low income and low productivity, which in turn, constrains development. Likewise, in the

analytical framework of Aghion and Bolton (1997), as greater amount of capital is accumulated by the rich, more funds become available to the poor for investment purposes.

Subsequent research has highlighted several ways in which financial inclusion can influence economic growth and development. First, consumers gaining access to the formal financial system are likely to lead to a rise in aggregate savings. Any increase in savings has the potential to raise the quantum of investible resources which can positively impact long-run economic growth (Aghion, Boustan, Hoxby, & Vandenbussche, 2009).

Second, by raising the investible surplus, financial inclusion is able to improve the penetration of credit, thereby enabling financial institutions to diversify their loan portfolios. In addition, lending to firms that were previously excluded financially might also reduce the average credit risk of loan portfolio, in turn, improving the recycling of funds. The net effect is an overall increase in aggregate economic activity (Bayoumi & Melander, 2008).

Third, greater levels of financial inclusion facilitate increased participation by different segments of the economy in the formal financial system. As the share of the formal financial sector increases, it strengthens the case for the use of interest rate as a primary policy tool, with implications for economic growth (Cecchetti & Kharroubi, 2012).

Several studies have empirically explored this nexus and uncover a positive relationship. Burgess and Pande (2005) for example, show that concerted efforts by the Indian authorities of adopting a branch-led financial inclusion strategy exerted a positive effect on state economic growth. Similarly, Dabla-Norris, Ji, Townsend, and Filiz Unsal (2015) show that by eliminating the major blockages to the flow of credit, financial inclusion is associated with 0.2–0.6% increase in the investment-GDP ratio. In sum, these studies veer around the view that financial inclusion has a salutary effect on economic growth.

3. RECENT LITERATURE

According to the FINDEX database, out of the 2 billion adults globally who did not have bank account in 2014, over 1 billion were women. Cross-country evidence by Demircuc Kunt *et al.* (2015) suggests that, globally, 58% of women and 65% of men have an account at a formal financial institution.³ These numbers mask the wide difference across countries. By way of example, the gender gap in account ownership is negligible in high-income OECD countries. As compared to this, for developing economies, roughly 60% of men had an account as compared with 50% for women.

Similar evidence is manifest on the credit side, as well. In South Asia for example, access to formal finance for women is less than 10%. When we look across countries, the differences are quite prominent. In Bangladesh for example, access to bank credit for women is just 2%, although they account for a quarter of total bank deposits (Pitt, Khandker, Chowdhury, & Millimet, 2003). In Africa, small women farmers obtain less than 10% of the credit. Focusing exclusively on SMEs also points to similar conclusions: among emerging markets, out of the roughly 35% of women-owned SMEs, close to one-third face disproportionately high and differentiated barriers in the access to finance vis-à-vis their male entrepreneurs. Even in advanced economies, barriers to accessing to finance are no less adverse for women. In the US, companies with a woman as CEO received only 3% of venture capital dollars invested (NWBC, 2015).

In fact, as early as 2000, the United Nations had advocated gender equality and women empowerment as a crucial plank

of the Millennium Development Goals (MDG), that was agreed to by all the world's countries and all leading development institutions globally. More specifically, the avowed objective of MDG3 which emphasized the promotion of gender equality and women empowerment stated that:

Eliminate gender disparity in primary and secondary education in all levels of education no later than 2015.

Some progress appears to have been made on this front. Based on extant evidence, it appears that the gender parity in school enrollment has largely been achieved in primary education, although gaps still persist in secondary and tertiary education, especially in the developing world where the respective ratios (as of 2013) were 71 and 27 as compared with 105 and 74 respectively, for developed economies (UNESCO, 2015).⁴

From a broader perspective, progress has been slow and uneven. For example, according to a report prepared for the G20 Labour and Employment Ministerial Meeting (OECD, 2014), since 1980, the global rate of female labor force participation has increased by 2 percentage points to 52% in 2012; the gender gap in labor force participation for the working age population has declined by 10 percentage points from 23% in 1990 to 13% in 2012. A similar disparity is also in evidence in respect of wages. The International Labour Organization (2010) estimated that the gender wage differentials across all occupations and all skills in most countries ranged between 10% and 30%. Likewise, although political participation of women has improved, the differences across advanced and emerging economies are quite significant. To illustrate, as of June 2016, women held 22.8% of the parliamentary seats in at least one chamber in over 140 countries, up from 11.3% in 1995 (UN Women, 2015); these numbers in advanced economies were roughly double that in emerging countries. In their assessment on the progress made on the Millennium Development Goals, the United Nations (2014) observed that women presently hold more 'hard' ministerial portfolios—such as defense, foreign affairs, and the environment—in addition to so-called "soft" portfolios, such as social affairs, education and women affairs, underscoring the progress made.

More recently, the 2030 agenda of Sustainable Development Goals (SDGs), adopted by the UN General Assembly in September 2015 (valid till 2030) listed gender equality (SDG 5) for achieving "gender equality and empower(ing) all women and girls".

There is an extensive literature which examines the impact of gender disparity in finance on various social and economic outcomes. Employing the FINDEX database, Demircuc Kunt *et al.* (2015) find that though account ownership has improved over time, the gender disparity in ownership of accounts still persists with 58% of women and 65% of men surveyed owning an account. Utilizing household survey data for transition economies, Beck and Brown (2011) show that banking services are more likely to be used by households located in urban areas, and those with greater income and wealth.

Studies on the gender gap in financial inclusion are also beginning to emerge for emerging economies as well. Employing country-level data, Beck, Behr, and Madestam (2015) identify a gender bias in the interest rate on micro-credit loans: borrowers matched to a loan officer of the opposite gender on average, pay 26–28 basis points higher rates as compared with when they are matched to a loan officer of the same gender. Malapit (2012) find that women are 11% more credit constrained as compared with men in Philippines. In the case of sub-Saharan Africa, Aterido, Beck, and Iacovone (2013) provide evidence in support of a gender gap in use of financial services. More generally, Demircuc Kunt, Klapper, and Singer

(2013a) show countries with laws that favor ownership of assets by women exhibit greater ownership of accounts by women.⁵

For India, Swain (2002) examines the extent of credit rationing in rural India and find that at least 60% of households were not to fully meet their demand for formal credit. Using data from the Rural Finance Access Survey, Basu (2006) finds that women-centric Self-Help Group-Bank models have performed considerably well in terms of their savings and repayment habits. Employing the 59th Round of the National Sample Survey Organisation (NSSO) data, Rajeev, Vani, and Bhattacharjee (2011) document that the incidence of indebtedness for female-headed households is 4–10 percentage points higher as compared with male-headed households, although they do not undertake any formal empirical analysis. Subsequently, Rajeev and Bhattacharjee (2012, 2015) show that female-headed households pay nearly 5 percentage points higher interest cost and have 7–10 percentage points lower access to formal sources of finance as compared with households headed by males. Basavaraj and Bhattacharjee (2014) also find that households with less landholding are more likely to access credit from moneylenders.

Similar evidence also exists on the use of finance. The International Finance Corporation (2014) has estimated that, of the US \$ 158 billion for the 3 million women-owned enterprises needed across industries in India, the share of formal finance has been merely US \$42 billion, entailing a significant unfinanced gap of US \$ 116 billion.

In sum, the balance of evidence appears to suggest a significant gender gap in access to finance in India, akin to that reflected in cross-country and other within-country research.

4. DATA AND VARIABLES

(a) Database

Our primary data set is the All India Debt and Investment Survey (AIDIS) conducted by the National Sample Survey Organization under the Ministry of Statistics and Program Implementation (MOSPI), Government of India. We use the data from the 70th round which was conducted during the period January 2013–December 2013. To the best of our knowledge, this is the only comprehensive database in India which provides household-level information on gender, including details of access to and use of finance.

A two-stage sampling technique is used for the survey. In the first stage, a “state sample” was surveyed by the state government officials in addition to the “central sample” surveyed by NSSO. In the second stage, stratification of households was done on the basis of overall indebtedness of a particular household. The units were census villages in rural areas and survey blocks in urban areas, covering a total of 110,800 households. The survey data are grouped into 16 blocks with information on 14 blocks being covered during the first visit and the remaining two blocks during the second visit. We focus on the first visit which provides comprehensive and granular data on household investment and borrowing behavior, including gender characteristics.

We exploit data from four blocks of the survey: Blocks 3, 4, 6, and 14. Block 3 includes characteristics such as household size, religion, and social group.⁶ Block 4 identifies the demographic characteristics with details on relation to the household head, gender, age, education, and employment status. The variable of interest, i.e., the head of the household is identified from this block. To be more specific, the survey asks the

respondent to identify the head of the household and we map the gender identity of the household head to determine whether or not a household is headed by a male or a female.⁷ Data on buildings and other constructions held by the household is provided in Block 6. Finally, Block 14 provides particulars on all cash loans payable to both institutional and non-institutional sources by the household. We make use of the amount borrowed, the sources from which they were borrowed, the nature of interest paid and the rate, the purpose of the loan and the net amount outstanding.

We classify the borrowing or the credit agency from which the cash loan was availed from into formal and informal sources. Formal finance comprises of the following sources: (a) government; (b) co-operative society/bank; (c) commercial banks, including regional rural banks; (d) insurance companies; (e) provident fund; (f) financial company; (g) self-help groups (bank or non-bank linked). Within formal finance, we focus on the sub-categories, such as bank finance (comprising items b, c, f, and g above), finance from the government (item a above) and other long-term sources (items d and e above)—if the household has availed at least one cash loan from that relevant source.

On the other hand, informal finance consists of money borrowed from landlords, agricultural and professional moneylenders, relatives and friends, doctors, lawyers, and other professionals. Our analysis utilizes information on cash loans for determining access to and use of finance.

On average, a household avails 2.91 different loans (in cash) from either formal or informal sources. The average number of loans taken by a female-headed household is 2.99 while the same number for a male-headed household is 2.90 and this difference is statistically significant.

In terms of amount of cash loans availed, the average amount borrowed by a household in the sample is INR 377,453 (≈US \$ 5,600). A female-headed household on average borrows INR 272,231 (≈US \$ 4,060), and a male-headed household on average borrows INR 389,628 (≈US \$ 5,815). The differences in the amount of cash loans are statistically different across households. For both male-headed and female-headed households, it is observed that a disproportionate amount of cash loans are availed to meet expenditure for current expenses, such as medical treatment and related household expenditure. Among female- *versus* male-headed households, 68% and 59% of the cash loans, respectively availed by them are for meeting such current expenditures.^{8,9}

We also use data on state-level variables. Thus, we employ per capita income, road length per 1,000 square kilometers, share of female population, and sector-wise gross enrollment ratio of girls to boys in both primary and upper primary classes. Data on these variables were obtained from IndiaStat.com, a private data service aggregator which provides socio-economic statistical data on Indian states.

