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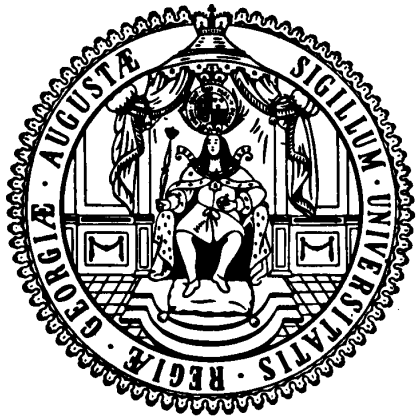

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The Financial Literacy Gender Gap and the Role of Culture

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Abstract

This paper empirically investigates the role of culture in explaining the frequently reported differences in financial literacy between women and men. Using nationally representative survey data from India, we find that women are significantly less financially literate than men. This gender gap is not observable, however, when we only consider matrilineal states. Moreover, matrilineal women are more financially knowledgeable than patriarchal women. Using the Blinder-Oaxaca decomposition method, we find that education, English language skills and the use of different information sources, such as newspapers and TV, are key transmission channels in explaining differences in financial knowledge between men and women in patriarchal states, and between patriarchal and matrilineal societies.

JEL-Codes: D8, D12, O1, Z1

Keywords: Gender, financial literacy, culture, matrilineal and patriarchal societies, Blinder-Oaxaca decomposition

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1. Introduction

Making informed decisions on financial management requires a sound understanding of financial concepts, such as interest rates, inflation and risk diversification, as well as a good deal of knowledge about alternative ways of saving, borrowing and investment or different retirement and decumulation plans. However, studies show that individuals' level of financial literacy is disappointingly low even in advanced economies (see, for example, Fonseca et al., 2012; Lusardi et al., 2012; Lusardi and Mitchell, 2014). For instance, a recent global survey by Standard & Poor's Ratings Services shows that only 33% of adults worldwide display an understanding of basic financial concepts (Klapper et al., 2015). Moreover, financial literacy differences exist amongst different sectors of society, with the young, the poor and women showing significantly lower levels of financial knowledge.

One of the consistently reported stylized facts regarding financial literacy is that women are financially less knowledgeable than men (Cole et al., 2011; Lührmann et al., 2014; Lusardi and Mitchell, 2014; Klapper et al., 2015). Men outperform women in both basic and sophisticated financial literacy questions (Lusardi et al., 2010). Strikingly, even single men have a higher level of financial literacy than single women despite both groups being equally responsible for their own finances (Bucher-Koenen et al., 2012). These significant gender gaps also exist among the young and educated (Lusardi et al., 2010). Moreover, while individuals living in developing countries generally show a substantially lower level of financial literacy than those in OECD economies (Klapper et al., 2015), especially women in developing countries display a very low level of financial literacy (Fanta et al., 2016). This does not necessarily imply, however, that the financial literacy gender gap narrows as economies develop. On the contrary, a recent paper by Cupak et al. (2018) shows that the financial literacy gender gap is lower in some developing than in developed countries.

As part of the effort to promote gender equality and to empower women, governmental and non-governmental agencies in developing countries are implementing numerous development projects and providing financial services that are often exclusively targeted to women. For instance, several microfinance institutions are designed primarily for women (D'espallier et al.,

2013)[1], either from a poverty reduction and equality perspective or because women are good credit risks. With women's lower financial knowledge, however, this emphasis on women may not achieve the intended goals and can even have unexpected repercussions such as difficulties in handling a surge in total debt (see, for example, de Janvry et al., 2010). As a result, enhancing women's financial literacy through financial literacy programs is becoming an important policy issue in developing countries. However, studies show that financial literacy programs that are targeted at both women and men are less effective for women (Berge et al., 2014). Lower financial literacy training outcomes are also observed amongst girls as compared to boys of high-school age (Lührmann et al., 2014).

To improve the efficiency of financial literacy training for women in developing countries, it is therefore important to understand the factors that drive the financial literacy gap in the first place. In this regard, the literature has identified differences between men and women in terms of degrees of household financial responsibility (Hsu, 2016), education levels (Lusardi and Mitchel, 2014) and income levels (Lusardi et al., 2010) as potential determinants of the gender gap in financial literacy. While these factors do contribute to the financial literacy gender gap, they do not fully account for it (Lusardi and Mitchel, 2014; Bucher-Koenen and Lusardi, 2011).

In this paper, we study how culture affects the financial literacy gender gap and show that gender roles rooted in culture have different effects for financial knowledge. Our country of analysis is India. Two reasons make India well-suited for analyzing the role of culture on financial literacy. Firstly, norms and social structures, which are fundamentals of culture, are still relatively strict in India[2]. Secondly, there exists inter-state variation in culture with respect to household decision-making: while in most Indian states intra-household responsibilities are ascribed to men, in very few Indian states women are the economic and financial household manager.

Acknowledging the important role of culture as a channel through which centuries-old social norms and traditions influence current individual behaviour (see Tabellini, 2010), we investigate the effect on financial literacy of a specific cultural trait in India, namely financial and economic

[1] In the dataset of D'Espallier et al. (2013), which covers 398 microfinance institutions in 73 countries worldwide, women constitute about 70 per cent of all microfinance customers. Moreover, 47 per cent of the microfinance institutions are found to specifically target women.

[2] For instance, the caste system, although officially abolished, is still prevalent and individuals continue to follow the caste customs and traditions.

responsibilities within the household. In particular, we argue that a culture that assigns the role of household financial decision-making to women increases women's financial literacy. The effect of female intra-household decision-making on financial literacy, however, might be endogenous to social and economic development. It is a widely observed fact that in developed countries women too are more often in charge of their own finances (e.g., Lusardi and Mitchel, 2011). Thus, in order to properly analyze the effect of culture on financial knowledge, in particular female empowerment and intra household financial decision making, we need a cultural counterfactual. A few matrilineal states in India differ exactly in this aspect: the financial decision making role is ascribed to women by culture. Thus, in contrast to existing studies we exploit the natural setting where the intra-household responsibilities are embedded in norms and traditions accepted by institutions and persist over centuries. Perhaps most importantly, females in the matrilineal society know from early childhood that they will not hand over their role as financial manager to their husband.

Investigating the variation in financial literacy between patriarchal and matrilineal states[3] we show that culture is an important determinant of the widely reported financial literacy gender gap. In the matrilineal societies of north eastern India, girls are the potential future financial manager of the household and they grow up with this awareness. Institutional rules and norms are in the favor of women, e.g., inheritance follows the female line, females rule over the household finances, and after marriage the husband moves into the female's house. The youngest daughter becomes the household head in the future - whereas in patriarchal societies this role is often ascribed to the oldest son.

We argue that this responsibility rooted in the matrilineal culture could be a motivating factor for girls to search for financial knowledge using different means. In contrast, girls in the patriarchal society learn from early childhood that household financial management is often assigned to the man in the household, which possibly motivates boys more than girls to invest in acquiring financial knowledge. Hence, the matrilineal culture increases financial literacy of women not only directly by giving them the opportunity to gather knowledge through learning-

[3] This kind of natural experiment has become increasingly popular since the seminal work of Gneezy et al. (2009), who compare two typically patriarchal and matrilineal societies to examine the role of culture in explaining gender differences in selecting into competitive environments. Gneezy et al. (2009) find that women in the patriarchal Masai tribe of Tanzania choose competitive environments less often than Masai men, which is similar to findings reported in Western societies. In contrast, women in the matrilineal Khasi tribe of India are found to be more competitive than Khasi men.

by-doing as suggested in the financial responsibility thesis (Hsu, 2016)[4], but also indirectly by increasing the intrinsic motivation to actively seek for knowledge of women by changing their expectation that they will manage their future household finances. The latter argument is consistent with Lusardi and Mitchell's (2014) conjecture that unmarried women's lower financial literacy in comparison to unmarried men may be a consequence of unmarried women's expectation that they would have someone (a husband or companion) later in life to manage household finances. We argue that the matrilineal culture changes this expectation and makes girls as interested in financial matters as boys. Thus, our approach goes beyond existing studies on financial literacy and financial responsibilities of women by taking into account the cultural environment in which the women live and grow up.

Most of the existing studies investigating financial responsibilities of women use data from developed countries like Europe or USA where women are already more empowered than in developing countries. However, the effects of culture on financial literacy might even be stronger in developing countries where social norms and intra-household roles are relatively strict. Thus we do not only provide new evidence in a developing country context, but also complement studies arguing that institutions, social ties and norms are relevant for individuals' behavior (e.g. Gneezy et al, 2009), or even for acquiring financial knowledge (Bönte and Filipiak, 2012).

For the empirical analysis, we employ data obtained from the National Data Survey on Saving Patterns of Indians (NDSSP) conducted at the request of the Indian Ministry of Finance in 2004 - 2005. An important advantage of this dataset is that it comprises information from all Indian states and allows us thus to compare respondents who live in the north-eastern matrilineal states of Nagaland, Mizoram and Meghalaya with those who live in other Indian states, which tend to have strong patriarchal societies. We use two indices based on six questions capturing general financial knowledge, such as knowledge of inflation or that the government guarantees deposits, as well as more specific knowledge on what a credit or ATM card is. This therefore allows us to capture a relatively broad range of financial knowledge measured by relatively simple questions, which is relevant when investigating financial literacy in developing countries (see, for example, Drexler et al., 2014).

Our results show that women are, on average, less likely to have knowledge of different

[4] Hsu (2016) uses data from the Cognition and Aging Study in the USA (CogUSA).

financial practices in comparison to men in patriarchal India. While we find a significant gender gap in financial literacy in patriarchal of about 10 percent, we do not find any significant financial literacy gender gap in the three matrilineal states. We also find education, English language skills and the use of information sources use to be key transmission channels from women's cultural roles in these two types of societies to financial literacy. Results from the Oaxaca-Decomposition Analysis for instance, show that differences in these transmission channels, account for around 49% per cent of the gender gap in financial literacy in patriarchal states. These results imply that alleviating the financial literacy gender gap in patriarchal societies requires promoting gender equality in access to education and the mass media. Perhaps more important is that it requires changing cultural norms in such a way that women anticipate that they will be responsible for financial and economic decisions from an early age. This is probably the most challenging, as norms and habits set by a culture are difficult to change. One potential way of achieving this in patriarchal societies is through educating young girls to be economically responsible right from when they are young.

This paper makes three main contributions to the existing literature. First, this paper introduces culture as an important determinant of financial literacy and the financial literacy gender gap by showing that the widely reported financial literacy gender gap is not a characteristic of matrilineal societies. Second, this work complements previous research on the impact of intra-household financial decision-making gender roles on the financial literacy gender gap. Whereas previous studies (for example, Hsu, 2016) employ general survey questions on who is responsible for financial decisions in the household, it is not clear whether this intra-household role changes over time. This study makes use of a natural testing ground where women's roles as the financial managers of their households are set by birth in the matrilineal society and do not vary over time. This allows us to test a new level of female empowerment and its effect on female financial knowledge. Third, this paper highlights the effects of different information sources, such as the internet, newspapers, radio and TV, on financial literacy -- another group of determinants for financial literacy that have not received much attention in the existing literature yet.

2. Theoretical Framework

This section provides a theoretical framework on the role of culture, and explains why matrilineal culture in particular could be favourable for women's financial literacy. Moreover, it highlights the importance of financial literacy in developing countries and discusses potential determinants of gender differences in financial literacy, emphasising the role of culture in financial literacy. It concludes by presenting some salient features of the matrilineal society in India.

2.1 The Importance of Financial Literacy in Developing Countries

Financial literacy is a broad concept that can be defined in different ways (Fanta et al., 2016). For instance, Lusardi and Mitchell (2014, p. 6) define financial literacy as "*people's ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pension."* Accordingly, financial literacy involves numeracy and the capacity to calculate wealth, income, interest rates and inflation. Moreover, it requires an understanding of important concepts such as inflation and risk diversification (Lusardi and Mitchell, 2014; Klapper et al., 2015). Awareness of saving and borrowing instruments, such as bank accounts and credit cards, are also an integral part of financial literacy.

Studies show that people with higher financial knowledge are often characterised by higher wealth, better preparation for retirement and ownership of riskier assets such as shares or bonds. On the other hand, individuals with lower levels of financial knowledge are more likely to be faced with higher costs; for example, they borrow at high interest rates, pay higher fees for financial transactions or do not participate in the financial market at all (Bucher-Koenen and Lusardi, 2011; Lusardi et al., 2012; Klapper et al., 2015). In general, there is a broad consensus in the literature that financial literacy affects financial decision-making and that individuals achieve better economic outcomes if they possess a reasonable degree of financial literacy (Lusardi and Mitchell, 2014; Klapper et al., 2015).

Low levels of financial literacy could increase vulnerability to poverty in developing countries, as a majority of households possess limited financial knowledge (Klapper et al., 2015; Fanta et al., 2016). Consequently, most people in developing countries may not adequately use financial resources, or may not use them at all (Karlan et al., 2014; Cole et al., 2011; Banerjee & Duflo, 2007). Additionally, sub-optimal decisions imposed by low levels of financial literacy,

lack of information and crude sources of financial advice may lead to economic risks for individuals (Lusardi and Mitchel, 2014). This is a serious problem, especially for women, since it is widely documented that women are less financially literate than men (Lusardi and Mitchel, 2014; Bucher-Koenen et al., 2012; Fanta, 2016) despite the fact that women are the main target group of microfinance services (D'espallier et al., 2013). Being prepared for future events, such as retirement or unexpected economic shocks, requires a certain level of knowledge of saving as well as short- and long-term expenditures and investments. This is a crucial issue for the poor as studies show that the poor continues to frequently use traditional ways of borrowing or saving such as saving in cash and in-kind at home, buying livestock or hiding money under a mattress (Karlan et al., 2014; Banerjee and Duflo, 2007).

The existing literature documents that the poor barely use financial services–despite the increasing supply of financial services (Somville and Vandewalle, 2015; Karlan et al., 2014; Fanta et al., 2016). Thus, enhancing an individual's financial knowledge to better understand the benefits of existing financial mechanisms could reduce such inefficiencies. In addition, a certain level of financial knowledge, for example, if banks offer deposit insurance or the awareness of financial instruments, such as ATM or Credit cards, could decrease the financial vulnerability of the poor and ideally assist them in building up a buffer against economic shocks. Studies, show that financial education programs together with financial subsidies increase the demand for financial products (Cole et al., 2011). A further challenge for properly designing adequate financial literacy programs is that financial knowledge markedly varies amongst different groups of society. For instance, in the Southern region of Africa, Fanta et al. (2016) document that women, the youth, the poor, the retired, the less educated and those living in rural areas show a particularly low level of financial literacy.

2.2 Gender Differences in Financial Literacy

One of the key stylized facts in the financial literacy literature is that women have a significantly lower level of financial literacy than men. This gender gap persists across generations, surveys, countries and is independent of the level of sophistication of the financial literacy questions asked (Lusardi and Mitchell, 2014; Klapper et al., 2015).

Several studies have tried to explain these gender differences. In the following, we briefly

discuss four of the potential determinants of the gender gap in financial literacy.

One of the often-argued reasons for women's lower level of financial literacy is their lower involvement in the financial decision-making process within the household. Being financially responsible provides the opportunity to acquire financial knowledge through learning-by-doing. For instance, individuals who manage household finances inform themselves of different savings and investment mechanisms, and inquire about the possible benefits and risks associated with their financial investments. Such activities demand repeated interactions with workers at the financial institution and other customers who have similar interests. This may raise the financial knowledge of a financially responsible individual and increase the knowledge gap with a less financially responsible partner. This view is echoed by studies such as Hsu (2016). The theoretical model by Hsu (2016) implies that women's lower level of financial literacy could be a consequence of their own rational decision to let their husband specialise in household financial matters. When women are less involved in financial decision-making within the household, they acquire a smaller amount of financial knowledge through learning-by-doing and their motivation to learn about financial matters may be lower since they may not see the use in acquiring this specific knowledge (Lusardi and Mitchell, 2014).

Interestingly, Fonseca et al. (2012) report that greater financial decision-making, and hence financial responsibility within the household, is positively correlated with higher financial literacy among US citizens, but only for men. They empirically show that men are more likely to increase their financial knowledge when they are in charge of financial and economic decisions. However, they do not find similar empirical evidence for female decision makers, which is in juxtaposition with the financial responsibility hypothesis. Bucher-Koenen et al. (2012), similarly show that a remarkable gender gap in financial knowledge exists in Germany even amongst the divorced and widowed, and that sole female decision makers --those who were never married, have equally low or even lower levels of financial literacy compared to women living in a partnership. Hence, it remains unclear to what extent the specialization of financial matters within the household fully explains the financial literacy gender gap.

The second potential determinant of the financial literacy gender gap discussed in the literature is education. Lusardi and Mitchel (2014) stress the relevance of education for financial literacy because substantial differences in financial literacy correspond with different levels of

education. Individuals with a lower level of education are less likely to be knowledgeable about financial issues (Lusardi and Mitchel, 2014; Drexler et al., 2014). This is likely because financial literacy requires numeracy skills, and a certain level of education is necessary to properly understand and use specific financial instruments. In addition, spouses with a higher level of education are more likely to be responsible for household financial matters thereby increasing their financial knowledge (Fonseca et al., 2012). Similarly, women with a higher level of education may be better able to assess the future benefits of investing in financial knowledge. However, although a generally higher level of education for men –in comparison to women— could potentially explain some part of the financial literacy gender gap in many countries, the gap is still evident even between equally educated men and women (Mahdavi and Horton, 2012; Lusardi and Mitchel, 2014). By the same token, the financial literacy gender gap could be partly, but not fully, explained by differences in other individual characteristics such as marital status, age and income level (Bucher-Koenen et al., 2012).

2.3 Culture and Financial Literacy

A third reason for why women might have a lower level of financial literacy than men is that women have different preferences than men. For instance, Lusardi and Mitchel (2014) argue that women may generally be less interested in financial matters than men, and therefore invest less to acquire financial knowledge. Consistent with this argument, Lührmann et al. (2014) provide empirical evidence that teaching high school children in Germany about financial issues significantly enhances interest in financial topics for boys, but not for girls. It is tempting to conclude that women's lack of interest in financial matters may be biologically driven, which in turn could lead us to attribute the financial literacy gender gap to nature. However, it is worth noting here that other factors such as culture could generate seemingly biological differences in the preferences among women and men. For instance, explaining why women are in general less competitive than men, Gneezy et al. (2009) show that while women often choose less competitive environments than men in patriarchal societies, the reverse is true in matrilineal societies. For the same reason, culture could be an important determinant of the financial literacy gender gap through its impact on the preferences of women and men.

Thus, as a fourth determinant of the financial literacy gender gap, we consider differences in

cultural values and norms. Culture can contribute to the financial literacy gender gap in several ways. For instance, given that education is a key determinant of financial literacy, a society that encourages the education of boys relative to girls makes boys more financially knowledgeable than girls. Likewise, boys could be more financially savvy than girls in a culture where boys have more freedom and access to the mass media and public discussions than girls, as the media and informal discussions are important sources of information about different financial services, products and practices.

Perhaps the biggest impact of culture on financial literacy is through its effect on dictating who decides on household financial issues. We have discussed how women's lower degree of financial responsibility in household finances could be one of the main reasons for women's lower level of financial knowledge in comparison to men. Hence, a culture that assigns the role of managing household finances to men increases men's financial knowledge relative to women. However, the impact of this role setting in managing household finances extends beyond the financial responsibility (learning-by-doing) argument. While being financially responsible increases financial knowledge through learning-by-doing, a culture which dictates that managing household finances is the domain of men encourages men (and discourages women) to invest in acquiring financial knowledge, formally and informally.

As a result, culture may foster the financial literacy gender gap by affecting the expected benefit from investments in this specific form of human capital. It is well known that investment in human capital usually involves costs and so does acquiring financial knowledge. Individuals invest in acquiring human capital taking into account the future flow of returns, mostly in income terms. This investment could be in the form of formal education, on the job training or by acquiring information about a specific topic or area that may be valuable in the future. Given that specific forms of human capital, such as financial literacy, is often of little use outside its immediate domain (Becker, 1962), the opportunity cost of investing in its acquisition is relatively higher than investing in a comparable amount of general human capital. Hence, individuals who are responsible for most of their household finances—including their expectation to remain in this role—are more likely to anticipate a larger net return from investment in financial knowledge than their partners. Conversely, individuals who expect others (their partners or the state) to manage their own finances in the future are less likely to invest in acquiring financial knowledge. Empirical support for this argument is found in Japelli and

Padula (2013), who document that people are less likely to invest in financial literacy when the social security system in their country is strong. This argument has the potential to explain the puzzle why even unmarried women are less financially knowledgeable than unmarried men. As long as women live in a society that often assigns men to manage household financial issues, women are likely to invest less in acquiring financial knowledge than men. Consequently, even unmarried women may have lower levels of financial literacy than unmarried men.

In this study, we emphasise that while household decision-making could increase women's financial literacy by giving them the opportunity for learning-by-doing, changing the expectation that they will hold this role permanently will have a more pronounced effect. In our study, we focus on women in a matrilineal society, who are in charge of economic and financial decisions of the household by culture, and learn how to fill this particular role starting from early childhood. We hypothesise that women who live in this culture have higher financial literacy than women who live in a society where intra-household economic and financial decisions are mainly made by men. These differences in financial literacy amongst women result from factors arising from different cultural backgrounds. While the matrilineal culture provides adequate conditions for women to learn and acquire financial knowledge, for example, by encouraging female education and allowing them to use different information sources and ensuring that they expect to be future household finance managers, the patriarchal culture offers these opportunities to men rather than to women. Thus culture may affect financial literacy directly, but also indirectly by affecting female education and their information access and use which could be important transmission channels.