Among others, we extract data on the proportion of crimes against women from the National Crime Records Bureau. In case of variables examining political participation and rights of women, the data for share of women legislative members in the most recently concluded elections are obtained from the website of [genderinpolitics.org], whereas the information on whether a state has implemented 50% reservation for women in panchayats were obtained from the website of the *Lok Sabha*, the lower body of the Indian Parliament. The work participation and female literacy rates were obtained from the Census 2011 database. Finally, data on wages paid to casual and regular employees by gender, sector, and state were obtained from National Sample Survey Organisation (NSSO). Table 1 provides a description of the variables

Table 1. *Variable description and summary statistics*

Panel A: Financial inclusion related							
<i>Relating to Access</i>		Data source	N.Obs	Male	N.Obs	Female	
Access_formal ¹	Dummy = 1 if a household has access to cash loans from formal sources, else zero	AIDIS	97,433	0.68 (0.47)	13,367	0.57 (0.50)	
Access_bank	Dummy = 1, if a household has access to cash loans from bank/NBFC, else zero	AIDIS	66,154	0.99 (0.04)	7,564	0.98 (0.06)	
Access_gov	Dummy = 1, if a household has access to cash loans from government, else zero	AIDIS	66,154	0.68 (0.47)	7,564	0.66 (0.47)	
Access_long-term	Dummy = 1, if a household has access to finance from sources such as insurance, provident funds, financial company, and/or financial corporations/institutions	AIDIS	66,154	0.96 (0.19)	7,564	0.97 (0.17)	
Accrss_informal ²	Dummy = 1, if a household has access to finance from sources such as insurance, provident funds, financial company, and/or financial corporations/institutions	AIDIS	66,154	0.36 (0.84)	7,564	0.29 (0.90)	
<i>Relating to Use</i>		Data source	N.Obs	Male	N.Obs	Female	Male vs. female (t-test)
Use_Cash_formal	Amount of cash loans outstanding from formal credit agencies (in logarithm)	AIDIS	39,487	7.27 (5.52)	3,881	6.90 (5.44)	4.06***
Use_Cash_informal	Amount of cash loans outstanding from informal sources (in logarithm)	AIDIS	25,662	5.40 (5.27)	3,533	5.45 (5.23)	0.44
Panel B: Others							
		Data source	N.Obs	Male	N.Obs	Female	Male vs. female (t-test)
D_FEMALE	Dummy = 1, if the household head is female, else zero	AIDIS	1,10,800	0.12 (0.33)			
D_SC	Dummy = 1, if the social group of household is SC	AIDIS	97,433	0.14 (0.35)	13,367	0.14 (0.35)	
D_ST	Dummy = 1, if the social group of household is ST	AIDIS	97,433	0.16 (0.37)	13,367	0.17 (0.38)	
D_OTHERS	Dummy = 1, if the social group of household is OTHERS	AIDIS	97,433	0.31 (0.46)	13,367	0.40 (0.49)	
AGE	Age of the household head	AIDIS	97,426	46.93 (13.29)	13,367	50.71 (14.88)	30.42***
D_EMPLOYED_SALARIED	Dummy = 1 if the household head has salaried/regular employment, else zero	AIDIS	88,140	0.23 (0.42)	6,865	0.21 (0.40)	
D_EMPLOYED_CASUAL	Dummy = 1 if the household head has casual employment, else zero	AIDIS	88,140	0.56 (0.50)	6,865	0.51 (0.50)	
D_URBAN	Dummy = 1 if the household is located in urban areas, else zero	AIDIS	97,433	0.44 (0.50)	13,367	0.45 (0.50)	
D_EDUCATION_HS	Dummy = 1 if the highest education of all household member is Higher secondary or below, else zero	AIDIS	97,433	0.73 (0.44)	13,367	0.69 (0.46)	
D_EDUCATION_GRAD	Dummy = 1 if the highest education of any household member is graduate and above, else zero	AIDIS	97,433	0.21 (0.41)	13,367	0.15 (0.36)	
INTEREST	Simple interest rate paid by the household head on loans taken	AIDIS	33,271	21.34 (18.46)	3832	23.46 (19.45)	6.43***
ASSET	Immovable asset of the household, in logs	AIDIS	84,417	5.79 (7.02)	11,053	5.77 (6.84)	0.35

Table 1 (continued)

Panel C: State-specific		Data source	N.Obs	Mean (SD)	p.75	p.25
PCNSDP	Log (per capita state income)	IndiaStat	32	11.09 (1.58)	12.78	9.51
ROAD	Log (road length/1,000 sq. kms)	IndiaStat	35	4.90 (1.14)	5.66	4.24
LITERACY	State literacy rate	Census, 2011		77.9 (8.59)	86.05	70.28
HEALTH	Primary Health Care (PHC) centers/ 100,000 population	Rural Health Statistics, 2012, Government of India	35	725 (832)	1254	57
PROPORTION	Proportion of female population in the state	IndiaStat	35	52.45 (2.91)	53.33	50.94
PARTICIPATION	Participation rate of female to male, in logs	Census 2011	35	1.26 (0.35)	1.50	0.93
SALARY_REGULAR	Average per day salary (in Rs.) of female to male of age 15–59 years, in logs	National Sample Survey Office (NSSO), July 2011–June 2012	35	0.19 (0.21)	0.33	0.03
SALARY_CASUAL	Average per day wage earning (in Rs.) of female to male by casual laborers of age 15–59 years in non-public work program	NSSO, July 2011–June 2012	30	−0.45 (0.32)	−0.22	−0.59
ENROLLMENT_UPRIM	Gross enrollment ratio of girls to boys in upper primary (Classes VI–X), in logs	IndiaStat	35	0.04 (0.09)	0.09	−0.004
ENROLLMENT_PRIM	Gross enrolment ratio of girls to boys in primary (Classes I–V), in logs	IndiaStat	35	0.02 (0.04)	0.04	−0.007
LEGISLATURE	Share of women members in legislative assemblies in latest concluded elections (2011 or after)	Gender in Politics.org	30	0.06 (0.05)	0.025	0.110
PANCHAYAT	Dummy = 1 if a state has 50% reservation for women in Panchayats, else zero	Lok Sabha website	27	0.56 (0.51)	1	0
CRIME	Crime against women/Total crime in the state in 2012	National Crime Records Bureau	35	0.09 (0.05)	0.12	0.07
FEOTICIDE	Dummy = 1 if the number of female foeticide in 2013 is greater than the median of the past five years. The median is calculated separately for states and Union Territories	IndiaStat.com	35	0.40 (0.49)	1	0
SEX RATIO	Number of females per 1000 males	Census, 2011	35	929 (0.79.7)	975	893

Notes: This table lists the set of variables used across regression models in our study. Panel A defines the dependant variables, while panel B defines the household-level independent variables, and panel C defines state-level variables. Column 2 provides the definition of each variable, column 3 lists the source of data, and columns 4–7 provide the summary statistics for each of these variables by gender. Column 8 reports the results of difference in means test if the variable is not a dummy variable. In Panel C, columns 4–7 report summary statistics of state-level variables.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

¹The various sources of formal finance are—government, cooperative society/bank, commercial bank including regional rural bank, insurance, provident fund, financial corporation/institution, financial company, self-help group—bank linked, self-help group—non banking financial companies (SHG-NBFC), and other institutional agencies.

²The various sources of informal finance are- landlord, agricultural moneylender, professional moneylender, input supplier, relatives and friends, doctors, lawyers and other professionals, and others.

employed in the analysis, including data source and summary statistics.

(b) *Descriptive statistics*

We begin the analysis by documenting the access to and use of financial services by gender. To be more specific, we provide information on the basic dimensions of financial services such as access to cash loans from formal sources, including sub-categories such as from the bank and the government as well as informal sources and the use of such cash loans.

(i) *Access to finance*

A household is classified as having access to formal finance if it has availed at least one cash loan from a formal source. Similarly a household is classified as having access to informal finance if it has availed at least one cash loan from an informal source¹⁰.

The summary statistics reported in Table 1 shows that 68% of male-headed households have access to formal finance from banks, while the percentage of female-headed households having access to bank finance is 56%. These numbers are marginally higher than those reported in cross-country research by Demircuc Kunt *et al.* (2015).¹¹ In case of access to informal finance, the disparity is smaller: 57% of male-headed households and 51% of female-headed households have access. This disparity in access by gender for both formal and informal

sources is consistent with Rajeev *et al.* (2011) who document the incidence of indebtedness for female-headed households to be roughly 4–10 percentage points higher than for male-headed households.

Figures 1–3 plot the difference in access to formal finance by gender of the household head juxtaposed with state-level variables. The evidence in Figure 1 appears to suggest that states with lower female-to-male ratio exhibit greater differences in access to finance. The evidence is reinforced when we employ the literacy rate or the female infanticide rate, instead of female-to-male ratio. Although these figures are consistent with our conjecture of a gender gap, a more rigorous framework is needed to test these causal relationships.

(ii) *Use of finance*

Gender disparity exists in the use of cash loans as well. The mean amount of cash loan availed by a male-headed household from formal sources is Rs 59,000 ($\approx$ US \$ 880) higher as compared with a female-headed household and the difference is statistically significant. In case of cash loans from informal sources, a female-headed household borrows INR 2,000 ($\approx$ US \$ 30) less than a male-headed household on average, and the difference is statistically significant. The large difference in amount borrowed from formal vis-à-vis informal sources can be explained by the purposes for which these loans are used. Basavaraj and Bhattacharjee (2014) show that loans taken from informal sources (money lenders) are used

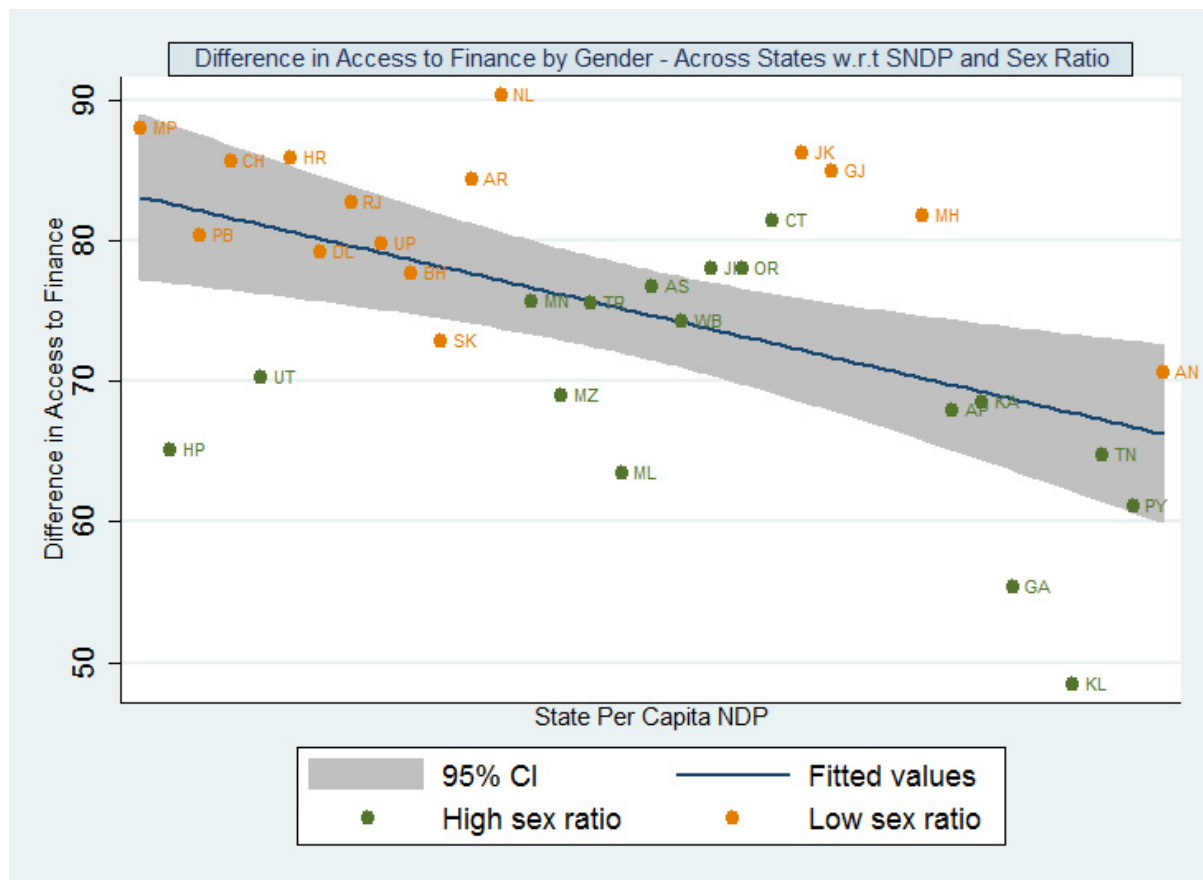


Figure 1. Difference in access to finance by gender, State Net Domestic Product (NDP) and sex ratio. Notes: Difference in Access to Finance, defined as the difference in proportion of male headed households (MHH) and the proportion of female headed households (FHH) having at least one outstanding cash loan, aggregated at the level of the States. The states have been arranged in terms of increasing State per capita Net Domestic Product. States have further been classified as Low versus High Sex Ratio states based on the median.

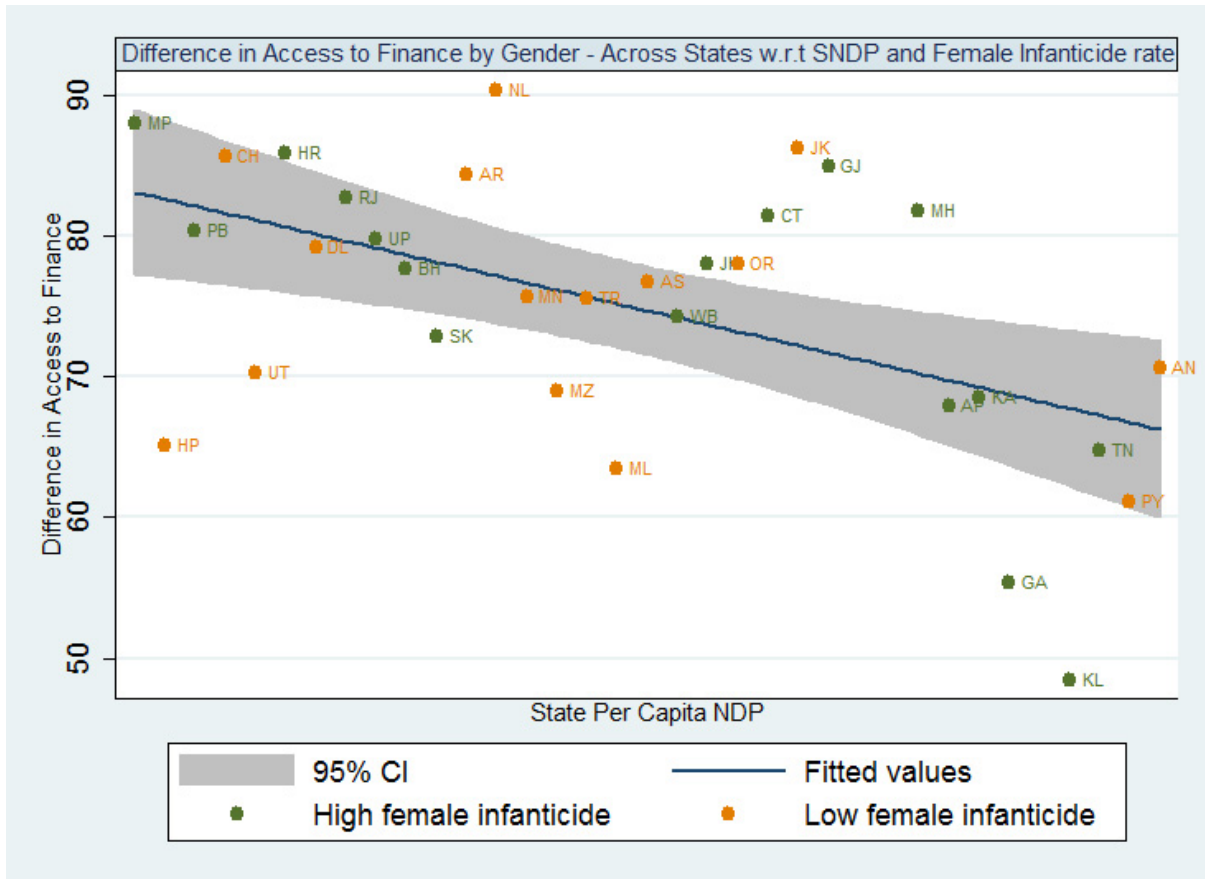


Figure 2. *Difference in access to finance by gender, State Net Domestic Product (NDP) and female infanticide rate.* Notes: *Difference in Access to Finance*, defined as the difference in proportion of male headed households (MHH) and the proportion of female headed households (FHH) having at least one outstanding cash loan, aggregated at the level of the States. The states have been arranged in terms of increasing State per capita Net Domestic Product. States have further been classified as Low versus High based on the median.

primarily for current expenditures, whereas loans from the formal sector are used typically for capital expenditures. The former are typically small in magnitude and availed of on more frequent basis, whereas the latter are large and lumpy. This appears consistent with the pecking order in the financing choices by households, wherein borrowings from informal sources tend to take preference over formal, interest-based finance (Ghosh & Kumar, 2014).

(iii) Interest rates

Tables 2 and 3 depict the disparity in the interest rate charged to female- and male-headed households by their place of residence and wealth, respectively. In terms of the former, the interest rate charged to female-headed household is significantly higher, irrespective of the type (compound, simple and concessional) of interest rate. To illustrate, the compound interest rate paid by female-headed households in urban areas is 15.8%, which is over 150 basis points higher as compared with that paid by male-headed household. This difference is statistically significant at the 1% level. In most of the other cases, the differences in interest rate paid by female-headed households are statistically and significantly higher as compared with those paid by their male counterparts.

The differences in interest rate paid by asset quartiles indicate that female-headed households pay higher interest rates vis-à-vis male-headed ones. The differences in interest rates paid are statistically significant at the lower quartiles, but less

compelling at higher quartiles. Intuitively, as the wealth position of the household improves, the constraint in terms of offering collateral for loans becomes less binding. As a result, borrowing costs decline. In the uppermost quartile, female-headed households face a lower interest cost as compared with male-headed households, irrespective of interest rate type. However, the differences are not statistically significant.

(c) Explanatory variables

In order to better understand the importance of gender in the access to and use of financial services, we combine information on gender with other household-level covariates. We also exploit state-level indicators on income, education, physical and health infrastructure that could influence the demand for and the supply of financial services. Contextually, we also collate data on various facets of discrimination against women.

(i) Household-level variables

The household-level characteristics include whether a household is headed by a female, number of household members,¹² age of the household head, immovable (building and other construction) asset position,¹³ place of residence, educational qualifications¹⁴ and employment status. As observed in Table 1 12% of the households are headed by a female. Male-headed households are much larger in size and the

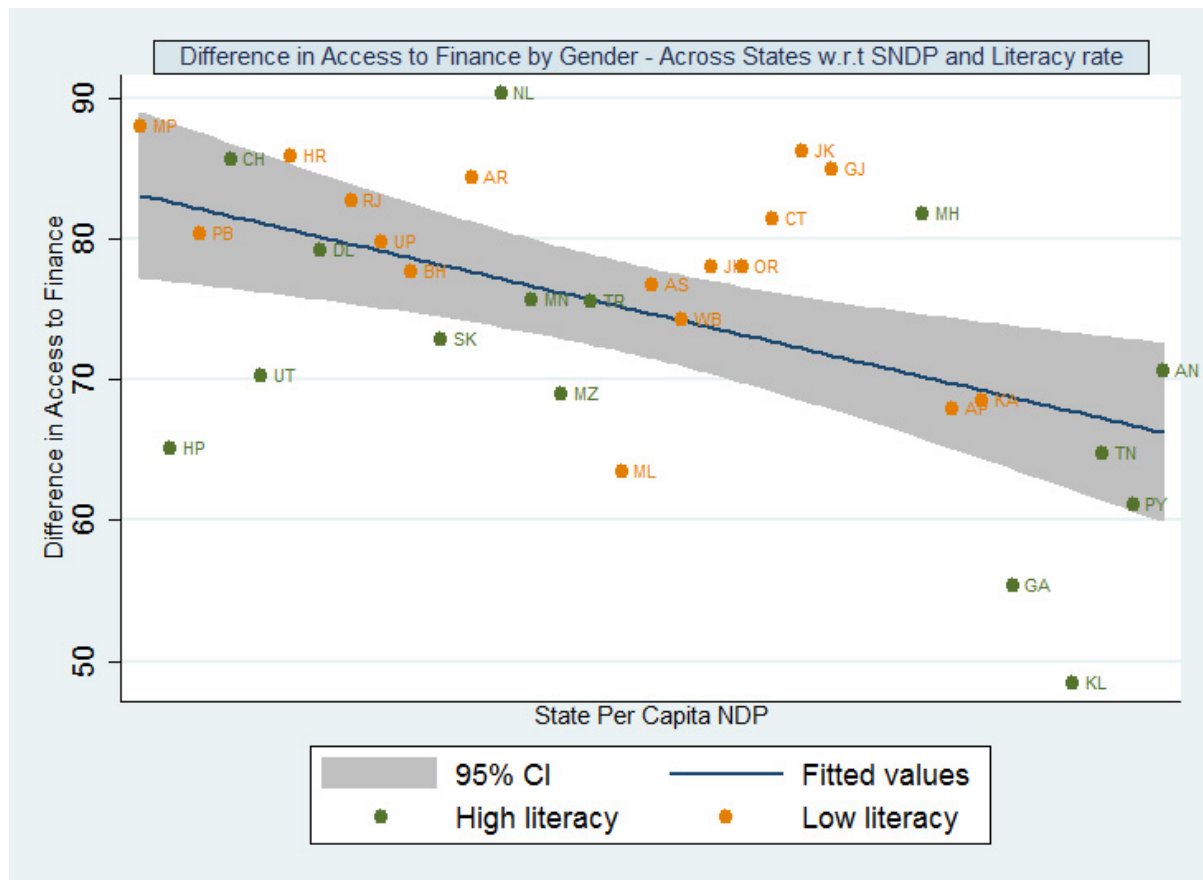


Figure 3. Difference in access to finance by gender, State Net Domestic Product (NDP) and literacy rate. Notes: Difference in Access to Finance, defined as the difference in proportion of male headed households (MHH) and the proportion of female headed households (FHH) having at least one outstanding cash loan, aggregated at the level of the States. The states have been arranged in terms of increasing State per capita Net Domestic Product. States have further been classified as Low versus High based on the median.

average male household head is three years younger as compared with a comparable female household head. In addition, male-headed households have a larger asset base, are more qualified and are more likely to be employed, either as salaried employees or as casual laborers, as compared with households with female head. Even in respect of cost, female-headed households pay on average, over 200 basis points higher interest cost as compared with male-headed households and these differences are statistically significant.

(ii) State-level variables

We also take on board several state-level characteristics. These include per capita income, literacy rate, share of female population and controls for physical and health infrastructure. The average literacy rate was 78% and there were 725 PHCs per 100,000 population.

In subsequent robustness checks, we employ several state-level variables relating to discrimination against women. These include, gender discrimination such as the rate of female foeticide and sex ratio, social discrimination such as the ratio of crimes against women to total crime in the state, educational discrimination which includes the gross enrollment ratio at the primary and upper primary levels for girls (per 100 boys), wage discrimination defined as the male–female wage gap for salaried employees and casual laborers, respectively, work discrimination defined in terms of the differential workforce participation rate and cost discrimination such as the cost of

borrowings. For measuring political discrimination against women, we employ two variables: first, the number of seats reserved for women in legislative bodies and second, states which have enforced legislation regarding reservation for women in *Panchayats*.

The evidence suggests that women face a significant discrimination on all aspects. Illustratively, the average female-to-male participation rate equals 0.48 in the rural areas, which is one-and-half times that obtaining in urban areas at 0.30. Likewise, the gross enrollment ratio of girls to boys at the primary (Classes I–V) level equals 0.98, whereas it is even lower at 0.95 at the upper primary (Classes VI–VIII) level.¹⁵ Even with respect to wages, the average daily regular wage for females in urban areas is INR 434 ($\approx$ US \$ 6.5), which is 18% lower than comparable male wages at INR 512 ($\approx$ US \$ 7.6). Only in case of casual laborers in urban areas, the average daily female wages (INR 194) is higher by roughly INR 70 ($\approx$ US \$ 1) as compared with males (INR 124).