2.3 The Matrilineal Society

The Garos, Jaintias, and the Khasis are the three main ethnic communities in Nagaland, Mizoram and Meghalaya, which are three relatively small states in North East India.[5] These tribes form some of the few matrilineal societies in the world. In their matrilineal culture, inheritance goes through the mother's lineage. Married couples reside with or near the wife's parents and the husband moves into his wife's house after marriage. Therefore, their culture is also called

[5] Nagaland, Mizoram and Meghalaya account for 0.25%, 0.09% and 0.16% of the Indian population, respectively (www.censusindia.gov.in.).

matrilocal. The youngest daughter usually stays with her mother and becomes the household head in the future. A man who is married to the youngest daughter in the family lives together with his wife and his mother-in-law, who is the head of the household. Men who are unmarried, divorced or widowed stay with their parents until they get married or re-married. Moreover, income earned by a matrilineal man is used to contribute to the wealth of the wife's or mother's family. Thus, economic decisions and household responsibilities are mainly borne by the wife. It is also worth noting that the Khasi families are well known for investing a great deal in educating their daughters (Nakane, 1967; Gneezy et al., 2009).

In view of the aforementioned essential elements of the matrilineal society, there are at least three factors that may change men's often-found superior performance in financial literacy over women in matrilineal societies. First, given that women know from early childhood that they will be responsible for handling household finances, they grow up paying close attention to take opportunities in order to gain financial knowledge such as attending formal education, following financial news in mass media and participating in household discussions on financial issues. Thus, seeing their mothers and grandmothers dealing with household financial items girls might anticipate that they will need this specific knowledge in the future. Second, since education has a statistically significant positive impact on financial literacy, matrilineal parents' emphasis on female education might enhance women's financial literacy. Third, when women get married, they will be responsible for handling household financial issues. Financial responsibility provides the opportunity to acquire financial knowledge through learning-by-doing and by allowing repeated interactions with workers from financial institutions and other customers of financial services.

In these societies, men were assigned political as well as religious occupations. Even before the advent of the British, men among the Gharos, Jaintas and Khasis participated in politics and justice, were warriors, hunters or priests (Nongbri, 1983). The important difference is that the pre-dominant role of women as household financial manager has long been accepted by the institutions in the matrilineal states.

3 Data

3.1 Source

For our empirical analysis, we use the National Data Survey on Savings Patterns of Indians (NDSSP), which is a nationwide and representative Indian survey conducted by AC Nielsen Org-Marg on behalf of the Indian Ministry of Finance in 2004/2005 (see also Bönte and Filipiak, 2012; Monsen et al., 2011). The NDSSP contains relevant information on Indian households' savings and investments in financial instruments as well as information about a respondent's financial knowledge. Moreover, the dataset allows us to control for a variety of relevant information with respect to financial knowledge, e.g. the respondent's income, age, marital status, level of education, frequency of use of information sources and place of residence.

The NDSSP covers 211,000 individuals and 40,862 households that were randomly selected by the local teams. Although all family members were asked to provide basic personal information (for example, gender, age, education, occupation), only one income-earning member per family was chosen to continue with the full questionnaire. The fact that the respondents are income earning family members allows us to focus on household members that have greater familiarity with handling money.[6]

Our final sample consists of 28,378 observations, with 3,001 women and 25,377 men, due to the exclusion of a substantial number of missing values. Our working sample is the one that has been used in Bönte and Filipiak (2012) and mainly excludes respondents without positive annual savings, computed as annual income minus expenditure (3,970 observations), and without a savings account (10,769 observations). The aim is to involve only those women and men who could have the minimum interest and experience with the financial system in order to avoid potential endogeneity issues arising from prior or current financial experiences.[7] With respect to

[6] The list of villages was obtained from the Census of India 2001 Database along with their total households. The required number of households was selected following systematic random sampling technique. In case of bigger villages (>400 households) the entire village was divided into four segments of equal size say 100 - 150 hh and two segments were selected at random. In these segments the survey was conducted. In each selected household, details pertaining demographics, marital status, education and occupation were collected for each member of the household. Then for all earning members of the household, one eligible respondent was chosen randomly to participate in the rest of the interview.

[7] The reduced sample is representative for Indian states as well. There are no significant differences between both samples when comparing variables of interest. Summary statistics for the sample of 40,862, which are available

their household responsibilities, 69.4 per cent of these respondents are household heads, 20.3 per cent are sons and son-in-laws, 5.6 per cent are spouses, 2.2 per cent are daughters and daughter-in-laws, 1.5 per cent are brother-in-laws and the remaining are other family members. Thus, most of the respondents in our sample are either the household head or income-earning representatives of the household head.

Our matrilineal sample comprises respondents from the north-eastern states of Nagaland Mizoram and Meghalaya, with 190 female and 705 male respondents. This is a unique feature of this data, as survey data on households in these states is still relatively rare.

3.2 Measurement of Variables

3.2.1 Dependent Variables

Over the past few decades in India, many financial products have emerged that are particularly targeted at low-income individuals, who often have relatively limited access to financial services. For example, a bank account can be opened free of charge and without a minimum deposit requirement. The Indian government also offers full guarantees for deposits in nationalised banks. Furthermore, financial instruments, such as Credit or Kisan cards, are becoming more frequent. Kisan cards are a common financial instrument used by farmers and people living in rural India and provide affordable short-term credit. They were launched in 1998 to help farmers to finance their agricultural activities.

Because the NDSSP survey precedes the recent financial literacy literature, it does not contain the financial literacy questions that have become standard in the literature (see, for example, Lusardi and Mitchell, 2014). However, it includes several questions on a respondent's financial knowledge and attitude, on which we can build our financial literacy measures. The advantage of these measures is that it captures financial literacy at its very basic level, namely

upon request, show for instance, that the ratio of female respondents remains almost the same as in the reduced sample of 28,378 (around 10% in patriarchal states and 20% in matrilineal states). There is also a clear financial literacy gender gap in patriarchal states. Unlike the working sample, however, there is a moderate financial literacy gender gap in matrilineal states too. Still, the financial literacy gender gap in matrilineal states (7% using FL1 and 5.9% using FL2) is substantially lower than the gender gap in patriarchal states (16.5% using FL1 and 14.9% using FL2). Regression results obtained by employing the bigger sample of 40,773 observations also corroborate these patterns from the summary statistics and are consistent with those reported in Tables 3 and 4. These results are available upon request.

the awareness of certain financial instruments and practices. In a developing country context, such basic questions are more adequate than the standard financial literacy questions which are often too complex for many individuals (Drexler et al., 2012).[8] Specifically, we use the following six questions in order to build two financial literacy indices: (1) Do you know what the current value of inflation is? (2) Does the government guarantee full deposits in a nationalised bank? (3) Do you know the current value of all your investments/inheritance? (4) Do you have a credit card? (5) Do you have a Kisan card? (6) Do you have an ATM card? These questions have the merit of being relevant measures of financial literacy in the context of a developing country; especially in India, where many people still do not have a bank account, or are not informed on standard financial products. Although these six questions may appear as being relatively simple, on the one hand, they capture a respondent's knowledge of financial instruments, e.g. Kisan, credit or ATM cards, and, on the other hand, they measure a respondent's knowledge of common financial procedures. Moreover, recent studies stress the importance of simplicity with respect to financial training and literacy tests, especially in developing countries (Drexler et al., 2014).

The respondent can answer with 'yes', 'no' and 'don't know what this is'. We consider 'yes' as having knowledge of the financial topic being asked and 'don't know what this is' as not having knowledge. However, the meaning of the 'no' reply is not straightforward. On the one hand, we believe that those who answer 'no' –given the option 'don't know what this is'—are aware of the financial topic at hand, and hence could be considered as having knowledge of it. On the other hand, those who answer 'yes' seem to have better knowledge (or at least more confidence in their knowledge) than those who say 'no'. To make sure that our empirical findings do not depend on our categorisation of the 'no' response, we build two indices for each question based on two different definitions for the 'no' reply.

For the **Financial Literacy Index 1 (FL1)** both 'yes' and 'no' responses take on the value of one (knowing), while 'don't know what this is' takes on the value of zero (not knowing). The **Financial Literacy Index 2 (FL2)** defines that a respondent who says 'no' to a particular

[8] Individuals in developing countries are often not aware that certain financial products exist, which prevents them from using the existing financial opportunities (see Boente and Filipiak, 2012). By asking "Do you know what an ATM / Credit card is" and allowing participants to respond with "yes", "no", or "don't know what it is", we believe to capture financial knowledge at the very basic level. Although we are not able to establish whether they really know the value of inflation rate (as this question is not provided in the questionnaire), it is apparent that those who answer "yes" have a better knowledge of inflation than those who say "I don't know what it is".

financial literacy question has a lower level of knowledge than those who say 'yes', but a higher level of knowledge than those who respond 'I don't know what this is'. Accordingly, the 'yes', 'no' and 'don't know what this is'[9] responses take on the values 1, 0.5 and 0, respectively. In both indices, we take the sum of the responses on the six financial literacy questions asked. Accordingly, FL1 takes on the values from the set {0, 1, 2,... ,6} with 0 and 6 representing the lowest and highest levels of financial knowledge, respectively. However, given that the 'no' response has a value of 0.5 according to the index FL2, this index takes on values from the set {0,0.5,1,1.5,...,6}.

3.2.2 Explanatory Variables

The NDSSP dataset allows us to identify individuals who live in the north-eastern Indian states of Nagaland, Mizoram and Meghalaya, where matrilineal structures are the predominant family structure.[10] Our first explanatory variable is the dummy variable *matrilineal* which takes on the value of one if the respondent lives in one of the three matrilineal states, and is zero otherwise. Although the majority of the people living in these states are indeed matrilineal, the data does not allow us to ensure that all respondents from these states belong to the matrilineal tribes. Nevertheless, the matrilineal culture is the most prevalent culture in these states and are likely to have an influence on (the relatively few) individuals who moved from another Indian state to this area. Moreover, the region is geographically isolated relative to other Indian states, making the influence of the patriarchal culture in neighbouring states fairly low.

Given that previous literature has shown that financial literacy depends on individual personal characteristics (for example, Lusardi and Mitchel, 2014; Fanta et al., 2016), our set of

[9] Although the choice "I don't know what this is" clearly suggests not knowing what the concepts inflation is or what the specific financial instrument (credit, Kisan or ATM card) is, its meaning for the question "Do you know the current value of all your investments/inheritance?" is less clear. It could imply that the respondent does not know what "current value" means. However, it could also indicate lack of knowledge on what "investment/inheritance" is. The same ambiguity can be raised about the question "Does the government guarantee full deposits in a nationalised bank?". Nevertheless, it is plausible to assume that all potential alternatives meanings of the "I don't know what this is" imply a lower level of financial literacy than the "yes" and "no" answers.