5. EMPIRICAL METHODOLOGY

To systematically investigate the gender differences in the access to and use of finance, following prior research (Demirguc, Kunt, & Randall, 2013; Demirguc Kunt *et al.*, 2013a, 2015; Zins & Weill, 2016), we employ a multivariate regression model, wherein we examine the impact of gender

Table 2. Average Interest rates paid by households—by nature of interest paid, gender of household head and place of residence

Variable		Reporting households	Rural				Urban			
			Total	HH head-Female	HH head-Male	Equality of Interest Rate: MHH vs. FHH (<i>t</i> -stat)	Total	HH head-Female	HH head-Male	Equality of Interest Rate: MHH vs. FHH (<i>t</i> -stat)
All	N. Obs	73,318	41,763	9.8	90.2	2.98***	31,599	10.9	89.1	1.19
	Interest rate	15.2	15.8	16.7	15.8		14.3	14.6	14.3	
Compound	N. Obs	20,204	10,297	8.3	91.7	1.96**	9907	9.1	90.9	3.54***
	Interest rate	15.4	16.4	17.7	16.3		14.2	15.8	14.1	
Simple	N. Obs	40,077	23,473	9.7	91.5	5.59***	16,334	11.1	88.9	
	Interest rate	22.3	23.0	25.3	22.8		21.2	21.9	21.2	
Concessional	N. Obs	22,452	13,460	10.7	89.3	3.28***	8992	12.2	87.8	2.05**
	Interest rate	1.1	1.4	1.0	1.4		0.7	0.5	0.8	

Notes: This table provides the summary statistics of the average interest rate paid by an household on the cash loans availed by place of residence, gender of the household head and nature of interest paid. The table reports the t-statistic for tests of equality of means in average interest rate paid by a female-headed household (FHH) versus a male-headed household (MHH) for each type of interest rate and separately for rural and urban areas.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table 3. Interest rate paid by households—by type, gender of household head and income quartile (measured in terms of asset)

Variable		1st Quartile				2nd Quartile				3rd Quartile				4th Quartile			
		Total	Female	Male	Difference in interest rate	Total	Female	Male	Difference in interest rate	Total	Female	Male	Difference in interest rate	Total	Female	Male	Difference in interest rate
All types	<i>N</i>	23,675	11.18%	88.82%	0.88 (**)	17,563	10.15%	89.85%	0.39	15,187	9.79%	90.21%	0.48	16,937	9.44%	90.56%	−0.18
	Mean	17.81%	18.59%	17.71%		16.32%	16.67%	16.28%		14.04%	14.47%	13.99%		11.35%	11.19%	11.37%	
	SD	20.37%	21.35%	20.25%		19.26%	18.82%	19.31%		14.92%	16.10%	14.79%		13.25%	10.90%	13.47%	
Simple	<i>N</i>	13,843	11.46%	88.54%	1.09 (*)	10,021	9.91%	90.09%	1.87 (***)	8291	9.20%	90.80%	1.44 (**)	7922	9.32%	90.68%	0.93 (*)
	Mean	25.95%	26.91%	25.82%		23.81%	25.50%	23.63%		20.59%	21.90%	20.46%		15.86%	16.70%	15.77%	
	SD	22.13%	22.53%	22.08%		19.39%	19.56%	19.37%		16.60%	16.49%	16.61%		17.62%	12.73%	18.05%	
Compound	<i>N</i>	5026	8.85%	91.15%	2.47 (***)	4101	8.68%	91.32%	0.98	4219	9.10%	90.90%	1.97 (***)	6858	8.38%	91.62%	0.52 (*)
	Mean	18.31%	20.56%	18.09%		17.38%	18.28%	17.30%		14.78%	16.57%	14.60%		12.33%	12.81%	12.29%	
	SD	17.14%	19.39%	16.90%		24.09%	17.67%	24.61%		12.83%	15.17%	12.56%		6.70%	6.28%	6.73%	
Concessional and others	<i>N</i>	7329	11.71%	88.29%	2.42 (***)	5673	10.95%	89.05%	−0.58 (***)	4884	11.04%	88.96%	−0.29 (*)	4566	11.28%	88.72%	−0.82 (***)
	Mean	0.95%	0.95%	0.95%		1.26%	0.74%	1.32%		1.19%	0.93%	1.22%		1.18%	0.45%	1.27%	
	SD	4.90%	4.94%	4.89%		4.89%	3.37%	5.04%		3.67%	3.37%	3.70%		3.13%	2.11%	3.23%	

Notes: This table provides the summary statistics of the average interest rate paid by an household on the cash loans availed by gender of the household head, asset quartile and nature of interest paid. The table reports the t-statistic which tests of equality of means in average interest rate paid by a female-headed household versus a male-headed household for each type of interest rate and within each asset quartile separately.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

on financial inclusion, while controlling for relevant state and household-level characteristics. Accordingly, for household h in state s , the basic regression takes the following form¹⁶:

$$FI_{h,s} = \alpha[D_FEMALE]_h + \beta[Characteristics]_h + \gamma[State]_s + \varepsilon_{h,s} \quad (1)$$

where FI captures the various dimensions of financial inclusion discussed earlier. The coefficient of interest is α , which identifies the response of female-headed households to financial inclusion. *Characteristics* is a set of household characteristics such as those relating to education, work status, location, age profile and asset status (disaggregated into quartiles), *State* is a set of state-specific variables such as income, proportion of female population, road and health infrastructure and literacy rate. ε denotes the normally distributed random error term.

When access to finance is the dependent variable, we employ a Probit model, since this variable is binary. As compared to this, when the dependent variable is use of finance, we employ a double-hurdle model. For this, in stage I, the dependent variable is dummy variable equal to one, if the household uses formal (resp., informal) finance, else zero. In stage II, the regression is estimated only for households for whom the amount of cash loan availed is a positive number. As a result, by segregating the probability of use, it is able to provide a better interpretation of household use of finance.¹⁷

The second step of the analysis is to understand whether there exist any interactive effects between female-headed household and other household characteristics. As a result, we also estimate Eqn. (2) according as:

$$FI_{h,s} = \alpha_1[D_FEMALE]_h + \alpha_2[D_FEMALE]_h * [Characteristics]_h + \alpha_3[Characteristics]_h + \alpha_4[State]_s + \varepsilon_{h,s} \quad (2)$$

More specifically, we focus on the household characteristics elucidated earlier and consider their interaction with FEMALE. Provided female-headed households improve their access to or use of finance in response to such characteristics, $\alpha_2 > 0$. The remaining variables are as defined earlier.

Finally, we estimate the following model using the same household-level data:

$$FI_{h,s} = \beta_1[D_FEMALE]_h + \beta_2[Characteristics]_h + \beta_3[D_FEMALE]_h * [State]_s + \beta_4[State]_s + \varepsilon_{h,s} \quad (3)$$

where, as earlier, FI refers to the indicators of financial inclusion and our coefficient of interest is β_3 . The coefficient enables us to discern discrimination against females affect financial inclusion. If greater discrimination against female-headed households impedes financial inclusion, $\beta_3 < 0$. In order to control for possible error correlation within states, all regressions are reported by clustering the standard errors at the state level.¹⁸

6. RESULTS AND DISCUSSION

(a) Female-headed households and access to finance

Table 4 reports the results of regressing the dummy for female household head on access to finance from various sources, while controlling for other relevant household and state-specific factors. With regard to access to formal finance, the results confirm the univariate findings that female-headed

households are less likely access to formal finance as compared with those headed by men. The point estimates in column 1 suggest that female-headed households are on average, 8% less likely to access a formal source of finance. The result is statistically significant at the 1% level. On the other hand, female-headed households are 6% more likely to access an informal source of finance relative to a male-headed household.

Several other household-level covariates such as the social group, age of the household head and asset position are statistically significant as well.

With respect to social groups, the findings indicate that weaker groups are less likely to access both formal and informal sources of finance. The magnitude of the effects is quite large. To put this in perspective, a household belonging to scheduled caste is 18% less likely as compared with a household belonging to other backward classes in accessing formal finance. This result reverberates when we examine access to informal finance as well: a household belonging to the scheduled caste is 6% less likely to access informal source of finance.

Relatively better-off (in terms of asset) households are more likely to access formal finance. At the same time, households belonging to higher quartile of asset class are less likely to use informal sources of finance and this relationship is statistically significant. Similarly, age plays an important role as well: households headed by relatively aged persons are more likely to access formal finance and less likely to access informal finance.

It is also interesting to note that, as the education level of the household improves, they are more likely to access from formal sources, such as government and less likely to borrow from informal sources. In terms of employment status, household heads employed in salaried jobs and self-employed are 8% and 9% less likely respectively, to access informal finance.

These results are echoed in both cross-country and country-specific findings. To illustrate, Demircuc Kunt *et al.* (2013a) found female-headed household are less likely to access formal (bank) finance. Similarly, Okurut (2006) and Campero and Kaiser (2013) find evidence to suggest that informal lending sources are preferred by households when faced with negative shocks. Even in case of India, prior research (Bhattacharjee & Rajeev, 2013; Rajeev *et al.*, 2011) supports these findings.

Next, we examine the various sub-categories of formal finance to ascertain which of these are less likely to be accessed by female-headed household. Based on the point estimates in columns (2) and (3), it appears that female-headed households are less inclined to access bank and government finance. In many cases where the household head is a female, the beneficiary for the government scheme is registered in the name of the male head of the family. It is also a common feature in low-income households that the oldest male in the household is designated as the head (or, the chief decision maker) and government benefit schemes are typically registered in his name, regardless of whether he is the primary source of household economic support. This could lead to exclusion of female-headed households from such schemes and lower the likelihood of receiving funds from various government-sponsored schemes (Deepti & Tiwari, 2014). This finding is consistent with recent findings from field-level survey in Sri Lanka as well (Fokus Women, 2015).

(b) Female-headed household—interactive effects

In Table 5, we interact the dummy for female-headed households with household characteristics. The dependent variable is whether a household has access to formal finance, irrespective of the source of such finance. Across all columns, a

Table 4. *Determinants to access to finance*

Variables	Formal				Informal
	Total (1)	Bank (2)	Government (3)	Long-term (4)	Informal (5)
FEMALE	−0.0827*** (0.0168)	−0.0005 (0.0006)	−0.263** (0.0104)	0.0028 (0.0068)	0.0594*** (0.0219)
<i>Social group</i>					
Scheduled caste (SC)	−0.1827*** (0.0322)	−0.0003 (0.0007)	0.018 (0.0303)	0.0043 (0.0057)	−0.0599*** (0.0179)
Scheduled tribe (ST)	−0.0007 (0.0143)	0.0006 (0.0006)	−0.0128 (0.0187)	0.0054 (0.0043)	0.0165 (0.0118)
Others (OTH)	−0.0673** (0.0318)	−0.0009* (0.0005)	0.0366** (0.0149)	−0.0112*** (0.0041)	−0.0436*** (0.0143)
<i>Age (in years)</i>					
[25, 55)	0.0513 (0.0348)	0.0017 (0.0011)	0.0376 (0.0309)	0.0102* (0.0054)	−0.1315 (0.0256)
Greater than 55	0.048 (0.0381)	0.002 (0.0013)	0.0502 (0.0304)	0.0127** (0.0058)	−0.1664*** (0.0273)
<i>Employment status</i>					
Salaried (SAL)	−0.0125 (0.0282)	0.0003 (0.0004)	0.0291 (0.0204)	−0.0055 (0.0053)	−0.0816*** (0.0152)
Self-employed (SEMP)	0.0326 (0.0265)	0.0009* (0.0005)	0.0733*** (0.0144)	−0.0088* (0.0051)	−0.0949*** (0.0212)
<i>Location</i>					
Urban (URB)	−0.1522 (0.0212)	−0.0001 (0.0004)	−0.0562*** (0.0215)	0.0027 (0.0048)	0.0499*** (0.0122)
<i>Education</i>					
Upto higher secondary (HS)	0.0272 (0.0272)	−0.002 (0.0007)	0.0551* (0.0284)	−0.0007 (0.0063)	−0.0384*** (0.0148)
Graduate and above (Grad)	0.0377 (0.0362)	0.0002 (0.0009)	0.0576** (0.0293)	−0.003 (0.0075)	−0.1023*** (0.013)
<i>Asset profile</i>					
2nd quartile (Q2)	0.0369** (0.0362)	0.0007 (0.0004)	0.0501*** (0.0151)	0.0023 (0.0053)	−0.0036 (0.0105)
3rd quartile (Q3)	0.0686** (0.0286)	0.0006 (0.0006)	0.0773*** (0.0186)	0.0007 (0.0064)	−0.0174 (0.0189)
4th quartile (Q4)	0.0867*** (0.0218)	0.0007 (0.0008)	0.0826*** (0.0188)	0.0076 (0.0052)	−0.0469** (0.0209)
<i>Household size</i>					
HH size ≥ median HH Size	0.0015 (0.0280)	−0.0001 (0.0003)	−0.0139 (0.0101)	0.0062 (0.0039)	0.0089 (0.0112)
State characteristics	Yes	Yes	Yes	Yes	Yes
Observations	75,424	52,420	52,420	52,240	52,240
Pseudo R square	0.0306	0.0631	0.0423	0.0185	0.0838

Robust standard errors (clustered by state) in parentheses.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

household with a female head is less likely to access formal finance and in most cases, the coefficient is statistically significant. Across columns (1)–(7), we find that a female-headed household is at least 10% less likely to access formal finance than a male-headed household. Though the individual coefficients for asset class and social group of the household are statistically significant and of the expected sign, the interactive terms are not significant. Hence, women do not seem to be worse off because they belong to poorer household or socially backward categories, although the wealth and social group status of the household significantly affects the ability of the household to access any formal source of finance.

The results in Table 5 indicate that education and residence of the household are significant in determining their likelihood

of accessing any formal source of finance. In particular, female-headed households in urban areas on average, are more likely to access any formal source of finance relative to their corresponding rural counterparts. Moreover, as the highest educational attainment of any member of the household increases, the likelihood of accessing a formal source of finance improves perceptibly. For example, the coefficient on FEMALE in column (5) is −0.15, the coefficient GRADUATE (indicating that the highest educational attainment of among all members of the household) is 0.07 and the coefficient of the interaction term FEMALE*GRADUATE equals 0.10, meaning that a female-headed household with a graduate degree is on average 10% more likely to access formal finance as compared with a female without any such degree.

Table 5. *Access to formal finance—model with interactions between dummy for gender of household head and household characteristics*

ACCESS TO FORMAL FINANCE													
(1) VARIABLES		(2) VARIABLES		(3) VARIABLES		(4) VARIABLES		(5) VARIABLES		(6) VARIABLES		(7) VARIABLES	
FEMALE	−0.1*** (0.021)	FEMALE	−0.181* (0.1008)	FEMALE	−0.0474 (0.0313)	FEMALE	−0.1041*** (0.0208)	FEMALE	−0.1476*** (0.0252)	FEMALE	−0.1031*** (0.032)	FEMALE	−0.1059*** (0.0165)
SC	−0.188*** (0.034)	Age [25, 55)	−0.183*** (0.032)	SALARIED	−0.0043 (0.0284)	URB	−0.1598*** (0.0218)	HIGHER SECONDARY	0.0653*** (0.0149)	Q2	0.0327** (0.0153)	HH SIZE LARGE	0.0034 (0.0275)
ST	−0.008 (0.0154)	Age Greater than 55	0.0461 (0.0328)	SELFEMPLOYED	0.0361 (0.0256)	FEMALE*URB	0.1146*** (0.028)	GRADUATE	0.0652*** (0.0185)	Q3	0.0663* (0.0268)	FEMALE* HH SIZE LARGE	0.0851*** (0.0273)
OTH	−0.0648** (0.0326)	FEMALE* [25, 55)	0.1249 (0.104)	FEMALE* SALARIED	−0.1049* (0.0509)			FEMALE* HIGHER SECONDARY	0.0953*** (0.0249)	Q4	0.863*** (0.0209)		
FEMALE* SC	0.061 (0.0406)	FEMALE* Greaterthan 55	0.0231 (0.1207)	FEMALE*SELF EMPLOYED	−0.0389 (0.0372)			FEMALE* GRADUATE	0.1014*** (0.0233)	FEMALE* Q2	0.0486 (0.0359)		
FEMALE* ST	0.085** (0.0362)									FEMALE* Q3	0.0267 (0.0512)		
FEMALE* OTH	−0.0387 (0.0366)									FEMALE* Q4	−0.0059 (0.0457)		
Household Characteristics	YES		YES		YES		YES		YES		YES		YES
State Characteristics	YES		YES		YES		YES		YES		YES		YES
Observations	75,424		75,424		75,424		75,424		75,424		75,424		75,424
Pseudo R- sq.	0.0310		0.0310		0.0308		0.0310		0.0228		0.0307		0.0309

Robust standard errors (clustered by state) are in parentheses.

*** $p < 0.01$.** $p < 0.05$.* $p < 0.10$.

Intuitively, higher education levels for any household member permeate through the family, in turn, increasing the awareness about the various sources of formal finance available and translate to greater likelihood of accessing these sources. Employment is another important determinant of access to finance.

What is of interest is that salaried female household heads are less likely to access formal finance. This could also be explained by the fact that having a regular income stream makes it less likely for the women to access finance from formal sources.

The balance of evidence appears to suggest that female-headed households are less likely to access formal finance. It, therefore, remains a moot question as to what factors inhibit their access to formal financing sources. To investigate this empirically, we examine possible channels through which gender discrimination might occur.

(c) Channels of discrimination

In Table 6, we examine the various channels of gender discrimination that could be correlated with access to finance. Across all regressions, we control for state-specific characteristics and household size.

In Column (1) we examine the social channel where gender discrimination is measured in terms of the sex ratio and rate of female foeticide. The sex ratio is statistically significant, suggesting that access to finance is higher in states with higher female-to-male ratio. However, the interaction terms are not significant, both statistically and in terms of magnitude.¹⁹ However, this could be due to measurement of these variables—sex ratio and female foeticide—at the state level, underestimating the level of social bias against women across regions.

In Column (2), we examine the issue of violence against women, the interaction term between the dummy variable whether the household is headed by a female and the proportion of crimes against women is positive but statistically insignificant.

Column (3) examines political discrimination. The evidence suggests that female-headed households are more likely to access formal finance in states where political representation of women is higher. More specifically, female-headed households in states where a larger proportion of seats are reserved for women in the state legislature and seats are reserved at the panchayat level, are more likely to access formal finance. Contextually, Chattopadhyay and Duflo (2004) find that investment in public goods preferred by women is greater when the decision maker is a woman, particularly in case of public goods. Beaman *et al.* (2010) also find that participation of women in village meetings is greater when the leader is of the same gender.

Column (4) looks at educational discrimination. The positive coefficient on the interaction suggests that states with higher female empowerment (in terms of primary enrollment) are more likely to access formal finance. Therefore, for a one-standard deviation increase in primary enrollment, access to finance by female-headed households improves by 3.5 percentage points.

In case of wage discrimination, a 1% increase in the male-to-female wage ratio lowers the likelihood of a female-headed household accessing formal finance by 10%.²⁰

Even in respect of work participation, we find that an increase in work participation by female headed households raises the likelihood of access to finance. We can glean the impact by looking at a change from the 25th percentile to

the 75th percentile of states. The estimates in Table 6 indicate that such a change in the probability of access to finance by female-headed households.

In summary, the findings suggest that female-headed households are less likely to access formal finance, although this differs across characteristics such as social groups, age, education and residential status. Additionally, the extent of gender discrimination in other economic, social, and political spheres is found to be significantly correlated with lack of access to formal finance. We next turn toward understanding the use of finance by female-headed households.

(d) Use of formal finance

In Table 7, we examine the use of cash loans from both formal and informal sources using a double hurdle model. We find that the gender of the household head is significant in determining the use (level of borrowing) of cash loans taken from a formal source, but not in the case of borrowings from informal sources. Based on the point estimates in column (2), a female-headed household borrows 20% less cash as compared with a comparable male-headed household.

The sign and significance of the covariates also differences in the use of cash loans. For example, socially weaker groups such as scheduled tribes borrow 14% less compared to a household to other backward classes; the coefficient for scheduled castes is more than twice that for scheduled tribes.

Employment, education, and location are the other important household indicators that explain the use of formal loans. Households where the head has regular employment or is self-employed also borrow more and use the borrowing more intensively relative to households where the head does not have any such employment. Likewise, a household located in the urban areas borrows relatively more from a formal source as compared with a rural household. Higher interest rates are likely to deter use of cash loans, although its impact on the level of such loans is not significant.

Looking at the informal segment, the evidence suggests that location is an important determinant. To be more specific, households residing in urban areas borrow 33% more in cash loans from informal sources relative to households in the rural sector. Among others, socially backward classes are more likely to be deprived even of informal finance, which could partially be explained by cultural reasons.

(e) Use of finance by female-headed household—interactive effects

Table 8 reports the results based on Eqn. (2) earlier, except that the dependent variable is the use of cash loans from formal sources. Across all specifications, the coefficients on the interaction terms with respect to age of the household head is negative and statistically significant, implying that older the female head of the household, less likely they are to avail cash loans from formal sources. The amount of cash loans taken by such household is also substantially lower. Intuitively, older household heads are likely to have greater level of savings and hence rely less on formal credit. The magnitudes are economically significant, as well. For instance, the coefficient on FEMALE*AGE[25–55] is –1.05 in column (1) and –0.8 in column (2), implying that a household headed by a female, with the age of the head of the household between 25 and 55, is less likely to access a formal source of finance. Moreover, such a household on average borrows less from formal sources relative to a male-headed household with the age of the household head between 25 and 55 years.

Table 6. *Access formal—interaction model between gender of the household head and various channels of discrimination*

(1) Social VARIABLES	(2) Violence VARIABLES	(3) Political Participation VARIABLES	(4) Educational Discrimination VARIABLES	(5) Wage Discrimination VARIABLES	(6) Work Participation VARIABLES
FEMALE	–0.3825 (0.03877)	FEMALE	–0.833* (0.0501)	FEMALE	–0.2004*** (0.0325)
FEMALE*INFANTICIDE	0.0313 (0.0923)	CRIMES AGAINST WOMEN	0.7358 (1.3112)	SEATS IN STATE LEGISLATURE	–0.0825*** (0.0234)
SEX RATIO	0.0033**	FEMALE* CRIMES AGAINST WOMEN	0.0191 (0.0943)	RESERVATION - PANCHAYATS	–0.6792 (0.8489)
FEMALE* INFANTICIDE	0.0299 (0.0006)	FEMALE*SEATS IN LEGISLATURE	0.9883*** (0.0884)	UPPER PRIMARY ENROLLMENT RATIO	–0.0877 (0.0543)
FEMALE* SEX RATIO	0.0003 (0.0244)	FEMALE* RESERVATION- PANCHAYATS	0.0614*** (0.3557)	REGULAR WAGES	–0.687 (0.1625)
State Characteristics	YES	YES	YES	CASUAL WAGES	0.2827*** (0.1177)
Observations	75,424	75,424	69,057	FEMALE* REGULAR WAGES	FEMALE* WORK PARTICIPATION
Pseudo R square	0.0756	0.0321	0.0368	FEMALE* CASUAL WAGES	0.1172*** (0.976)
					–0.1917*** (0.0282)
					–0.2135** (0.976)
					0.1172*** (0.022)
					0.0532 (0.1315)
					–0.1038*** (0.0244)
					YES
					75,424
					0.0379
					0.0479

Robust standard errors (clustered by state) are in parentheses.

*** $p < 0.01$.** $p < 0.05$.* $p < 0.10$.

The coefficients for the interaction terms for employment status and location of the household are equally compelling. To see this, note that the coefficient on the interaction of FEMALE*SELF EMPLOYED is positive with a point estimate of 0.12, i.e., a self-employed, female-headed household is more likely to use cash loans. However, in terms of level of cash loans accessed, a household of the former type access less than that by a household of the latter type. One can conclude that households with regular source of employment have an income stream and hence are more likely to have higher savings and therefore lower their demand for cash credit. Likewise, female-headed households in urban areas are less likely to use formal finance, suggesting the availability of alternative sources of finance at competitive rates.