[10] Meghalaya, for instance, which is the largest matrilineal state we consider, is predominantly a tribal state. The population of Meghalaya during the 2001 Census was 2,318,822. Of these 1,992,862 persons were Scheduled Tribes (STs), which constitute 85.9 percent of the state's total population. The matrilineal Khasi constitute more than half of the total ST population of the state (56.4 per cent). The matrilineal Garo are second with 34.6 per cent. They together constitute 91 percent of the total ST population, and about 80% of the total population (see Census of India 2001).

explanatory variables includes the respondent's gender, marital status, age, social category, level of education, use of information sources, income from primary and secondary occupations, if they own land (other than the homestead) and the respondent's risk attitude. Note that some of these variables can, as discussed above, be considered transmission channels of how matrilineality affects financial literacy. In particular, if girls in matrilineal societies receive more education than in patriarchal societies to prepare them for their greater decision-making roles and this promotes their financial literacy, education would be an important transmission channel. The same can be said about use of information sources, or ownership of land which can also be treated as potential transmission channels.

The Scheduled Castes (SC) and Scheduled Tribes (ST) constitute the two most disadvantaged social groups in India. While the SC group refers to the bottom of the caste hierarchy, the ST group is comprised of several socially and economically marginalised tribes (Nakajima et al., 2017). The dummy variable *lower social category* takes on the value of one if the respondent belongs to either the SC or ST group, and zero otherwise.

Risk attitude is measured using a lottery-type question where only one of the three choices guarantees a positive return. The interviewee has to make a hypothetical investment of 1000 rupees and can choose between three alternative investments with equal probability. In the first choice, the 1000 rupees may increase to 2000 rupees after one year or the investor may only get 500 rupees back. In the second choice, the amount may increase to 1200 rupees or the investor may lose some of the money and get 800 rupees back. In the third choice, the amount will grow to 1050 rupees without any loss. The dummy variable *risk averse* takes on the value of one if an interviewee opts for the third choice and is zero otherwise.

The level of education of the respondents may strongly affect their financial knowledge (Lusardi and Mitchel, 2014; Klapper et al., 2015; Fanta et al., 2016). Given that the survey asks the highest level of education achieved, it does not indicate how many years the respondent has spent in school. Thus, we generate a dummy variable, which takes on the value of one if the individual has completed primary school and zero otherwise. Moreover, we consider whether or not the respondent speaks, reads or writes English.

The other potential set of explanatory variables include the use of information sources because financial information may be obtained through different channels. Thus, we consider whether or

not the respondent watches TV, listens to the radio, reads the newspaper or uses the internet. The corresponding dummy variable takes on the value of one if the respondent uses the information source at least once a week and is zero if the source is used less frequently.

Differences in financial knowledge may also be related to regional characteristics of the state where the respondent lives. To control for this issue, we consider whether the respondent lives in a rural or an urban area. Most importantly, our regressions include state dummies, which control for socio-economic development at the state level.

3.2.3 Methodology

In order to analyse if gender-specific differences in financial literacy persist even after controlling for observable characteristics, such as the level of education, income and the use of information sources, we firstly estimate an ordinary least squares (OLS) regression of the determinants of financial literacy in India, first for all states, and then separately for respondents living in matrilineal and patriarchal states. The reduced form regression model can be written as:

$$FL_i = \alpha + \beta_1 female_i + \beta_2 matrilineal_r + \beta_3 (female_i * matrilineal_r) + \beta_4 X + \varepsilon_i, \quad (1)$$

where the subscripts denote individual i and region r. FL denotes the financial literacy indicator, either FL1 or FL2, and X is a vector of the control variables mentioned above.

To understand the drivers of differences in financial literacy between men and women, we apply the Blinder-Oaxaca decomposition technique (Blinder 1973; Oaxaca 1973). This method allows us to decompose the financial literacy differences into the 'explained' and 'unexplained' parts.[11] Although the simplicity of this method has made it very popular amongst practitioners, its limitations, such as its lack of invariance to the choice of omitted group or counterfactuals, have also been widely discussed (see, for example, Jann, 2008 and Fortin et al. 2011).

In this study, we employ the following decomposition taken from Jann (2008):

$$\underbrace{FL_m - FL_f}_{Overall\ difference} = \underbrace{\left[E(X_m) - E(X_f)\right]' B^*}_{explained\ part} + \underbrace{\left[E(X_m)'(B_m - B^*)\right] + \left[E(X_f)'(B^* - B_f)\right]}_{unexplained\ part} \quad (2)$$

[11] See Fortin et al. (2011) for a detailed discussion of several decomposition methods and their limitations, and Jann (2008) for a discussion of the Blinder-Oaxaca method and its implementation in Stata.

In (2), FL denotes the financial literacy indices FL1 and FL2, B stacks the parameters attached to the explanatory variables X and the indices m, f and $*$ indicate that the parameters are obtained from linear estimations using the male sub-sample, the female sub-sample and the full sample, respectively. It is noteworthy that the decomposition will be done for patriarchal and matrilineal states separately so that the full sample could mean the full patriarchal sample or the full matrilineal sample. For the purpose of explaining how this decomposition works, we will restrict our attention to the patriarchal sample only. Accordingly, the 'explained' part (also known as 'endowment', 'characteristics' or 'quantity' effect) measures the portion of the financial literacy difference between men and women in patriarchal states that could be accounted for by differences in observed explanatory variables such as the level of education, income and the use of information sources. One limitation of this method is that the decomposition can be done using a different.[12] The remaining portion, the 'unexplained' part, is the residual, which might arise from different responses of the two groups for a given change in the explanatory variable (i.e. different βs) or differences in unobservables. In the literature, for instance in the research on the wage differential between men and women, a significant 'unexplained' part is often attributed to (unobserved) discrimination, (see, for example, Blinder, 1973; Jann, 2008). The 'explained' portion can provide information on the role of transmission channels in accounting for the gender differences in financial literacy, while a significant 'unexplained' part in our study would imply that unobserved cultural factors, amongst other factors, encourage patriarchal men to acquire (or discourage women from acquiring) financial knowledge.

4 Empirical Results

4.1 Descriptive Statistics

Table 1 reports group differences between female and male respondents in their financial knowledge. Panel A of the table reports group differences in financial knowledge, measured according to the Financial Literacy Index 1 (FL1); first, for all sample respondents except those who live in the three north-eastern states (Patriarchal sample); and second, only for those respondents who live in the three matrilineal states (Matrilineal sample). The table shows that in

[12] B^* obtained by using another counterfactual subsample than the pooled sample, and the results might depend on the choice of B^*.

patriarchal India, the percentage of women who know what is meant by all six financial items is significantly lower in comparison to men. In contrast, focusing only on individuals who live in matrilineal states, women and men do not differ significantly in their financial knowledge on the six considered financial items. Matrilineal women are also clearly more knowledgeable than patriarchal women. In fact, women in matrilineal states have, on average, a higher level of financial knowledge than even men in patriarchal states. For instance, 76.8 per cent of female respondents who live in matrilineal states say that they know what is meant by inflation, compared to 56.3 per cent of male respondents in patriarchal states. About 84.7 per cent of female respondents in the matrilineal states know what a credit card is compared to 58.2 per cent of men in patriarchal states. Moreover, it is an interesting result that even men in matrilineal states know more about the respective financial items than men in other Indian states.

Similar results are obtained using our second financial literacy index (FL2). Using the second index, Table 1 shows that gender differences are somewhat smaller in the patriarchal sample, but still significant indicating that men are more financially literate than women. For the matrilineal sample the only noteworthy differences are that a significantly higher percentage of women than men know about inflation (at the 5% significance level) while the reverse is true for knowledge of the Kisan card, though only at the 10 per cent level. [13]

Table 1 shows moreover, the gender gap as the differences in the financial literacy measures as the percentage of the overall mean level of financial literacy. These results are reported in the last column and show that the financial literacy gender gap in patriarchal states is about 10% (10.9% for FL1 and 9.6% for FL2). These gaps are on par with an average developing country financial literacy gender gap. For instance, Cupak et al. (2018) report that the financial literacy gender gap in developing countries varies between 3% in Croatia and Russia, 4% in Brazil and 18% in Jordan.

Table 2 reports summary statistics for all explanatory variables for the patriarchal sample in Panel A and for the matrilineal sample in Panel B. Statistics documented in Panel A show that 87.4 per cent of the male respondents from the patriarchal states are married compared to 67.7 per cent of the female respondents. Moreover, the men have an average age of 39.7 years, are

[13] Interestingly more women in matrilineal states than in patriarchal states state that they possess a Credit, ATM or KISAN card. Thus, a better knowledge about these instruments does not seem to be directly related to the possession of these financial instruments.

two years older than the women, and with 29.4 percent slightly more women belong to a lower social category than men (23.4 percent). Men are also characterised by a higher annual income compared to the women. In addition, 40.9 per cent of the male respondents report owning land, whereas only 27.3 per cent of the women reported are landowners. Furthermore, females are significantly more risk averse than men. With respect to education levels, almost half of the male respondents completed primary school education, while only 40.6 per cent of the women completed primary school. A similar pattern exists with respect to English language skills: 47.7 per cent of the men and 41.1 per cent of the women respondents can speak, read or write in English.

The women and men in patriarchal states also differ in their use of information sources. Approximately 63.0 per cent of the male respondents read newspapers at least once a week, compared to only 44.3 per cent of the female respondents. Internet usage was generally low at the time of the survey (2004/2005), with 3.6 per cent of the men and 4.1 per cent of the women indicating that they use the internet at least once a week. In contrast, a relatively larger share of the respondents reported using a radio or TV. On average, 52.2 per cent of the male and 42.7 per cent of the female respondents said that they listen to the radio, and 74.0 per cent of the male and 71.8 per cent of the female respondents reported watching TV at least once a week.

With respect to regional characteristics, a moderately larger percentage of the men (46.6) than the women (43.9) respondents live in areas that are considered to be rural.

In the patriarchal sample, in general, except for the use of the internet, the differences between men and women in all the explanatory variables are statistically significant. Moreover, except for living in rural areas, all of these differences are in line with the literature and our expectation in that they should lead to a lower level of financial literacy of women in comparison to men. In particular, the fact that fewer women are married, and women are younger, poorer, less educated and use information sources less frequently than men, is consistent with the lower level of financial literacy of patriarchal women in comparison to patriarchal men shown in Table 1.

Considering the summary statistics for the matrilineal sample documented in Panel B of Table 2, the following patterns emerge as the main differences with respect to the statistics for the patriarchal sample. First, unlike in the patriarchal sample, the differences between men and

women in all of the explanatory variables are often statistically insignificant. The few exceptions include the fact that more men are married than women and that men are older than women. Another important difference with the patriarchal sample is that education levels for both men and women are much higher, and a significantly higher percentage of women in matrilineal states read the newspaper and watch TV programs at least once a week than do men in matrilineal states. The absence of gender differences, compared to patriarchal societies in education, access to information, and land ownership suggests that these factors could be important transmission channels from the greater status of women in these societies to their greater financial literacy. We will test that below. Interestingly, the difference in risk aversion is similar in both societies, suggesting that women's status in the household is less related to this. We include risk aversion nevertheless as a potentially important control variable.

4.2 The Determinants of Financial Knowledge

4.2.1 The gender gap in financial knowledge

Table 3 documents estimation results from our baseline estimation on the determinants of financial literacy in India. The table reports the OLS results of our main variables of interest being *female* and living in a *matrilineal culture* on the two financial literacy indices FL1 and FL2. When considering the more fine-spun index FL2, the effects of our female variable are slightly smaller than for the index FL1. This indicates that when investigating gender differences, using a more precise measure is important. Similar effects are found for our measure of the matrilineal culture as well as the interaction of both. We start with a parsimonious regression that only includes dummy variables for gender, living in a matrilineal state, and the interaction term (columns 1 and 2), then we add our other explanatory variables in two blocs (columns 3-6) bearing in mind that some of them are likely transmission channels from matrilineal culture to financial literacy. Moreover, state dummies are included in all the specifications.

Columns 1-2 of Table 3 show that females in patriarchal societies have a 0.53 lower value of the index FL1 and a 0.34 lower value than men when using the index FL2. Given means of 4.1 for FL1 and 2.9 for FL2, these are large differences (gender gaps of 12.9 % and 11.7%). Men living in the matrilineal society have a slightly higher value of FL1 and FL2 than those who live in a

patriarchal environment though the coefficients are statistically insignificant. The positive interaction term between being female and living in a matrilineal society indicates that, even after accounting for state level socio-economic differences, women in matrilineal states are more knowledgeable than their peers in patriarchal states. In particular, women in matrilineal societies have a 0.49 higher value of FL1 and 0.36 higher value of FL2 than women in patriarchal societies. As a result, the gender gap found in patriarchal societies is nearly eliminated in matrilineal societies. With state dummies being the only additional explanatory variables, these results largely reflect the descriptive statistics shown in Table 1, where the financial literacy gender gap exists only in patriarchal states, and where women (and, to a lesser extent, men) have higher financial literacy in matrilineal societies.

In columns 3 and 4. we add a set of individual control variables, including the possible transmission channels education, and land ownership. Our main variables of interests, as well as the interaction term, still show statistically significant effects, but they all are quantitatively smaller now. This is likely to be due to the inclusion of education and English language which both have a sizable positive effect on financial literacy. Since female education and English language competence is much higher for females in matrilineal societies and the gender gap is much smaller there, these variables act as important transmission channels from culture to financial literacy. In contrast, land ownership does not seem to play an important role for financial literacy. The variable risk aversion shows a negative and significant effect on the financial knowledge of the respondents.

After adding the remaining information source variables in columns 5 and 6, our main variables of interest are smaller and some are now insignificant. While women in patriarchal societies still have significantly lower financial literacy than men (by 0.22 points for FL1 and 0.12 points for FL2), this difference is much smaller now. The interaction term remains positive but is smaller and not significant for either FL1 or FL2. This is a result of the strong positive effects of the information sources on financial literacy, where women in matrilineal societies do better, relative to women in patriarchal societies, and there is no gender gap. So it appears that the better access and use of information sources by women in matrilineal societies is another important transmission channel from culture to gender gaps in financial literacy.

The control variables all have the expected effects. Older people, those of higher social class

and with higher incomes and living in urban areas all have greater financial literacy. Married people have also higher financial literacy although the effect is not statistically significant when financial literacy is measured using FL1. On the contrary, risk aversion remains negatively associated with FL1, but the effect is not statistically significant for FL2. In all other cases, however, the two financial literacy measures are consistent in showing qualitatively similar effects of the explanatory variables on financial literacy.

As an alternative way of examining if a matrilineal cultural environment favours women's financial literacy more than a patriarchal does, we estimate the model separately for patriarchal and matrilineal states. Our aim here is to see if there is a difference between the patriarchal and matrilineal states in the statistical significance of the female dummy. The results in the first four columns of Table 4 show that, similar to the full sample results documented in Table 3, being female has a negative and statistically significant impact on the level of financial literacy of household heads in patriarchal states. Controlling for the full set of control and transmission variables, being female is associated with a 0.22 points and an 0.12 points lower financial literacy score for FL1 and FL2, respectively.

However, this gender effect vanishes when we consider matrilineal states only as documented in columns (5) - (8) of Table 4. Furthermore, results in columns (5) and (6) of Table 4 show that the absence of a significant financial literacy gender gap in matrilineal states is evident even when no other variable except state dummies and a constant are included in the regression. The latter evidence is consistent with the statistically insignificant differences between the mean financial literacy of women and men documented in the descriptive statistics (Table 1). Thus, results presented in Table 3 and 4 confirm our hypothesis that the financial literacy gender gap is a fact of patriarchal states and not of matrilineal states.

Among the key transmission channels we identified, education and internet and TV use have a similarly positive and statistically significant impact on financial literacy in both types of societies. Other information sources and English language competence have a larger impact in patriarchal than in matrilineal societies, likely reflecting the fact that the sample size in the matrilineal sample is not large enough to allow disentangling separate effects of highly correlated variables, such as being educated and knowing the English language (see Table A3 in the Appendix), on financial literacy. In order to investigate the role of these transmission

channels in the two different cultural environments in more detail, we employ the Blinder-Oaxaca decomposition analysis.

4.2.2 **Blinder-Oaxaca decomposition results**

In order to investigate in greater detail why the financial literacy gender gap exists in patriarchal Indian states and not in matrilineal Indian states, we employ the Blinder-Oaxaca decomposition method. Results are reported in Table 5 for patriarchal states and in Table 6 for matrilineal states. The underlying regressions for the total sample (males and females) in the two regions that form the basis for these decompositions are shown in Table A.4. This method allows us to investigate how much of the observed financial literacy differences could be accounted for by our transmission channels and other control variables and how much remains unexplained.

The upper panel of Table 5 shows that differences in our transmission channels, (education, English language competence, and the use of information sources) account for around 49% per cent of the gender gap in financial literacy in patriarchal states. Results from using FL1 are similar to those of FL2, except that the explanatory power is higher for FL2 with respect to personal characteristics as well as for education and English skills. Among the personal characteristics that are controls, we find that the financial literacy gender gap could in part be attributed to men's higher probability of getting married, being older, belonging to an upper social category and owning land in comparison with women. In general, differences in personal characteristics contribute, however, to only 17-24 per cent of the financial literacy gender gap in patriarchal states.

Among the transmission channels, education explains a significant portion of the observed gender gap. Looking at both financial literacy indices, differences in the percentage of men and women who have completed primary school education and who can speak, read and write in English are relatively similar. Both indicators show that these determinants could explain about 21 percent (FL1) and 23.8 percent (FL2) of the financial literacy gender gap in patriarchal Indian states. Another 28 percent (FL1) of the observed financial knowledge differences between men and women could be attributed to the more frequent use of information sources (newspapers, radio, and TV, but not the internet) by men in comparison to women. Of this effect, about 88 per cent is accounted for by reading newspapers. Finally, the regional factor of living in rural areas has a statistically significant and negative, but quantitatively small, effect on the financial

literacy gender gap.

A sizable share of the observed financial literacy gender gap remains unexplained by the differences in observable factors included in the model. With respect to FL1, about 37.81 per cent remains unexplained and 30.50 percent using FL2. Thus, the unexplained part is smaller when using the more fine-spun index FL2. This 'unexplained' part could be further decomposed into the distinct responses of the financial literacy of women and men for a given change in observable effects (the so-called 'coefficient effect') and the 'unexplained' part due to unobservables. This unexplained part indicates that there are other determinants affecting financial literacy which we do not account for in the model. While most of the coefficients are not statically significant, we observe that the financial knowledge of patriarchal men responds distinctly to that of women with regard to changes in income and, to a smaller degree, to changes in the use of radio. This implies that the higher level of income for men has substantially widened the financial literacy gender gap, not only because income positively affects financial literacy (endowment effect), but also because for a given level of increase in income men increase their financial literacy with a higher magnitude than women (coefficient effect). The coefficient effects of radio is negative, implying that a given increase in the frequency of use of radio increases the financial literacy of women more than it increases the financial literacy of men.

Note that the 'coefficient effect' could also be obtained by using the interaction terms of the *female* dummy with other explanatory variables in the OLS estimation of the determinants of financial literacy documented in Table 3.

Still, a sizable portion of the financial literacy gender gap cannot be attributed to either the endowment or the coefficient effects. This underscores the potential impact of deeper cultural factors that are not captured by our model. In particular, we argue that men in patriarchal societies are likely to invest more in acquiring financial knowledge from early childhood than their female peers. Whereas men in a patriarchal culture grow up knowing that they will one day be in charge of household financial and economic decisions, women in these societies know that someone else will be responsible for the economic and financial matters of the family in the future. This tendency could have already been reflected by men's larger investment in general human capital, English language skills and their use of the mass media. Nonetheless, the means

of acquiring financial knowledge could also include other channels not observed by the data. For instance, men might be keen to hear and ask about financial issues whenever there are formal or informal gatherings in the household or community.

In Table 6, we do the same decomposition for matrilineal societies. The table shows that the gender gap is very small and there are hardly any significant effects by the explanatory variables. This is not surprising as women and men differ little in characteristics in matrilineal societies and there is not much of a difference in financial literacy to explain as shown in Tables 1 and 2.

5 Robustness Checks

In order to test the robustness of our results, we conduct several additional analyses. First, with respect to the construction of our dependent variables, we apply alternatively the Principal Component Analysis (PCA), instead of summing up the values from the six individual components to arrive at FL1 and FL2 to reduce the data to obtain a few linear combinations of the data that contain most of the variance. Polychoric correlations between the six individual items and corresponding estimates of principal components are provided in Tables A1 and A2 of the Appendix. It can be seen from the tables that while the first three financial literacy measures (knowledge about inflation, bank deposit and investment) are less correlated to each other and to the other measures that reflect knowledge about financial instruments (credit card, Kisan Card and ATM Card), the latter measures are highly correlated to each other, especially for FL1. With respect to principal components, it appears that using one principal component accounts for more than half of the variations in the indices while using two principal components accounts for most of the variation in (80.3% for FL1 and 73.6% for FL2).

We further use the first principal components as alternative financial literacy indices to show the robustness of our key results to distinct types of data reduction. Thus, second, we compute FL1 and FL2 not by summing individual values of the six financial literacy questions as before, rather by taking the first principal components from the polychoric correlations between the six individual items. The results show that our key findings remain unchanged when using the PCA-based indices.