In terms of asset holding, female-headed households belonging to the second quartile are more likely to use formal finance and borrow larger amounts relative to the poorest household. This could be the result of lack of collateral among households in the poorest quartile which constrains them from accessing credit. The relationship between the asset holdings of the

household and the amount of cash loan availed becomes tenuous at the higher quartile. Households in the upper quartiles might be in a position to meet their credit requirements using their wealth or assets owned by them.

The data however, do not contain information as to whether a household was able to meet its credit demand. Swain (2002) found that there is extensive credit rationing in rural India with at least 60% of the households unable to fully meet their demand for credit from formal sources. There does not seem to be any statistically significant discrimination in terms of the average interest rate paid by a female-headed household vis-à-vis a male-headed household (Column 2).

(f) Channels of discrimination

Table 9 examines the impact of various channels of discrimination on the borrowings of households from formal sources. In case of the political channel, we find that when the political participation variable is favorable for women, female-headed households are more likely to access formal cash loans

Table 7. Use of formal finance—baseline model

Variables	(1)	(2)	(3)	(4)
	LOG (CASH LOANS FORMAL)		LOG (CASH LOANS INFORMAL)	
FEMALE	0.0111 (0.099)	−0.2006*** (0.049)	0.0455 (0.123)	0.0232 (0.119)
SOCIAL GROUP-SCHEDULED CASTE	0.0271 (0.059)	−0.3504*** (0.100)	−0.2128*** (0.082)	−0.4597*** (0.147)
SOCIAL GROUP-SCHEDULED TRIBE	−0.0409 (0.054)	−0.1438* (0.078)	−0.1496*** (0.056)	−0.1999*** (0.060)
SOCIAL GROUP-OTHERS	0.0649 (0.065)	0.02849* (0.145)	−0.0730 (0.071)	0.0707 (0.125)
LOG(AVERAGE SIMPLE INTERST RATE)	−0.0060 (0.036)	0.0220 (0.072)	0.0365 (0.030)	0.0286 (0.073)
AGE ≥ 25 & <55	−0.0017 (0.158)	0.0855 (0.086)	0.2213 (0.151)	0.0333 (0.226)
AGE ≥ 55	0.1071 (0.160)	0.1304 (0.130)	0.2452 (0.167)	0.1486 (0.306)
SALARIED/REGULAR	0.3368*** (0.061)	0.5675*** (0.115)	−0.0287 (0.091)	0.2059 (0.142)
SELF EMPLOYED	0.2154*** (0.040)	0.3579*** (0.055)	−0.0763 (0.087)	0.1199** (0.060)
URBAN	0.0305 (0.030)	0.4123*** (0.045)	−0.0375 (0.076)	0.3303*** (0.068)
HIGHER SECONDARY	−0.0560 (0.069)	0.1577* (0.094)	−0.0030 (0.149)	0.0451 (0.100)
GRADUATE	0.0982 (0.081)	0.7988*** (0.118)	0.0405 (0.176)	0.1606 (0.107)
ASSETS 2nd QUARTILE	0.0060 (0.070)	0.2291*** (0.065)	−0.1180** (0.056)	0.3071** (0.133)
ASSETS 3rd QUARTILE	−0.0135 (0.080)	0.4925*** (0.098)	0.1642** (0.065)	0.5547 (0.096)
ASSETS 4th QUARTILE	0.1838*** (0.070)	1.2430*** (0.131)	−0.0098 (0.116)	0.9568*** (0.176)
HH SIZE ≥ MEDIAN HH SIZE	−0.0502 (0.035)	−0.0238 (0.061)	0.0759 (0.078)	0.0486 (0.044)
Constant	−1.0768 (0.802)	8.2447*** (0.835)	−0.1849 (0.0853)	6.6316** (1.071)
State characteristics		Yes		Yes
Observations		16,345		9,415
Log likelihood		−4.510e+07		−2.770e+07

Robust standard errors (clustered by state) are in parentheses.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table 8. *Use of formal finance—model with interaction terms between household head dummy and household characteristics*

USE OF CASH LOANS FROM FORMAL SOURCES											
(1) VARIABLES			(2) VARIABLES			(3) VARIABLES			(4) VARIABLES		
	(1)	(2)		(1)	(2)		(1)	(2)		(1)	(2)
FEMALE	0.1197 (0.103)	−0.1985*** (0.043)	FEMALE	0.2787 (0.339)	−0.1853 (0.331)	FEMALE	1.0791* (0.630)	0.6812*** (0.112)	FEMALE	−0.0416 (0.135)	−0.0391 (0.202)
SOCIAL GROUP-SCHEDULED CASTE (SC)	0.0271 (0.054)	−0.3421*** (0.111)	AVERAGE SIMPLE INTEREST RATE	−0.0001 (0.037)	0.0223 (0.075)	AGE ≥ 25 & <55	0.0231 (0.165)	0.1174 (0.092)	SALARIED/REGULAR	0.3371*** (0.063)	0.5836*** (0.127)
SOCIAL GROUP-SCHEDULED TRIBE (ST)	−0.0177 (0.052)	−0.1618** (0.078)	FEMALE* (AVERAGE SIMPLE INTEREST RATE)	−0.1034 (0.105)	−0.0060 (0.129)	AGE ≥ 55	0.1386 (0.164)	0.1839 (0.142)	SELF EMPLOYED	0.2067*** (0.040)	0.3797*** (0.067)
SOCIAL GROUP -OTHERS	0.0758 (0.064)	0.2948* (0.153)				FEMALE*(AGE ≥ 25 & AGE < 55)	−1.0475* (0.581)	−0.800*** (0.129)	FEMALE*SALARIED	−0.0755 (0.180)	−0.1441 (0.208)
FEMALE*(SC)	−0.0207 (0.156)	−0.1018 (0.354)				FEMALE*(AGE > 55)	−1.1441** (0.535)	−1.1532*** (0.187)	FEMALE*SELF EMPLOYED	0.1169 (0.082)	−0.2553 (0.272)
FEMALE*(ST)	−0.2872*** (0.083)	0.2283** (0.099)									
FEMALE*(OTHERS)	−0.2188 (0.141)	−0.2732 (0.265)									
Constant	−1.0859 (0.809)	8.2447*** (0.837)		−1.0910 (0.795)	8.2439*** (0.836)		−1.1006 (0.806)	8.2185*** (0.833)		−1.0665 (0.801)	8.2171*** (0.845)
Observations		16,345			16,345			16,345			16,345
Household characteristics		Yes			Yes			yes			Yes
State characteristics		Yes			Yes			Yes			Yes
Log likelihood		−4.510e + 07			−4.510e + 07			−4.510e + 07			−4.510e + 07
(5)			(6)			(7)			(8)		
Variables			Variables			Variables			Variables		
	(1)	(2)		(1)	(2)		(1)	(2)		(1)	(2)
FEMALE	0.0772 (0.120)	−0.1899*** (0.060)	FEMALE	0.1696 (0.175)	−0.0835 (0.111)	FEMALE	−0.0126 (0.121)	−0.2468*** (0.081)	FEMALE	−0.0111 (0.113)	−0.1631*** (0.052)
URBAN	0.0529 (0.034)	0.4157*** (0.047)	HIGHER SECONDARY	−0.0281 (0.080)	0.1784 (0.116)	Q2	−0.0056 (0.067)	0.2221*** (0.068)	HH SIZE ≥ MEDIAN	−0.0541 (0.034)	−0.0175 (0.062)
FEMALE*URBAN	−0.3353*** (0.130)	−0.0609 (0.180)	GRADUATE	0.1327 (0.095)	0.8273*** (0.136)	Q3	−0.0076 (0.082)	0.4845*** (0.102)	FEMALE*HH SIZE ≥ MEDIAN	0.0908 (0.116)	−0.1440 (0.131)
			FEMALE*HIGHER SECONDARY	−0.1649 (0.103)	−0.1097 (0.134)	Q4	0.1810** (0.073)	1.2453*** (0.138)			
			FEMALE*GRADUATE	−0.3327* (0.172)	−0.3260 (0.204)	FEMALE*Q2	0.1552** (0.076)	0.0904 (0.110)			
						FEMALE*Q3	−0.1240 (0.234)	0.1354 (0.096)			
						FEMALE*Q4	0.0273 (0.182)	−0.0687 (0.182)			
Constant	−1.0712 (0.806)	8.2459*** (0.835)		−1.1052 (0.795)	8.2187*** (0.835)		−1.0695 (0.799)	8.2523*** (0.832)		−1.0758 (0.800)	8.2430*** (0.831)
Observations		16,345			16,345			16,345			16,345
Household characteristics		Yes			Yes			Yes			Yes
State characteristics		Yes			Yes			Yes			Yes
Log likelihood		−4.510e+07			−4.510e+07			−4.510e+07			−4.510e+07

Robust standard errors (clustered by state) are in parentheses.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table 9. *Use of formal finance—interaction model between dummy for the gender of the household head and various channels of discrimination*

SOCIAL Variables			VIOLENCE Variables			POLITICAL PARTICIPATION Variables		
	(1)	(2)		(1)	(2)		(1)	(2)
FEMALE	−2.6678*	−2.1436**	FEMALE	−0.2129***	−0.0534	FEMALE	−0.4267***	−0.0092
	(1.455)	(1.024)		(0.080)	(0.058)		(0.051)	(0.104)
LOG(AVERAGE SIMPLE INTEREST RATE)	−0.0099	0.0209	LOG(AVERAGE SIMPLE INTEREST RATE)	−0.0002	0.0083	LOG(AVERAGE SIMPLE INTEREST RATE)	−0.0026	0.0181
	(0.031)	(0.074)		(0.028)	(0.070)		(0.033)	(0.071)
FEMALE INFANTICIDE	−0.2274**	0.5029*	CRIMES AGAINST WOMEN	3.0337***	−3.9688***	RESERVATIONS LEGISLTATURE	2.0631***	2.2986
	(0.091)	(0.282)		(0.771)	(1.316)		(0.689)	(1.964)
SEX RATIO	0.0004	−0.0009	FEMALE*(CRIMES AGAINST WOMEN)	2.5525***	−1.6362	RESERVATION-PANCHAYATS	0.2209***	−0.1732**
	(0.001)	(0.001)		(0.862)	(0.678)		(0.049)	(0.075)
FEMALE*(INFANTICIDE)	0.0880	0.1926				FEMALE*(RESERVATION LEGISLATURE)	4.6409***	−1.7485
	(0.161)	(0.136)					(0.621)	(1.179)
FEMALE*(SEX RATIO)	0.0027*	0.0018*				FEMALE*(RESERVATION PANCHAYAT)	0.1422***	−0.0629
	(0.001)	(0.001)					(0.053)	(0.081)
Constant	−2.0735*	10.4200***		−2.8007***	10.3997		−3.1623***	7.0931***
	(1.225)	(1.166)		(0.662)	(0.879)		(0.0741)	(1.191)
Household characteristics	Yes			Yes			Yes	
State characteristics	Yes			Yes			Yes	
Observations	16,345			16,345			15,185	
Log likelihood	−4.500e+07			−4.500e+07			−4.500e+07	
USE OF CASH LOANS—FORMAL SOURCES								
EDUCATION Variables			WAGE DISCRIMINATION Variables			WORK PARTICIPATION Variables		
	(1)	(2)		(1)	(2)		(1)	(2)
FEMALE	−0.0433	−0.1417**	FEMALE	0.0407	−0.2314**	FEMALE	0.2389	−0.2266***
	(0.133)	(0.059)		(0.224)	(0.103)		(0.209)	(0.077)
AVERAGE SIMPLE INTEREST RATE	−0.0081	0.0278	AVERAGE SIMPLE INTEREST RATE	−0.0024	0.0071	AVERAGE SIMPLE INTEREST RATE	−0.0062	0.0242
	(0.038)	(0.067)		(0.035)	(0.063)		(0.036)	(0.071)
UPPER PRIMARY ENROLLMENT	−0.8821*	1.6510***	REGULAR WAGES	−0.2626**	0.6620***	WORK PARTICIPATION RATE	−0.0023	0.0977
	(0.474)	(0.591)		(0.120)	(0.218)		(0.096)	(0.095)
PRIMARY ENROLLMENT	1.7611*	−2.9749*	CASUAL WAGES	−0.1450	0.4659*	FEMALE*(WORK PARTICIPATION)	−0.3352	0.0430
	(0.973)	(1.578)		(0.176)	(0.253)		(0.229)	(0.096)
FEMALE*(UPPER PRIMARY ENROLLMENT)	1.4540	−2.9021**	FEMALE*(REGULAR WAGES)	−0.2996	0.0108			
	(1.127)	(0.859)		(0.482)	(0.221)			
FEMALE*(PRIMARY ENROLLMENT)	1.1303	5.0525***	FEMALE*(CASUAL WAGES)	0.2883***	0.0724			
	(2.488)	(1.715)		(0.109)	(0.169)			
Constant	−0.7545	7.5831***		−0.7552	7.3213***		−1.0479	8.0204***
	(0.729)	(0.665)		(0.684)	(0.648)		(0.858)	(0.819)
Household characteristics	Yes			Yes			Yes	
State characteristics	Yes			Yes			Yes	
Observations	16,345			16,159			16,345	
Log likelihood	−4.500e+07			−4.490e+07			−4.510e+07	

Robust standard errors (clustered by state) are in parentheses.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

although the quantum of such loans is lower, on average. Illustratively, the use of cash loans by female-headed households is 14% higher in states where there is reservation for women in *Panchayats*. This can be viewed in the context of results obtained by Beaman *et al.* (2010) where they find that the likelihood of having to pay bribes to obtain a service when the gram panchayat is reserved for women is low. In terms of our analysis, the correlation observed could be due to states with better political representation for women having better infrastructure and banking facilities. This in turn can explain the lower reliance on cash credit for the female-headed households.