Third, we study whether the results are robust to dropping individual items of the two financial literacy indices. Specifically, one may argue that knowledge or possession of credit,

Kisan or ATM cards is more an indicator of financial information than financial literacy. We drop these items from the financial literacy indices and find that our results are still unchanged, and all our key findings are preserved. We also re-estimated the models additionally excluding the question about the knowledge of inflation from the index as this is also partly a matter of financial information. This does not change the key results either.

Fourth, we use the sample of 40,773 observations instead of our working sample of 28,378, which excludes respondents without positive annual savings and/or without a savings account. As already mentioned in Section 3.1, results using the bigger sample are qualitatively very similar to those reported in Tables 3 and 4.[14]

Moreover, we check the robustness of our results by adjusting standard errors for intra cluster correlation within Indian states as well as within Indian villages. As the error term may contain unobserved village level, or state level effects and standard errors of the effects of our aggregate explanatory variables might be biased. However, adjusting standard errors for intra-cluster correlation at the village level (97 villages) or at the state level (26 states) leaves our main results unaffected.

Finally, as some of the control variables could be strongly correlated, we document the polychoric correlations between all the control variables in Table A3 of the Appendix. The level of correlation among most of the control variables is fairly low. However, there are a few instances of a very high degree of correlation, including the one between being educated and English language (0.85), being educated and using newspaper (0.74), using TV and newspaper (0.65), and between living in a matrilineal state and belonging to a lower social class (0.71). As these few instances of high correlation will not bias our estimation, but only affect the statistical significance of some of the correlated variables, we refrain from dropping these variables. Rather, we note these high correlations while discussing insignificant coefficients associated with such variables.

6 Discussion

While a number of studies have investigated the role of financial decision-making for financial knowledge especially for women, existing evidence about the role of culture for financial literacy

[14] Results can be obtained upon request.

is still limited. We investigate empirically the role of culture, testing the widely reported financial responsibility hypothesis which explains the differences in financial knowledge between women and men. In contrast to existing studies which analyze financial intra-household decision making for financial literacy, we distinguish whether the role of the economic and financial decision maker in the household is ascribed to men or women by culture. Moreover, we explain how financial knowledge can be acquired in a matrilineal or patriarchal cultural environment, namely through different *transmission channels*, when culture favours the intra-household economic and financial decision maker role of either men or women. We identify as relevant transmission channels, the use of information sources, education, and a sound knowledge of English.

Culture can be considered as a system of shared beliefs, values, customs, behaviours, and artefacts that the members of a certain society use to interact with their world and with one another. These cultural values and customs are transmitted from generation to generation through teaching and learning. If, for instance, women are by culture responsible for economic and financial decisions in the household, they may be more alert to gather new financial information than women who are not dealing with financial responsibilities at all because the possession of such knowledge is important for them to make sound financial decisions. Similarly, a certain level of education, as well as knowledge of the English language facilitates the processing of new knowledge. Sub-optimal financial decisions could lead to negative outcomes. Thus, the stronger females' financial responsibilities are positioned in the society - as in the matrilineal society - the higher is their financial knowledge acquired through different sources and means. Perhaps most importantly, women who grow up in a society that assigns household decision financial and economic decision making know from early childhood that they will not hand over their responsibilities in the future to their husband. This puts matrilineal women in a similar position to men in a patriarchal society who know that they will not hand over the role of the household financial manager to their spouse.

In India, cultural structures are still very strict, and norms and traditions are strongly embedded in the cultural environment. A good example is, for instance, the caste system, which – despite being officially outlawed by the Indian government in 1950- still persists and affects the daily life of individuals belonging particularly to lower caste groups (see Hoff and Pandey,

2006; Bönte and Filipiak, 2012).[15] Although we are not able to observe individuals over time, we argue that the intra-household role structure is determined by culture and highly persistent over time. It could be argued, however, that women are by nature less interested in financial matters than men. If this were true, this could easily explain the widely reported phenomenon that women are less financially literate than men. It would then not make any difference whether women are more or less financially responsible or live and grow up in a cultural environment where financial responsibilities are ascribed to women. This would however contradict with our observation that women are as financially knowledgeable as men in matrilineal states of India.

Our approach allows us to disentangle cultural effects where financial responsibilities are ascribed either to men or women in the household by birth from financial responsibilities that women face when they are single, their relationships break, or during widowhood. Our results show, firstly, that a gender gap exists in patriarchal states whereas it does not exist in matrilineal states. Women are less likely to know about general as well as about more precise financial matters. Interestingly, our interaction term between the female and matrilineal dummies is positive and statistically significant, implying that women who live in a matrilineal state have a higher level of financial literacy than women in patriarchal states.

Among the transmission channels, *information sources* seem to be the most relevant. Those individuals who are regularly reading the newspaper, listening to the radio, watching TV or browsing the internet are more likely to possess general as well as more specific financial knowledge than those who do not use these information sources.

From our descriptive results we learn that while patriarchal women use information sources less frequently than patriarchal men, matrilineal females use information sources significantly more often than patriarchal women, patriarchal men and even slightly more often than matrilineal men. Thus, it appears that the specific cultural trait of intra-household economic and financial responsibilities of women makes a difference by providing access and interest for the acquisition of financial knowledge through information sources.

In India, still a lot of information is provided in *English*. Thus, a sound knowledge of the

[15] In order to strengthen the opportunities for individuals belonging to scheduled castes and scheduled tribes (the so called backward castes in India), the Indian government has targeted many affirmative action programs over the past years. Nonetheless, it remains challenging to motivate individuals belonging to these caste groups to take other opportunities e.g. in occupation and education than their caste respective ones.

English language enables individuals seeking financial information to process it more easily and in a larger amount. Similarly, it can be argued that individuals with a higher level of *education* are more capable of understanding the financial information provided. In the matrilineal culture, female education is highly encouraged and it is more important than the education of boys. Thus, girls are trained from early childhood that knowledge in general is important whereas the patriarchal culture places more emphasis on education of boys. Thus, culture could affect financial knowledge through its impact on education. Nonetheless, in Meghalaya for instance, there are no differences in math competencies among high school boys and girls.[16]

The results of the Blinder-Oaxaca decomposition corroborate the aforementioned arguments. The results show, for instance, that education, a sound knowledge of English and the use of information sources explain more than 65 per cent of the gender gap in financial knowledge in a patriarchal cultural environment. Although we identified relevant transmission channels explaining the financial literacy gender gap, the Blinder-Oaxaca decomposition results point further to a sizable gap that cannot be explained by our variables included in the model in the patriarchal culture. We argue that this unexplained portion could likely refer to patriarchal men's tendency to invest more in acquiring financial knowledge from early childhood than their female peers, as the former grow up knowing that they will be in charge of household financial decisions in the future. In Indian culture, patriarchal men have a strong intra-household standing, and boys learn this from early childhood, similar to girls in the matrilineal society. This explains the result that no observable gender gap in financial knowledge exist in the matrilineal society where girls know from childhood that they will be responsible for managing household finances in the future.

In a developing country context, it is important to employ measures that firstly, capture financial knowledge at a very low level, as many individuals still possess little financial knowledge, and secondly, to use measures that are fine-spun enough to portray differences at lower levels of financial literacy. Our results show that although both indices do not differ much, the more fine-spun Index FL2 explains more of the financial literacy gender gap.

Three main policy implications can thus be derived from our empirical findings. Firstly, education is a relevant determinant to mitigate the financial literacy gender gap in developing

[16] The math scores are obtained from the Human Development Survey 2004-05.

countries. Policies should therefore focus not only on providing elementary education, but also on financial education to boys and girls beginning in early childhood; in patriarchal societies, promoting the education of girls will be of particular importance. Secondly, investments in expanding access to mass media could also improve women's financial knowledge. These could be effective channels through which financial information can become much more available for women (e.g. through specific broadcasts). Thirdly, however, cultural norms need to change in such a way that women anticipate that they will be responsible for financial and economic decisions from an early age. This is probably the most challenging, as norms and habits set by a culture are difficult to change. One potential way of achieving this in patriarchal societies is through educating young girls to be economically responsible right from when they are young.

7. Conclusion

This paper shows that the widely observed fact of women's lower financial knowledge compared to men, is also a matter of cultural gender norms and rules embedded in society. We use a quasi-experimental framework in India where the existence of matrilineal societies offers a rare natural experiment. The Khasis, Jaintias and Garos, who live in the north-eastern Indian states of Nagaland, Mizoram and Meghalaya, form one of the few matrilineal cultures in the world. In these states, women are household heads and know from early childhood that they will be responsible for household economic and financial decisions in the future. Using a nationally representative Indian survey, we find that women are generally less likely to have knowledge of different financial instruments and practices than men, which is a widely observed fact in developing as well as in developed countries. We use two indices based on six simple questions capturing general financial knowledge. Our estimation results suggest that being female is indeed associated with significantly lower financial knowledge. We find, moreover, that individuals who live in one of the matrilineal states are more likely to have a better financial knowledge. The use of information sources, education as well as a sound knowledge of the English language are relevant transmission channels for female knowledge acquisition. and it appears that these transmission channels, are more relevant when women have sufficient economic and financial responsibilities within the household.

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Table 1: Means and standard deviations in financial knowledge

	Men			Women			Difference		
	Mean	St.Dev.	Obs.	Mean	St.Dev.	Obs.	Difference	Gender gap (in %)	t-Statistic
Panel A: Financial Literacy Index 1									
Patriarchal sample									
Inflation	0.563	0.496	24672	0.505	0.500	2811	0.059	10.5	5.9
Deposit guarantee	0.935	0.246	24672	0.887	0.317	2811	0.048	5.2	9.6
Actual investments	0.825	0.380	24672	0.778	0.416	2811	0.047	5.8	6.2
Credit card	0.582	0.493	24672	0.497	0.500	2811	0.086	14.9	8.7
Kisan Card	0.632	0.482	24672	0.505	0.500	2811	0.127	20.5	13.2
ATM Card	0.616	0.486	24672	0.537	0.499	2811	0.079	13.0	8.2
FL1	4.155	1.813	24672	3.708	2.017	2811	0.446	10.9	12.2
Matrilineal sample									
Inflation	0.776	0.417	705	0.768	0.423	190	0.007	1.0	0.2
Deposit guarantee	0.950	0.217	705	0.937	0.244	190	0.014	1.4	0.7
Actual investments	0.930	0.254	705	0.921	0.270	190	0.009	1.0	0.4
Credit card	0.833	0.374	705	0.847	0.361	190	-0.015	-1.8	-0.5
Kisan Card	0.783	0.413	705	0.737	0.442	190	0.046	6.0	1.3
ATM Card	0.816	0.388	705	0.779	0.416	190	0.037	4.5	1.1
FL1	5.088	1.396	705	4.989	1.455	190	0.098	1.9	0.9
Panel B: Financial Literacy Index 2									
Patriarchal sample									
Inflation	0.383	0.383	24672	0.351	0.389	2811	0.032	8.5	4.2
Deposit guarantee	0.889	0.275	24672	0.847	0.331	2811	0.042	4.8	7.6
Actual investments	0.690	0.382	24672	0.647	0.404	2811	0.043	6.3	5.7
Credit card	0.306	0.272	24672	0.260	0.271	2811	0.046	15.4	8.6
Kisan Card	0.331	0.267	24672	0.257	0.259	2811	0.074	22.9	14.0
ATM Card	0.347	0.303	24672	0.305	0.310	2811	0.042	12.4	7.0
FL2	2.948	1.202	24672	2.666	1.333	2811	0.281	9.6	11.6
Matrilineal sample									
Inflation	0.554	0.369	705	0.626	0.405	190	-0.072	-12.7	-2.3
Deposit guarantee	0.887	0.262	705	0.863	0.286	190	0.023	2.7	1.1
Actual investments	0.795	0.309	705	0.779	0.319	190	0.016	2.0	0.6

Credit card	0.421	0.195	705	0.432	0.194	190	-0.010	-2.4	-0.6
Kisan Card	0.396	0.213	705	0.371	0.225	190	0.025	6.3	1.4
ATM Card	0.440	0.242	705	0.426	0.262	190	0.013	3.1	0.7
FL2	3.492	0.996	705	3.497	1.137	190	-0.005	-0.1	-0.1

Table 1 reports the means and standard deviations for the group differences between women and men with respect to the two alternative financial literacy indices and the six individual measures that make up the two indices. The respondents have three options to respond to each of the six financial literacy questions: 'yes', 'no' or 'I don't know what this is'. In Financial Literacy Index 1 (FL1), both 'yes' and 'no' responses take on the value of one (knowing), while 'don't know what this is' takes on the value of zero (not knowing). In Financial Literacy Index 2 (FL2), the 'yes', 'no' and 'don't know what this is' responses take on the values of 1, 0.5 and 0, respectively. The first index, FL1, is obtained as the sum of the six indicators, while the second index: FL2, equals the sum of the six but is the more fine spun measure as it is the more gradual measure. FL1 is defined between 0 and 6 {1, 2, 3,...6}, with 0 as not knowing at all and 6 as having knowledge of all of the six financial measures. FL2 is similarly defined except that it considers half-steps {0, 0.5, 1, 1.5,...6}.

Table 2: Summary statistics for the explanatory variables

	Men			Women				
	Mean	St.Dev.	Obs.	Mean	St.Dev.	Obs.	Diff-	t-Statistic
Sample A: Patriarchal states								
Married	0.874	0.331	24672	0.677	0.468	2811	0.198	28.6
Age*	39.699	11.393	24672	37.818	10.829	2811	1.881	8.3
Lower social class	0.234	0.424	24672	0.294	0.456	2811	-0.060	-7.0
Income*	8.616	1.382	24659	8.267	1.616	2810	0.350	12.5
Landowner	0.409	0.492	24672	0.273	0.446	2811	0.136	14.1
Risk averse	0.748	0.434	24672	0.771	0.421	2811	-0.022	-2.6
Educated	0.498	0.500	24672	0.406	0.491	2811	0.092	9.3
English	0.477	0.499	24672	0.411	0.492	2811	0.067	6.7
Newspaper	0.630	0.483	24672	0.443	0.497	2811	0.187	19.4
Internet	0.036	0.185	24672	0.041	0.197	2811	-0.005	-1.3
Radio	0.522	0.500	24672	0.427	0.495	2811	0.095	9.6
TV	0.740	0.439	24672	0.718	0.450	2811	0.022	2.5
Rural	0.466	0.499	24672	0.439	0.496	2811	0.027	2.7
Sample B: Matrilineal states								
Married	0.867	0.340	705	0.511	0.501	190	0.356	11.5
Age*	40.555	10.331	705	37.068	10.584	190	3.486	4.1
Lower social class	0.894	0.309	705	0.937	0.244	190	-0.043	-1.8
Income*	9.419	1.225	705	9.538	1.298	190	-0.119	-1.2
Landowner	0.348	0.477	705	0.321	0.468	190	0.026	0.7
Risk averse	0.824	0.381	705	0.874	0.333	190	-0.050	-1.6
Educated	0.777	0.416	705	0.784	0.412	190	-0.007	-0.2
English	0.888	0.316	705	0.874	0.333	190	0.014	0.5
Newspaper	0.896	0.305	705	0.958	0.201	190	-0.061	-2.6
Internet	0.108	0.310	705	0.153	0.361	190	-0.045	-1.7

Radio	0.732	0.443	705	0.732	0.444	190	0.000	0.0
TV	0.904	0.295	705	0.968	0.175	190	-0.065	-2.9
Rural	0.399	0.490	705	0.342	0.476	190	0.056	1.4

Table 2 reports the summary statistics for the explanatory variables separately for women and men. The table reports t-test results for the group differences between women and men in matrilineal and patriarchal India. Continuous variables are indicated by one asterisk.

Table 3: Determinants of financial literacy in all Indian states

	1	1	3	4	5	6
Variables	FL1	FL2	FL1	FL2	FL1	FL2
Female	-0.530***	-0.337***	-0.319***	-0.180***	-0.223***	-0.119***
	(0.037)	(0.025)	(0.032)	(0.022)	(0.031)	(0.021)
Matrilineal	0.211	0.463	0.074	0.344	-0.152	0.179
	(0.311)	(0.399)	(0.845)	(0.744)	(0.757)	(0.696)
Female*Matrilineal	0.493***	0.362***	0.311***	0.233***	0.157	0.125
	(0.119)	(0.088)	(0.117)	(0.086)	(0.116)	(0.085)
Married			0.038	0.046***	0.035	0.050***
			(0.026)	(0.018)	(0.026)	(0.017)
Age			0.004***	0.004***	0.005***	0.005***
			(0.001)	(0.001)	(0.001)	(0.001)
Lower social class			-0.190***	-0.133***	-0.149***	-0.106***
			(0.022)	(0.014)	(0.022)	(0.014)
Income			0.154***	0.123***	0.118***	0.096***
			(0.007)	(0.005)	(0.007)	(0.005)
Land owner			0.044**	0.048***	0.049**	0.054***
			(0.020)	(0.013)	(0.020)	(0.013)
Risk averse			-0.108***	-0.035**	-0.090***	-0.021
			(0.021)	(0.014)	(0.021)	(0.014)
Educated			0.714***	0.480***	0.517***	0.349***
			(0.024)	(0.016)	(0.025)	(0.016)
English			0.876***	0.608***	0.671***	0.469***
			(0.025)	(0.016)	(0.025)	(0.016)
Newspaper					0.587***	0.367***
					(0.025)	(0.016)
Internet					0.251***	0.442***
					(0.032)	(0.027)
Radio					0.089***	0.066***
					(0.018)	(0.012)
TV					0.352***	0.229***
					(0.025)	(0.016)

Rural			-0.415***	-0.253***	-0.282***	-0.164***
			(0.021)	(0.014)	(0.021)	(0.014)
Constant	4.803***	3.564***	2.887***	1.998***	2.455***	1.716***
	(0.045)	(0.034)	(0.079)	(0.055)	(0.079)	(0.054)
Observations	28,378	28,378	28,364	28,364	28,364	28,364
R-squared	0.147	0.125	0.370	0.366	0.397	0.395

Table 3 reports the OLS estimation results on the determinants of financial literacy in Indian states. Robust standard errors are given in parentheses. ***, **, * denote significance at the 1, 5 and 10 per cent levels, respectively. FL1 and FL2 are the two financial literacy indices, each constructed from six different financial literacy questions. All specifications include state dummies. For further notes, see Table 1.

Table 4: Determinants of financial literacy in patriarchal and matrilineal Indian states

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	FL1	FL2	FL1	FL2	FL1	FL2	FL1	FL2
Female	-0.530***	-0.337***	-0.219***	-0.117***	-0.036	0.026	-0.095	0.002
	(0.037)	(0.025)	(0.031)	(0.021)	(0.113)	(0.085)	(0.116)	(0.087)
Married			0.039	0.052***			-0.032	0.024
			(0.026)	(0.017)			(0.126)	(0.092)
Age			0.005***	0.005***			-0.004	-0.001
			(0.001)	(0.001)			(0.005)	(0.003)
Lower social class			-0.145***	-0.102***			-0.193	-0.204*
			(0.022)	(0.014)			(0.160)	(0.109)
Income			0.120***	0.098***			0.007	0.017
			(0.007)	(0.005)			(0.039)	(0.028)
Land owner			0.053***	0.059***			-0.075	-0.091
			(0.020)	(0.013)			(0.097)	(0.069)
Risk averse			-0.087***	-0.018			-0.251**	-0.142*
			(0.021)	(0.014)			(0.104)	(0.074)
Educated			0.514***	0.345***			0.578***	0.452***
			(0.025)	(0.016)			(0.141)	(0.096)
English			0.682***	0.477***			0.062	0.066
			(0.025)	(0.016)			(0.176)	(0.118)
Newspaper			0.587***	0.368***			0.357	0.201
			(0.025)	(0.016)			(0.245)	(0.156)
Internet			0.249***	0.446***			0.295***	0.412***
			(0.034)	(0.028)			(0.090)	(0.083)
Radio			0.093***	0.066***			-0.074	0.064
			(0.018)	(0.012)			(0.113)	(0.078)
TV			0.352***	0.228***			0.335	0.272*
			(0.025)	(0.016)			(0.233)	(0.145)
Rural			-0.281***	-0.164***			-0.313***	-0.158**
			(0.021)	(0.014)			(0.115)	(0.078)

Constant	4.803***	3.564***	2.408***	1.687***	4.515***	3.008***	4.164***	2.421***
	(0.045)	(0.034)	(0.080)	(0.055)	(0.102)	(0.069)	(0.463)	(0.309)
Observations	27,483	27,483	27,469	27,469	895	895	895	895
R-squared	0.141	0.120	0.397	0.396	0.074	0.111	0.169	0.225

Notes: The table shows OLS regression results for patriarchal and matrilineal states separately. The dependent variables are the financial literacy measures FL1 and FL2, which are each constructed from six different financial literacy questions (see Table 1). All specifications include state dummies. Robust standard errors are given in parentheses. ***, **, * denote significance at the 1, 5 and 10 per cent levels, respectively.