Among others channels of gender discrimination, violence against women impacts the use of finance: states with higher proportion of violence against women are more likely to borrow from formal sources but the quantum of cash loans are both economically and statistically lower. Similarly, greater the level of discrimination in education, greater the differential impact on the use of finance. To see this, note that in Table 9, the coefficient on upper primary enrollment ratio in column (2) is 1.65 and the dummy for female household head is -0.14 , while their interaction term equals -2.9 . Hence as the enrollment ratio worsens, households headed by females borrow less from formal sources, on average.

To encapsulate, our analysis provides evidence in favor of gender discrimination as regards financial inclusion—both in respect of access as well as use - which is explained primarily by political, wage, and education-related factors. This raises the question as to what kinds of policy interventions can be designed to address this challenge. We highlight some of the possible interventions in the next section.

7. POLICY CONCERNS

As the aforesaid discussion suggests, women face several constraints that impede their access to and use of financial services. Such constraints can emanate from both the demand and supply sides. As regards the former, it is possible to envisage that women do not have either the skills or the confidence to manage their finances. They might also encounter difficulties in providing immovable collateral, further exacerbating the challenges.

On the supply side, service delivery might not be attuned to serve them or even for that matter, product features might not be suited to their requirements. Paucity of sufficiently granular data, particularly by gender, further limits a meaningful assessment on what products and services they want and need. This calls for policy responses that can address this gap. The possible policy interventions can be categorized under five heads: (a) data-related; (b) technology-related; (c) institution-related; (d) information-utilities related and finally, (e) product-related.

As regards data-related intervention, one possible way is through better data management. In the case of Zambia for example, the central bank has engaged with financial institutions to persuade them to collate gender-disaggregated data so as to better target their financial products and services. Such an approach can prove useful going forward, in addressing the financial inclusion of women.

As regards technology-related interventions, having less stringent account opening requirements could be a possibility that can be explored. While international anti-money laundering norms call for regulatory regimes with proactive emphasis on customer due diligence, it is possible to consider suitable adjustments which permit remote access opening of accounts

(e.g., through agent banking) and to take on board the limited formal documents available with women, by expanding the range of identification documents and employing innovative forms of digital technology such as biometrics, eye scanning and finger printing.

New and dedicated institutions can also make a difference. Perhaps the best known example is the Wells Fargo Bank in the United States, which serves women-owned businesses with lines of credit up to US \$100,000. Banco Santander Santiago in Chile has also mainstreamed gender considerations in its loan extension strategy. It operates a microfinance affiliate (Banefe) for whom women make up to 54% of borrowers and 60% of loan officers. In Tanzania likewise, where the laws largely exclude women from owning land, a major form of collateral, the predominantly collateral-based banking system leaves them under-served. To address this gap, Sero Lease and Finance (Selfina), a women's leasing and finance company provides small-ticket business loans (up to US \$ 500), enabling women to acquire equipment for immediate use with a down-payment.

Information utilities related solution can empower women in their choice of products and services. One of the perennial challenges for women seeking to borrow is the provision of collateral. In practice, women might find it challenging to provide collateral: their fixed asset holdings, which is often the major collateral required, is typically limited. To help overcome collateral constraints, expanding the coverage of credit bureaus by requiring them to collect disaggregated information by gender on lending and performance and permitting lower loan amounts can prove to be a useful alternative. New credit bureaus in several African countries such as Uganda and Ghana have drastically lowered the minimum extendible loan amount. This works to the advantage of women, since they make use of smaller loan amounts than men (Beck, Maimbo, Faye, & Triki, 2011).

Finally, product-related interventions can also be a way forward. Globally, 110 million (or 37%) women receive their wages in cash, with the percentages in low-income countries (close to 80%) far outweighing the 13% number in high-income countries (Klapper, 2015). As Klapper (2015) observes, 80% of women in low-income countries still receive their wages in cash, because the use of technology in financial inclusion is still not quite pervasive. Digital financial services can provide women with greater privacy, confidentiality and control over their finances as well as the flexibility to spend on household expenditures and child welfare measures (Duflo, 2012).

8. CONCLUDING REMARKS

In the quest for financial inclusion, the role and relevance of gender has come into prominence in recent times. Economies, both emerging and developed, are engaged in devising policy responses to address this challenge. In this context, the paper provides an overview of this issue, drawing upon extant evidence.

Subsequently, it analyzes the evidence for India, using household-level data. The findings suggest that on average, households with female heads are less inclined to access formal finance and more inclined to access informal finance. These results are robust in multivariate regressions that take on board several household and state-level characteristics.

Further disaggregation as regards the channels of discrimination indicates that for female-headed households, educational and wage discrimination are more relevant in

explaining the access to finance, whereas political and social factors are much more germane in explaining the use of finance. These findings are consistent with prior research (Allen, Demirguc Kunt, Klapper, & Peria, 2016; Demirguc Kunt, & Randall, 2013). Moreover, the results on discrimination in other socio-economic channels worsening access to finance for female-headed household are a significant and new addition to the existing literature.

On balance, the importance of gender in financial inclusion is increasingly getting public attention, although several challenges still persist. These challenges are not just economic, but

also political and societal, as well as factors specific to the financial sector. Countries have been adopting a broad range of practices to circumvent these challenges. While some of these innovations are a response to market pressures, others are led by forward-looking policy designs. With gender issues in financial inclusion beginning to be explored more systematically, there is scope for greater focus on such issues. Intensifying this focus holds the promise of more effective policy, which can serve the cause of greater financial inclusion of women.

NOTES

1. G20 Leaders' Declaration, September, 2013.

2. A household is defined as having access to finance if it avails at least one cash loan from a formal and informal sources. The use of finance by a household is determined by the total level of cash loans availed by the household from various formal and informal sources.

3. Comprising commercial and cooperative banks, credit unions, post offices, or microfinance.

4. The gross enrollment ratio in primary education across both sexes was 101.2 in the developed economies and 108.9 in the developing economies as compared with a global average of 108.

5. There are also studies which show that microcredit to women might not necessarily be welfare-enhancing (Karlan & Zinman, 2011; Fafchamps, McKenzie, Quinn, & Woodruff, 2011).

6. Comprising scheduled castes, scheduled tribes, other backward classes, and Others.

7. The respondent to the questionnaire need not necessarily be the head of the household.

8. Comprising scheduled castes, scheduled tribes, other backward classes, and Others.

9. The household survey collects information on the original amount of the loan and the outstanding amount net of repayments as on the date of survey. For purposes of our analysis, we use the original amount of borrowing for cash loans. We thank Asli Demirguc-Kunt for raising this query.

10. In the AIDIS dataset, we observed that all households that access formal finance have access to informal finance as well but not *vice versa*.

11. As compared to the AIDIS data, the Findex data for India is less comprehensive, because it (a) is based on a much smaller sample and (b) excludes certain states and union territories. Secondly, while Findex measures access in terms of ownership of an account, our measure of access is defined on the basis of a household accessing a cash loan. It is however not possible to make a perfect comparison with respect to loan data vis-à-vis the Findex database since the latter does not track the amount of loans (Demirguc Kunt *et al.*, 2013b).

12. In our dataset, the median household size is 4. We classify households into two categories, large and small, based on the median size and employ a dummy code it as a control variable in all regressions.

13. We use immovable asset such as buildings and other properties as a proxy for household wealth. This constitutes the second largest form of household asset in both rural and urban areas, next only to landholdings (Subramanian & Jayaraj, 2006). We employ this variable as opposed to landholdings, since information on the latter is extremely scanty, which significantly reduces the sample size.

14. We consider the highest educational attainment of any member of the household.

15. Data on some of the state-level variables, such as workforce participation rate and wage rate for regular/salaried employees and casual laborers are reported separately for rural and urban areas. We match these data at the household level with respect to place of residence (i.e., urban *versus* rural) within a state.

16. All our regressions have been run after factoring for sample weights. We report the marginal effects for all regressions.

17. In our data, households who have accessed cash loans from at least one source of informal finance necessarily access cash loans from at least one formal source of finance. As a result, we cannot model household choices between formal and informal sources of finance (see, for example, Demirguc Kunt *et al.*, 2013a, 2013b).

18. When we run the models in Tables 4, 5, 7, and 8 using state fixed effects (instead of using state-level variables), the results are unaltered in terms of the direction, although the magnitudes are marginally altered. We thank Asli Demirguc Kunt for this suggestion.

19. We ran separate regressions considering one of these variables at a time—sex ratio and female feticide. The results (not reported) remain unchanged.