Table 5: The Blinder-Oaxaca decomposition: financial knowledge differences between men and women in patriarchal states

		FL1		FL2	
Panel A					
		Overall		Overall	
Men		4.155***		2.948***	
Women		3.708***		2.666***	
Gender gap		0.447***		0.282***	
Explained		0.228*** (62.19%)		0.165*** (69.50%)	
Unexplained		0.219*** (37.81%)		0.117*** (30.50%)	
Panel B					
Variables		Explained	Unexplained	Explained	Unexplained
Personal characteristics					
Married		0.008	0.003	0.010***	-0.021
Age		0.010***	0.000	0.009***	-0.006
Lower social class		0.009***	-0.013	0.006***	-0.015
Income		0.042***	0.653***	0.034***	0.593***
Land owner		0.007***	0.004	0.008***	0.000
Risk averse		0.002**	0.070	0.000	0.043
	Sub sum	0.078	0.907	0.058	0.773
		(17.4 %)		(23.8 %)	
Knowledge and skill					
Educated		0.048***	-0.057	0.032***	-0.015
English		0.046***	-0.064	0.032***	-0.029
	Sub sum	0.094	-0.125	0.064	-0.036
		(21.0%)		(22.7%)	
Information sources					
Newspaper		0.110***	0.035	0.069***	-0.003
Internet		-0.001	0.005	-0.002	0.005
Radio		0.009***	-0.136***	0.006***	-0.107***
TV		0.008**	-0.080	0.005**	-0.036
	Sub sum	0.126	-0.176	0.078	-0.141

	(28.2%)			(27.7%)	
Regional characteristics					
Rural	-0.007***	-0.007		-0.004***	-0.017
Sub sum	-0.071	0.554		-0.045	-0.81
	(-15.9%)			(-16.0%)	
Constant		-0.754***			-0.622***
Overall sum	0.228	0.219		0.165	0.117
Observations	27,466	27,466	27,466	27,466	27,466

Note: Table 5 reports the financial knowledge differences for men and women living in the patriarchal states of India. It also documents the proportion of the financial literacy gender gap that is explained by all of the explanatory variables considered in the model (the explained part) and the part that could be attributed to distinct responses of the two groups for a given change in the explanatory variable (the unexplained part). 'Sub sum' is obtained as the sum of the reported numbers for a specific group of explanatory variables, and hence reflects the importance of those variables in explaining the financial literacy gender gap in patriarchal India. Dividing 'sub sum' by the overall gender gap yields the percentage of the total gender gap that is explained by that specific group of variables (given in parenthesis). The 'sub sum' for regional characteristics includes contributions of both the rural dummy variable and all the state dummy variables. ***, ** and * denote significance at the 1, 5 and 10 per cent levels, respectively.

Table 6: The Blinder-Oaxaca decomposition: financial knowledge differences between men and women in matrilineal states

	FL1		FL2	
Panel A				
	Overall		Overall	
Men	5.088***		3.492***	
Women	4.989***		3.497***	
Gender gap	0.098		-0.005	
Explained	0.003(3.1%)		-0.004 (80%)	
Unexplained	0.095 (96.9%)		-0.002 (40%)	
Panel B				
Variables	Explained	Unexplained	Explained	Unexplained
Personal characteristics				
Married	-0.011	-0.212	0.009	-0.090
Age	-0.014	0.415	-0.004	0.487
Lower social class	0.008	-0.197	0.009	-0.118
Income	-0.001	0.168	-0.002	0.339
Land owner	-0.002	-0.019	-0.002	-0.074
Risk averse	0.012	0.011	0.007	0.053
Sub sum	-0.008	0.166	0.017	0.597
	(8.2)		(-340.0%)	
Knowledge and skill				
Educated	-0.004	-0.035	-0.003	0.002
English	0.001	0.189	0.001	0.006
Sub sum	-0.003	0.154	-0.002	0.008

	(-3.1%)			(40.0%)	
Information sources					
Newspaper	-0.022	0.420		-0.012	0.377
Internet	-0.013	-0.038		-0.018	-0.002
Radio	-0.000	0.096		0.000	0.069
TV	-0.022	-0.183		-0.018*	0.156
Sub sum	-0.057	0.295		-0.048	0.574
	(-58.2%)			(960.0%)	
Regional characteristics					
Rural	-0.018	0.031		-0.009	0.062
Sub sum*	0.071	-0.015		0.031	-0.085
	(72.4%)			(-620.0%)	
Constant		-0.506			-1.119
Overall sum	0.003	0.095		-0.004	-0.002
Observations	895	895	895	895	895

See notes to Table 5.

Appendix A

Table A1: Polychoric correlations between components of FL1

	Inflation	Deposit guarantee	Actual investments	Credit card	Kisan Card	ATM Card
Inflation	1.000					
Deposit guarantee	0.357	1.000				
Actual investments	0.381	0.481	1.000			
Credit card	0.633	0.371	0.435	1.000		
Kisan Card	0.570	0.360	0.419	0.937	1.000	
ATM Card	0.657	0.364	0.390	0.930	0.873	1.000

Principal component analysis

Number of principal components	Eigenvalues	Proportion explained	Cumulative explained
1	3.827	0.638	0.638
2	0.989	0.165	0.803
3	0.522	0.087	0.890
4	0.498	0.083	0.973
5	0.117	0.020	0.992

6	0.045	0.008	1.000

Table A2: Polychoric correlations between components of FL2

	Inflation	Deposit guarantee	Actual investments	Credit card	Kisan Card	ATM Card
Inflation	1.000					
Deposit guarantee	0.108	1.000				
Actual investments	0.215	0.381	1.000			
Credit card	0.556	0.189	0.263	1.000		
Kisan Card	0.444	0.201	0.242	0.780	1.000	
ATM Card	0.579	0.174	0.244	0.839	0.681	1.000

Principal component analysis

Number of principal components	Eigenvalues	Proportion explained	Cumulative explained
1	3.156	0.526	0.526
2	1.193	0.199	0.725
3	0.643	0.107	0.832
4	0.566	0.094	0.926
5	0.302	0.050	0.977

6	0.140	0.023	1.000	

Table A3: Polychoric correlations between explanatory variable

	Female	Matrilineal.	Married	Age	Lower social class	Income	Land owner	Risk averse
Female	1							
Matrilineal	0.21	1						
Married	-0.37	-0.1	1					
Age	-0.09	0.01	0.44	1				
Lower social class	0.12	0.71	-0	-0.05	1			
Income	-0.1	0.27	0.08	0.11	-0.05	1		
Land owner	-0.18	-0.1	0.1	0.09	-0.02	0.06	1	
Risk averse	0.04	0.12	0.03	0.04	0.05	-0.09	0.03	1
Educated	-0.1	0.33	-0.1	-0.12	-0.13	0.34	-0.08	-0.07
English	-0.06	0.49	-0.1	-0.06	-0.09	0.35	-0.09	-0.06
Newspaper	-0.21	0.41	0	-0.03	-0.19	0.35	-0.15	-0.08
Internet	0.06	0.27	-0.2	-0.08	-0.03	0.33	-0.16	-0.1
Radio	-0.11	0.25	0.02	-0.02	0.01	0.03	0.01	-0.03

TV	-0.02	0.3	-0	-0.06	-0.11	0.3	-0.23	-0.12
Rural	-0.04	-0.1	0.06	0.02	0.11	-0.2	0.57	0

	Educated	English	Newspaper	Internet	Radio	TV	Rural
Educated	1						
English	0.85	1					
Newspaper	0.74	0.73	1				
Internet	0.54	0.56	0.57	1			
Radio	0.14	0.15	0.28	0.12	1		
TV	0.51	0.54	0.65	0.42	0.32	1	
Rural	-0.34	-0.3	-0.4	-0.32	0.03	-0.46	1

Table A4: Determinants of financial literacy in male-only and female-only subsamples: OLS estimation

	patriarchal states				matrilineal states			
	FL1		FL2		FL1		FL2	
Variables	male	female	male	female	male	female	male	female
Married	0.028	0.021	0.039**	0.066	-0.160	0.166	-0.032	0.105

	(0.029)	(0.063)	(0.019)	(0.042)	(0.161)	(0.201)	(0.115)	(0.151)
Age	0.006***	0.006**	0.005***	0.005***	-0.001	-0.011	0.002	-0.010
	(0.001)	(0.003)	(0.001)	(0.002)	(0.005)	(0.014)	(0.003)	(0.010)
Lower social class	-0.152***	-0.105	-0.110***	-0.057	-0.216	-0.006	-0.216*	-0.090
	(0.023)	(0.069)	(0.015)	(0.046)	(0.177)	(0.399)	(0.117)	(0.332)
Income	0.130***	0.052**	0.107***	0.036**	0.012	-0.006	0.030	-0.006
	(0.007)	(0.023)	(0.005)	(0.015)	(0.043)	(0.092)	(0.030)	(0.077)
Land owner	0.059***	0.046	0.062***	0.064	-0.094	-0.036	-0.133*	0.095
	(0.021)	(0.076)	(0.014)	(0.050)	(0.109)	(0.239)	(0.075)	(0.187)
Risk averse	-0.074***	-0.165**	-0.009	-0.065	-0.240**	-0.253	-0.130*	-0.191
	(0.022)	(0.075)	(0.015)	(0.050)	(0.109)	(0.343)	(0.075)	(0.256)
Educated	0.500***	0.637***	0.340***	0.375***	0.549***	0.594*	0.436***	0.433*
	(0.026)	(0.106)	(0.016)	(0.068)	(0.161)	(0.332)	(0.109)	(0.228)
English	0.671***	0.826***	0.472***	0.542***	0.116	-0.100	0.058	0.051
	(0.026)	(0.110)	(0.017)	(0.071)	(0.208)	(0.346)	(0.135)	(0.247)
Newspaper	0.593***	0.516***	0.368***	0.375***	0.416	-0.027	0.263	-0.135
	(0.026)	(0.093)	(0.017)	(0.060)	(0.275)	(0.418)	(0.176)	(0.296)
Internet	0.260***	0.124	0.458***	0.327***	0.219**	0.491***	0.395***	0.416**

	(0.036)	(0.108)	(0.030)	(0.091)	(0.107)	(0.182)	(0.096)	(0.177)
Radio	0.057***	0.368***	0.039***	0.283***	-0.041	-0.173	0.099	0.005
	(0.019)	(0.064)	(0.013)	(0.043)	(0.125)	(0.298)	(0.083)	(0.216)
TV	0.334***	0.444***	0.218***	0.267***	0.333	0.522	0.288*	0.126
	(0.027)	(0.081)	(0.017)	(0.051)	(0.250)	(0.607)	(0.154)	(0.451)
Rural	-0.295***	-0.279***	-0.176***	-0.138***	-0.308**	-0.398	-0.124	-0.299
	(0.022)	(0.072)	(0.014)	(0.048)	(0.123)	(0.304)	(0.082)	(0.213)
Constant	2.209***	2.963***	1.536***	2.159***	4.025***	4.531***	2.180***	3.299***
	(0.083)	(0.230)	(0.057)	(0.156)	(0.522)	(1.005)	(0.339)	(0.779)
Obs.	24,659	2,810	24,659	2,810	705	190	705	190
R-squared	0.392	0.435	0.395	0.417	0.165	0.202	0.225	0.261