20. Wage discrimination is measured as the logarithm of the ratio of wages paid to men over wages paid to women.

REFERENCES

- Aghion, P., & Bolton, P. (1997). A theory of trickle-down growth and development. *Review of Economic Studies*, 64, 151–172.
- Aghion, P., Boustan, L., Hoxby, C., & Vandenbussche, J. (2009). The causal effect of education on economic growth: Evidence from United States. In D. Romer, & J. Wolfers (Eds.), *Brookings Paper on Economic Activity (Spring)*. Available at [<http://brookings.edu/economics/bpea>].
- Allen, F., Demircuc Kunt, A., Klapper, L., & Peria, M. (2016). The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation*, 27, 1–20.
- Annual Report. (2014). International Finance Corporation. (Accessed at http://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/annual+report+14/2014_online_report/2014_printed_report).
- Ashraf, N., Karlan, D., & Yin, W. (2010). Female empowerment: Impact of a commitment savings product in the Philippines. *World Development*, 38(3), 333–344.
- Aterido, R., Beck, T., & Iacovone, L. (2013). Gender and finance in Sub-Saharan Africa: Is there a gender gap?. *World Development*, 47, 102–120.
- Basavaraj, A., & Bhattacharjee, M. (2014). A study of household borrowing in the villages of Channarayapatna block, Hassan district. *Journal of Business and Economic Policy*, 1(1), 71–83.
- Basu, P. (2006). *Improving access to finance for India's rural poor, directions in development*. The World Bank.
- Bayoumi, T., & Melander, O. (2008). *Credit matters: Empirical evidence on US macro-financial linkages*, IMF Working Paper 169. Washington DC: IMF.
- Beaman, L., Pande, R., Duflo, E., & Topolova, P. (2010). *Political reservation and substantive representation: Evidence from Indian village councils*. Indian Policy Forum.
- Beck, T., Behr, P., & Madestam, A. (2015). *Sex and credit: Is there a gender bias in lending?* European Banking Center Discussion Paper No 2012-017. (Accessed at <http://dx.doi.org/10.2139/ssrn.2126489>).
- Beck, T., & Brown, M. (2011). *Use of banking services in emerging markets – Household level evidence*, CEPR Discussion Papers 8475 CEPR Discussion Papers.
- Beck, T., Demircuc Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth*, 12, 27–49.
- Beck, T., Maimbo, S. M., Faye, I., & Triki, T. (2011). *Financing Africa: Through the crisis and beyond*. Washington DC: The World Bank.
- Bhattacharjee, M., & Rajeev, M. (2013). *Credit exclusion of the poor: A study of cultivator households in India* ICDD Working Papers No. 8. Germany: Kassel.
- Browne, K. R. (2006). Evolved sex differences and occupational segregation. *Journal of Organizational Behavior*, 27(2), 143–162.
- Burgess, R., & Pande, R. (2005). Do rural banks matter? Evidence from the Indian social banking experiment. *American Economic Review*, 95, 780–795.
- Buvinic, M. (1997). *The picture of poverty contains mostly female faces*, Chicago tribune.
- Campero, A., & Kaiser, K. (2013). *Access to credit: Awareness and use of formal and informal credit institutions* Banco de Mexico Working Paper No. 2013-07. London: Sage.
- Cecchetti, S., & Kharroubi, E. (2012). *Reassessing the impact of finance on growth* BIS Working Paper 381. Basel: BIS.
- Chakrabarty, K. C. (2012). *Financial inclusion – Issues in measurement and analysis*, IFC Workshop on financial inclusion indicators. Bank for International Settlements (Accessed at http://www.bis.org/ifc/publ/ifcb38_keynotespeech.pdf).
- Chattopadhyay, R., & Duflo, E. (2004). Women as policy makers evidence from a randomized policy experiment in India (2004). *Econometrica*, 72 (5), 1409–1443.
- Coleman, S. (2000). Access to capital and terms of credit: A comparison of men and women-owned businesses. *Journal of Small Business Management*, 38, 37–52.
- Dabla-Norris, E., Ji, Y., Townsend, R., & Filiz Unsal, D. (2015). *Identifying constraints to financial inclusion and their impact on GDP and inequality: A structural framework for policy* IMF Working Paper 22. Washington DC: IMF.
- Deepti, K. C., & Tiwari, M. (2014). *Financial inclusion of women: Myth or reality, ideas for India*. (Accessed at http://www.ideasforindia.in/article.aspx?article_id=307).
- Demircuc Kunt, A., Klapper, L., & Singer, D. (2013a). *Financial inclusion and legal discrimination against women: Evidence from developing countries* Policy Research Working Paper no WPS 6416. Washington D.C.: World Bank.
- Demircuc Kunt, A., Klapper, L., & Singer, D. (2013b). *The Global index database: Financial inclusion in India* Findex notes; no. 8. Washington DC: World Bank.
- Demircuc Kunt, A. A., Klapper, L., Singer, D., & Van Oudheusden, P. (2015). *The global index database 2014: Measuring financial inclusion around the world* Policy Research Working Paper WPS7255. Washington D.C.: World Bank Group.
- Demircuc, A. L., Kunt, L., & Randall, D. (2013). *Islamic finance and financial inclusion: Measuring use of and demand for formal financial services among Muslim adults* Policy Research Working Paper 6642. Washington DC: The World Bank.
- Doepke, M., & Tertilt, M. (2014). *Does female empowerment promote economic development?* NBER Working Paper No w19888.
- Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic Literature*, 50, 1051–1079.
- Ellis, K., Lemma, A., & Rud, J.-P. (2010). *Financial inclusion, household investment and growth in Kenya and Tanzania* ODI Project Briefing No.43. London: Overseas Development Institute.
- Esteve-Volart, B. (2004). *Gender discrimination and growth: Theory and evidence from India* STICERD Working Paper 42. UK: London School of Economics.
- Fafchamps, M., McKenzie, D., Quinn, S. R., & Woodruff, C. (2011). *When is capital enough to get female microenterprises going? Evidence from a randomized experiment in Ghana* NBER Working Paper 17207. MA: Cambridge.
- Fletschner, D. (2008). Women's access to credit: Does it matter for household efficiency?. *American Journal of Agricultural Economics*, 90 (3), 669–683.
- Fletschner, D. (2009). Rural women's access to credit: Market imperfections and intra household dynamics. *World Development*, 37(3), 618–631.
- Fokus Women (2015). *A report on the status of female heads of households and their access to economic, social and cultural rights*. (Accessed at http://www.fokusvinner.no/PageFiles/9876/percent28ESCR_percent29_percent20in_percent20Anuradhapura.pdf).
- Food and Agriculture Organisation (2011). *State of food and agriculture report 2011*. Rome: Italy.
- Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *Review of Economic Studies*, 60, 35–52.
- Gender and Development Unit (2013). *Gender at work: A companion to the world development report on jobs*. World Bank Group (Accessed at http://www.worldbank.org/content/dam/Worldbank/document/Gender/GenderAtWork_web.pdf).
- Ghosh, S., & Kumar, K. (2014). *Monetary policy and informal finance: Is there a pecking order?* MPRA Paper No 65243. Munich Personal RePEc Archive.
- Hazarika, G., & Guha-Khasnobis, B. (2008). *Household access to microcredit and children's food security in rural Malawi: A gender perspective* Discussion Paper Series IZA DP No 3793. IZA.
- Holvoet, N. (2005). The impact of microfinance on decision-making agency: Evidence from South India. *Development and Change*, 36(1), 75–102.
- Honohan, P. (2007). *Household financial assets in the process of development* Policy Research Working paper Series 3965. The World Bank.
- Iyer, L., Mani, A., Mishra, P., & Topalova, P. (2012). The power of political voice: Women's political representation and crime in India. *American Economic Journal: Applied Economics*, 4(4), 165–193.
- Karlan, D., & Zinman, J. (2011). Microcredit in theory and practice: Using randomized scoring for impact evaluation. *Science*, 332, 1278–1284.
- Klapper, L. (2015). *Digital financial solutions to advance women's economic participation* Report prepared for the Turkish G20 Presidency. Washington D.C: The World Bank.
- Klasen, S., & Lamanna, F. (2008). *The impact of gender inequality in education and employment on economic growth in developing countries: Updates and extensions* Centre for Research in Economic Development Working Paper 10. Belgium: CRED.

- Lampietti, J. A., & Stalker, L. (2000). *Consumption expenditure and female poverty a review of the evidence, policy research report on gender and development working paper series no 11*. Washington D.C: World Bank.
- Lusardi, A., & Tufano, P. (2009). *Debt literacy, financial experiences and overindebtedness* NBER Working Paper No 14808. .
- Malapit, H. J. L. (2012). Are women more likely to be credit constrained? Evidence from low-income urban households in the Philippines. *Feminist Economics*, 18(3), 81–108.
- Neumark, D., & Stock, W. A. (2007). The labor market effects of sex and race discrimination laws. *Economic Inquiry*, 44(3), 385–416.
- NWBC (2015). *Spreading the wealth: getting venture capital to women entrepreneurs*. (Accessed at <https://www.nwbc.gov/sites/default/files/Accesspercent20to percent20Capital percent20Fact percent20Sheet.pdf>).
- Organisation for Economic Cooperation and Development (2014). *Achieving Stronger Growth by Promoting a more Gender-balanced Economy*. Report prepared jointly by the OECD, ILO, IMF and the World Bank for the G20 Labour and Employment Ministerial Meeting, Melbourne, Australia.
- Okurut, F. N. (2006). *Access to credit by the poor in South Africa: Evidence from household survey data 1995 and 2000* Stellenbosch Economic Working Papers No 13/06. .
- Pitt, M. M., Khandker, S. R., Chowdhury, O. H., & Millimet, D. L. (2003). Credit programs for the poor and the health status of children in rural Bangladesh. *International Economic Review*, 44, 87–118.
- Quisumbing, A. R., Haddad, L., & Pena, C. (1995). *Gender and poverty: New evidence from 10 developing countries* FCND Discussion Paper No 9. International Food Policy Research Institute.
- Rajeev, M., Bhattacharjee, M. (2012). Access to financial services: Are poor excluded: A case study of India. Norwegian Institute of International Relations, NUPI Working paper No. 808, Norway.
- Rajeev, M., & Bhattacharjee, M. (2015). *Access to financial services: Are poor excluded – A case study of India* NUPI Working Paper 808.
- Rajeev, M., Vani, B. P., & Bhattacharjee, M. (2011). Credibility of equal access to credit: does gender matter?. *Economics and Political Weekly*, XLVI(33), 76–79.
- Rawlings, L. B., & Rubio, G. M. (2005). Evaluating the impact of conditional cash transfer programs. *World Bank Research Observer*, 20(1), 29–55.
- Rodrik, D. (2012). Why we learn nothing from regressing economic growth on policies. *Seoul Journal of Economics*, 25(2), 137–151.
- Seguino, S., & Floro, M. S. (2003). Does gender have any effect on aggregate saving? An empirical analysis. *International Review of Applied Economics*, 17, 36–48.
- Shahriari, H., Danzer, A. M., Giovarelli, R., & Underland, A. (2009). *Improving women's access to land and financial resources in Tajikistan* Economic Sector Work Report. Washington D.C: The World Bank.
- Subramanian, S., & Jayaraj, D. (2006). *The distribution of household wealth in India* UNU-Wider Research Paper 2006/116. .
- Swain, R. B. (2002). Credit rationing in rural India. *Journal of Economic Development*, 27(2), 1–20.
- UN Women. (2015). Accessed at <http://www.unwomen.org/en/what-we-do/leadership-and-political-participation/facts-and-figures>.
- UNESCO Institute of Statistics (2015). Accessed at [<http://data.uis.unesco.org/?queryid=142>].
- Zins, A., & Weill, L. (2016). The determinants of financial inclusion in Africa. *Review of Development Finance*, 6, 46–57.

FURTHER READING

- Beck, T., Demircuc Kunt, A., & Peria, M. (2006). *Banking services for everyone? Barriers to bank access and use around the world* Policy Research Working Paper no WPS 4079. Washington D.C.: World Bank.
- Demircuc Kunt, A., & Levine, R. (2008). *Finance, financial sector policies and long-run growth* Policy Research Working Papers WPS4469. Washington D.C.: World Bank Group.
- Dupas, P., & Robinson, J. (2013a). Why don't the poor save more? Evidence from health savings experiment. *The American Economic Review*, 103(4), 1138–1171.
- Dupas, P., & Robinson, J. (2013b). Savings constraints and microenterprise development: Evidence from a field experiment in Kenya. *American Economic Journal: Applied Economics*, 5(1), 163–192.
- Fiske, E. B. (2012). *World atlas of gender equality in education*. UNESCO (Accessed at <http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/pdf/Atlas-education-gender-equality1.pdf>).
- Guiso, L., Sapienza, P., & Zingales, L. (2004). Does financial development matter?. *The Quarterly Journal of Economics*, 119(3), 929–969.
- Klapper, L., & Parker, S. C. (2011). Gender and the business environment for new firm creation. *World Bank Research Observer*, 26(2), 237–257.
- Ministry of Statistics and Programme Implementation (2014). *Key indicators of debt and investment in India*. Government of India: National Sample Survey Office (Accessed at http://mospi.nic.in/Mospi_New/upload/KI_70_18.2_19dec14.pdf).
- Peachy, S., & Roe, A. (2004). *Access to finance – What does it mean and how do savings banks foster access?*. Brussels: World Savings Banks Institute.
- Pounder, J. S., & Coleman, M. (2002). Women – Better leaders than men? In general and educational management it still “all depends”. *Leadership and Organization Development Journal*, 23(3), 122–133.
- Rajan, R., & Zingales, L. (1998). Financial dependence and growth. *The American Economic Review*, 88(3), 559–586.
- Rajeev, M. (2015). *Financial inclusion and disparity: A case of India* GLU Working Paper No 37.

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